Agility as a strategy in Zimbabwean manufacturing industries

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ABSTRACT

Customer needs as well as requirements are always in a continuous state of flux and more often than not, Manufacturing Companies find themselves in a quandary as they try to meet these. The inherent ability of Manufacturing Companies to meet the ever-changing customer requirements is key in ensuring that they are able to gain a competitive advantage over their counterparts as well as succeed in this highly volatile market. The advent of the COVID-19 pandemic as well as its noticeably widespread effects also brought about disruptive effects within an already turbulent environment as the Zimbabwean Manufacturing Sector was not spared the scourge of the pandemic. The organizations thus have to gain resilience so as to be able to thrive as well as grow competitively within their sector. The purpose of this paper was to assess how applicable the Agile Strategy is within the Zimbabwean Manufacturing sector as well as to come up with effective methods by which the strategy could be adopted by more organizations within the sector. The key drivers to the implementation of the strategy within these sectors as well as challenges associated with the implementation were also reviewed in depth.

Keywords: Agile, Strategy, Manufacturing, Zimbabwe, Competitive, Flexibility

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1. INTRODUCTION

The presence of stability within a market, allows organisations to plan for the future with an increased sense of accuracy, but the world or business markets seldom remain stagnant and are in a continuous state of fluctuation. The organisations better suited to surviving in this rather volatile environment are ones which can easily adapt to the ever-changing trends.

Agility in essence refers to the ability of a business or an organisation to rebrand itself, renew timeously and succeed in a volatile environment which is synonymous with rapid change and turbulence (De Smet, 2015) . The ability to respond quickly to changes allows an organization to become stronger and hence gain a competitive advantage over its competition.

In order to stay competitive as well as in sync with the ever-changing times, the manufacturing sectors globally have constantly been advancing in terms of technology as well innovation and in order for them not to be left behind. Zimbabwean. manufacturing industries have to follow the same. Zimbabwean manufacturing sector has been generally slower in adopting new technologies which are being introduced in other parts of the world as well as being rather rigid in terms of adjusting their operations, and this failure has been attributed to several factors, chief amongst them being the ever evident economic recession (World Bank, 2021) . Despite this general slowness, great potential exists within the Zimbabwean manufacturing industries to upgrade their standards and reach the levels of global competitors and this is evidenced by the availability of skilled workforce, abundant natural resources, and a proximity to regional markets (African Development Bank, 2023).

Over the years, there has been a general outcry from the manufacturing sector on the emergence of cheaper imports which have generally challenged the uptake of locally produced products by the domestic market. A bird's eye view of the manufacturing sector in Zimbabwe will give an indication that, the local manufacturers are making use of archaic methods which have generally been noticed to be labour intensive, generally expensive as well as time consuming and this has a huge weight on their bottom-line.

In order for local industries to better compete in terms of quality as well as price with the imports, they have to improve their manufacturing operations and practices to meet those being used by their rivals (Ministry of Industry and Commerce, 2022).

2. RESEARCH METHODOLOGY

2.1 Objectives

The primary aim of the research was to assess the applicability of Agile as a Strategy in Zimbabwean Manufacturing Industries as well as to come up with an effective way of adopting the Agile Strategy within these industries. In order to meet the aim, the following objectives were formulated:

i. To establish the elements of the Agile Strategy.
ii. To assess the key drivers in implementing the Agile Strategy in Zimbabwe Manufacturing Industries.
iii. To identify the challenges and Barriers faced by Zimbabwean industries in implementing as well as maintaining the Agile Strategic Framework.
iv. To outline how Zimbabwean Manufacturing Industries can utilize the Agile Strategic Framework in order to support the 3 competitive stances (product, price and, customer service) and the five main Competitive Performance Objectives (CPOs) which are cost, quality, speed, dependability, and adaptability (Pozo, et al., 2017).

