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72%

APPENDIX GA36a

LEVEL 4 ASSESSMENT SPECIFICATION

Student name:	<i>Leuke Andersen</i>		Student ID number:	
Programme:	HNC/D IN Mechanical Engineering/Electrical/Electronic Engineering			
Module:	Management, Innovation and Sustainability			
Module code:	M5X01176	Contribution to Overall Module Assessment (%):	50%	
Lecturer:	Coral Planas	Internal Verifier:	Dr. R. Kadhim.	
Assignment Title:	Engineering Case study	Word count (or equivalent):	1200 min	
Submission deadline:	02/05/2019	Return date of provisional marks & written feedback:	23/05/2019	
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.			
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.			

Module Learning Outcomes (from module syllabus)

- 1) Demonstrate the ability to apply appropriate theoretical and practical methods to the analysis and solution of structures and dynamics engineering problems.
- 2) Demonstrate key transferable skills in problem formulation and decision making, interpreting experimental results.

TASK DESCRIPTION

Assignment Brief

This module introduces the student to the social and commercial context of the engineering industry in terms of business environments including: management organisation and administration, regulation and legislation.

Assignment Scenario

You have been working as an Engineering Technician for a small to medium sized engineering company manufacturing parts for the aircraft industry. Your duties are to ensure the production process operates efficiently and that all aspects of installation and maintenance are carried out in accordance with recognised procedures and cost effectively.

In recent years the company has seen a steady decline in turnover and profit, mainly resulting from increased competition from within the UK and overseas along with a lack of investment in technologically advanced systems and machinery.

The company has advertised the position of 'Engineering Project Manager' with a good salary, private health insurance and a final salary pension. The position is being advertised internally and externally.

Applicants are required to (a) deliver a 10 minute PowerPoint presentation outlining the key factors that influence organisational success and to balance them against the key factors that could potentially lead to organisational failure and (b) write a structured report (minimum 3000 words) encompassing the factors outlined in (a) detailing how those factors can be utilised to address the following issues:

- Falling Sales
- Limited European and International customer base
- 10% reduction in production targets on previous year
- 5% increase in product rejection rates
- Escalating maintenance costs
- Unusually high turnover of staff
- 3 '7 day' + lost time accidents

Your research should result in a professional report and PowerPoint presentation with clear structure, aims, objectives and outcomes based on your research. This presentation and report can then be delivered and submitted as required as part of the job application process.

Your research should result in a professional report and PowerPoint presentation, the report and the presentation can then be delivered and submitted as required as part of the job application process.

Your report should include;

- A title page
- Table of contents
- Introduction
- Objectives
- Theory / Research
- Methodology
- Results
- Analysis
- Discussion / Evaluation
- Conclusion
- References

Word count: The recommended word count is 3000 words.

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

You will need to consider:

- **Business Organisations And The Environment:** types of business organisations; analysis of the organisation and its external environment; the engineering industry in the UK and global economy.
- **Regulation and Legislation:** product liability and contractual obligations, data protection legislation, protection of intellectual property.
- **Business Ethics:** Corporate social responsibility, the engineer's responsibility to society.
- **Management and Group Behaviour:** management and leadership styles; management roles; management decision making and problem solving; management of change; motivation; quality management; group behaviour and dynamics; individual behaviour; personality and perception.
- **Marketing:** the marketing mix; sponsorship funding models; developing a business plan for a Small Business Unit.
- **Project Management:** Project planning techniques, project monitoring, managing risk.
- **Brexit:** Comment on the potential effects (positive or negative) this will have on the economy in general and more significantly the company in which you are employed.

The report must be structured to include a contents page and a page of references which record all sources of information used in the report adhering to the 'Harvard' referencing system. Any quotations or citations within the report must also be referenced using the correct method as detailed in the 'Harvard' referencing system.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The extent to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Common Assessment Criteria Applied		Marks available	Marks awarded
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions.			
Excellent research used throughout. It is clear throughout the assignment that you have a clear grasp of the topic and have used it effectively.		30	21
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.			
A clear understanding has been demonstrated throughout. You have linked this to practical examples throughout.		25	18
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence			
You have communicated your ideas very well, after analysing the issues in detail. Your ideas are logical + of a high professional standard.		15	11
4. Practical Application and Deployment Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.			
You have taken the issues and tried to solve them highly effectively with the knowledge gained from thorough research.		15	11
5. Skills for Professional Practice Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation.			
Your presentation was on a very good standard. The content looked at success and failure well.		15	11

Assignment Mark Overall (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)

Late Submission Penalties (tick if appropriate)

Up to one-week late	
Over one week late	

72 %

72% ✓

COMMON ASSESSMENT AND MARKING CRITERIA

Assessment Criteria	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
	0-29%	30-39%*	40-49%	50-59%	60-69%	70-79%	80-100%
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupportable/missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	Can communicate effectively in a suitable format, but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure.	Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.

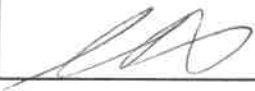
Student Self Evaluation Form

Student name:	<i>Luke Andersen</i>	Student P number:	
Programme:	<i>HND in electrical Engin'</i>	Year of programme	<i>18/19</i>
Assignment Title:	<i>Engineering case study.</i>		

This section repeats in brief the common assessment criteria detailed on previous pages. The *extent* to which these are demonstrated by you determines your mark. Using these criteria, tick the box that best indicates the level of achievement you feel you have achieved with regard to each of them.

Common Assessment Criteria Applied	Level of Achievement						
	REFER		3 rd	2:2	2:1	1 st	1 st
	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
1. Research-informed Literature	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
	☐	☐	☐	☐	☐	☐	☒
2. Knowledge and Understanding of Subject	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
	☐	☐	☐	☐	☐	☒	☐
3. Analysis	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
	☐	☐	☐	☐	☐	☒	☐
4. Practical Application and Deployment	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
	☐	☐	☐	☐	☐	☒	☐
5. Skills for Professional Practice	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
	☐	☐	☐	☐	☒	☐	☐

PLEASE COMMENT ON AREAS IN WHICH YOU FEEL THAT YOU HAVE PERFORMED WELL	PLEASE COMMENT ON AREAS YOU FEEL THAT YOU NEED TO DEVELOP
<i>Presentations on theory's</i>	<i>N/A</i>

Student's Name	<i>Luke Andersen</i>	Date	<i>2/5/19</i>
Student's Signature			



Assignment 1

Management, Innovation and Sustainability

Luke Andersen

HND Electrical Engineering

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Introduction

I have been working as an Engineering Technician for a medium sized engineering company called Sumitomo. Sumitomo are a unique engineering company as they manufacture parts for the aircraft industry. My duties are to ensure the production process operates efficiently and that all aspects of installation and maintenance are carried out in accordance with recognised procedures and cost effectively.

In recent years the company has seen a steady decline in turnover and profit, mainly resulting from increased competition from within the UK and overseas along with a lack of investment in technologically advanced systems and machinery.

