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Introduction

As a result of the COVID 19 pandemic, Griffiths & Hughes Ltd. have seen great success with a mobile device designed to review the suitability of an individual to enter an area based upon their body temperature.

With the growing popularity, Griffiths & Hughes have now requested a review of locations to take strategic advantage of the wider global market while the headquarters remain in Wales.

This review will take into consideration locations in South America, Asia and Africa to establish a localised manufacturing facility and establish a consumer-based market in the area.

Griffiths & Hughes are also looking to better exploit their innovation opportunities that are available. To better utilise this, they have asked for a review on ISO 56000 and its impact to the business should it be implemented.

Location Analysis

South America

Porto Alegre (Brazil) is the capital of Rio do Sul.

Manufacturing and production have a strong presence within the city, with key skills in automotive and food sectors. The area benefits from a strong, mostly localised supply chain, limiting global disruptions and impact on manufacturing. However, manufacturing costs are typically higher, primarily due to high taxes and labor rates.

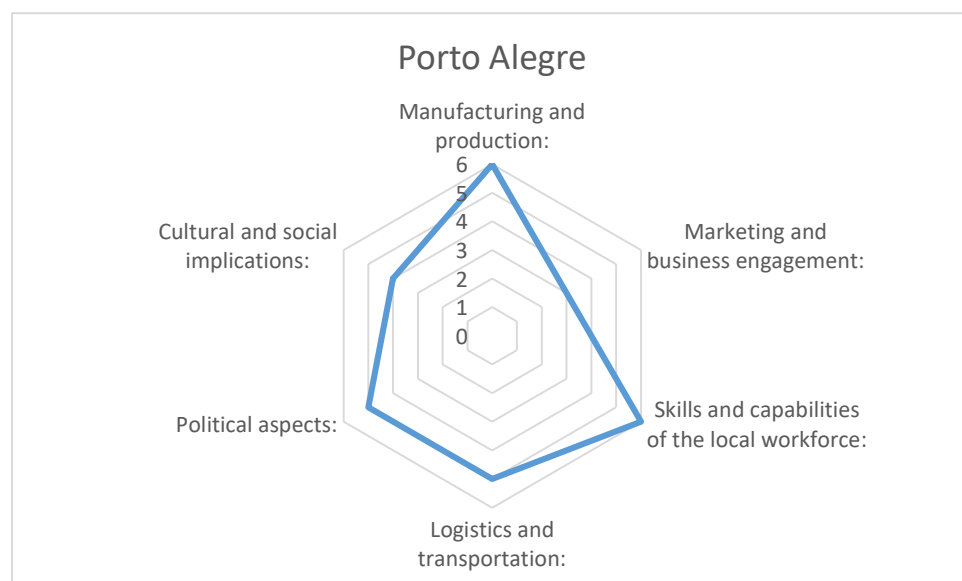
There is a strong government support and investment for business however, this is in place due to the lack of market presence and business development, often affecting business' ability to reach their target market.

The workforce is highly skilled in the areas of engineering, information technology and logistics however, skills outside of these industries are hard to find. In addition, the skilled workforce attracts a premium in labour rates, increasing production costs.

Porto Alegre benefits from an excellent infrastructure that is typical with most modern cities including seaports, rail networks, an international airport and an extensive road network. The transportation system however suffers with severe congestion, hindering a consistent transport time of supplies and goods.

Politically, the area is stable with a reputation of non-corruption supported by underlying government systems. The area has complex regulations that can often introduce road blocks for new businesses and manufacturing projects.

The area has a strong heritage and inclusive attitude, but difficulties may arise due to inequality and a large amount of poverty.



Graph 1

Montevideo (Uruguay) manufacturing industry have seen a consistent growth in the areas of electronics, textiles and food processing however, when compared to other regions the labour rates are high. Additionally, the area's licencing laws can often make establishing new businesses difficult.