2.2 Research Questions

The guiding research questions were as follows:

1) What does the Agile Strategy imply?
2) What are the elements of the Agile Strategy?
3) What are the key drivers in implementing the Agile Strategy?
4) What challenges are being faced by Zimbabwean industries in implementing the Agile Strategy?
5) What steps can be put in place by Zimbabwean manufacturing industries so that they can successfully implement the Agile Strategy?
6) How best can Zimbabwean Manufacturing Industries utilize the Agile Strategic Framework in order to support the 3 competitive stances and 5 CPOs?

2.3 Research Methods

In order to meet the research objectives, the methodology outlined in Table 1 was utilised.

Table 1 : Research Methods

Objective	Methodology	Tools
To establish the elements of the Agile Strategy.	Literature Review	Content Analysis
To assess the key drivers in implementing the Agile Strategy in Zimbabwe Manufacturing Industries.	Quantitative (Survey)	Questionnaire
To identify the challenges and Barriers faced by Zimbabwean industries in implementing as well as maintaining the Agile Strategy.	Quantitative (Survey)	Questionnaire
To outline how Zimbabwean Manufacturing Industries can utilize the Agile Strategy in order to support the 3 competitive	Literature Review and analysis of	Content analysis

stances and the 5 CPOs.	results	

A closed ended questionnaire was developed and sent out to eight (8) manufacturing companies. The questionnaire was designed in such a way that an organisation would outline from the list, technologies as well as systems critical to Agile Manufacturing which they are currently utilising, the key factors behind their need to implement the Strategy as well as the challenges they are facing in the implementation.

2.4 Scope of Study

The questionnaires were sent out to 8 Manufacturing Companies within Zimbabwe and the organisations' grouping in terms of their products are as illustrated in Figure 1.

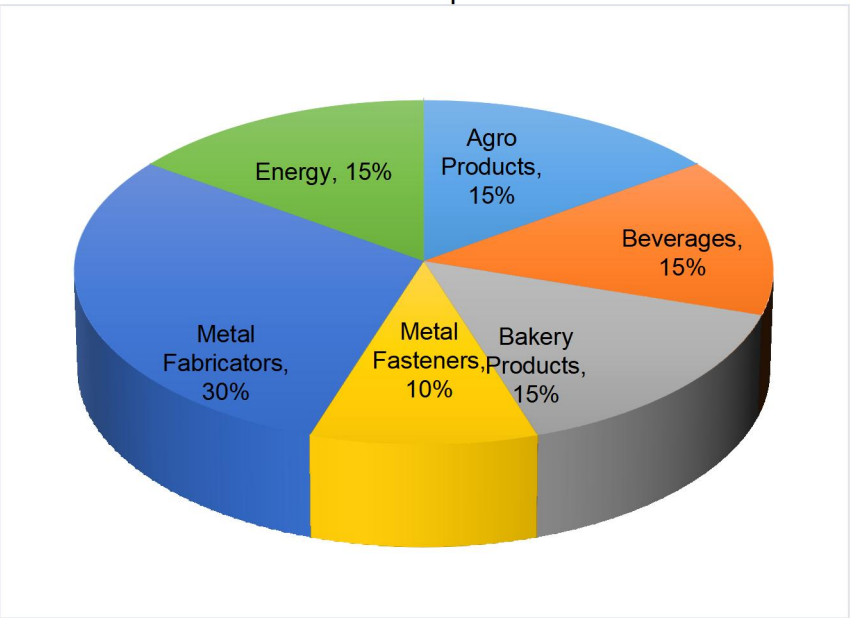

Figure 1 : Distribution of Companies Reviewed

3. LITERATURE REVIEW

3.1 What is an Agile Strategy?

Over the years, the needs of customers have changed drastically. Customers now require business organisations to provide them with a wide range of goods and services at a lower cost and the demands are immediate. In order for manufacturing industries to be able to maintain a competitive edge over their rivals, they have to be able to deal effectively with the adverse effects of demand volatility.

This year due to the surge of the COVID-19 pandemic, several cases of demand volatility where witnessed in the global markets. Companies which are in the business of producing cleaning detergents as well as sanitisers witnessed huge surges in terms of demand of their products and within the first quarter of the year 2020 most of them struggled to meet the demand. This saw the entrance of several new players in that industry in a bid to benefit from the unexpected flux and those that quickly adjusted to the surge have since obtained a great market share. On the other hand, during this year, industries whose goods were deemed non-essential were left with a rather large inventory on their hands as demand plummeted.

