

Case Study of Product Management of the Dense Medium Cyclone Range

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Abstract--The Cyclone division of the company in the case study has been plagued by maintaining sales growth, late delivery of products, a high turnover of staff and a lack of developing new products. The interrelationships between the aspects are complex and contribute towards substandard performance in the division. The investigation set out to determine how the sales function should be managed and how to improve on product delivery accuracy. Equally important is the aspect of retaining skills in the division, as well as the management actions required to develop new products.

Managing a product line involves a number of factors to manage such as life cycle, on-time deliveries, cost quality, risks, development, human resources, operations, etc. The study focuses on four management aspects, namely sales, on-time delivery, skills retention and product development.

The investigation reveals that there are shortcomings in the day to day operations, especially in terms of on-time deliveries. Based on the findings of the investigation, the gap is identified in the current management model and it is further explored on how to influence the overall performance of the division. Practical recommendations are made accordingly to improve the approach towards the management principles.

I. INTRODUCTION

Managing a product involves a number of factors to manage, such as operations, life cycle, time, cost, quality, risk, development, and human resources. Operations management is managing the sales team, operations, sub-suppliers and the assembly of the components. Whereas life cycle management is to manage the life of the product. Is the product still relevant in the market or will it be phased out in the near future? Time management is delivery management, which includes the assembly process till delivery to the client. Cost management involves raw material cost control, selling cost, overheads, gross profit and administration cost. Quality management is to ensure the components meet the required specifications, and risk is an uncertain event or condition that if it occurs, it has an effect on at least one project objective. Development is managing the research and development of the product range, and includes innovative ideas, development of new products or improvement of existing products. Human resource management is managing those human resource factors that may influence the management of the product, such as product knowledge, know-how, as well as employee turnover. Of interest in this study is what influences the management approach has on the abovementioned factors, when managing a product range.

A. Background to company in case study

The research focuses on a company which has been established more than thirty years ago. The company offers process equipment solutions to the mining industry, and

consists of five divisions, namely Cyclone, Technology, Sampling, Gravity Concentration, and Solid/liquid and Magnetic Separation divisions.

This study focuses on the Cyclone division, and particularly on the management of the dense medium cyclone range. The cyclone division contributes to approximately 45% of the sales of the company. The dense medium cyclone range contributes to approximately 49% of the annual sales in the cyclone division. The product range of the cyclone division consists of two product lines, the dense medium cyclone range and the classification cyclone range. The dense medium cyclone range is made up of high chrome cyclones and ceramic lined cyclones.

B. Objectives

The intention of the study is to focus on four management aspects of the dense medium cyclone range, i.e. sales, on-time deliveries, retention of skills and product development. The associated research questions within the context of the management strategy are:

- How should the sales function be managed?
- How can the delivery accuracy improve?
- How can retention of skills be accomplished?
- What is the relationship between the management practise and the development of new products in the range?

By answering these questions, the objective of the paper is to determine the gap between the current versus best practise. This will assist to establish what management model, actions, strategies and practise will best influence the overall performance of the cyclone division.

II. LITERATURE STUDY

A literature analysis was done for each of the study focus points, e.g. sales, on-time deliveries, retention of skills and product development. The focus points are interrelated and all four areas of concern were addressed in order to meet the research goals or outcomes of improving the current management model.

The analysis highlighted the importance of good customer relationships, which often leads to more sales. Liang and Mao [1] referred to customer relationship management which turn out to a certain number of new sales leads. Wan *et al.* [2] mentioned that a greater product variety is not necessarily associated with higher sales, product ranges must be streamlined. The sales function is in essence a small business unit and Murphy and Ledwith [3] indicated four success factors for such enterprises:

- clear goals objectives,
- senior management support,

- resource allocation, and
- client consultation.

Managing on-time product delivery includes satisfying customer needs. Pinto, Mettler and Taisch [4] refer to delivery reliability. They mention that this is strongly affected by strategic and tactical decisions such as selecting the “right” suppliers. Kristianto *et al.* [5] consider three areas which are important in terms of delivery lead times: assembly - and demand planning, as well as inventory allocation. Planning is fundamental to ensure the product reach the customer on-time. Pinto, Mettler and Taisch [4] suggest using “buffers” to minimize the impact of late deliveries.

The literature refers to a few key reasons responsible for difficulty with product management, i.e. customer focus, lack of shared understanding, poor portfolio management and poor communication and knowledge transfer. The research set out to investigate the relationships with suppliers and compare this with Lee and Wang’s [6] supplier-manufacturer relationships.