The company has advertised the position of 'Engineering Project Manager' with a good salary, private health insurance and a final salary pension. The position is being advertised internally and externally.

good

Falling Sales

Due to the decline in turnover and profit over the recent years it asks the questions;

Why is this happening?

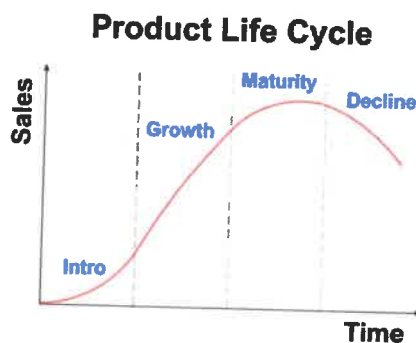
What can be done to prevent this?

One of the key issues with the loss of profit could be competitive rivals who also manufacture parts for the aircraft industry. If our rivals are marketing a new product which is cheap, effective and also quick to manufacture, this could cause a significant decline in sales for the company. It is important to have any competition on our radar at all times so we are able to react quickly and effectively in order to gain customers and sales. Another issue which has an impact on turnover and profit is marketing. Marketing is the key strategy to get our product or business out there in the world of manufacturing. Without marketing there are no customers, with no customers comes no sales. There are 3 simple rules which we must abide by to enhance the marketing of the company and products. (Olenski, 2014)

1. Make ourselves known – Customers will only do business with a well trusted company who are known. When marketing, whether it be a product or company, it must be made public in order for it to become known. The customer does not need to know the ins and outs of the company or product, but they must know enough to determine whether we can be trusted.
2. Taking the competition seriously – When advertising our business it is vital for us to face the reality that our service may not be the best in the world. Where one customer may think we are efficient in what we do another may not, so it is important not to get ahead of ourselves. The competition has to be taken seriously where the marketer must always make an effort to stand out to gain an advantage over our competitive rivals.
3. Relate to our audience – To overcome the obstacle of our audience not having the same level as expertise, the message should be very clear and include a clear understanding of the business which is being concluded.

Product Life Cycle

As shown in the graph below there are four main stages of a product life cycle (Introduction, Growth, Maturity, and Decline). During the final phase of the product life cycle, the market for the product will rapidly start to decline. One reason customers will stop to buy this product is in favour of a cheaper replacement or there is the same product on the market which may be newer and better. (© Living Better Media, 2019) There is very little we as manufacturers can do to prevent this. Due to a decline within the market, sales of the product will start to fall, therefore the overall profit that is available to us in the market will start to decrease



Although the decline of a product is very negative in terms of turnover and profit, there is a strategy which may be used to utilise the decline of the products life cycle. The strategy used could be to reach out to a cheaper market. To continue making profit from a product e.g. Aeroplane Engine, the opportunity to look into new, cheaper markets may be a viable option. For example, if the engine costs £5,000,000 to be purchased and the target customers are Emirates and Qantas which are luxury airlines, reducing the cost to purchase the engine and target smaller budgeted airlines like Easy Jet and Ryan Air could be a very cost effective solution in continuing to make profit on products past their 'Sell by date'.

SWOT Analysis

The purpose of a SWOT analysis is to get our managers to think about all the potential impacts that could affect the success of our organisation. It is very important to look at the strengths, weaknesses, opportunities and threats of the company to understand a clearer verdict of just where the company is in terms of success. The usefulness of a SWOT analysis is that it can help us uncover opportunities that are well placed to exploit. (© Mind Tools Ltd, 2019)

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
Due to the nature of work there are very few aerospace manufacturing companies around the UK. Unlike businesses such as catering or metal manufacturing which are very popular, the uniqueness of our work gives us an advantage to any local customers. Another benefit of the location of our company is that the local suppliers can offer cheaper prices due to the shorter distance of transportation of goods. Being a small to medium sized engineering company ensures better control over any logistical and managerial aspect of work. Thus, creating a small but powerful workforce.	The falling sales of the company could be due to various variables such as cheaper competitors and/or dated management styles. With a limited European and international customer base this could also reflect on the falling sales which have appeared over the last few years. With machinery now categorised as out dated and old, this has a huge impact on the ever growing maintenance costs. The very high turnover of staff is an increasing weakness as with new employees, comes with inexperience. With the inexperience of employees, time will have to be found in order to train these employees until they are competent.
OPPORTUNITIES	THREATS
Employing 'fresh' students from university and/or college enables the company to train the individuals to the standards and strategies that the company require. By doing this we can structure the learning and information gained of each individual to meet our needs. A change in management and management styles offers the chance to reorganise the company's structure and policies. With the change of management a chance for involving more employees with the discussions of strategies and projects opens the window for fresh new ideas.	With every field of manufacturing, there is always more than one competitor in the same business. Competitors globally can offer cheaper prices of products, include shipping fees free of charge and also free sample of products. Such things give them an advantage over our local business as customers look for the cheapest alternative. Where fresh employees who have come straight from education also comes with a disadvantage, although the potential to become a great engineer in the future they leave their studies with no hands on experience. One other weakness is the every growing fundamentals of existing customers. Customers will expect more and more which in turn, increases pressure on the workforce to deliver.

Bullet points would have been a better option here.

PESTLE Analysis

PESTLE analysis is a tool used to track the environment our business is operating in. A look into all areas within the business as you are shown on the next page (Political, Economic, Social, Technological, Environment, and Legal). The aspects of using this technique is crucial for our business. More than just understanding the market in which our company operates in, the framework of this technique is one of the vertebrae of the backbone of strategic management that not only defines what we as a company should do, but also accounts for an organization's goals and the strategies strung to them. (© Weberience, 2019) With the use of this analysis we can see that many opportunities for local people to work for us arise in the city of Swansea but with many positives there are also the negative aspects of the

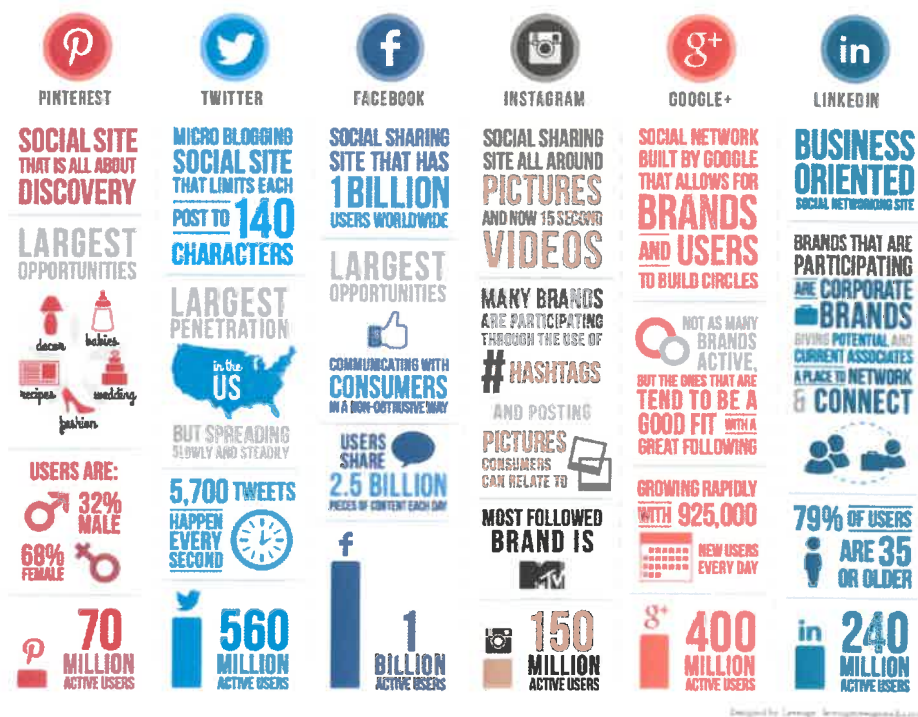
Management, Innovation and Sustainability

