May and August 2020 Operational Case Study Examination

Pre-seen material

ChargeIT

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1. Job and role outline

You are a Finance Officer for ChargeIT. Your main role is to support Sophie Jacobs, the Finance Manager. Your tasks include preparation of the annual budget, producing the monthly management accounts and providing information to management as required. You also assist with the preparation of the financial statements and deal with any queries regarding financial reporting.

2. Company information

Company background

The company, ChargeIT, develops, designs and manufactures cordless domestic electric products. The company operates from a single site in Eastland, in Northern Europe. Eastland has the E$ as its home currency.

The company was founded in 2001 by Gavin Mansell and is owner-managed by Gavin and his wife Anthea, who each hold 50% of the company's equity. The company started when Gavin, who worked for a competitor vacuum cleaner manufacturer, decided to set up his own company to exploit his expertise in product design. Manufacturing was originally outsourced to a company in South-East Asia but in 2016, the decision was taken to bring the manufacturing operation to Eastland.

The company's development was initially slow, but it has since grown rapidly despite a contraction in the overall market for vacuum cleaners. As a result of investment in research and development, it has established a market lead in battery technology which it continually exploits in the development of new and innovative products. In the financial year to 31 December 2019 the company reported annual sales revenue of E$96.7 million (an increase of 32.4% on the previous year) and profit before tax of E$12.0 million (an increase of 59.4%).

This rapid growth however has presented a number of challenges in terms of managing the business, its staff and putting in place an appropriate infrastructure.

The products

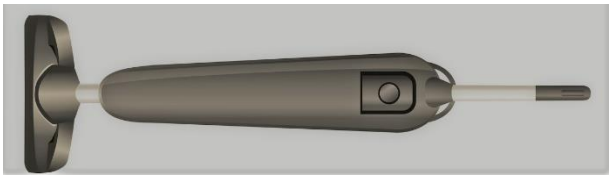
The product range consists of cordless floorcare and garden products including vacuum cleaners, lawnmowers and hedge trimmers. These products are sold in Eastland to consumers through its own website and directly to major retailers. Sales are also made in the USA and Europe. At present, the majority of the company's sales revenue (around 75%) is from sales in Eastland.

All the products sold are cordless and exploit ChargeIT's lead in battery technology. The company has a reputation for producing quality products and being a reliable supplier.

The product range is split into two main segments: floorcare products and garden products.

Floorcare products:

- Upright vacuum cleaners
- Stick vacuum cleaners
- Hand-held vacuum cleaners
- Robotic vacuum cleaners



Garden products:

- Lawnmowers
- Grass trimmers
- Hedge trimmers
- Robotic lawn mowers

Company strategy

The company aims to continue to develop its product range, whilst meeting environmental standards and providing the best quality products and service. It also aims to develop new markets for its products.

To achieve these aims, it continues to invest in research and development. It focuses on the philosophy of bringing battery technology to a wider market sector. It uses technology to make people's lives easier and designs products which are as easy to use as possible. A key long-term strategy is to promote the benefits of cordless appliances and by exploiting the company's battery technology, to be a lead player in the sector as customer preferences change from corded to cordless.

With these aims in mind, the company has invested heavily in new manufacturing equipment. It has however identified a need for future investment in its central systems and processes to support this ongoing product development.

The people

The company currently employs 250 staff of which 120 operate in Production and Research and Development and 75 operate in Logistics. The remainder are administrative staff operating in the Marketing and Sales, Finance, IT and Human Resources (HR) areas of the business. Staff numbers have grown rapidly, in response to the growth in sales revenue which has presented significant challenges in human resource management.

The directors

The company directors are as follows:

Gavin Mansell	-	Managing Director
Anthea Mansell	-	Sales and Marketing Director
Gemma Jorgensson	-	Research and Development Director
Ben Da Silva	-	Finance Director
Jack Martinez	-	Production Director

The directors have a wide range of previous experience mainly in the electrical and retail industries. They are relatively young and highly enthusiastic. Gavin and Anthea, as both owners and directors of the business, are keen to ensure profitable business development. They keep a close watch on company operations and are the main decision makers within the business.