The cyclone division has been troubled by a high turnover of employees causing instability in the division. Continuity is lost to a large extent when employees resign. Inkpen and Tsang [7] argue that workforce instability prevents employees from developing long-lasting interpersonal relationships and maintaining continuous knowledge transfer. Skilled labour is scarce as there is a general lack of skills in the country. People should be considered as a company’s greatest asset. People want to feel valued and not left out, and further want to be challenged and do meaningful work. Kennedy and Daim [8] mentioned that one important factor in employee retention is to keep employees motivated and

dedicated. Darchen and Tremblay [9] found in their study that the social network in the organization having an impact on the retention of skills. The study embarks to answer the question whether the employees feel there is a social network to support them. The literature argues that communication in the firm (top-down and bottom-up), vision and mission alignment and shared goals, promote mutual understanding and cooperation.

Cormican and O’Sullivan’s [10] refer in their basic model to management direction and strategy in terms of product development. The research in terms of focus point 4 departs to test the strategy and vision. The model also refers to the environment, the voice of the customer, ideas, problems and analysis. The investigation also touches on supplier involvement for new product development. Gassmann [11] suggests that firms have to take advantage of external knowledge to conduct research and development. Teirlinck and Spithoven [12] emphasise the need to engage in relations to reap greater benefits. These statements are investigated in the work. Companies need to innovate; the idea with product development is to get smarter and to use better technologies. New technologies will affect product life cycle. Lui, Chen and Tsai [13] found that due to advances in science and technology, a product’s life cycle has become shorter than before.

III. RESEARCH METHODOLOGY

The different research methodologies that were followed for each focus point are discussed hereunder. Figure 1 shows the individual input measures, methods and expected output measures for the research.

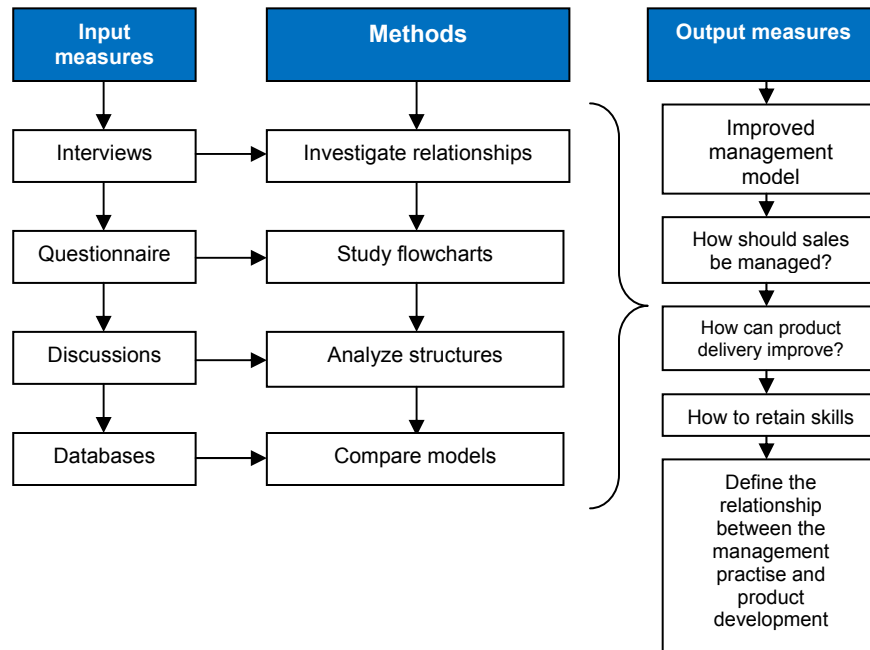


Figure 1: Research design framework for the investigation

A. Focus point 1 – Sales

The company's database on sales history was studied and the cyclone database of installations was used to identify sales opportunities. Potential sales opportunities in the market in terms of new projects were identified in the discussions with the senior and middle managers, as well as engineers.

B. Focus point 2 – Delivery

The company's database was used for the history of late - or on-time deliveries. The processes in the dense medium cyclone flowchart were studied as a contributing factor to late - or on-time deliveries. Interviews were held with the relevant role players, as identified in each step of the flowchart. The relationship with suppliers was investigated to identify what these relationships are.

C. Focus point 3 – Skills retention

Interviews were held with the human resource department to determine the reasons for change as stipulated in the exit interviews with ex-employees. The organogram of the cyclone division was analyzed in terms of positions, vacancies and work load. Discussions were held with role players to understand their expectations and suggestions to retain skills.

