MODETECH SERVICES

ModeTech Services, based in Vanderbijlpark, Gauteng is a small but growing high-tech engineering and manufacturing business which is poised to move from servicing traditional markets, such as mining, to new emerging markets, such as the renewable energy sector. This is being achieved by both expanding its current operation and upgrading its technology to capitalise on emerging trends. The first signal of a company seeking to embrace "technology meets manufacturing" is evident when signing in as a visitor. Visitors are inducted, scanned and registered online – and this commitment to digitalisation flows through to the shopfloor where the full impact of increased automation and digitalisation is evident.

The company, based in Vanderbijlpark, Gauteng, is the creation of Cordelia Mgidi who set up the business in 2014. She is no stranger to this traditionally all-male environment. After completing her apprenticeship in electrical engineering, she worked for companies such as AECI and Hillside Aluminium and then later joined Transnet Engineering. Throughout this time, Mgidi was driven by a desire to start her own business and despite it proving a challenging environment she was not deterred. While ModeTech Services is poised to take up some lucrative contracts in the renewable energy space, its core business is the manufacture, repair and refurbishment of metal and steel parts, components for railway, mining and petrochemicals companies. The company delivers engineering designs, consulting services and turnkey solutions to clients such as Transnet, Global Railway Engineering, TMH Africa, Nampak, Barloworld Equipment, Exxaro, Sasol, Vestas Southern Africa, Go wind, Nordex Acciona and Siemens Gamesa.

SHOWCASING TECHNOLOGICAL CHANGE

Companies adopt new technologies and digitise for different reasons. These may be innovation and staying ahead of competitors, cost reductions, reducing production times, enhancing customer support, or even as a means to resuscitate a company at risk. This series of case studies explores the success that companies have experienced in adopting new technologies and digitising their operations. Companies have made these changes over time and in all the case studies have had positive outcomes. The companies have grown, improved employment[1] and increased skills levels. These case studies form part of work TIPS has undertaken with the Department of Trade, Industry and Competition (the dtic) and in partnership with the World Economic Forum to showcase the benefits and importance of technological change by South African companies. This case study profiles ModeTech Services, a small engineering and manufacturing business that is moving into new markets such as renewable energy. Other case studies are: Prestige Clothing TFG; Hi-Alloy Castings: Imraan Textile Mills and Jendamark Automation. Copies are available at Technological Change and Innovation System Observatory.

TECHNOLOGICAL CHANGE AND INNOVATION SYSTEM OBSERVATORY

The aim of the Technological Change and Innovation System Observatory project is to support the Department of Trade, Industry and Competition (the dtic) and industry sectors to develop an integrated, strategic response to discontinuous technological change and disruptive innovation. It aims to equip public and private organisations to become more sensitive to global technological shifts, and the changing demands placed on the innovation system, the manufacturing sector and its stakeholders.

TRADE & INDUSTRIAL POLICY STRATEGIES

TIPS supports policy development through research and dialogue. Its areas of focus are trade and inclusive industrial policy, and sustainable development.

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Since 2014, the company has grown from having no assets to slowly growing its asset book and expanding its reach into emerging sectors such as renewable energy where it has the potential to become a market leader. It is working on both new projects in the mining sector and expanding its customer base – this is mainly being driven by the acquisition of new machinery and equipment as well as the growth of its workforce. Over the years, the company's staff complement has grown from less than 10 to more than 60 permanent employees – the majority of whom are highly skilled.

The key areas of technology change have been the introduction of CNC (computer numerical control) machines, which reduce the use of manual work and allow for more intricate welding. This is complemented by the introduction of 3D measuring arms. The company has also focused increasingly on tightening up its tracking of the full production process through the use of tablets, so that the team can monitor in real time what stage the projects are at. This is crucial for the company to upscale and meet tight deadlines to complete projects.