Directors' profiles

Gavin Mansell, Managing Director, is responsible for the company's strategy. He worked for a competitor company before founding ChargeIT in 2001. Gavin's main love is product design and he takes a very close interest in the product development side of the business. Gavin is proud of the success of the company but is concerned to ensure that an appropriate infrastructure is in place to support future expansion.

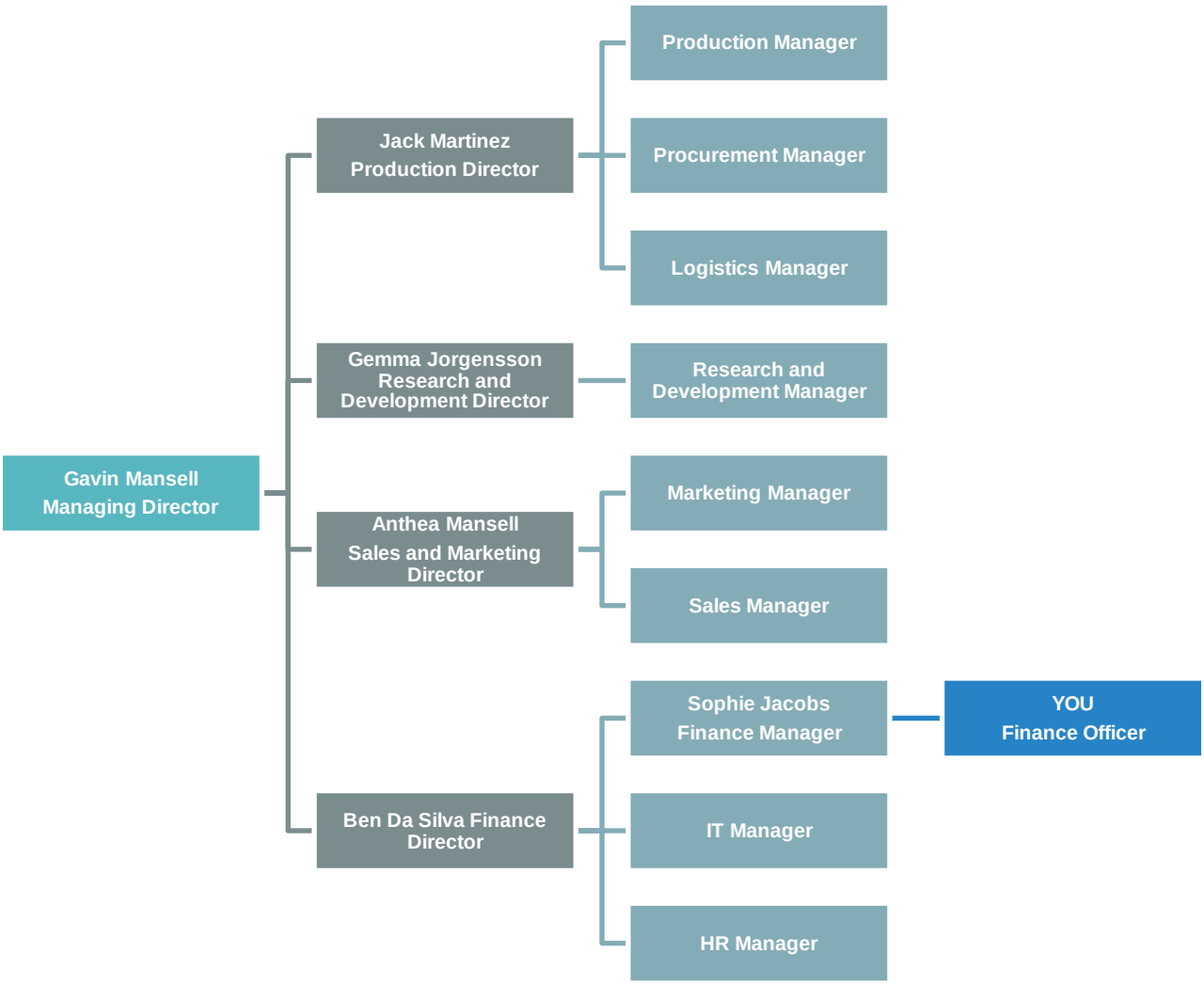
Anthea Mansell is the Sales and Marketing Director. Anthea graduated from Eastland University with a BA in Management Studies. She worked as a marketing executive for a retailing company before joining her husband to form ChargeIT. Her experience in the retailing side of the industry is invaluable for the company.

