



1. *Executive Summary*

This report investigates how Victoria Heavy Equipment Limited (VHE) can improve its current organisational structure and design. With the use of Robbins' Structural Model and questionnaire, VHE was determined as displaying a low level of formalisation, high level of complexity and low level of centralisation. Size, environment, strategy and technology were also analysed to identify their influences on VHE's structure.

Weak linkages and the lack of control were identified as problems because integration and control is crucial in aligning departments towards achieving organizational goals.

Vertical information systems (VIS) and Concurrent control system (CCS) have been integrated into the recommendation as a possible way of easing these two problems. An action plan was then devised to ensure smooth implementation of the recommendation.



2. *Introduction*

Understanding organisational theory not only throws light on how organisations operate in their ever changing environment, it also focuses on the various influences such as strategy, size, technology and environment on Robbins three structural dimensions.

Organisation Effectiveness (OE) helps to gauge how successful organisations are in achieving their goals (Daft, 1998). Having this knowledge will enable one to have a clearer picture as to the health of such organisations.

Linkage is the degree of information sharing and coordination in any organisation (Daft, 1998) while control is seen as a monitoring instrument to aid effectiveness. Failure to perceive these two elements can have disastrous implications for organisations.

Structural problems plaguing organisations can sometimes be resolved through the understanding and application of such theories, therefore they should not be taken so lightly.



3. Classification Of Organisation Structure

3.1 Brief Overview of the Organisation

VHE, established since 1902, had become the second largest producer of mobile cranes in the world. The organisation led by Walters, had since gone through two reorganisations in recent years to maintain its competitive stance in the crane market.

3.2 Description Of The Organisation's Structure

Organisation structure refers to the way an organisation allocates responsibilities, the extent of formalisation and the location of decision-making (Robbins and Barnwell, 1998).

Robbins' Structural Model and questionnaire had been adopted to provide an in-depth analysis of VHE's structural dimensions of complexity, formalisation and centralisation.

The following are the results of the questionnaire:

Robbins' Structural Dimensions	Score	(%)	Rating
Complexity The degree of differentiation that exist with an organization (Robbins, 1990)	23 /35	66%	High
Centralisation The degree to which decision making is concentrated at a single point in the organisation (Robbins, 1990)	11/50	22%	Low
Formalisation The degree to which rules, instructions, procedures and communications are written (Robbins, 1990)	11/35	28%	Low

Table 1: Results of Robbins' questionnaire

The following is an analysis of each dimension together with its supporting evidence and implications.

3.2.1 Complexity

Complexity consists of three types of dimensions, Horizontal, Vertical and Spatial differentiation.

Complexity's Three Dimension	Score	(%)	Rating
Horizontal Differentiation The degree of differentiation between units based on the orientation of members, the nature of the tasks they perform, and their education and training (Robbins, 1990)	7/10	70%	High
Vertical Differentiation The number of level of hierarchy (Daft, 1998)	9/10	90%	High
Spatial Differentiation The degree to which the location of an organisation's offices, plants and personnel are dispersed geographically (Robbins, 1990).	8/15	53%	Moderately High

3.2.1.1 Horizontal Differentiation

Percentage derived from questionnaire:	70%, High
Implications resulting from high horizontal differentiation:	<p>Lack of coordination between inter-department (Robbins, 1990).</p> <p>Difficulty in communication between organisational members (Robbins, 1990)</p> <p>Without the specific knowledge for the task, it would be impossible for the department to function effectively and efficiency.</p>
Evidence from case:	Every individual center requires specialised knowledge and skills to perform the task allocated to them.

3.2.1.2 Vertical Differentiation

Percentage derived from questionnaire:	90%, High
Implications resulting from high vertical differentiation:	Distortion of facts and information Intricacy for management to oversee actions of operation (Robbins,1990)
Evidence from case:	From the chief executive to those working on the production of the crane, there are probably more than 12 levels.

3.2.1.3 Spatial Differentiation

Percentage derived from questionnaire:	53%, Moderately high
Implications resulting from high spatial differentiation:	Lack of control and coordination Difficulty for separated decision makers to make decisions (Robbins, 1990)
Evidence from case:	VHE's operation is located in Canada and U.S.A.

VHE is identified as having high horizontal, vertical and spatial differentiation, hence the organisation is classified as high in complexity.