These unanticipated situations clearly outline the need for Organizations to quickly adapt to the trends in the market at a given period and be quick to respond to the market's demands. A quick response to the market's demands more often than not is a determining factor in whether or not an organisation gets to retain its competitive advantage failure of which will result in future sales dwindling.

The chief goal of the Agile strategy is to respond to customer as well as market

demands in a timeous as well as effective manner in a bid to utilise the small windows of opportunity in volatile as well as rapidly changing business environments (Ambe, 2010).

The major concentration of agile strategies is on how organizations or companies quickly adapt to the demands of their markets. This includes the close connection that should be between the manufacturing staff, manufacturers, marketing, customer support and other stakeholders directly involved in the operations. This enables a focus on the customer needs as the primary input into the quality of the work and to ensure there is efficient implementation of necessary changes in the products (Esturilho, 2010) . Another important area addressed by agile strategies is production flexibility. Product changes have to be made with versatility according to the customer demands saving considerable amount of production time (Jin-Hai, et al., 2003).

More often than not companies have to be very much aware of the amount of time the customers are willing to wait for a product or service (Customer Order Cycle). In the event that the Customer Order Cycle is very short, the Agile strategy would be very much beneficial to the organization.

As previously stated, markets change very rapidly and organisations have to keep up. Failure by an organisation to keep up with market trends will result in the organisation being left behind and losing a significant portion of its market share. The thrust behind the Agile strategy is to keep the Organisation ahead of its competitors so as to ensure that it's considered first by consumers and hence it will manage to maintain a strong consumer base. Within highly competitive environments, small variations in performance and product delivery go a long way in ensuring the long-term survival of an organisation as well as ensuring a good reputation among consumers.

3.2 Motivation for Implementing

3.2.1 Improvement in Quality

When utilising the Agile strategy there is greater focus on the Quality of the final product. When production is broken down into smaller segments or time frames, a complete and thorough focus can be placed upon ensuring Product Quality.

3.2.2 Improvement in Efficiency

The Agile strategy is effective in the sense that, it addresses directly the concerns as well as issues raised by the consumers. The Agile strategy allows business organisations to catch a glimpse of the existing marketplace and its demands, hence the organisation may now transform these to its advantage by developing products that meet the needs of its customers.

3.2.3 Reducing Operational Costs

An Agile approach can lower the costs of a Manufacturing by significantly reducing the overhead costs associated with manufacturing typically emanating from unnecessary documentation and control requirements

3.2.4 Improved Business Value

Business stakeholders are involved in the development process of the Agile strategy and hence an increased focus on delivering strategic business value is realised. The teams involved are then more aware of what's essential and hence will make more effort in delivering the features that provide the most business value to their organisation.

3.2.5 Faster Time to Market

In light of the shorter start-up times associated with the Agile strategy, the time to market is more often than not reduced. The maintenance of flow of information across the whole supply chain ensures the maximum utilization of capacity. Customer demands when they are effectively shared along the supply chain it will help in the unnecessary delays in the fulfilment of the needs (Bottani, 2010).

3.2.6 Organisational Synergy

An Agile approach can improve organizational synergy by breaking down organizational barriers and developing a spirit of trust and partnership around organizational goals.

3.2.7 Increase Employee Morale

An Agile/Scrum approach should also result in higher employee satisfaction from all employees that are engaged in the effort because they are much more engaged to take responsibility for their own work as part of an empowered team.

3.2.8 Increased Customer Satisfaction

The starting point for an organisation seeking to employ the Agile strategy is the realisation that, the highest priority is satisfying the customer. By effectively taking note of customer feedback and criticisms, an organisation can timeously provide the consumers with products that match their taste and hence improving on customer satisfaction. By delivering value to customers on time, an organisation is better able to maintain or improve its market share.