Gemma Jorgensson is the Research and Development Director. Gemma graduated from Eastland University with an MA in Product Design. Gemma works closely with Gavin Mansell in new product design and development. Gemma is keen to expand the company's product range further and is constantly looking at potential new product opportunities.

Ben Da Silva, Finance Director, is responsible for Finance, IT and Human Resources (HR). Ben is a qualified accountant and was appointed as Finance Director last year. He has quickly earned a reputation for keeping a tight rein on the company's finances. He is a bit of a 'techie' and is interested in exploring the use of digital technology to make processes more efficient.

Jack Martinez, Production Director, is responsible for Production, Procurement and Logistics. Jack is an engineer by profession and has been with the company since 2007, intially as part of the Product Development team. He was appointed as Production Director in 2016. Jack would like to improve the production facilities but needs to convince Ben that investment in new production technologies would yield sufficent returns.

Extract from ChargeIT's organisation chart

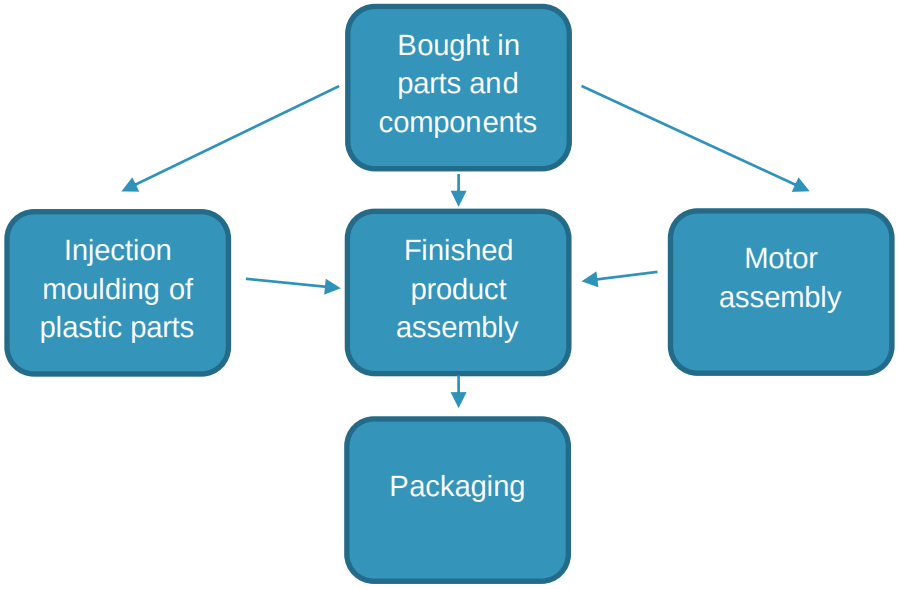


3. Company operations

Manufacturing

The company's products are all manufactured at its factory in Eastland. Many of the parts and components, including the batteries, are bought in from external suppliers and then assembled at the Eastland factory to create the finished product.

There are four main operations carried out in the factory: injection moulding of plastic parts; motor assembly; finished product assembly and packaging.



At each stage of the manufacturing process quality inspections are carried out to ensure the products meet the high-quality standard set by the company.