3.2.2 Formalisation

Percentage derived from questionnaire:	28%, Low
Implications resulting from low formalisation:	Potential overlapping of roles and responsibilities. Lack of standardisation and control
Evidence from case:	Walter had to bring in consultants to define staff responsibilities. Difficulty in allocating responsibilities

3.2.3 Centralisation

Percentage derived from questionnaire:	22%, Low
Implications resulting from low centralisation:	Exploiting the autonomy of decision making. Difficult to control, coordinate and implement policies. Departments may pursue their own agendas instead of supporting the corporate strategy .(Cushway and Lodge, 1993) Undermine authority of management
Evidence from case:	Lack of control resulted in over expenditure of profit centers Poor coordination of problem solving

3.2.4 Summary

Robbins' Structural Dimensions	(%)	Rating
Complexity	66%	High
Centralisation	22%	Low
Formalisation	28%	Low

To summarise, VHE is high in complexity, low in centralization and low in formalisation.



4. Influences On Structure

4.1 Strategy

Strategy (Robbins 1990) is the achievement of long term organisation goals through the undertakings of various decisions and resource allocations.

“ Structure tends to follow strategy” (Robbins & Coulter, 1999). It is vital to establish an appropriate structure to assist the strategy. There are three types of strategies, namely:

- 1) Corporate-level;
- 2) Business-level and
- 3) Functional-level.

Strategy Level	Definition
Corporate	A strategy that coordinates all Business-level strategies so as to enhances the organisation's standing in the market.
Business	A strategy that focuses on the best way compete other businesses in the same industry while supporting Corporate-level strategy.
Functional	A strategy that emphasizes on technical aspects of business operations to support Business-level strategy.

Adapted and modified from Bartol, Martin, Tein and Matthews, 1998.

4.1.1 Porter's Competitive Strategies

“Business-level strategy considers how a particular business competes. The best-known approach for strategy development at the SBU level is based on Porter's (1980) work” (Bartol, Martin, Tein and Matthews, 1998, pg 232).

The three generic Business-level strategies outlined by Porter are as follows:

Strategies	Definition	Predicted Structural Configurations
Cost-Leadership	A strategy that involves efficiency in production, leading to competitive advantage in low pricing of goods while up keeping quality.	High Complexity High Centralisation High Formalisation
Differentiation	A strategy that differentiates the product from others and that differentiating attribute is “significant enough to justify a price premium that exceeds the cost of differentiation” (Robbins, 1990, pg 137).	Low Complexity Low Centralisation Low Formalisation
Focus	A strategy that uses low cost, differentiation, or both strategies but in a narrower sense to compete in the market.	A continuum of structural configurations with low complexity, centralisation and formalisation on one end and high complexity, centralisation and formalisation on the other.

Adapted and modified from Robbins, 1990.

4.1.2 Victoria Heavy Equipment's Strategy

It is believed that VHE used Porter's competitive strategies. More specifically, VHE used the Focus strategy in its business and the reasons being:

- ♣ VHE only sold cranes and competed substantially in the customised cranes segment. (Differentiation)
- ♣ It tried to reduce costs in production, but this strategy was offset by the operation of inefficient and old equipment. (Cost-leadership)
- ♣ VHE focused on satisfying special orders from its customers because it cannot compete on price. (Differentiation)
- ♣ Flying in prospective clients from all over the world to visit its production plant in Walters' plane. (Differentiation)