current on goings. We can see that due to the low volume of local aircraft business most customers come from overseas which has the "knock on effect" of our products. Due to this we will have to increase shipping costs, production times and also increase our networking to over sea suppliers and customers.

PESTLE Analysis		
Political	Economic	Social
* Increase international trade agreements * Governmental funding * The laws of employment	* Inflation * Low volume of local aircraft businesses * Slowdown of engineering manufactures in Swansea	* Busy lifestyles * Rising disposable income * Local opportunities
Technological	Environment	Legal
* Aircraft in air malfunctions * Increasing future in social media advertisement * Increased research and development	* Changes in climate conditions in some regions * Rising interest for corporate environmental programs * Increasing emphasis on sustainable business practices	* Health regulations in workplaces * Rising legal minimum wage * Increasing animal welfare regulations

The future of Marketing

With companies using different marketing techniques such as bus stop posters, leaflets, TV adverts, the techniques for marketing are forever growing. One of the newest and most powerful types of marketing is social media. Social media is one of the most versatile and cost effective strategies used for companies to reach their target audience. Marketing through social media can help increase the company's recognition. In the picture below you can find various social media platforms along with information which portrays just how powerful social media can be with regards to marketing. (Keran Smith, 2018)



Excellent suggests which work well

I think it is very important for us as a medium sized company to enhance the growth of its marketing using social media as it gives the chance for customers to reach out and interact with the company, engaging in various platforms. With the use of social media we are not only interacting with customers within the UK but we will now be reaching out to people all over the world.

around the world at the cost of nothing. Social media is forever growing and for me personally I see it as the future of business marketing.

Marketing Mix

The marketing mix is a helpful way which uses the '4 P's' as a guide to ensure that the marketing of a service or product is sufficiently suitable. With the use of the marketing mix we are able to understand as to why a product's sale may have fallen.

- Place
- Product
- Promotion
- Price

Place – The place is identified as a medium sized manufacturer of parts for the aircraft industry. Due to the place (UK) the cost of materials to be imported from various suppliers may be more expensive than those competitors from overseas. Due to the location we as a company may have a disadvantage of importing materials and may have to use materials from suppliers more locally to compete with our competitors.

Product – The product is one of the most vital aspects with regards to the turnover of our company. If the product is not meeting standards and regulations then this could result in re-builds, which in turn suggests as to why over the years the company has resulted in a steady decline in turnover and profit. Using materials which do not meet critical standards could be because the materials purchased from overseas are cheap. At the time buying cheap materials may save you a considerable amount of money in terms of spending but, in time it will cost more to replace the product/materials with more durable and stronger types.

Promotion – With the use of advertisement, this is to establish who our company are and what our company do. Spreading the word of our company locally and also globally will create many future opportunities and gain potential customers. Another form of promotion could be within the company itself. Offering promotion within will create motivation and will increase the morale of employees. With the chance of promotion at hand this will increase productivity of the employees hence improving overall profits and turnover.

Price – There are many variables in business' which control the cost of materials and products. In hind sight there is always going to be another company who will be able to offer a product at a lower price. Whether that is because of cheaper materials, cheaper labour or even a smaller turnover, it is always going to be difficult to control the costing of a product. One variable which will be dependent on competitive suppliers is the costing of materials. Within a business it is very important to gain a network of suppliers, by doing this we open the opportunity of each supplier battling to beat the next with cheap prices to gain business from ourselves. Taking into account the cheap prices of materials, the cost of transportation for the materials to reach our factory may be overlooked. If a supplier based outside of Europe offered a very low price per unit of materials in a high quantity, it may still be cheaper to purchase more expensive materials from a local supplier simply due to the cost of transporting those materials back to our factory. Quality is also of high concern when buying cheap materials. The materials may withstand all tests and regulations but how they age and perform in the future is vital for future business. Purchasing more expensive higher grade materials which last a considerable time longer suggests to the customer that the product is in

service for a long period of time, hence why they would come back and purchase further products.

Limited European and International customer base

Existing & Potential New Customers

With a limited European and international customer base it asks the question where is the markets biggest customers? If we are having to pay excessive shipping costs in order for our biggest customers to receive our products, then it may be time to look elsewhere. As talked about above it may be time to make use of social media to reach potential new customers.

In order to maximise profits and turnover, we will need to start considering solutions which will help us gain new customers more locally to ourselves. By gaining customers who are more local to us we are able to cut shipping fees, decrease transportation times of products, which benefits us as the quicker the product is received then the quicker we receive payment. As well as new customers it is important we keep targeting big customers.

Firstly in order to gain a new customer we begin by researching companies in our field of work. At this stage, we don't know whether they will be actively looking for new manufacturers such as ourselves, this information will not be publicly available. Our first step will be to draw up a list of companies local (European) to us and then globally. Large companies often look for opportunities to show that they are connected with and contributing to local community, so working with a small-medium scaled local business like ourselves could be a good opportunity for them to take (Andrew Blackman, 2017). Being in the same area will also make it easier to find face-to-face networking opportunities and to attend meetings, although this is not essential as meetings held via computer programmes such as Skype tend to be the more preferred option as upon recent times. Finding a customer who are 'neighbours' is advantageous but it is not a requirement for us. After finding a potential list of new and existing customers it is time to investigate further. Products and suppliers of the customers should be the focus when the research takes place as we have to beat the current price and productivity of their current suppliers. There are many factors to uptake when competing with already established manufactures. With the likes of material prices and labour being cheaper from companies abroad, energy and transporting goods are variables which we will still have to take under consideration.