3.3 Challenges to Implementing

3.3.1 Absence of Managerial Support

In order to achieve agility, more often than not, radical changes are required in Manufacturing and these may include reengineering processes within the business, adopting new policies within the organisation as well as a general change in Business culture (Hasan, et al., 2007) . In order to institute as well as support these radical changes, commitment as well as approval from the top hierarchy of the organisation is required.

The institution of the Strategy within an organisation cuts across various departments as well as Levels within the organisation and in order to ensure cohesion as well as a smooth flow, the support of top-level management is critical.

3.3.2 Insufficient Training

The successful development as well as implementation of an Agile Strategy is heavily dependent upon the human resource and its behaviour. A skilled workforce is of the uttermost essence as it is key in ensuring that the changes required are executed well. Hence an organisation has to invest in the training of its workforce.

3.3.3 The Fear of Change

For companies shifting towards the Agile strategy, one of the greatest challenges they face is in transforming the employees as well as Company Culture. The transition will require employees to shift their way of work at a fundamental level.
Organisations also have to be open to the idea of significant internal change which may require significant inputs with regards to capital, infrastructure or policy changes. Allowing room for change implies that the Organisation is aware that the methods it has been utilising have not been yielding the required results and hence it may be time to look out for new ones. The reasons for the change have to be properly communicated and solidly so as to ensure the resistance is minimum.

3.3.4 Insufficient Funding

The shift towards Agile may be associated with a need for significant amounts of Capital to be released into the project. In the event that the business is not readily liquid and is facing a cash slow crisis at that moment, the introduction or implementation of the Agile strategy may meet a very early doom.

The Manufacturing companies in developing companies have over the years faced the problem of non-availability of working capital (Ngendakumana, et al., 2014) . These organizations have always had a reliance on the Banking Sector within their nations for credit lines in order to fund their operations, but over the years, in most countries, these credit lines have dried up and at other moments the credit lines come with interest rates which are rather exorbitant in nature.

Cash flow issues were observed in most sectors of the economies and the manufacturing sectors were not spared the scourge. This also had further ripple effects on activities downstream (Juergensen, et al., 2020) as finances were greatly needed in the procurement of digital technologies within the organization (Cai & Luo, 2020).

The cash flow issues also meant that the efforts with regards to staff training were thwarted (Huang, 2020) at a time when the manufacturing companies really needed to invest in further training for their workers.

The Finance Department within the individual organisations also have to play a critical part in the formulation of the strategy as lack of funding from their end also may hinder the implementation of the strategy.

3.3.5 Unavailability of Required Technology

More often than not, in order for an organisation to maintain its Agile capabilities, Technology plays a huge and critical role. The required technologies may vary from process and product technologies including Numerically Controlled Machines, Rapid prototyping tools, Supply Chain Management Systems or electronic Commerce based tools.

The non-availability of these tools may hinder an organisation's progress in relation to the implementation of the Agile Strategy. Also, integration of the tools is required when they are available as well as skilled manpower to manage as well as operate them.

3.3.6 Poor Transmission of Customer Feedback

Since the customer is a critical component in an Agile strategy, there is great need to improve the volume of their voice in terms of product development, hence their feedback has to be seamlessly transferred within the system.

3.3.7 Human Based Perceptions

Generally, human beings are not very much open to the idea of change and will always want to continue doing things in the way they have always done them, even if that method has proven to be inefficient overtime. In transitioning to the Agile strategy, Human based perceptions tend to be one of the biggest obstacles (Gandomani & Nafchi, 2016).

3.3.8 Lack of Clarity around Roles

In order for there to be a smooth flow of operations, the roles of different individuals have to be clearly spelt out, that way there is less bashing of heads as well as untouched areas.

3.3.10 Poor Communication

The smooth flow of information between teams

in Agile is very important as failure to do so may result in reduced efficiency of the strategy. The organisation has to ensure the availability of proper communication channels within the organisation (Dikert, et al., 2016).

3.3.11 Poor Design-Manufacture Interfaces

The development of new products as well as the associated innovation is very much dependent upon the existence of a healthy relationship between the Manufacturing and Design Functions. Several barriers have to be overcome in order to improve this relationship which may include organisational or physical barriers.