Extract from the ChargeIT website

How our upright vacuums are manufactured

Injection moulding of plastic parts

The plastic parts are shaped in a two-part steel mould, that is lowered into the chamber of an injection moulding machine. Tiny plastic pellets are poured into a heating vat and melted. The melted plastic is injected, under high heat and pressure, into the chamber of the injection moulding machine, penetrating every part of the mould. The two halves of the mould are opened and the plastic part falls into a bin. The plastic hardens on contact with the air as the mould opens. Many identical plastic parts of the same type are made during the injection moulding process. When the desired number have been made, the mould is removed from the injection moulding machine, another one is inserted, and the process is repeated for another type of part.

Motor assembly

The motors for the products are built on an assembly-line. Workers at assembly stations attach sub-assemblies or individual parts to the motor as it moves along the assembly line.

Finished product assembly

Assembling an upright vacuum starts with the base, which is made of moulded plastic. To this is fitted a steel beater bar with brushes. A rubber drive belt is placed in around the beater bar and pulled over a belt guide and motor pulley on the underside of the base.

At the rear of the base, an axle is inserted that passes from one side of the base to the other. A release handle is fitted onto one end of the axle that allows the vacuum's operator to raise or lower the handle during operation. Wheels are added to both ends of the axle.

The fan is bolted onto the base, and the motor assembly is attached to the top side of the base. Plastic fittings that support the bag and handle are attached to the rear of the base. An opening at the back of the base holds a rubberized length of flexible hose that transfers dust from the fan to the bag.

The final touches are added, including attaching the bag and outer markings giving operating instructions and information such as the serial number and the power of the motor.

Packaging

The completed machine is taken to the packing department where it is wrapped in a plastic bag and put in a carton. A box of plastic attachments, including nozzles and a hose for upholstery cleaning, is also put in the carton with an information booklet, assembly instructions, and a warranty card. The cartons, which have been pre-printed with marketing information, are then closed, sealed, and stored for shipping and distribution.

Procurement

Raw materials and components are purchased from a range of suppliers with whom ChargeIT has built close relationships over the years. Supplier selection is based on a mixture of price, quality and reliability. ChargeIT works closely with its suppliers to ensure that quality standards are met and that suppliers maintain at least the same environmental standards applied by ChargeIT.

The batteries used in the products are purchased from a specialist battery manufacturer which licences the battery technology from ChargeIT.

Logistics

The company's logistics system records the movement of all goods from the receipt of raw materials, part and components at ChargeIT's warehouses to the distribution of the packaged products to customers. The raw materials, components and finished products are held in warehouses which are situated adjacent to the Eastland factory.

ChargeIT's products are distributed to online customers and major retailers in Eastland by road using its own haulage trucks. It also works with a number of shipping partners to deliver products to distributors in other countries.

The warehouses employ a total of 75 staff who are assigned to four teams which carry out the following activities:

- Receiving: receiving of raw materials, bought-in components and finished goods
- Picking: picking of raw material and bought-in components for production and finished goods for customers' orders
- Packing: packing orders ready for despatch to customers
- Despatch: loading delivery vehicles heading to online customers, retailers and shipping partners.

Sales and marketing

In Eastland, the company's products are sold to consumers through its own website and directly to major retailers who sell the products both online and through physical stores. The company's website contains detailed information about the company's background, strategy and current product ranges. It offers a secure platform for the processing of financial transactions.

In the USA and Europe, ChargeIT use carefully selected distributors. The main responsibility of the distributors is the fulfilment of online orders, however in some countries they also distribute ChargeIT products to retailers.

At present, sales made in Eastland represent around 75% of the company's sales revenue. Profit margins vary depending on the sales channel used to sell the product.

Sales of floorcare products are evenly spread throughout the year however garden product sales are seasonal with the majority of the sales volumes being in the spring and summer quarters.

Marketing is carried out by the company's Marketing Department which employs a range of marketing methods. The company's website is considered an important marketing tool as it represents its main sales channel. The website has been continually developed to ensure visitors are engaging with the content. Web pages are informative, clear and easily navigated.