D. Focus point 4 – Development

Research was conducted and compared with the actual environment of product development. The main method for gathering information was interviews with sales engineers, existing - and potential partners. Their contribution and knowledge assisted in drawing up a management model in terms of research and development.

Regarding the methods been used in this study:

Interviews are one to one discussions with an individual to obtain information on a certain topic. Interviews are not in group settings, hence respondents are more likely to participate, contribute, be honest and open. Interviews are structured and seek to cover factual information. It is about getting the story behind the story. In interviews, guided questions are set; therefore it is possible to get in-depth information about the topic. Interviews also allows one to make follow up questions and considered a more personal experience. Questionnaires are stating a hypothesis. Questionnaires are structured and avoid open ended or policy questions. The survey is limited as it can only be applicable to respondents who have knowledge of the dense medium cyclone product range. Discussions can take the form of group discussions or individual discussions. In individual discussions, conversation is normally easier. People tend to be shy and hold back in group discussions. The information obtained however, may be limited as it is from one source only.

IV. RESULTS AND DISCUSSION

The majority of the persons interviewed have at least 10 years of experience in the company, which makes the results credible. The results on the focus points were as follows:

A. Focus point 1 – Sales.

- **Hypothesis 1: The management of the sales function is dependent on time, support, resources and relationships.**

Figure 2 shows the results from the questionnaire on managing sales in the dense medium cyclone range.

Sales		Strongly agree				Agree				Neutral				Disagree				Strongly disagree			
Percentage		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Q1	Sales engineer's visit to clients lead to more sales	50										50									
Q2	Management is supporting more sales	100																			
Q3	Management does have clear sales objectives	15				50										35					
Q4	Sales engineers are too busy with administration work and meetings	15				85															
Q5	Management is allocating sufficient resources to the sales function	60										20				20					
Q6	The large DMS product variety leads to confusion for customers	60										40									
Q7	Customer relationship management lead to new sales contacts	85																	15		

Figure 2: Results from the sales questionnaire

2014 Proceedings of PICMET '14: Infrastructure and Service Integration.

Both middle management and the engineers confessed that they are not visiting clients often enough. People sell to people. The sales engineer must understand the needs and deliver a service to the client. All the respondents who completed the questionnaires are in 100% agreement that management is supportive of sales.

The research shows that 65% of the respondents agree that there are clear goal objectives. Sixty percent of the respondents feel that sufficient resources are allocated to the sales function. More than 80% of the employees interviewed, regard client consultation/customer relationship management as an important aspect of the sales management function. The management of sales in the dense medium cyclone range can be regarded as a small enterprise. The research shows that the

four success factors (clear goal objectives, senior management support, resource allocation and client consultation) in this small enterprise are met as per the model.

B. Focus point 2 – Delivery.

- **Hypothesis 2: Delivery accuracy can improve by proper planning, correct management of the internal processes, suppliers and clients.**

Figure 3 shows the results from the questionnaire on managing product delivery in the dense medium cyclone range.