4.1.3 Structural Fit

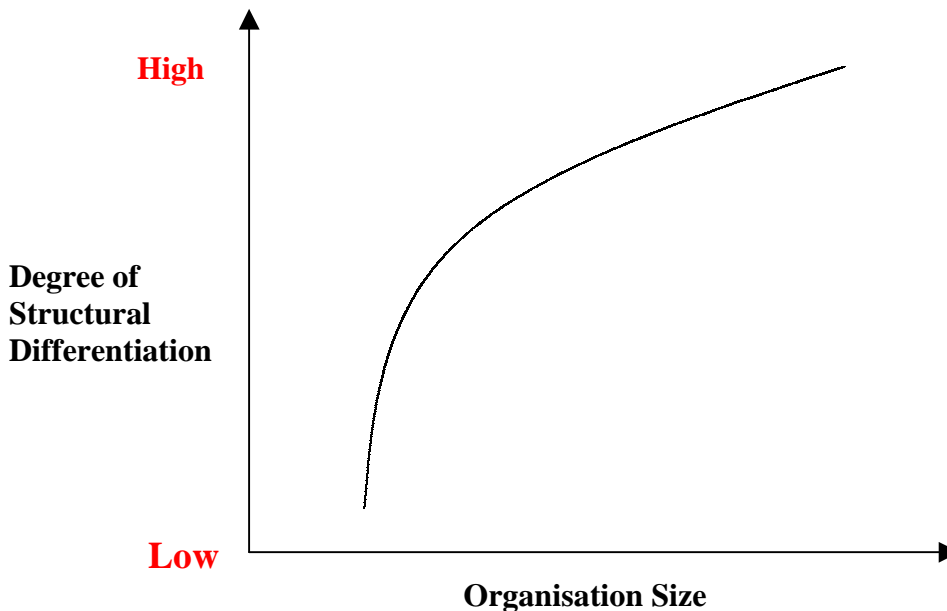
A match is seen in predicted structural configurations as VHE operates in a structure with high complexity and low centralisation and formalisation. These matched the characteristics of the Focus strategy's implications on structure. With this strategy, VHE will be able to maintain a competitive edge over its competitors.

4.2 Size

Size is measured in absolute terms as referred by Daft (1998). It can be used to measure the organisation as a whole or sub-divided into its plants or divisions. Robbins (1990) suggested that organisations with less than two thousand employees are considered as small in size.

A research by Blau (Robbins, 1990) showed that as organisations grow larger, its structure would be affected. He found that complexity increased with increasing size. Similarly, the Aston Group also discovered that as size increases, so will specialisation and formalisation.

While “organisational size was related positively to specialisation, formalisation and vertical span”(Robbins, 1990, pg. 152), it had a negative relation to centralisation.



Modified and adapted from Robbins, 1990.

From the diagram above, it can be seen that an increase in size affects the structure, but at declining rate, however, “size certainly does not dictate all of an organisation’s structure but that it is important in predicting some dimensions of structure” (Robbins, 1990, pg 157).

4.2.1 Structural fit

VHE is a small organisation in its industry. It should therefore display structural characteristics of being low in complexity and formalisation while being high in centralisation.

There is a mismatch as VHE operates with high complexity and pursues a more decentralised stance, however this is not necessary bad. Reasons being that VHE fought primarily in the custom-made cranes segment. In order to capture this segment effectively, various departments need to gather information on customers' preferences. They may have to work together to give what the customers desire and therefore resulting in having high complexity even when the organisation is small in the industry.

In some cases, decisions must be made on the spot regarding sales or tasks on hand that need immediate attention, hence the low centralisation to suit flexibility.

4.3 Technology

Technology combines physical with intellectual or knowledge processes that transform materials into desired outputs (Scott, 1992).

Woodward's study is chosen to classify VHE as:

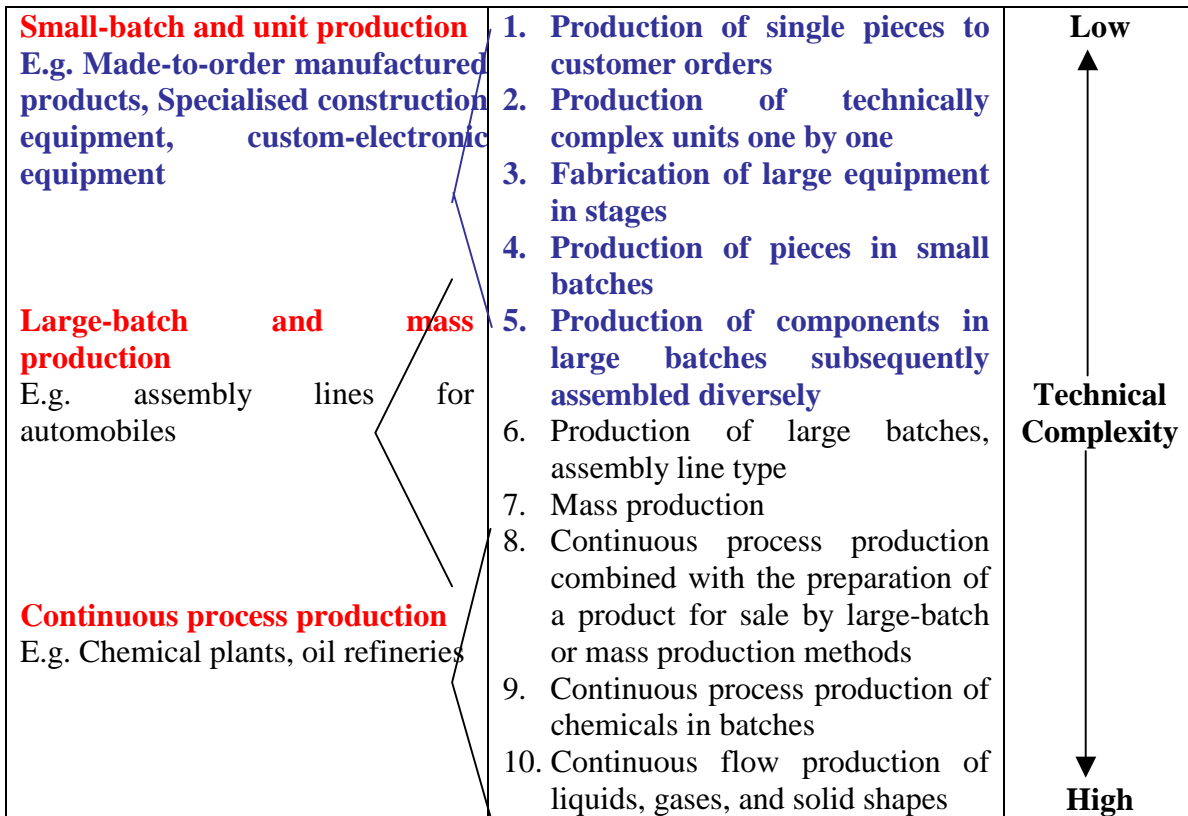
Rationale Of Using Woodward's Model	
Woodward's Model	♣ Woodward's conception of technology focuses on manufacturing firms.
	♣ Woodward's study analyses more on organisational level technologies rather than departmental technologies.
	♣ VHE falls in the manufacturing technologies whereby emphasis is on production technology rather than service.

4.3.1 Woodward's Technology

Woodward categorised technology into 3 groups (Daft, 1998):

- ♣ **Units (small batch)**
- ♣ **Mass (large batch)**
- ♣ **Or continuous process production.**

These technologies are categorised on a scale of technical complexity of the manufacturing process.



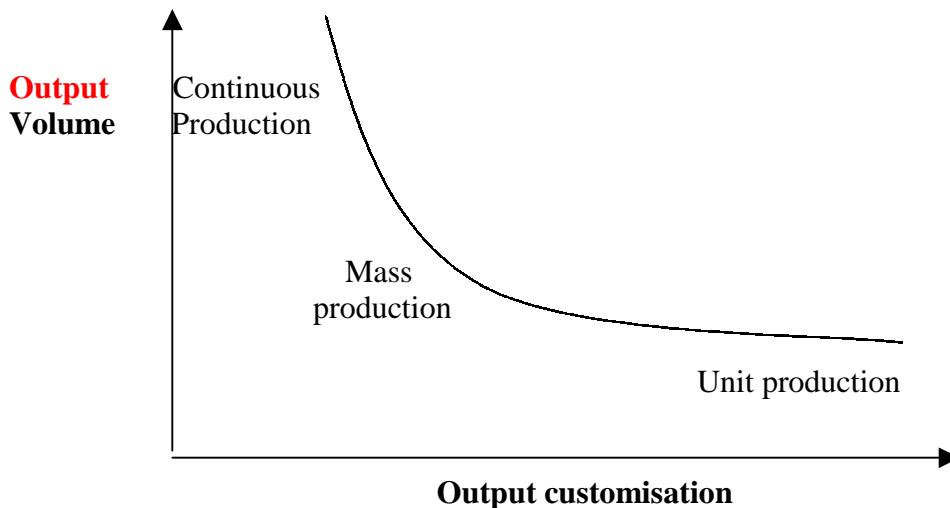
Adapted and modified from Daft, 1998.