Opportunities are very much short lived and there is a limited window to harness the opportunities and hence the efficiency of the relationship between the Design and Manufacturing functions is of the uttermost importance in Agile Manufacturing.

3.4 Overcoming challenges in implementation of Agile

Following the challenges and barriers aforementioned, literature reviewed, produced some recommendations as well as enablers that have been tested with positive results. The 'Production type' followed in manufacturing influences the organizational barrier to agile implementation, and it is typically not a simple aspect to modify once it is ingrained in the organization (Stettina & Horz, 2015). However, the changes in manufacturing styles carry with them significant benefits as well as obstacles. Batch manufacturing is a more sophisticated process that needs meticulous planning, scheduling, and control (Araujo, et al., 2017). This complexity, along with a continually changing environment, can provide significant organizational challenges (Moreira, et al., 2017).

The Companies' degree of change with respect to the adoption of agile methodologies, the company has to focus on adaptation, responsiveness to unanticipated changes, continuous improvement, and innovation (Hariyani & Mishra, 2022). It is vital for sectors

that are often defined by intrinsically inflexible, predictable, and stable structures to swiftly adapt to new societal demands and continuously changing surroundings (Ahmed, et al., 2022).

Another recognized impediment is absence of managerial support which has an impact on both the organizational and knowledge and technology elements (Potdar, et al., 2017) . Closer ties, such as good management support, are critical for preventing a lack of management participation and encouraging education and training (Sindhwani, et al., 2019) . As stated in (Ghani & Bello, 2015) , this ensures a qualified and competent workforce with a clear understanding of the agile objectives from a knowledge and technology standpoint.

Furthermore, (Caldera, et al., 2019) identified organizational challenges and technological knowledge as hurdles to innovative product creation. This implies that these hurdles have been recognized as some of the primary problems impacting the application of agile approaches in manufacturing. In addressing the application of agile in manufacturing, the deployment of an agile team and a communicational workflow is presented in order to increase agile manufacturing performance (Loiro, et al., 2022) . The deployment of an APM-specific team might be a huge facilitator from both an 'organizational' and a 'knowledge and technology' standpoint (Goncalves, et al., 2022).

On the financial barriers, there is no formula for calculating the economic benefits of adopting agile methodologies. The authors estimate that this barrier is more likely to rise in the automobile sector and in nations with lower productivity since company yield is often lower (Goncalves, et al., 2022).
These factors limit the utilization of a company's own financial resources to assist agile transformation, even though agile approaches return the investment required in a shorter period of time (Hariyani & Mishra, 2022). Agile tends to lessen the impact of unpredictability, enhance time-to-market, respond to and adapt to complexity, and prioritize customer happiness. These variables contribute to recouping the original investment in personnel education and training (Loiro, et al., 2022).

4 SURVEY RESULTS AND ANALYSIS

4.1 Results

The Questionnaire for the survey was developed and sent out to twenty (20) companies as previously stated. Of the twenty questionnaires sent out; all were returned bringing about a 100% response rate from the selected pool of participants.