With labour rates and also material rates from overseas countries at a considerably lower amount than the UK it asks the question what can we do to compete with cheap overseas companies? One strategic solution to this could be creating a manufacturing plant overseas along with the appropriate logistical backing from the UK headquarters. By moving a plant abroad this could open the opportunity to the cheap labour and also the cheap materials which countries far and wide have easy local access to.

an excellent analysis

The Centre of Gravity Method

Creating a new factory which would be closer to distribution centres and fulfilment centres could save us money along with the benefit of quicker movement of manufactured parts. With the use of 'The Centre of Gravity' we are able to make an approach that seeks to compute geographic coordinates for a potential new factory that will minimise costs. The main inputs are Markets, Volume of goods shipped and Shipping costs. The method used is beneficial because it's simple to compute, considers existing facilities and minimises costs. Below is a step by step guide on how to use the Centre of gravity (Shmula, 2011)

Step 1:

Place the existing factory, fulfilment centre and distribution centre locations in a coordinate grid. Place the grid on an ordinary map. The relative distances must be noted.

Step 2:

Use the equations as follows;

$$C_x = \frac{\sum d_{ix} V_i}{\sum V_i}$$

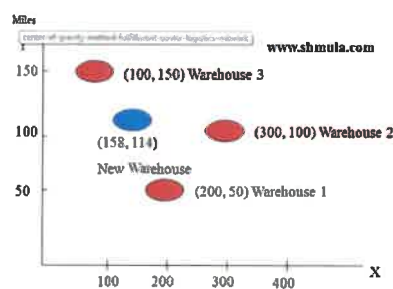
$$C_y = \frac{\sum d_{iy} V_i}{\sum V_i}$$

We calculate the X and Y coordinates using these equations where C_x is the X (horizontal axis) coordinate for the existing factory. C_y is the Y (vertical axis) coordinate for the new factory, d_{ix} is the X coordinate of the existing location, d_{iy} is the Y coordinate of the existing location, and V_i is the volume of goods moved to or from the new location.

Step 3:

Once you have obtained the X and Y coordinates place that location on the map.

With the use of the formulas and graph you will find below an example of how a simple centre of gravity graph would look.



The use of 'The Centre of Gravity' is a very cost effective and a time saving method in which the relocation or added factory could help ensure quick and successful business. With the use of this method it also offers opportunity to overseas customers due to the close proximity of the distribution centres.

Another solution to increase our European and International customer base would be to form a partnership with a 'like for like' business such as ourselves. There are many reasons as to why creating a partnership between two companies is a good idea. Doubling resources and

Management, Innovation and Sustainability

ability to reach customers is one of the many benefits when joining partnership. Simply by helping each other become one will multiply the amount of ideas, intelligence, background and experience business can draw upon. As the famous saying goes 'Two heads are better than one.'

Brexit

A referendum which is a vote in which everyone voting age can take part in was held on Thursday 23 June, 2016, to decide whether the UK should leave or remain in the European Union. Leave won by 51.9% to 48.1%. The referendum turnout was 71.8%, with more than 30 million people voting. The UK is scheduled to leave at 11pm on Friday, 29 March, 2019. The World Trade Organization sets rules for countries that don't have free trade deals with each other, including tariffs and taxes charged on the import of goods (Alex Hunt & Brian Wheeler, 2019). As long as Britain has been in the EU all trade within the European Economic Area is tariff free, but with the ongoing Brexit negotiations it is going to have a huge impact on securing European Customers due to the new costs of importing goods from country to country. By increasing the duty to import and export customers will look for suppliers within a closer proximity. Staying in the EU would have been more beneficial to us as a company as it makes it easier for us to move money, people and products around the world.

Another difficulty we face as a manufacturer is that several countries and customers will have different regulations in terms of the safety of employees and product specification. In the UK our work will meet a specific regulation, whether that be COSHH (Control of substances hazardous to health) or City and Guilds 17th Edition. Every precaution which could harm humans is taken under consideration when creating regulations and they are in place for the safety of everyone. While there are laws and directives in place across the EU as a whole, national legislation and how it is enforced varies quite a bit between all European countries (Luke Rees, 2016).

So how would it affect your company?

5% Increase In Product Rejection Rates

As of recently there has been an increase of 5% In product rejection rates, this could be down to a number of situations which are ongoing within the company. If we take a top down approach in an assessment of the management, we can start to identify the key issues as to why we have an increase in product rejection rates. Looking at the theory of management we can refer to McGregor's XY Theory. Douglas McGregor was a social psychologist who created his famous XY Theory in 1960 (© Businessballs , 2018).

McGregor Theory XY

Theory X Management Style

- Individuals who dislike work and avoid it where possible
- Individuals who lack ambition, dislike responsibility and prefer to be led
- Individuals who desire security

The noticeable aspects of McGregor's XY Theory are found in the behaviors of autocratic managers and organizations which use autocratic management styles. The management

implications for Theory X workers are that, to achieve organizational objectives, a business would need to impose a management system of coercion, control and punishment.

Some of the characteristics of a Theory X manager include;

- Intolerant
- Aloof and Arrogant
- Short Temper
- Shouts
- Poor listener

Working for an X Theory boss is not easy, some extreme X Theory bosses will make extremely unpleasant managers, but there are ways of managing these people upwards. Avoiding confrontation and delivering results which hit the deadline are the key tactics. Theory X manager are primarily results oriented, so another key tactic in working alongside a Theory X manager is to orientate your own discussions and dealings with them around results i.e. what you can deliver and when.

Theory Y Management Style

- Individuals who consider effort at work as just like rest or play
- Ordinary people who do not dislike work. Depending on the working conditions, work could be considered a source of satisfaction or punishment
- Individuals who seek responsibility

Theory Y managers have an optimistic, positive opinion of their employees, and they use a decentralized, participative management style. Using this style of management it encourages more collaborative, trust based working relationships between managers and their team members.

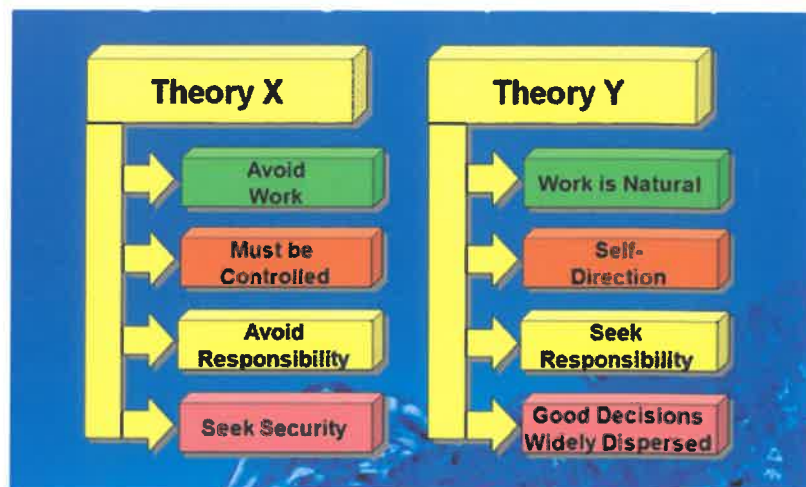
Some of the characteristics of a Theory Y Manager include;

- Good listener
- Open to new ideas
- Approachable
- Team player
- Responsible
- Honest

A Theory Y manager is always likely to involve every employee in open discussions on bringing new ideas forward and adding new ideas to project plans. The advantage of a Theory Y manager is that they are very approachable and seek responsibility.