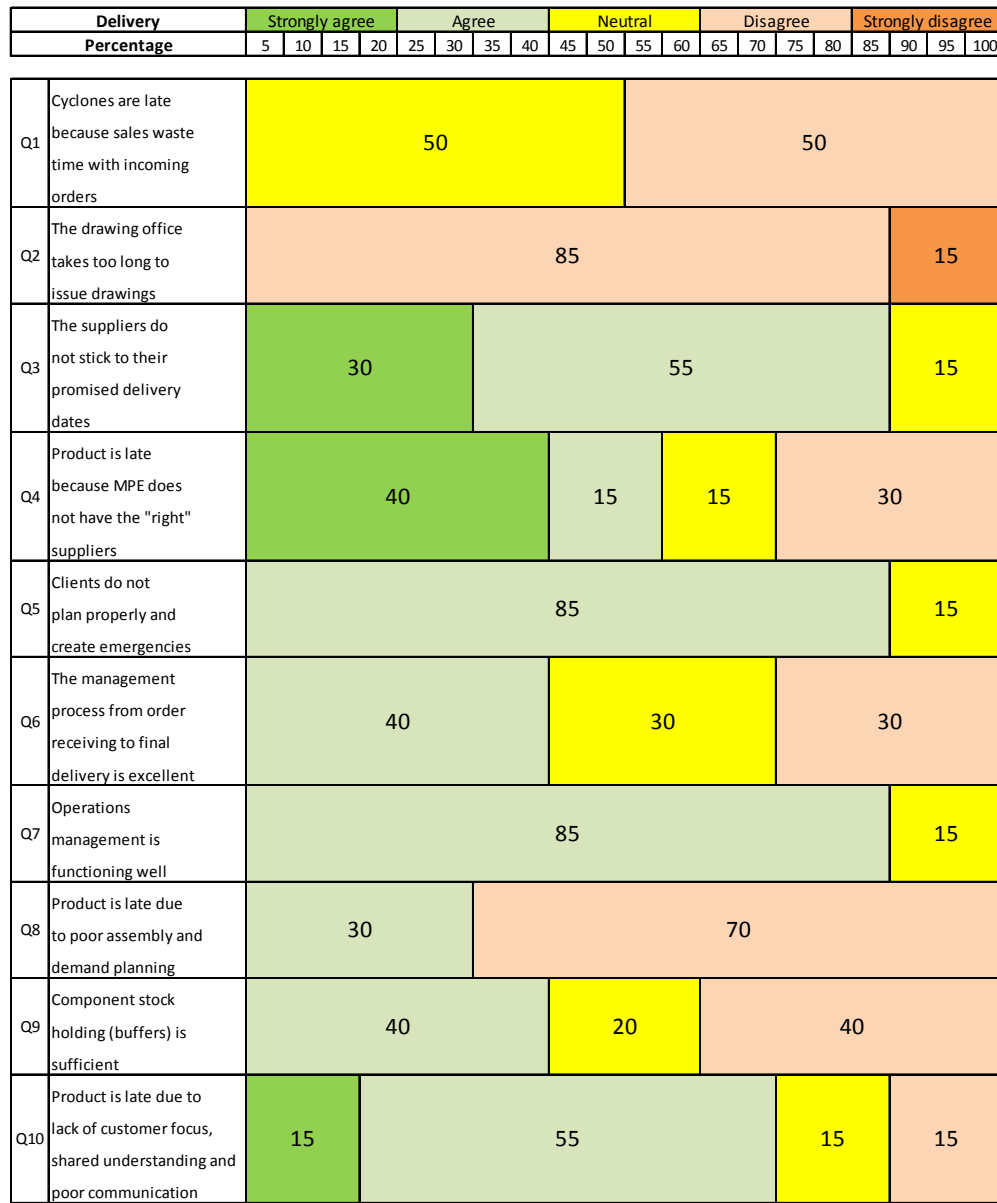


Figure 3: Results from the delivery accuracy questionnaire

The survey shows that the internal management processes are functioning well. There is a belief that time is not wasted by sales or the drawing office and therefore does not contribute to late deliveries.

An important issue to ensure on-time deliveries is reliable suppliers. The majority of the respondents felt that the company does not have the “right” suppliers - the Operations and Planning managers who were interviewed agreed to this.

One of the main reasons why product is late is due to improper planning by clients causing emergencies. The research shows that the majority of the respondents agreed that product is late due to lack of customer focus, shared understanding on how long it takes to manufacture the product and poor communication.

Cormican and O’Sullivan [10] found key reasons for trouble with product management:

- lack of customer focus,
- lack of shared understanding,
- poor portfolio management, and
- poor communication and knowledge transfer.

The research shows that 70% of the respondents agree that product is late due to the above mentioned key reasons. Figure 4 summarises the reasons for late product deliveries.

C. Focus point 3 – Skills retention

- **Hypothesis 3: Managing networks, job satisfaction, career paths and communication will retain skills.**

Figure 5 shows the results from the questionnaire on skills retention in the dense medium cyclone range.

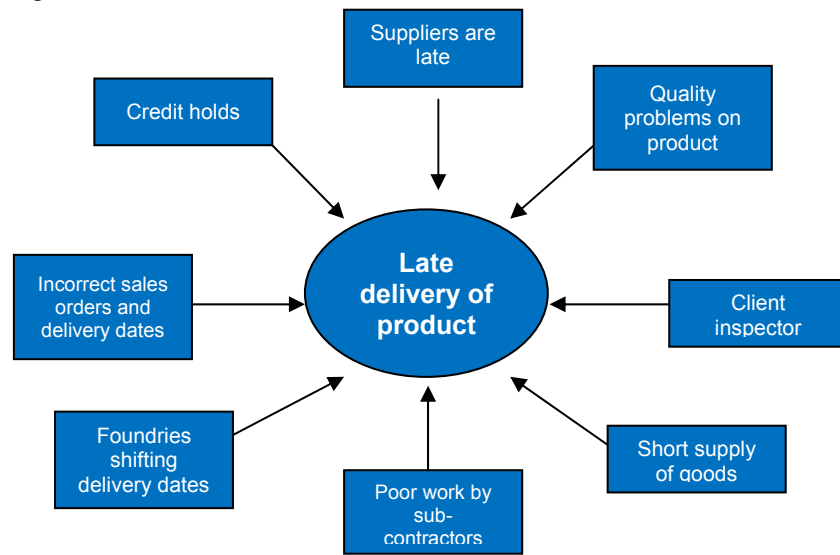


Figure 4: Reasons for late deliveries are shown schematically.