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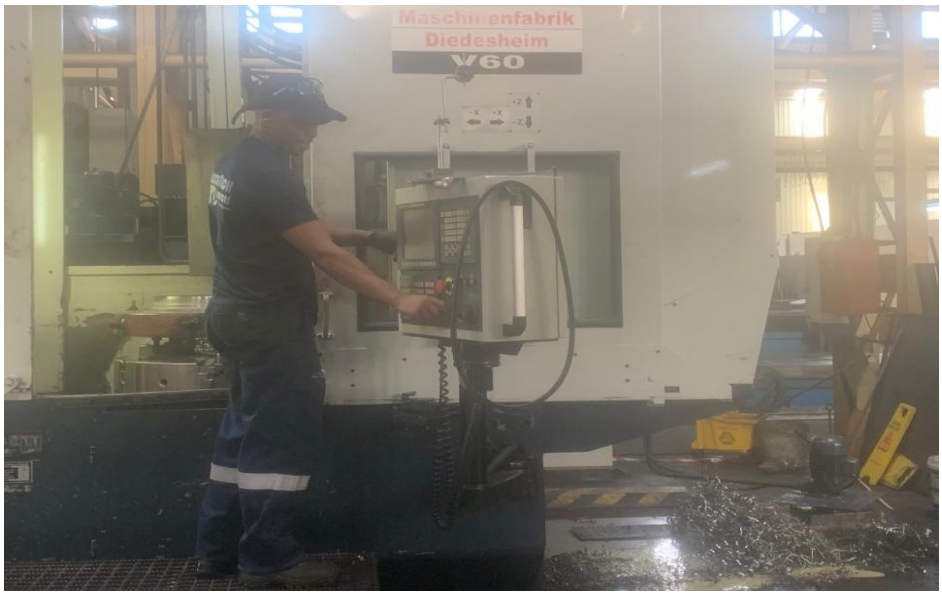
The challenge that ModeTech faces – similar to other emerging and growing small businesses – is access to funding for its expansion plans.



TECHNOLOGICAL ADVANCES

ModeTech has in recent years begun introducing new systems and processes in line with its commitment to rolling out Lean Six Sigma[1] principles and new machinery to grow the business, especially as it moves into the renewable energy sector. Some of the technological changes include:

First, digital connectivity and monitoring of major business and production functions. The company has begun to digitalise all its processes – both general business systems as well as to monitor production processes. For example, project planning and the monitoring of production processes is now being done online and is visible to the relevant teams in real time.

Second, the company has shifted from paper and forms to digital solutions. It has not totally moved away from paper to digital solutions, but all major processes are being moved online.

Third, ModeTech has increased automation of parts of its production. It has invested in welding booms on rails which automates part of the welding process. These welding booms help reach areas that are not possible through manual welding. In addition, the company has introduced 3D measuring arms which help to scan and measure components and, importantly, reach places that cannot be reached with traditional measuring tools.

[1] *Lean Six Sigma is a process improvement strategy that seeks to improve employee and company performance (and reduce inefficiencies) in a company's process flow by identifying the causes of waste or defects.*

Fourth, the company has organisation-wide communications and collaboration tools. It is using a number of business process systems to manage human resources and overall business processes. These include Pastel Payroll, HR from Sage, and for financial management the energy resource planning (ERP) system and SAGE 200 Evolution. This has seen the company also implementing a customer relationship management (CRM) system and improving inventory and job tracking. The company has put in place systems to monitor the tracking of client orders as well as to ensure that customers are able to see the progress, and to improve and increase accountability to customers.

Fifth, ModeTech Services is focusing on health and safety issues. The company indicated that it is very focused on upgrading its training around safety and this is being combined with a more vigilante maintenance programme of machinery and equipment.

IMPACT ON JOBS, SKILLS AND WORK ORGANISATION

Not only does the company have a relatively young workforce, with more than 50% under the age of 45, but the bulk of the workforce are either in specialised skilled positions such as mechanical, electrical, maintenance and industrial engineers or in artisan positions such as fitters and turners, turner machinists, welders and boilermakers. As the company grows and expands, it will need more engineers and qualified artisans who are able to work on the new CNC machines that have been ordered to make the components for wind turbines as well as the PV solar systems. One example is qualified turner machinists who are able to do some programming, which requires digital and analytical skills.