4.3.2 VHE's Technology

VHE's technology falls under the unit production category due to the following reasons:

- ♣ VHE focus its attention exclusively on cranes.
- ♣ VHE may be the world's second largest producer of cranes, however it does not mass-produce as they do not want to build them to stock.
- ♣ VHE produces "tailor-made" cranes to customer specifications and compete primarily in this custom market segment. Each crane is unique and must be produced individually or in small batches.
- ♣ VHE limits their production orders to 10 or less rather than 100 cranes on a single order.

These evidence clearly justifies that VHE belongs to the unit production category. (Please refer to graph below for the relationship between output volume and output customisation)



Adapted from Northcraft and Neale, 1990

4.4 Environment

An organisation's environment refers to the external elements that potentially or actually influence the organisation itself (Robey and Sales, 1994). It can be subdivided into general and specific environment. (Please refer to appendix A)

It is important to acknowledge the organisation's environment as it serve to determine an appropriate structural match. Not only do organisations have to identify but also adapt to their environment to maintain or increase organisation effectiveness (Robbins, 1990). Hence environment is deemed to have the most influence on VHE's structure.

4.4.1 Burns and Stalker's

Burns and Stalker identified that organisation structure and managerial practice might differ depending on different environmental conditions (Robbins and Barnwell, 1998).

Their study states that an organisation environment could be located on a continuum as shown below.

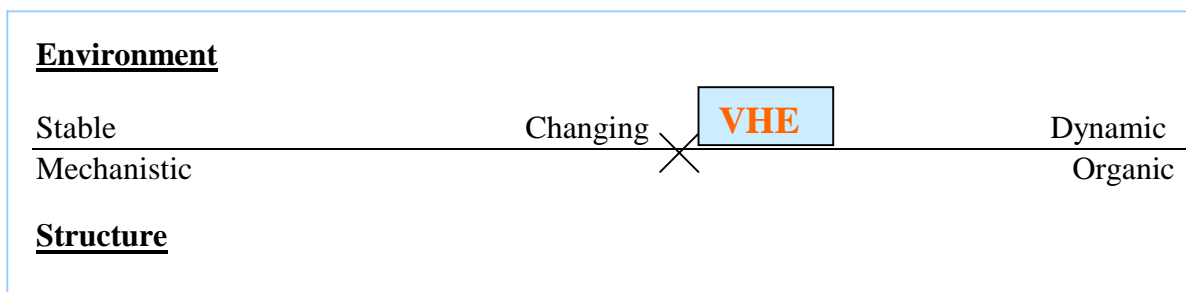


Diagram 1

4.4.2 VHE's Environment

Burns and Stalker identified the characteristics of the three environment as shown below:

Stable	Changing	Dynamic
<ul style="list-style-type: none"> Products that have not change in Years (Stable & predictable demand) 	<ul style="list-style-type: none"> Products that are continuously changing (fluctuating demand, but at predictable rate) 	<ul style="list-style-type: none"> Products changes rapidly.(demand fluctuates rapidly)
<ul style="list-style-type: none"> Stable set of competitors, unchanging 	<ul style="list-style-type: none"> Changing competitors 	<ul style="list-style-type: none"> Sudden changes in competitors
<ul style="list-style-type: none"> Little technological change & innovation 	<ul style="list-style-type: none"> Significant technological change & innovation 	<ul style="list-style-type: none"> Rapid technological change & innovation
<ul style="list-style-type: none"> Stable governmental policies & regulations 	<ul style="list-style-type: none"> Predictable change in governmental policies & regulations 	<ul style="list-style-type: none"> Rapidly evolving governmental policies & regulations

Adapted and modified from Hellriegel, Jackson & Slocum, 1999.

VHE operates in a changing environment based on reasons below:

- Products are continuously changing at a stable rate, as their emphasis is on custom – made cranes that are not monotonously designed & assembled.
- There are new entrants to the industry, such as Toshi and Sato.
- In 1982, VHE underwent technological change and innovation, was able to developed a crane with more advanced capabilities that was initially thought to be impossible.

4.4.3 Structural Fit

According to Burns and Stalker, there are intermediate stages between the two extreme systems. The relationship between the mechanistic and organic systems is not rigid (Mullins, 1996).

The characteristics of the two structures are shown below.