Skills		Strongly agree				Agree				Neutral				Disagree				Strongly disagree			
Percentage		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Q1	Workforce instability prevents employees from developing relationships and knowledge transfer	40								60											
Q2	Management created a social network which supports employees	40								60											
Q3	Management do not do enough to make the job interesting	15			70												15				
Q4	There is a clear career path with milestones for each employee	30						70													
Q5	Top-down and bottom-up communication is good in the organization	40								60											
Q6	Management keep employees motivated and dedicated	80															20				

Figure 5: Results from the skills retention questionnaire.

The research shows that workplace instability prevents employees from developing long-lasting interpersonal relationships and maintaining continuous knowledge transfer.

Sixty percent of the population feels that there is no social network in the business which supports the employees. It was mentioned in the exit interviews that employees felt isolated from management. They also argued that communication in the firm (top-down and bottom-up), vision and mission alignment and shared goals promote mutual understanding and cooperation. The research shows that employees believe that communication is not good within the organization; this was confirmed in the exit interviews.

The study shows that employees feel they do not have enough decision making power. They want to be responsible and accountable. They also experience policies and procedures as red-tape which make them inefficient and do not contribute to cost savings. Some employees feel they are in positions where they do not fit - management do not understand how to deal with their sub-ordinates.

D. Focus point 4 – Development.

- **Hypothesis 4: Senior management involvement benefits development work.**

Figure 6 shows the results from the questionnaire on product development in the dense medium cyclone range.

The survey shows that the respondents agree that suppliers must be involved in the development of new products for the dense medium cyclone range. Forty percent of the respondents agreed that more products must be developed. The results from the survey show that the cyclone product development is too conservative and not radical enough. People within the organization would like to see more radical changes. The research shows (100% agreement) the focus should be to involve external partners like universities to assist with new product development.