By comparing both Theory X and Theory Y I think it is evident that the managers currently employed are Theory X biased. Employing Theory Y managers would have a major positive impact on the workforce as they will create more of a unity between all employees and their line managers. My opinion is that by employing a Theory Y biased manager it is very possible that new ideas will flow easier due to the more relaxed approachable environment. The employees will now be encouraged to think outside the box, thus creating new opportunities for the company to decrease the % of rejection rates.

excellent



Source?

As shown below I have created a simple comparison table for Theory X & Y

BASIS FOR COMPARISON	THEORY X	THEORY Y
Meaning	Theory X is a motivational theory, which involves high supervision and control over the subordinates, and greater degree of centralization.	Theory Y, is an advanced theory, wherein it is assumed that the workers are self-directed and self-motivated, for growth and development and takes active part in decision making.
Work	Dislikes work	Work is natural
Ambition	Little to no ambition	Highly ambitious
Responsibility	Avoids responsibility.	Accept and seek responsibility.
Leadership style	Autocratic	Democratic
Direction	Constant direction is required.	Little to no direction is required.
Control	Tight	Lenient
Authority	Centralized	Decentralized

good

BASIS FOR COMPARISON	THEORY X	THEORY Y
Self-motivation	Absent	Present
Focuses on	Psychological needs and Security needs	Social needs, esteem needs and self-actualization needs.

In the terms of motivation within an employee in our workforce, I think it is essential that we also look into 'The Mayo Effect'. In the early 1930's a theorist Elton Mayo suggested that motivation at work was promoted by such factors as;

- Greater communication
- Good teamwork
- Showing interest in others
- Involving others in decision making
- Ensuring the wellbeing of others
- Ensuring work is interesting and non-repetitive

Mayo based his assumptions on research undertaken with workers at the Hawthorne plant of the Western Electric Company in Chicago. His work resulted in the Hawthorne theory. He suggested that boredom and repetitiveness of tasks led to a reduction in motivation. He believed that motivation was improved through making employees feel important, giving them a degree of freedom to make choices and acknowledging their social needs. By researching further into the Mayo Effect it is evident that internal or external factors motivate a person to change or develop their actions. For example, an internal factor may be the desire to learn a new skill. So if we as a company were to put many members of the welding team onto a TIG welding course, this would enhance motivation levels and would also benefit us as a company having multi coded welders as part of the workforce. Feeling a sense of achievement and being valued by your employer are important factors which drive employee's motivation. The Mayo Theory is seen to be operating throughout the company. This may be through a 1-to-1 discussions with an employee and manager. I suggest that each line manager should hold regular team meetings to update all employees on a day to day basis. During these meetings I think once a month recognition should be awarded to employees who have continued excel and meet targets, this could be in the form of extra holidays, half days or bonuses. By offering these rewards it is another way of saying "Thank you for your hard work and dedication" and celebrating achievements.

Some excellent examples.

10% Reduction In Production Targets On Previous Year

By taking a look at psychologist Fredrick Herzberg's theory of employee satisfaction we are able to determine the effect of attitude of motivation. Herzberg's finding revealed that certain characteristics of a job are consistently related to job satisfaction, while different factors are associated with job dissatisfaction as shown below; (© Mind Tools Ltd, 2019)

Factors for Satisfaction	Factors for Dissatisfaction
Achievement	Company policies
Recognition	Supervision
The work itself	Relationship with supervisor and peers
Responsibility	Work conditions
Advancement	Salary
Growth	Status
	Security

According to Herzberg, the factors leading to job satisfaction are "separate and distinct from those that lead to job dissatisfaction." Therefore, if you set about eliminating dissatisfying job factors, you may create peace and enhance performance. Following Herzberg's theory offers the opportunity to increase morale and motivation in the workplace which in turn will improve production.

The characteristics associated with job dissatisfaction are called hygiene factors. When these have been adequately addressed, people will not be dissatisfied nor will they be satisfied. If we want to motivate our workforce, we will have to focus on satisfaction factors like achievement, recognition and responsibility. I think offering bonuses is a clever incentive because bonuses will motivate employees to raise their performance to meet the business goals we set. For example, we want to increase production targets for this year, we simply give holiday or cash bonuses as incentives. Bonuses can serve as an important tool as we are a medium sized engineering company, the bonuses will help ensure employee loyalty and turnover. If we were to use a bonus plan we would have to make it very clear who's eligible for it, as if we offer one set of engineers the opportunity of a bonus then we must offer them all the same scheme. We want all employees to feel equal in terms of how important they are as a person to the company, by offering only a selection of the employees a chance to receive a bonus then this is will result in unfair treatment of staff.

Excellent examples

To apply Herzberg's theory we will have to take two steps to ensuring that motivation is at its highest so we can increase production rates.

Step One: Eliminate Job Dissatisfaction

Herzberg called the causes of dissatisfaction "hygiene factors." To get rid of them we will need to;

- Create and support a culture of respect and dignity for all employees
- Ensure that wages are competitive
- Provide job security
- Build job status by providing meaningful work for all positions

Step Two: Create Conditions for Job Satisfaction

To create satisfaction, Herzberg says that we will need to address the motivating factors associated with work. He called this "Job enrichment." His premise was that every job should be examined to determine how it could be made better and more satisfying to the employee doing the work. Things to consider include:

- Providing opportunities for achievement
- Recognizing people's contributions
- Creating working that is rewarding and that matches employees skills and abilities
- Offering training and development opportunities, so that employees can pursue the positions they want within our company

Escalating Maintenance Costs

Preventative Maintenance

Before using any piece of equipment on the shop floor of the factory and even before purchasing it, we must review its preventive maintenance requirements with the manufacturers and our own engineers. It is important that all suggested preventative maintenance is followed. Preventative maintenance ensures that the failure of equipment and downtime is reduced further. If we ignore the guidelines given on the maintenance of equipment we will see a loss in turnover due to no products being able to be manufactured as a piece of equipment is down. Ensuring that we foresee all maintenance on all machines in the future we:

- Decrease labour costs
- Reduce parts purchased
- Increase efficiency and overall uptime of the machines

Optimal timing of Maintenance

Preventative maintenance should be scheduled to that of the specific needs of our production schedule. This way our manufacturing plant can take machinery out of service at a time that allows us to maximise our uptime or efficiency. By planning our schedule way ahead of time we can there take into account future work needed on the machine which are

Management, Innovation and Sustainability

going to be used. For example, if the CNC lathe was not to be used from January until March but needed preventative maintenance in May then the work planned within the period of April-May would have to be taken into consideration. By taking the lathe out of service for maintenance during these working months where it will be in use 24/7, then we would be increasing direct labour costs. This can simply be prevented by the maintenance manager and project managers holding a meeting where they can discuss future projects to coincide with the maintenance schedule. The simple solution to this situation would be to hold the preventative maintenance a month early (March) so that the machine will be fully functioning when needed.