In this young company that is growing and evolving, management is focused on creating a learning environment. As part of this, there is a focus on upskilling and reskilling and when gaps are identified, there are a range of training interventions. The management team explains that for every job, the qualifications, skills and abilities required are identified and linked to a training plan. "If we have to spend money to upskill, we will do so."

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The type of interventions to address skills gaps include their commitment to the recognition of prior learning (RPL)[2]. As part of its commitment to RPL and to use existing skills as it continues to automate, between eight and 12 employees who have been working on machines for years as production machinists are being put through an RPL process so that they can go through a trade test. Management explained that a number of these employees either have a grade 10 or matric, with some having done N courses between N1-N6 but they have not qualified as artisans. The plan is to ensure they become fully qualified artisans so they can move into higher positions and become machinists. The company has also invested in welding booms and this will require additional training of the welders and boilermakers. Plans are already in place to ensure they are trained ahead of the arrival of the new machines.

Finally, as automation and digitalisation continue as part of the ModeTech Service's approach, there have been no job losses. Rather, the company is growing and moving into new markets, and is looking to recruit additional staff. In the last few months, the staff complEment has grown to 63. One of the four directors driving the business, Bart Pieterse, points out that the company is creating jobs in an unfavourable economic environment. Both he and Mgidi note that while the number of jobs is low, relative to the size of the company it is significant. This is especially so when a large number of manufacturing companies have closed down in what has become a depressed area in the Vaal region.

[2] *Recognition of Prior Learning is defined as a process whereby workers' previous learning (or skills and knowledge, which were gained through either informal or formal education and training can be formally recognised in terms of registered standards regardless of where and how the learning was attained. The recognition of skills and or learning could lead to the |individual earning an accredited National Qualification Framework (NQF)-led qualification. Hence, RPL can help workers gain recognition of their skills and expertise. A NQF is a nationally recognised framework that allows for the acknowledgement, accrual and the transfer of credits from one qualification to another within the framework.*

The way jobs have changed has not necessarily led to more complex tasks. Rather, it has needed an increased focus on digital skills and a higher degree of autonomy for employees. There has also been an increased focus on teamwork and employees having the space to explore solutions to challenges emerging during the production processes. Management also pointed out that most of the employees understand that there is going to be "a learning component part that they have to go through".

IMPACT OF NEW TECHNOLOGIES ON THE BUSINESS

The upgrading of machinery and equipment, coupled with plans to introduce lean manufacturing principles to enhance product quality and advance technological capability, has led to the following:

- **Improvement in productivity and overall efficiencies:** The introduction of Lean Six Sigma is intended to improve efficiencies. Managers will now face more defined and stringent reporting systems while there will be an increased focus on introducing problem-solving techniques on the shopfloor. The key problem-solving technique being implemented is the fishbone approach, which seeks to identify challenges and potential bottlenecks in the production processes. As part of this, the company is not only focused on identifying and reducing bottlenecks but on measuring turnaround time so as to improve productivity.

  Pieterse points out that there are high penalties for failing to complete orders on time for some of the newer contracts. Hence, the need to have proper processes in place to identify bottlenecks and carefully manage production processes so that projects are completed on time. Central to this, the production team explained that such systems seek to measure a range of variables to measure productivity better. "The minute you can monitor better, you can manage better." As part of this approach, employees' clock in for each job so that "we can see if we are quoting at the right level whilst clocking in per job also enables us to monitor the time spent vs the quotes/costs".

  Other productivity improvements include revisiting the company's maintenance programme for machinery and equipment. This is to ensure that there is a proper maintenance plan that anticipates breakdowns so they can be managed.

- **Improved accuracy, quality and expansion of product offering:** The company has invested in a welding boom as well as a 3D measuring arm, which together aim to improve accuracy and the quality of products. Both machines seek to reach areas which cannot be reached either through manual welding or by traditional measuring tools. As part of this, the company wants to invest in more CNC machines to expand its product offering into its new markets.