The website employs data analytics to enable the company to source sales data but also other metrics such as: number of visits; number of downloads; average time on page and 'bounce rate', which measures the percentage of visitors entering the website and leaving without visiting another page. These website data analytics are considered an important source of information to help determine customer preferences and the sales potential of the company's products.

Research and development

Research and development are a major focus for the company as it strives to develop new products and exploit new technologies.

Research and development are carried out by a separate department. The department's primary purpose is to drive forward the development of an idea through to the proof of concept stage, ready for the business to take forward into production. This is achieved through researching and exploring existing methods and applications or by identifying where new technologies could be used. Once the concept is proved, it can then be implemented through the fast turnaround of building and then testing of prototype models.

A major focus for the department is the development of battery technology for which the company has a strong competitive advantage. The company exploits this competitive advantage in its new products and through the development of new product ranges which rely on battery technology.

The Research and Development department is also responsible for the design and functionality of the electronics used in all of ChargeIT's products. This also includes supporting other areas of the business with electronics knowledge and understanding.

Finance and IT

The financial information system produces monthly management accounts and annual statutory accounts. This information system also generates daily and weekly sales revenue and gross margin information. The company operates a standard absorption costing system and applies a factory-wide overhead absorption rate based on direct labour hours.

Budgets are produced by the Finance Department on an annual basis using a top-down incremental budgeting approach. Standard costs are reviewed as part of the budgeting process and other information to formulate the budgets is obtained from the directors and senior managers. The final budgets are approved by the Board. Individual functional managers do not have budget responsibility. Monthly reporting on actual performance compared to budget is to the Senior Management Team. The Finance Department is relatively small and much of the staff time is spent on day to day transaction processing. The Finance Department's role within the company has changed very little since the company was formed in 2001.

Human resources

Human resources are the responsibility of the HR Manager. The company has expanded rapidly which has created a number of issues in managing human resources. It has been recognised that there is a need to build new processes for human resource management to ensure the well-being of both existing and new staff.

4. Industry analysis

Vacuum cleaners

The vacuum cleaner manufacturing industry in Eastland was dominated in 2019 by three major players who account for more than 40% of market share. ChargeIT ranks 4th in terms of market share.

Sales volumes of vacuum cleaners in Eastland contracted slightly in 2019 to just over 6 million units (E$648 million sales revenue). Upright and cylinder vacuum cleaners still represent the main categories, but sales volumes have continually fallen since 2015. In contrast, sales of cordless hand-held vacuum cleaners continued in an upward trend, rising by 5.7% in 2019. This increase was mainly due to exceptionally high levels of innovation and investment that has significantly improved battery performance. Convenience is key with the cordless/low weight factor of hand-held vacuum cleaners appealing to consumers looking to transform a chore into a quick and easy task. Unit prices of hand-held cleaners are gradually decreasing, making this category more accessible to a wider range of households. Robotic vacuum cleaners, whilst still one of the smallest categories, showed strong growth with sale volumes rising by 17.5% in 2019.

Online retailing of vacuum cleaners is booming as physical stores are increasingly being used for consumers looking to see, touch and sometimes try the product before making a purchase online. The major online retailers are increasingly demanding special deals from manufacturers to purchase bulk products at a low price, while manufacturers are still being asked by the online retailers to pay to advertise on their websites. Online retailers also provide strong guarantees on labelled product ranges and provide consumers with the option to return unsatisfactory products free of charge.

Lawnmowers and gardening power tools

Sales of gardening power tools in Eastland increased in 2019 by 3.9% to E$324.4 million whilst sales of lawnmowers contracted by 1.1% to E$356.9 million. Robotic lawnmowers however showed strong growth from E$51.5 million to E$58.9 million.

Sales of both power tools and lawnmowers are expected to continue to grow over the next five years. The main growth area will be in robotic lawnmowers with sales expected to reach over E$90 million by 2024. Awareness of this product category is low in Eastland compared to other countries in continental Europe and the potential for growth is high.