Maximising the efficiency of our staff

By training manufacturing workers to provide preventive maintenance assistance on a daily basis, we will maximise the efficiency of our manufacturing plant staff and take the preventive maintenance burden off of our senior maintenance engineers. Simple tasks which the employees can complete are;

- Cleaning all machinery
- Inspecting oil gauges
- Inspecting Cables
- Watching particular equipment characteristics

When a monitored characteristic is showing signs of needing preventive maintenance, then action must be taken to prevent any failure.

Equipment & Machinery

Dated equipment and machinery

In order for our productivity to reach its full potential we need access to up-to-date equipment. Normally it is difficult to decide when to replace old assets but with the increase in maintenance costs I think it is evident that now is the right time. Every piece of equipment has a lifecycle and while we need to get the most out of our equipment, going beyond its natural life is harmful for the business from both productivity and profitability perspectives. With technology changing at such a rapid rate, we cannot afford to operate using old, outdated equipment. If we do this then we are unnecessarily putting ourselves at a disadvantage, and are risking our own productivity and growth. Not only will new machinery increase productivity but it will also increase profits as down time will be significantly decreased due to the lack of preventative maintenance.

Unusually High Turnover Of Staff

While I have been an employee here for a number of years it has come to mine and also many other employees attention that there has been a high turnover of staff over the last few years. While offering a lot of employees a fantastic opportunity to work for this company it does come with a cost. Instead of focusing solely on employee retention ideas, a better move may be to invest more into employee training programs so that the new employees can adapt faster to the working environment. (© TINYpulse , 2018)

Management, Innovation and Sustainability

Over the last 3-4 years it is evident that you have also stopped paying new employees the standard engineer's wage of £12 an hour and have further reduced these rates to £6.50 an hour. It is well known that a lot of college/university graduates have been taken on and are being paid very close to minimum wage although requiring degrees and exceptional work experience to qualify for the job. Even though it is an "Employer's market," taking advantage of experienced, highly educated employees who are desperate for work comes at a cost to you. These employees who have recently been taken on are likely to be looking for better jobs immediately and do not think that they are appreciated. While searching for jobs elsewhere where competitors may be offering more in terms of salary. It does not mean you have to offer more financially through salaries, although making more flexible schedules, more perks, more benefits may actually increase employee engagement and satisfaction.

Leadership

Taking a deeper look into why there may be an unusual high turnover of staff could be down to leadership styles. Leadership is a skill, which requires a person to influence the subordinates to work voluntarily, and stimulating them to put their efforts into achieving the goals of the company. The company is able to choose from different leadership styles, one being Autocratic leadership. Autocratic leadership is where the leader while solemnly make all important decisions acting as a leader solely. On the other hand we have a democratic leadership which alludes to a type of leadership in which the leader shares decision making power and other responsibilities with the group members. Based on the recent figures of the unusual high turnover of staff it is apparent that various engineering managers are taking the autocratic leadership role. Using this technique can prove very ineffective in terms of controlling the workforce as it can morale and lead to resentment of the current managers (Kendra Cherry, 2018). While autocratic leadership can have its benefits, there have been many instances within the workshop where the leadership style has been very problematic. Within the company we have a vast amount of experience, high skilled worked. These workers have been left feeling that their knowledge and contributions have been undermined due to the lack of input they have within projects. To tackle the problem with leadership styles I think the solution to this would be to involve more democratic style managers. Democratic is a form of leading people that is found in human resources and participative management theory. From a business prospective, this type of leadership will include redistributing power and authority between the employees and managers to encourage the employee involvement within the decision making process. (Crystal Ayres, 2016) A democratic leader must have the follow traits;

- Honesty
- Creativity
- Intelligence
- Fairness

A leader who has the above will create the opportunity of building strong effective teams within the business. Under this type of leader collaboration and honesty within the workforce would flourish, as everyone's opinions would be taken into consideration when facing various task within the working life. To introduce opportunities to the managers for them to go on training courses which encourage the use of democratic style of leadership. This will be beneficial to us as a company as it will see employees feel more comfortable in approaching managers with new ideas along with the support of theirs.

3 '7 Day' + Lost Time Accidents

Outdated Machinery

One issue which arises in the terms of lost time accidents is with the conditioning and age of the machinery we have on the factory floor. As an employer it is your duty to provide enough protection, assistance and training to try and prevent any accidents from occurring. Although with the correct training and assistance this would not matter if the machinery being used is dated. With dated machinery parts are worn, fragile and old. This could cause serious malfunctioning with any machine and the result of this could leave the company liable for negligence along with any compensation the employee seeks. The solution to this problem is solely dependent on the budget available in order to replace the machinery. There are two options we can undertake;

1. Purchase brand new machinery
2. Lease new machinery

Which option we choose is reliant on how long we plan on using that machinery which is where resource management comes in to play. Resource management is where we analyse current projects and future projects and forecast machinery/tooling requirements. The current project for Emirates Airlines Boeing 747 currently uses an outdated movable pipe bending machine. Having looked at future projects over the next two years it is evident that we will no longer need this type of machinery after the completion of the Emirates project. Due to no longer needing this type of machinery the best option to undertake is to lease a brand new pipe bending machine. The reason why we should lease the piece of equipment rather than purchasing it is because the capital expenditure required for new machinery purchase cannot be justified against the project profitability. It will not be possible to absorb the cost of the machinery into the project costs while still maintaining profitability. The benefit of leasing any type of machinery is that all corrective and preventive maintenance costs are covered by the leasing company. As talked about previously this could be beneficial to us due to the escalating maintenance costs leasing all types of equipment would significantly decrease the costing of maintenance.

Maslow's Hierarchy of Needs

Maslow's hierarchy of needs is a motivational theory in psychology comprising a five-tier model of human needs, often depicted as hierarchical levels within a pyramid (Saul McLeod, 2018). The needs lower down in the hierarchy must be satisfied before an individual can attend to any of the needs higher up. As you can see from the picture below, from bottom to top the needs are, physiological, safety, love and belonging, esteem and self-actualization.



Using the structure and meeting the needs of this pyramid will be an essential tool to tackling the problem of absences'. We will have to start from the bottom and meet the basic

needs of an individual working our way to the top until each employee feels a sense of job satisfaction and security. Maslow initially stated that an individual must satisfy lower level basic needs before progressing on to meet the higher level growth needs. Every employee is capable and has the desire to move up the hierarchy towards a level of self-actualization. Unfortunately, progress is often disrupted by a failure to meet lower level needs. To progress through the pyramid it is essential that the physiological needs are met otherwise the human body cannot function optimally. After the physiological and safety needs have been fulfilled, the third level of human needs is love and belongingness, examples of this include friendships, trust and acceptance. Next is the esteem needs, a sense of accomplishment and achievement meet these physiological needs as these will increase an employee's self-esteem. At the top of the pyramid is self-actualization, such needs include realizing personal potential, self-fulfilment and creative activities.