Characteristic	Mechanistic	Organic	VHE
Complexity	High	Low	High
Horizontal Differentiation	High	Low	High
Formalisation	High	Low	Low
Decision authority	Centralise	Decentralise	Decentralise
Communication	Downward	Lateral , upward, downward	Lateral , upward, downward
Hierarchical relationships	Rigid	Flexible	Relatively flexible
Task Definition	Rigid	Flexible	Flexible

Adapted & Modified from Robbins, 1990 and Robey and Sales, 1998.

As no organisation is purely mechanistic or organic (Robbins and Barnwell, 1998), hence VHE cannot fall at either ends of the continuum. VHE is seen moving towards the organic form, which matches its changing environment. It is a match as organic structures adapt more readily to changing environment (Robey and Sales, 1998). Its current structure has a mixture of both the characteristics of the extreme forms, thus justifies its position on the continuum as seen in Diagram 1.



5. Organisation Effectiveness (OE)

Organisations exist because of the drive to achieve certain goals and objectives. How best they can achieve these goals are measured through their effectiveness (Daft, 1998).

5.1 Types of OE approaches

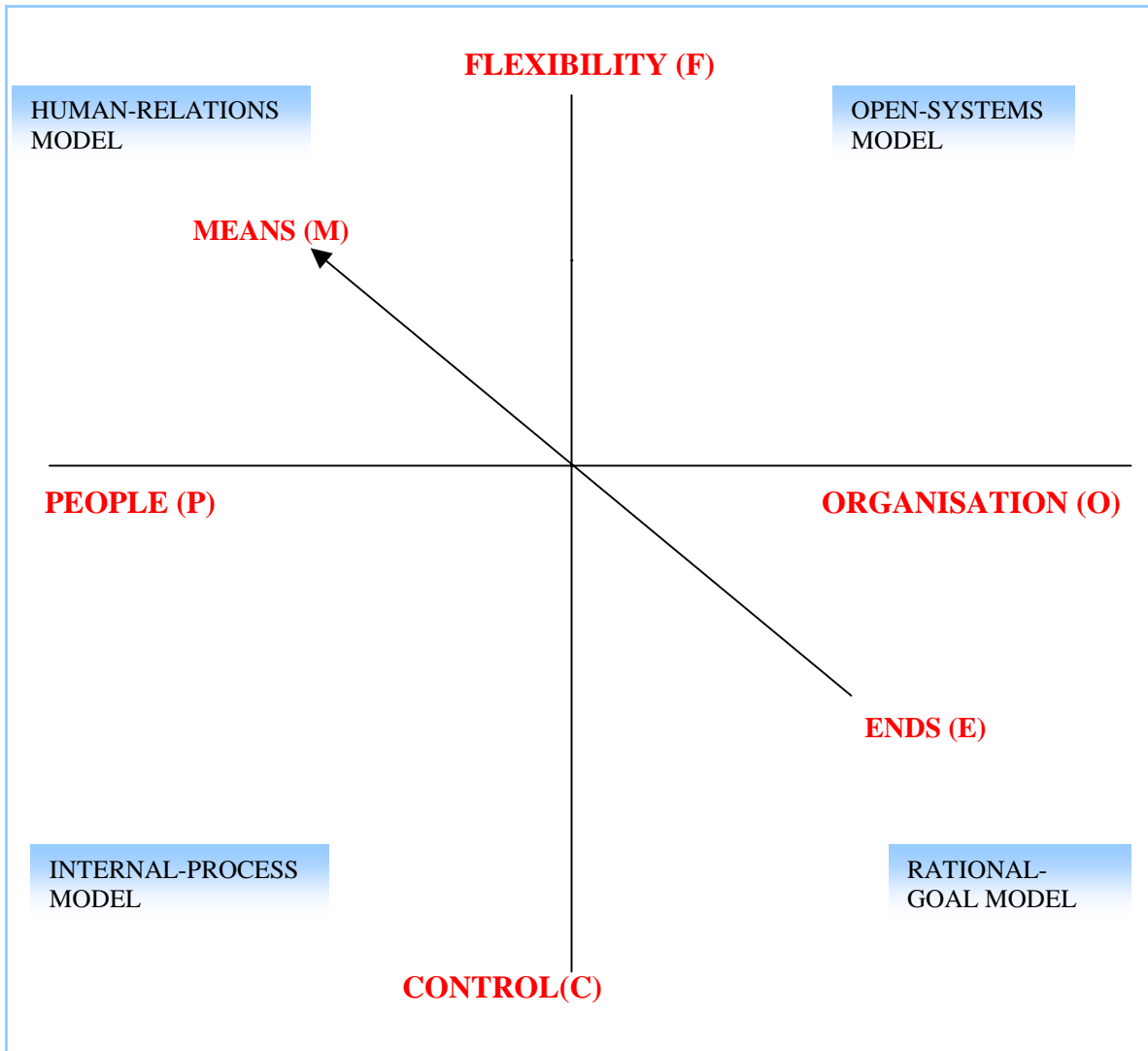
There are four approaches to evaluate how effective an organisation attains its goals.