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- **Monitoring of production processes and improved customer relations:** The introduction of online monitoring of production processes via tablets is also aimed at ensuring the customer can track progress. This is all shared on the digital planner which the whole team can access. When components are completed, pictures are uploaded onto the planner so that the finance department can see that the task has been completed. The monitoring of the production process online is crucial to ensure accountability and assurance to customers.

To deal with the changes the workers face, the company is committed to training, which will lead to the further upskilling of employees. For example, the RPL process will ensure that workers' skills and experience will be recognised, leading to their promotion. Further, the changes in technology will see employees experiencing a higher degree of autonomy. This has seen employees being promoted and accordingly their skills recognised.

FACTORS WHICH ENABLED OR HINDERED CHANGE

The company is now driven by four directors who have a combined experience of over 100 years in the metal, engineering and related sectors. The skills mix of the directors is one of the factors which has facilitated the change process. The evolution of the partnership arrangement began a year after establishing the company when Mgidi met Bart Pieterse who was running a company called Machine Tool Promotion (MTP), which was involved in machine development, machine trading and machine services. Mgidi and Pieterse entered into a partnership and ModeTech then bought into the manufacturing part of MTP thereby expanding ModeTech's capacity. Further expansion came when Mgidi and Pieterse met Gerald Nienaber who was one of ModeTech's customers involved in the renewable energy sector. The three decided to go into partnership together and emerging out of that they began to offer services to various original equipment manufacturers (OEMs) in the wind and renewable energy sector. As a result of its expanded capacity and offering, ModeTech was awarded two large contracts to manufacture wind turbine components for the OEMs. The shift into the wind and renewable energy sector was solidified after a Chinese-based company, JU-Tracker, granted ModeTech the licence to become the local manufacturer to produce Solar PV tracker systems.

Mgidi, Pieterse and Nienaber, who all have the background, experience and qualifications in various engineering-related fields, were later joined by Paul Breitenbach who is the financial director. Mgidi and Pieterse point out that they all bring together a range of different skills which are key in understanding people and technology "and when you put these two together you enhance what you do". They argue that "technology is not just what you have but what you produce and the balance between the two shows you your competitiveness".

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There are, however, a number of other factors which have contributed to the evolution and expansion of the business. The management team has focused extensively on building a relationship with employees on the shopfloor as well as with two unions which have members at the company, the National Union of Metalworkers of South Africa (NUMSA) and Solidarity. The company indicated that although there was no recognition agreement in place as only a minority of workers belonged to unions, it believed that doing business in an open and honest way entailed engaging stakeholders. While the unions represent a minority they are still stakeholders in the business. As a result, detailed presentations were made to the unions about how the business was being transformed – including growth forecasts and job creation. Linked to this approach, the management team is focused on "leading by example and treating people with dignity". As part of that, management is visible on the shopfloors and hands on. With the introduction of the new machines, including the CNC machines, the company will require employees who can read engineering drawings and use the machines.

The main challenge is the ability of the company to raise funds for expansion and acquisition of more machinery and equipment. This is critical if the company is to grow and be able to derisk the business. The management team points out that the company's balance sheet is not strong – an issue that many young companies face.

The company has a core of highly skilled employees coupled with a number of employees are going through an RPL process, which aims to address that gap. The company views the renewable energy sector as a potential new market. As such the company believes that it is well-placed to take advantage of this emerging market as it has gone through a rapid learning curve over the last three years. Coupled with this, the company had to go through an intense audit to be able to produce for the OEMs.

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VISION FOR THE FUTURE

ModeTech is well poised to continue growing its client base in the renewable energy space. To date, it has been awarded two contracts to produce components for wind turbines for Vestas Southern Africa and Goldwind Africa and BioTherm Energy. It has now set its sights on a large number of other potential projects and has quoted for contracts in excess of R1 billion.

ModeTech believes that as the energy crisis continues, coupled with global commitments to decarbonise the economy, the opportunities are endless. This is especially so as the company has already been approved as a supplier to the OEMs. While the company has its sights on this emerging market, the management team believes it is also well-positioned to take advantage of participating in infrastructure projects – if government were to release such projects into the market.