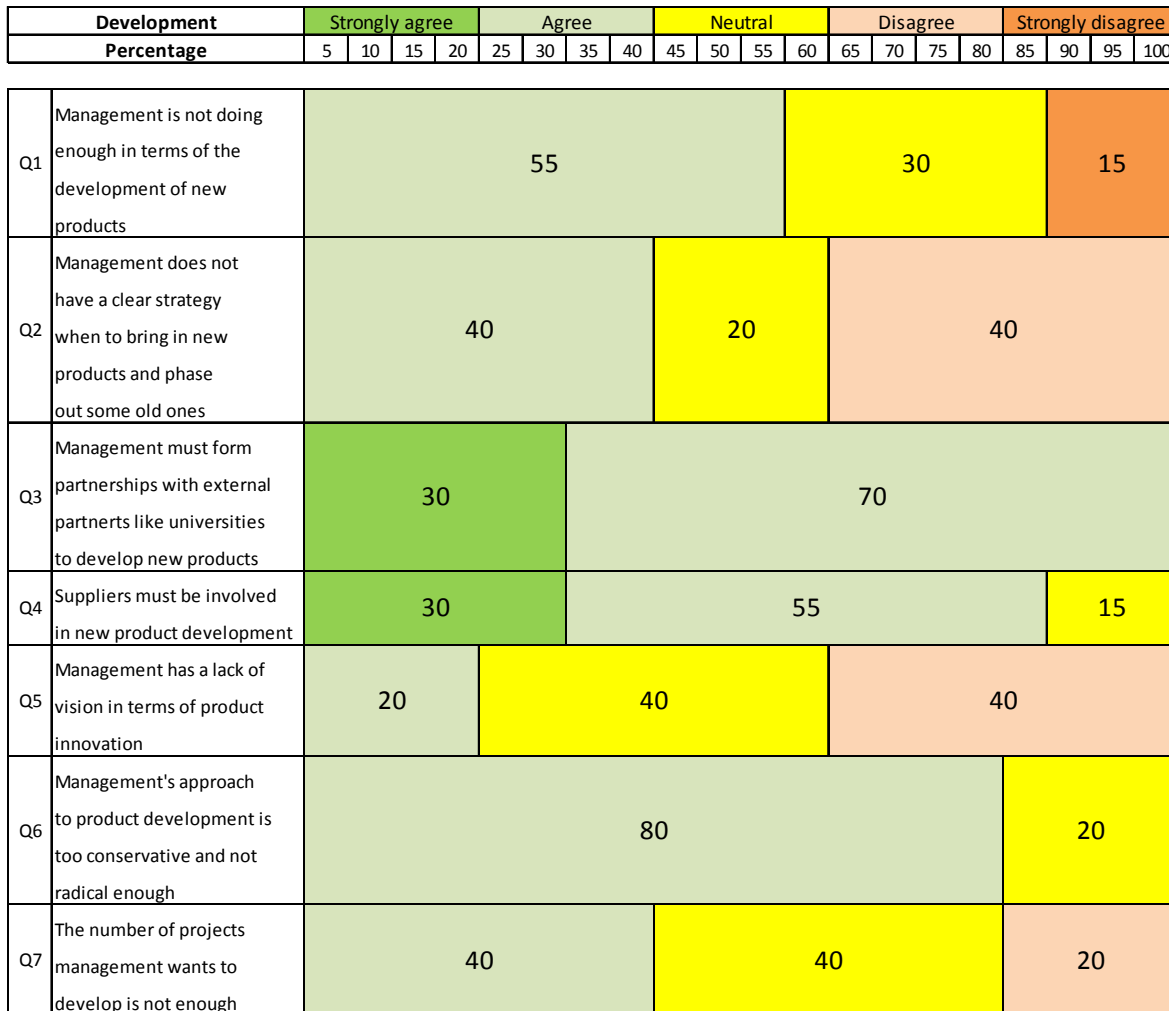


Figure 6: Results from the product development questionnaire

V. CONCLUSIONS AND RECOMMENDATIONS

A. Focus point 1 – Sales

For the sales focus point, the hypothesis states that the management of the sales function is dependent on time, support, resources and relationships. The research shows the hypothesis is true. The study confirmed that sales engineer's visit to clients lead to more sales; therefore customer relationship management is important. Management is supportive of sales. There are clear sales objectives. Sales engineers do have enough time to visit clients and sufficient resources are allocated to the sales function. The large DMS product variety leads to confusion for customers. It is recommended that sales engineers must visit clients more often. Sales engineers should also focus on opportunities to convert business to the company.

B. Focus point 2 – Delivery

In terms of the delivery focus point, the hypothesis states that the delivery accuracy can improve by proper planning, correct management of the internal processes, suppliers and clients. The research confirms the hypothesis is true. The study shows that the planning and internal processes are well managed. The main contributors to late product delivery are shown in Figure 4. It is recommended to use make use of forecasting to counter act late deliveries. Identify the critical and fast moving components and keep a minimum stock level of these. If the lead times on components are reduced, then the sales will increase. Clients cannot wait excessively long for their equipment and has no other option than to look for alternative supplies.

C. Focus point 3 – Skills retention

Referring to the skills retention focus point, the hypothesis states the management of networks, job satisfaction, career paths and communication will retain skills. The investigation shows that this may be partly true. Managing the above may encourage employees to stay with the company, but there are no definitive guarantees. The employees feel the workforce instability prevents them from developing relationships and transfer of knowledge. People learn from people and a high staff turnover results that long lasting relationships of trust cannot be built, as well as problems to transfer knowledge to the remaining staff. Employees are under the impression that no social network is created by management to support them. They want to feel valued and not left out, and have a clear career path with milestones for their own development. In general, employees believe that communication is poor. It is recommended to challenge people, to create stimulation and further to provide recognition. It is suggested to create a career development plan for each employee. Management must implement a social network to support employees. The survey showed that top-down - and bottom-up communication is poor.

D. Focus point 4 – Development

In the case of the development focus point, the hypothesis states senior management involvement benefits development work. The investigation shows the hypothesis is true. The study shows that management is not doing enough in terms of the development of new products. Continuity is a problem in technology development due to the high turnover of managers. There are mix feelings in terms of management's strategy to bring new products in and faze old ones out. The research shows that suppliers must be involved in new product development. The feedback confirms that there is a lack of vision in terms of product innovation. The results from the survey show that the development is too conservative and not radical enough. More products must be developed. The company must involve external partners if needed. It is recommended to get smarter by using better technologies.

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