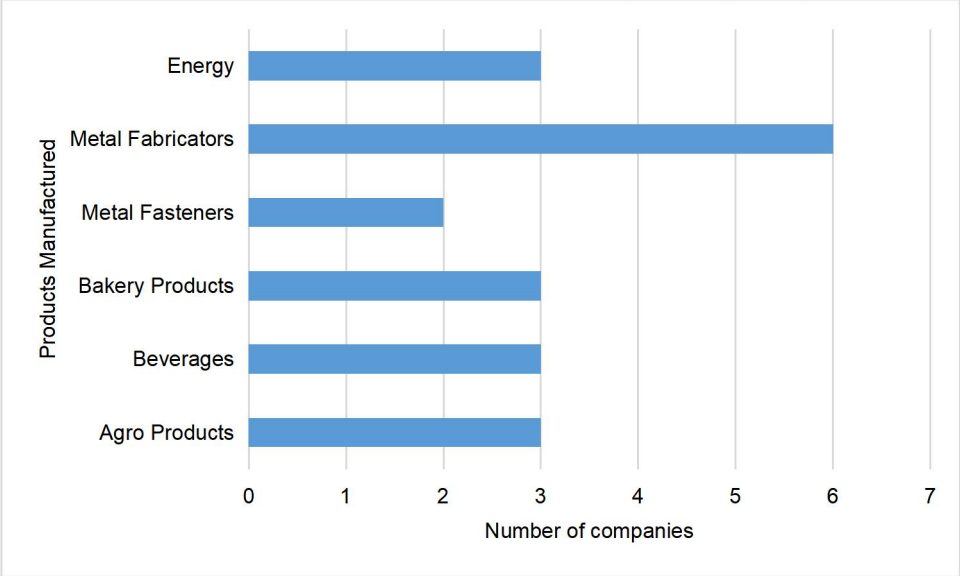

Figure 2 : Number of Respondents

4.1.1 Size of Organisation

In order to investigate the belief that the size of the company can play a key role in its quick response to changing customer trends, the information in this section was collected. The data obtained is presented in Figure 3.

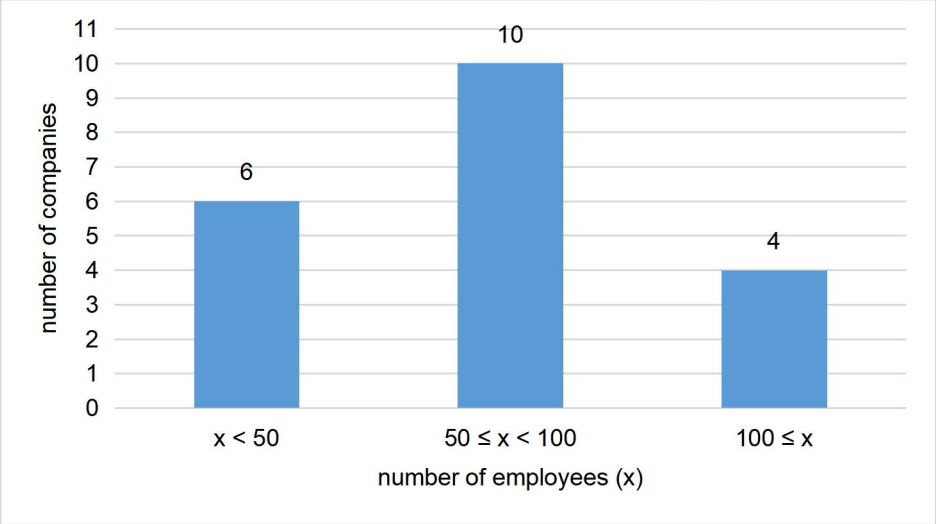

Figure 3 : Organisation Size

4.1.2 Agile Enabling Systems & Technologies

The section focused on the technologies or systems which are required for a system to be Agile and quickly respond to market forces. The non-availability of the systems limits the Agility of the organisation