Any employee who have recently begun their career with our company will be very concerned with physiological needs such as adequate wages, stable income and security needs such as benefits and a safe work environment. (Robert Tanner, 2019) To ensure we meet these basic needs we must ensure all outdated machinery is removed or replaced due to the severe dangers all employees are at risk to. The employees whose lowest level needs have not been met will make job decisions based on compensation, safety or stability concerns. The very first priority of all employees is their survival. We must always be honest and hold regular departmental meetings to ensure all employees are informed on the company's stability and any form of an economic downturn. If this is not followed then callous implementation of difficult decisions will cause our employees to feel threatened about the ability and desire of our company to continue to meet their physiological security needs. Employees who are "kept in the dark" about operational matters and the future plans of our company will feel like they are an organizational outsider. Once we ensure that the employees basic needs are met then they will want their social needs met, which provide a sense of "belongingness." The key point to take into consideration when satisfying their social needs is that employees desire to work in an environment where they are accepted in our organization and have some interaction with others. Interpersonal relations will be necessary as managers are able to create an environment where all employees cooperation is rewarded. Physiological and basic needs of all employees must be met to ensure a well-motivated team of employees. Employees needs change with time and to promote workplace motivation, effective leaders such as departmental managers must continually adapt to these changing needs.

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a good presentation, you have to make a good attempt to,

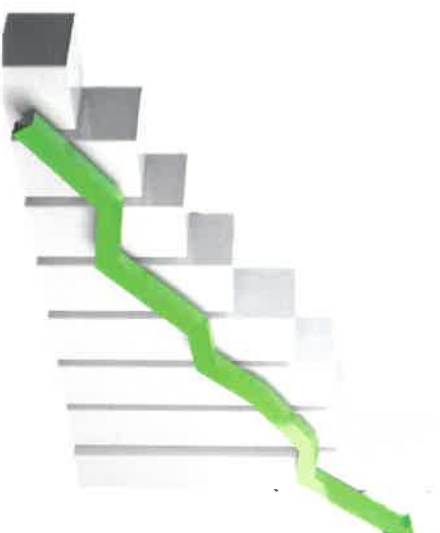
give
a
balanced
view.

Management, Innovation and Sustainability

Luke Andersen
HND Electrical Engineering

Factors to succeeding and growing

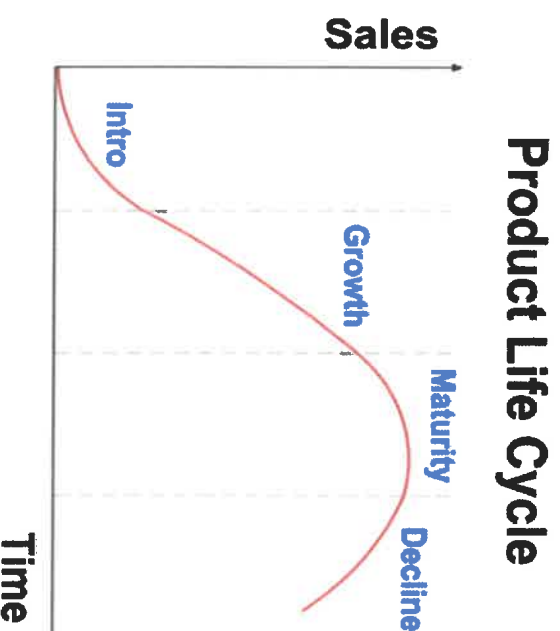
- Research the competition
- Identify new opportunities
- Form strategic partnerships with suppliers
- Leverage global platforms
- Internal expansion
- Create a business plan



Product Life Cycle

As shown in the graph below there are four stages of a products life cycle, which are;

- Introduction
- Growth
- Maturity
- Decline



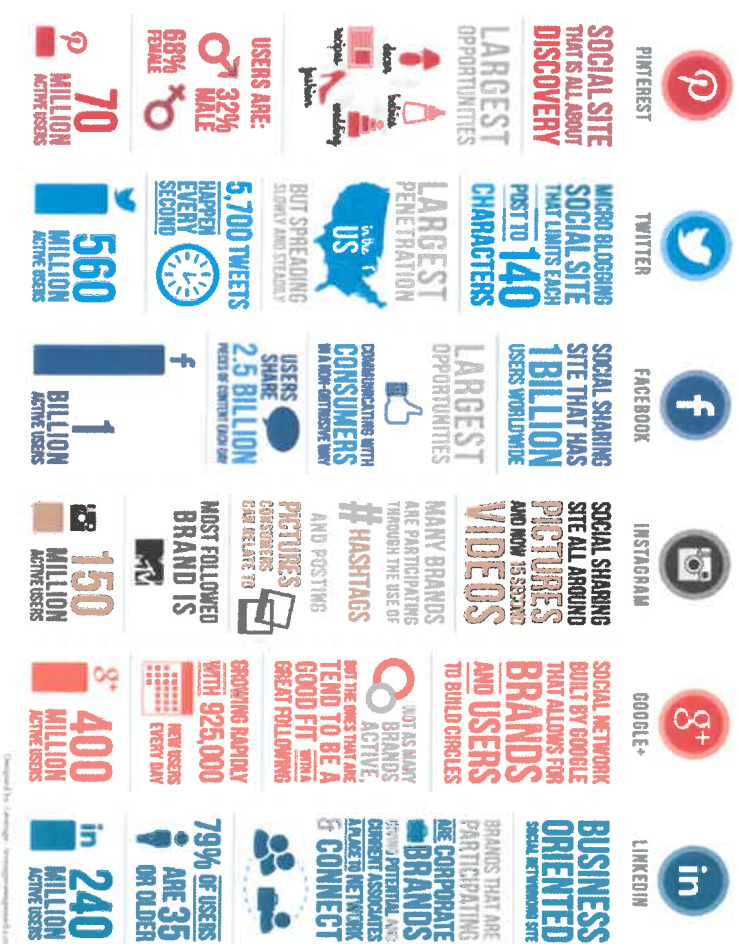
Strengths, Weaknesses and Opportunities

- SWOT Analysis – To think about all potential impacts that could affect the success of our organisation
- PESTLE – Track the environment our business is operating in. A look into all areas within the business such as the political and economic environment we operate in

PESTLE Analysis			
Political	Economic	Social	
* Increase international trade agreements * Governmental funding * The laws of employment	* Inflation * Low volume of local aircraft businesses * Slowdown of engineering manufactures in Swansea	* Busy lifestyles * Rising disposable income * Local opportunities	
Technological	Environment	Legal	
* Aircraft in air malfunctions * Increasing future in social media advertisement * Increased research and development	* Changes in climate conditions in some regions * Rising interest for corporate environmental programs * Increasing emphasis on sustainable business practices	* Health regulations in workplaces * Rising legal minimum wage * Increasing animal welfare regulations	