Robotic lawnmowers have improved significantly in recent years due to the advances in robotics. With most models, it is still necessary to lay a boundary wire for the robot to locate the boundary of the area to be trimmed. The lawn mower tackles the task utilising a "random" mowing system (basically, the robot moves around the lawn until it detects the boundary wire limiting the lawn area, then changes direction until it detects the wire again). Modern versions however now include advanced features such as self-docking and rain sensors which means the robot will return automatically to the charging station if rain is detected.

5. Extract from ChargeIT's 2019 Financial Statements

Statement of Profit or Loss for the year ended 31 December	2019 E$000	2018 E$000
Revenue	**96,674**	**73,009**
Cost of sales	**(47,499)**	**(33,364)**
Gross profit	**49,175**	**39,645**
Operating expenses	**(37,176)**	**(32,115)**
Operating profit	**11,999**	**7,530**
Finance income	**42**	**26**
Profit before tax	**12,041**	**7,556**
Taxation	**(1,828)**	**(826)**
Profit for the year	**10,213**	**6,730**

Statement of Financial Position as at 31 December	2019 E$000	2018 E$000
Non-current assets		
Property, plant and equipment	**11,429**	**11,296**
	11,429	**11,296**
Current assets		
Inventories	**9,528**	**8,043**
Trade and other receivables	**5,974**	**5,388**
Cash and cash equivalents	**12,703**	**2,779**
	28,205	**16,210**
Total Assets	**39,634**	**27,506**
Equity and Liabilities		
Share capital	**8**	**8**
Revaluation surplus	**560**	**560**
Retained earnings	**27,843**	**17,630**
Total equity	**28,411**	**18,198**
Non-current liabilities		
Warranties	**2,800**	**2,682**
	2,800	**2,682**
Current liabilities		
Trade and other payables	**7,322**	**6,115**
Tax payable	**1,101**	**511**
	8,423	**6,626**
Total Equity and Liabilities	**39,634**	**27,506**

Extract from ChargeIT's Statement of Accounting Policies

f) Property, plant and equipment

The company uses the revaluation basis for its property. Plant and equipment are held at depreciated historic cost. Depreciation is provided on all property, plant and equipment at rates calculated so as to write off the cost or revalued amount, less residual value, of each asset on a straight-line basis over its useful economic life. Depreciation is charged on a pro-rata basis in the year of purchase and disposal.

h) Significant judgements and estimates

Warranties - the company is required to estimate the cost of potential repair of goods under warranty. The estimate is based on the expected level of returns.

Statement of Cash Flows for the year ended 31 December	**2019 E$000**	**2018 E$000**
Cash flows from operating activities		
Profit / (loss) before tax	**12,041**	**7,556**
Depreciation	**2,179**	**1,654**
Loss on disposal of property, plant and equipment	**23**	**0**
Finance income	**(42)**	**(26)**
Increase in inventory	**(1,485)**	**(1,320)**
Increase in trade and other receivables	**(586)**	**(1,015)**
Increase / (decrease) in trade and other payables	**1,207**	**(5,258)**
Increase / (decrease) in warranty provision	**118**	**(880)**
Cash generated from operations	**13,455**	**711**
Tax paid	**(1,238)**	**(1,645)**
Net cash generated from/(used in) operating activities	**12,217**	**(934)**
Cash flows from investing activities		
Interest received	**42**	**26**
Purchase of property, plant and equipment	**(2,585)**	**(1,317)**
Proceeds on disposal of property, plant and equipment	**250**	**0**
Net cash used in investing activities	**(2,293)**	**(1,291)**
Cash flows from financing activities		
Dividend paid	**0**	**(1,688)**
Net cash from/(used in) financing activities	**0**	**(1,688)**
Net increase/(decrease) in cash and cash equivalents	**9,924**	**(3,913)**
Cash and cash equivalents at beginning of the year	**2,779**	**6,692**
Cash and cash equivalents at the end of the year	**12,703**	**2,779**