Types	Rationale	Strengths
Goal-attainment approach	Effectiveness is measured by how successful an organisation has achieved its goals.	This approach allows easy measurement of OE as end goals are often verifiable.
Systems approach	Effectiveness is measured by the ability to obtain needed resources to sustain the organisation.	Inputs and outputs have a distinct linkage, allowing measurement of OE to be ongoing.
Strategic-constituencies approach	Effectiveness is appraised by the ability of the organisation in satisfying its stakeholders in the environment.	This measure helps examine major factors in the environment that have an impact on the organisation.
Competing-values approach	Effectiveness is based on criteria dependent on the organisation's values.	Allows gathering and organising of diverse preferences. It also aids organisations in measuring OE when their own emphasis is poorly defined.

Adapted and modified from Daft, 1998.

5.2 VHE's Approach

VHE measures effectiveness with the aid of the Competing-values approach. Under this approach, there are four main organisational values, together with the emphasis on either means or ends to be considered.



Adapted from Robbins, 1990.

VHE falls under the Open-systems model of effectiveness. This is because its organisational evaluator (Walters) chose values of Flexibility and Organisation over Control and People.

The Open-systems model includes both OFM and OFE cells. Under this model, Robbins (1990) explained that effectiveness is measured on how flexible an organisation is as well as its ability to acquire needed resources.

It was shown in the case that VHE had been trying to upkeep its flexibility over the years. Walter knew that there were control problems but still pushed for decentralisation in order to maintain flexibility.

Walters realised that the success of VHE depends on the competency and motivation of his staff. Although it was thought to be gearing towards the development of his people, the end result actually emphasised the well being and growth of VHE.

So far, VHE has been able to upkeep its flexibility to adapt to suit their external environment, hence it is within reasonable assumptions that it is relatively effective. However, should it improve on its ability to gather much needed resources to sustain its business, it will become more effective.



6. Current Structural Problems

6.1 Control Issues

“The organic structure creates some problems of control over operations” (Hill, Middlemist and Mathis, 1989, pg 247). As VHE moves towards a more organic operation, it would face the lack of control over its staff and business activities. These control problems may ride alongside with low formalisation in any organisation.

6.1.1 Evidence From Case

- ♣ The engineering department developed a new crane without anybody’s knowledge. Clearly a control problem as the department operated beyond their authorisation.
- ♣ Over expenditures by several profit and costs centres made matters worse. Budgetary controls were disregarded.
- ♣ The reward system was inequitable as there is no standard yardstick to measure real performance. Everyone was penalised by the non-performance of certain groups. This clearly showed a poor rein control of VHE over its departments.
- ♣ Despite lower profits, manpower was increasing especially in the production function. The computer-assisted production system, a non-cybernetic control, was also proved inefficient as inventory was still increasing.

6.2 Linkage issues between top management and departments.

Decentralisation was employed to solve VHE's initial problems, however it is impossible not to acknowledge decentralisation-related problems, such as the lack of coordination and communication. If these problems are left unattended, the overall operation of the organisation will begin to creak at its joints.

6.2.1 Evidence From Case

- ♣ Disputes between line and staff workers became rife.
- ♣ The engineering department developed a new crane without anybody's knowledge, due to the lack of communication.
- ♣ No clear and distinct organisational direction was projected to staff.
- ♣ Lack of a real leader resulting in poor coordination of problems and difficulties in allocating responsibilities
- ♣ Operation literally came to a halt when Walters left the executive to their own discretions.



7. Solutions

7.1 Solutions For Control Problems

1. Feed forward control system

This control measure helps to anticipate potential problems as it focuses on the inputs to “ensure they meet standards necessary for the transformation process” (Bartol et al., 1999, pg 658). It looks at resources such as people, finances and information before becoming part of the task on hand.