The future of marketing

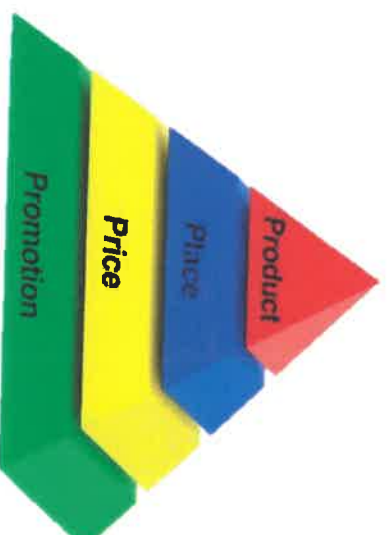
Social media is one of the most versatile and cost effective strategies used for companies to reach their target audience. Marketing through social media can help increase the company's recognition



Marketing Mix

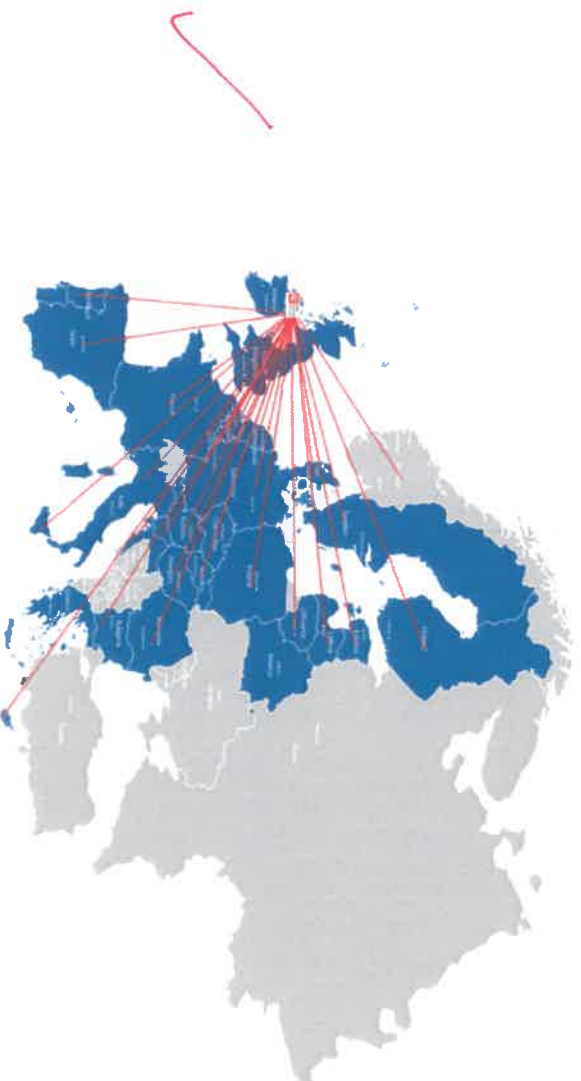
The marketing mix is a helpful way which uses the '4 P's' as a guide to ensure that the marketing of a service or product is sufficiently suitable. With the use of the marketing mix we are able to understand as to why a product's sale may have fallen

- Product
- Place
- Price
- Promotion



Existing & Potential New Customers

- Oversea extension – Cheap labour
- Materials bought from outside of Europe – Cost saving
- Potential new customers – Offer better prices
- Moving of factory – Easier access to motorway and also cheaper shipping costs



Maximising the efficiency of staff

- Cleaning all machinery
- Inspecting oil gauges
- Inspecting Cables
- Watching particular equipment characteristics

By training manufacturing workers to provide preventive maintenance assistance on a daily basis, we will maximise the efficiency of our manufacturing plant staff and take the preventive maintenance burden off of our senior maintenance engineers.



Leadership

Democratic leader

- Honesty
- Creativity
- Intelligence
- Fairness

Autocratic leader

- Power
- Control
- Authority



Maslow's Hierarchy of Needs

Basic Needs

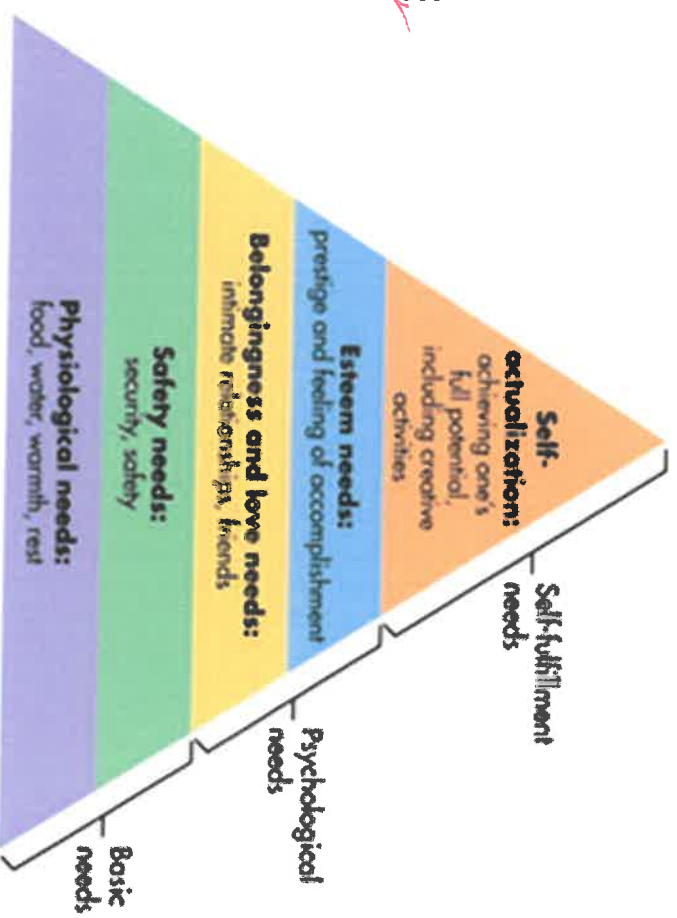
- Physiological
- Safety

Psychological Needs

- Belongingness and love
- Esteem

Self Fulfilment Needs

- Self-actualization



Source:

Herzberg's Theory of Employee Satisfaction

Certain characteristics of a job are consistently related to job satisfaction, while different factors are associated with job dissatisfaction

Factors for Satisfaction	Factors for Dissatisfaction
Achievement	Company policies
Recognition	Supervision
The work itself	Relationship with supervisor and peers
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Mayo Effect

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- Greater communication
 - Good teamwork
 - Showing interest in others
 - Involving others in decision making
 - Ensuring the wellbeing of others
 - Ensuring work is interesting and non-repetitive
- 

McGregor Theory X and Y

Looking at the theory of management we can see the two types of management, along with their characteristics