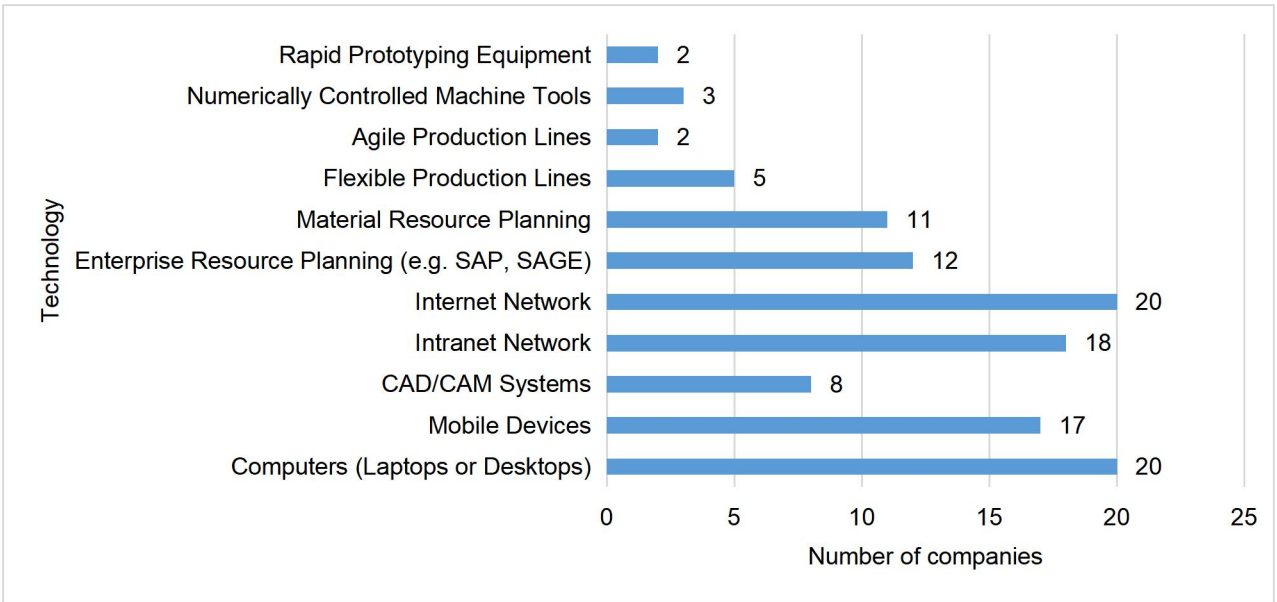

Figure 4 : Technologies Enabling Agility

In order to ensure smooth communication within the organisation as well as with clients as well as suppliers, there is need for internet as well as intranet facilities to be present. Almost all of the respondents have internet facilities at their places of operation. Rapid prototyping equipment as well as Numerically Controlled tools are very much in short supply as outlined by the survey.

For an organisation to consider the Agile strategy, several forces will be in existence and driving it towards the transition. Outlined in Figure 5 below are the views of the participating companies on the extent to which each factor is pushing them towards implementing the strategy.