6. Budget information

Budget for the year to 31 December 2020

Total company budgeted revenue and gross profit:

	Floorcare E$000	Garden E$000	Spare parts and accessories E$000	Total E$000
Total sales revenue	53,608	47,507	10,111	111,226
Cost of sales	28,176	21,923	4,044	54,143
Gross profit	25,432	25,584	6,067	57,083
Gross profit margin	47.4%	53.9%	60.0%	51.3%

Note: The figures above show the total from all sales channels. Different gross profit margins apply to each channel.

Detailed budget for floorcare products:

	Upright vacuum cleaners	Stick vacuum cleaners	Hand-held vacuum cleaners	Robotic vacuum cleaners	Total
Quantity (units)	207,000	34,500	86,250	9,200	
Per unit	**E$**	**E$**	**E$**	**E$**	
Average selling price	165.00	135.00	115.00	530.00	
Standard cost	89.75	70.25	57.25	243.00	
Gross profit	75.25	64.75	57.75	287.00	
	E$000	**E$000**	**E$000**	**E$000**	**E$000**
Total sales	34,155	4,658	9,919	4,876	53,608
Total cost of sales	18,578	2,424	4,938	2,236	28,176
Total gross profit	15,577	2,234	4,981	2,640	25,432
Gross profit margin	45.6%	48.0%	50.2%	54.1%	47.4%

Budgeted average standard costs for floorcare products:

	Upright vacuum cleaners	Stick vacuum cleaners	Hand-held vacuum cleaners	Robotic vacuum cleaners
	E$	**E$**	**E$**	**E$**
Direct material cost	65.00	50.00	40.00	180.00
Direct labour cost	8.25	6.75	5.75	21.00
Variable production overheads	2.48	2.03	1.73	6.30
Fixed production overheads	14.02	11.47	9.77	35.70
Total standard costs	89.75	70.25	57.25	243.00

Detailed budget for garden products:

	Lawnmowers	Grass trimmers	Hedge trimmers	Robotic lawnmowers	Total
Quantity (units)	97,750	57,500	51,750	6,900	
Per unit	**E$**	**E$**	**E$**	**E$**	
Average selling price	325.00	85.00	135.00	560.00	
Standard cost	148.75	37.75	65.25	266.00	
Gross profit	176.25	47.25	69.75	294.00	
	E$000	**E$000**	**E$000**	**E$000**	**E$000**
Total sales	31,769	4,888	6,986	3,864	47,507
Total cost of sales	14,540	2,171	3,377	1,835	21,923
Total gross profit	17,229	2,717	3,609	2,029	25,584
Gross profit margin	54.2%	55.6%	51.7%	52.5%	53.9%

Budgeted average standard costs for garden products:

	Lawnmowers	Grass trimmers	Hedge trimmers	Robotic lawnmowers
	E$	**E$**	**E$**	**E$**
Direct material cost	100.00	25.00	45.00	200.00
Direct labour cost	16.25	4.25	6.75	22.00
Variable production overheads	4.88	1.28	2.03	6.60
Fixed production overheads	27.62	7.22	11.47	37.40
Total standard costs	148.75	37.75	65.25	266.00

ChargeIT key performance indicators				
	Budget 2020	**Actual 2019**	**Actual 2018**	**Actual 2017**
Sales revenue (E$000)	111,226	96,674	73,009	52,582
Sales growth	+15.1%	+32.4%	+38.8%	+26.2%
Gross profit (E$000)	57,083	49,175	39,645	30,831
Gross profit margin	51.3%	50.9%	54.3%	58.6%
Operating profit (E$000)	13,200	11,999	7,530	10,642
Operating profit margin	11.9%	12.4%	10.3%	20.2%
Number of new products launched	4	2	4	3

7. The tax regime in Eastland

Corporate profits:

- The corporate tax rate applicable to taxable profits is 20%.
- The value added tax (VAT) rate is 20%. The sales revenue threshold for VAT registration is E$150,000.
- Unless otherwise stated below, accounting rules on recognition and measurement are followed for tax purposes.
- The following expenses are not allowable for tax purposes:
    - accounting depreciation;
    - amortisation;
    - entertaining expenditure;
    - donations to political parties; and
    - taxes paid to other public bodies.
- Tax depreciation allowances are available on items of plant and machinery (including vehicles used for business purposes) at a rate of 25% per year on a reducing balance basis.
- Tax losses can be carried forward to offset against future taxable profits from the same business.

Technology Monthly

April 2020 No. 77 E$4.70

Battery power – lithium-ion is here to stay

Georgio Lossatti - Business Correspondent

It has long been argued that if we want to convince skeptical consumers about electric cars and running the grid on renewable power, then we need a better battery. And yet it seems that the battery of the future will almost certainly be the battery of the past.

Lithium-ion technology has existed for decades. The basic battery works by sending charged lithium atoms, or ions, through a liquid electrolyte substance, moving back and forth between a positive cathode and a negative anode.

Over the years, changes made to the materials used in the cathode has increased the amount of energy the batteries can hold. As a result, what started out inside consumer electronics, such as mobile phones, can now be found in electric cars and connected to the power grid.

The humble lithium-ion battery has built up such a commanding lead that competing technologies may struggle to catch up. That lead is only likely to increase further as a number of planned new lithium-ion factories come online in the next five years. The need to produce a return from this capital investment will create a powerful incentive for the industry to keep tweaking lithium-ion technology rather than developing something new.

The recent development of a silicon-based powder which could boost the energy storage of a lithium-ion battery by 20% or more, has further enhanced the staying power of the lithium-ion battery. Silicon can hold more lithium than the carbon in graphite, the most common anode material, which means batteries using silicon can store more energy.

All things considered it looks like lithium-ion technology is here to stay, at least for a few more years yet.

Technology Monthly

May 2020 No. 78 E$4.70

March of the Robots!!

Georgio Lossatti – Business Correspondent

When the first robotic vacuum cleaner was developed most people didn't even think it was a robot. Our mental image of how robots were going to vacuum was a humanoid pushing a manual upright vacuum.

The first form of robotic vacuum cleaner was however ideally suited for moving around tables and chairs because of its small size. The two-wheeled, disc-shaped autonomous vacuum could detect the presence of obstacles and sense steep drops, using sensors. Most models had a pair of brushes rotating in opposite directions and a horizontally mounted side-spinning brush that swept against walls, followed by a vacuum that directed airflow through a narrow slit.

Early models were also relatively static in their approach to sweeping. They relied on a set of algorithms like spiral cleaning, room crossing, wall-following, and random-walk angle-changing, triggered by collisions with walls and furniture. As a result, they covered some areas more frequently than others and took several times longer to clean rooms than a human would.

Newer models have a forward-looking, obstacle-detecting infrared sensor and a self-charging, bin-emptying home base that they seek out at the end of each cleaning session via embedded infrared beacons.

The advent of modern AI techniques has accelerated the pace of robotics innovation, particularly in computer vision.

A new imaging sensor uses odometry to infer distance travelled from wheel turns, and internal sensors identify particularly dirty spots on floors.

So, does this innovation mean that we will soon see a single home robot capable of doing it all — the sort that has dominated science fiction for decades? Apparently not!!

Developing autonomous assistants to help with domestic tasks is more complicated than it seems. While household chores are relatively easy for humans to achieve, they are surprisingly difficult for an autonomous system to understand and carry out reliably. Robots, of course, have no 'innate' knowledge. While we might like to tell an assistive robot to just 'do the laundry', the robot needs much more information, from how to move each of its joints to where it should look as it performs each operation, and how to use its cameras and sensors.

It looks like our current form of robotic vacuum cleaners and lawnmowers are about as good as it is going to get for now.