VHE can use this control system to “double-check” with various departments on the projects that they may be embarking on. This help to prevent unnecessary duplication of tasks while at the same time have knowledge about the on-goings of the organisation.

Types of Control	Benefits	Costs
Feed Forward	Anticipate problems before they happen.	Expensive and time-consuming.

2. Concurrent control system (CCS)

This control measure “assesses an activity while it is in progress” (Aldag and Stearns, 1991, pg 577). It helps to sieve out any problems before it gets out of control. This is carried out at various specified stages to check and report on progress. Decisions are made at these checkpoints to continue, halt or take corrective steps with regards to the task on hand (Bartol et al., 1999).

This control system’s benefits are similar to the Feed forward control. However, it has an edge over the former as it allows the identification of deviating problems since it calls for periodic checks on the work-in-progress.

Types of Control	Benefits	Costs
Concurrent	Identifies and track on progress at various stages to prevent problems and deviations.	Difficult to implement on tasks that requires creativity and innovations.

7.2 Solutions To Vertical Linkage Problem

7.2.1 Vertical Information System (VIS)

In order to facilitate communication among employers and departments, VHE can adapt the use of VIS. It is a form of information system that alleviates vertical information capacity. It includes the periodic reports, written information and computer-based communications distributed to managers. (Daft, 1998)

With the use of VIS, it will help reinforce communication and coordination between different levels of management in VHE. For example, the engineering group can communicate regularly to Walters in the development of the new crane.

Benefits	Costs
<ul style="list-style-type: none">♣ Improve communication making it more effective and efficient♣ Enhances coordination between the management level and the employees♣ Increases the efficiency and effectiveness of the employees	<ul style="list-style-type: none">♣ Expensive♣ Requires high degree of control

7.2.2 Hierarchical Referral

Hierarchical referral is another structural mechanism that can help to achieve vertical linkages. Whenever the employees face any difficulties or uncertainties in their work, they can always refer to their immediate superior for help. Management will convey the suggested recommendations back to the employees.

Benefits	Costs
♣ Enhances coordination among employees	♣ Time consuming
♣ Overcoming barriers between departments	♣ It may add on to management's workload.
♣ Reduces distortion of facts and information	♣ It will discourage the development of the employees.



8. Recommendations

Our recommendation would be one that combines both VIS (using periodic reports) and CCS simultaneously. This combination saves time as time is an essence to a changing environment. It is designed in such a way as it will be more effective because periodic reports also serve as a function of control. However no one action plan is perfect, each recommendation package will have its inherent costs. (Please refer to Appendix B for cost and benefits of the recommendation)

Action Plan

Step 1:	<p>Define and set the scope of the new directive.</p> <ul style="list-style-type: none"> ♣ Identify the required information needed from various departments. ♣ Design the task report.(Refer to appendix 'TASK')
Step 2:	<p>Inform employees.</p> <ul style="list-style-type: none"> ♣ Disseminate the new directive to all departments, requiring them to submit a periodic report to the Executive Committee every fortnightly with regards to what they are currently and might be doing. (Please refer to Appendix C for rationale of the new directive)
Step 3:	<p>Implement the plan.</p>
Step 4:	<p>Monitor</p> <ul style="list-style-type: none"> ♣ Ensure that the standards are met with the help of concurrent control.
Step 5:	<p>Feed back</p> <ul style="list-style-type: none"> ♣ Top management will then send back comments regarding the work-in-progress report, either giving encouragement, advice or ordering a halt of the work
Step 6:	<p>Evaluate</p> <ul style="list-style-type: none"> ♣ See how effective the plan is taking place ♣ Identify what are the setbacks and success of the plan.



9. Conclusion

In order for VHE to stay competitive in a changing environment, it has to constantly innovate and restructure. Adopting a receptive attitude towards change will help improve efficiency and inched towards achievement of organisational goals.

VHE have configured its structure to achieve organisational effectiveness, however in the course of doing so, it encountered some structural problems. Careful diagnosis helped find solutions to solve these problems, but it must be noted that not all problems can be completely eradicated.

It is recommended that VHE use a combination of both VIS and CCS to ease its problems as both measures (employed simultaneously) help to improve control while maintaining flexibility.

In conclusion, it will be VHE's relentless challenge to formulate and pursue plans for further enhancement.



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