4.1.3 Agile Strategy Implementation Drivers

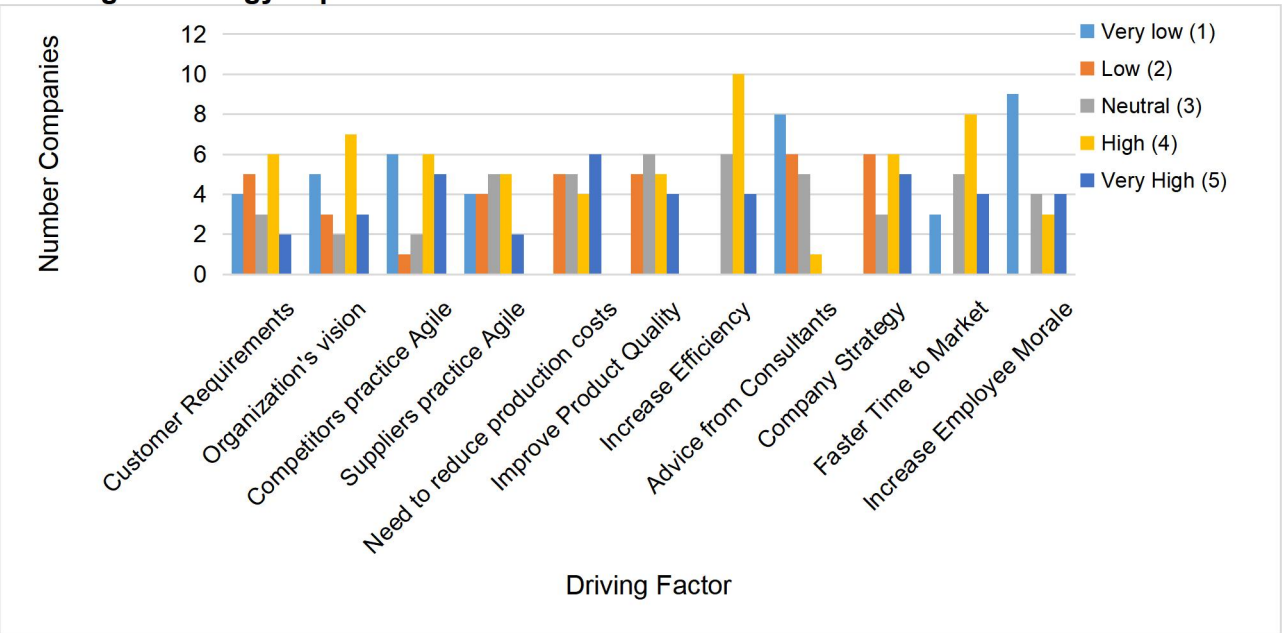

Figure 5 : Factors Driving Agility

The vision of each organisation as well as the need to improve efficiency play a critical role in influencing whether or not the organisation will move towards the Agile strategy. On the other hand, according to the survey there is very little evidence that Consultants are encouraging their clients to shift towards the Agile Strategy.

The implementation of the Agile strategy is not without its plethora and myopia of challenges which hinder or detract organisations from moving towards the strategy. The extent to which the listed factors affect the different participants are as outlined in Figure 6.

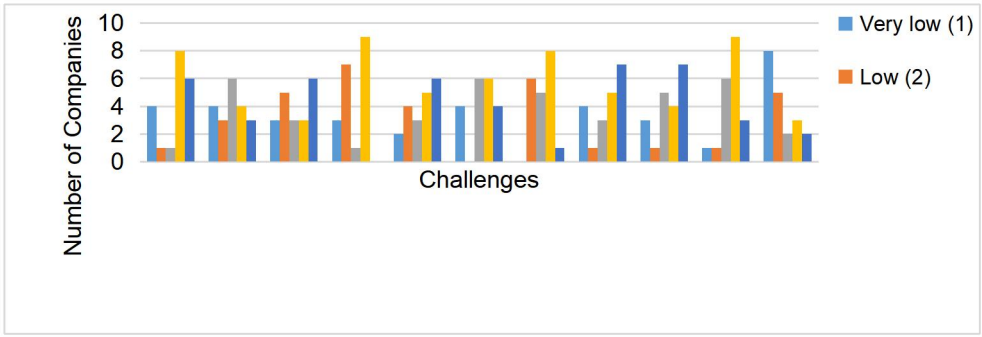

Figure 6 : Challenges in Implementing Agility

4.1.4 Challenges in Implementing Agile Strategy

For organisations intending to transcend to the Agile Strategy, there is need to avail technologies which enable the shift as results from the survey indicated a general absence of these.

5. RECOMMENDATIONS

In order for the transition to the Agile Strategy to be as smooth as possible there are several changes that have to occur within the organisation.

5.1 Customer Oriented Products

The product supplier has to be very much aware of the value derived from a product by their clients at times even much more than the customers themselves. Customers also tend to want to be treated as individuals and mass production doesn't serve this need well as customisation of products is required.

5.2 Integration of Production with Design

By integrating the Manufacturing function with the design function, a lot of unnecessary time delays are eliminated. The Agile strategy requires fast and effective design hence the integration is of paramount importance.

5.3 Proper Channelling of Customer Feedback

There is need for feedback of products from customers to be properly relayed within the organisation so that responsible persons are aware of what is required of them. Even the manufacturing function is supposed to have access so that they can be aware of the bearing they have on customer satisfaction.

5.4 Cooperation

It is seldom the case that a single organisation at any given point in time has all the skills as well as requirements in order to meet the ever-changing customer requirements. Cooperation with other firms is thus required in order to obtain logistical, informational or service needs to meet the requirements.

6. CONCLUSION

The Authors in this paper, focused on the determination of the current state of implementation of the Agile strategy within the Zimbabwe Manufacturing Industries as well as the Factors driving the Industries towards implementation and the challenges they are facing in this endeavour. The responses obtained from the twenty companies reviewed reflected the view that the local organisations still have steps to climb in order to reach Agile maturity.

Some of the technologies required for the Agile Strategy are already in existence in the Organizations, what is lacking though is their interconnectivity as well as optimisation so that they may be utilised at their full potential.

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