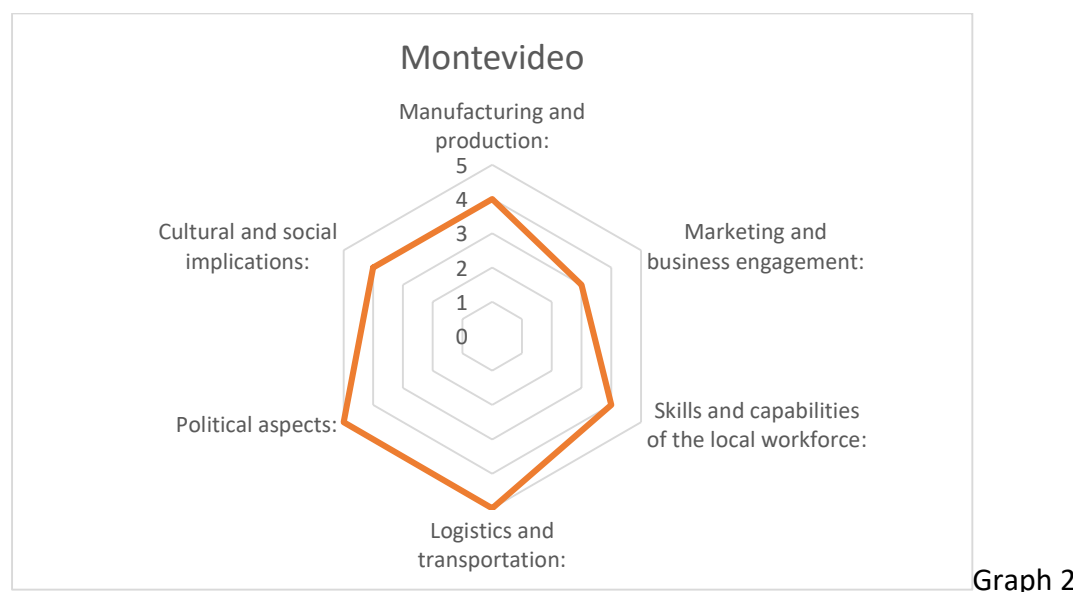
Montevideo is considered a hub for innovation withing Uruguay. Within the city there is a large consumer market further aiding business engagement. This large market has resulted in competition for customer's attention. Furthermore, opportunity beyond the city and international marketing could be limited.

The area benefits from an educated and skilled workforce, competent in a technical and professional field however, sourcing the skills needed is often difficult due to a high unemployment rate of unskilled workers.

Montevideo has a developed logistics system including a seaport, airport and road systems. The area suffers with congestion during peak times and when compared with surrounding regions it can be considered expensive.

The city benefits from a stable democratic government that is actively engaged in supporting businesses. However, changes in government that forms part of the democratic process can change policies and bureaucratic processes.

Montevideo has a diverse and rich inclusive culture. Often there can be challenges with businesses from other cultures assimilating to the local customs of work and business.



Buenos Aires (Argentina) is at the heart of Argentina's industrial and economic industries. This has resulted in an established manufacturing sector, with good access to supply routes and raw materials. Demand in this growing manufacturing sector have put a strain on some utilities and has resulted in a high cost of energy. Government regulations often present challenges with establishing a business in the area.

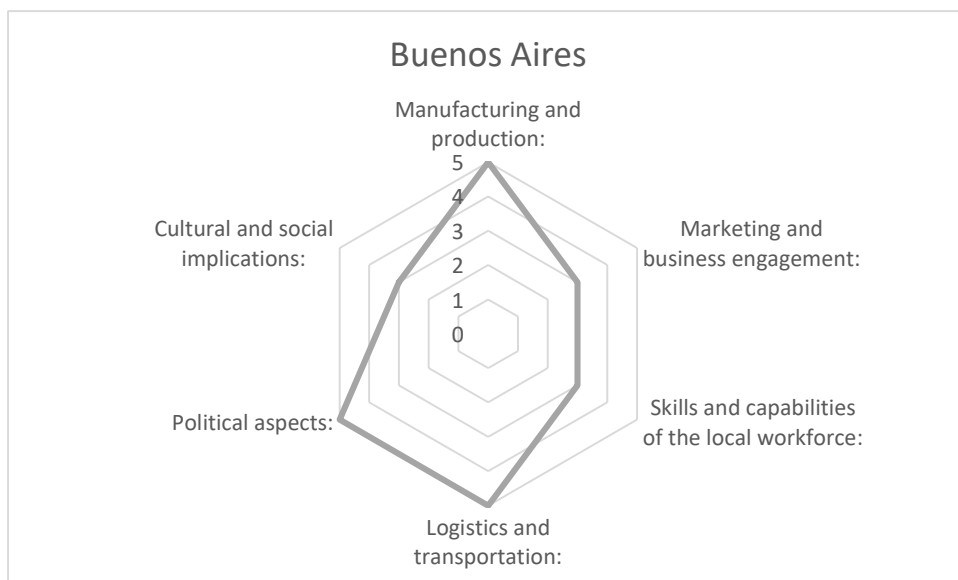
Buenos Aires is a vibrant city with a flourishing business and a large consumer market. Businesses in the area also benefit from opportunities for international business engagement and marketing. This international platform has resulted in stiff competition in the area

Buenos Aires has a highly skilled and educated workforce especially in technical areas. However, with a high level of unemployment, finding suitable employees can be difficult.

The area benefits with modern logistic infrastructure such as an airport, seaport and road networks however, congestion and high transportation costs can be disruptive.

Buenos Aires has a stable democratic government however, government changes in policy is always a risk.

Buenos Aires has a diverse and rich society. There can be issues with adapting to local customs for companies not founded in the area.



Graph 3

Asia

Shenzhen (China) is home to many electronics and technology companies. Often seen as the leading hub for production and manufacturing in China. In addition, Shenzhen has very good access to raw materials. The attraction of the technology companies has also resulted in high employment rates that have made labour resources competitive

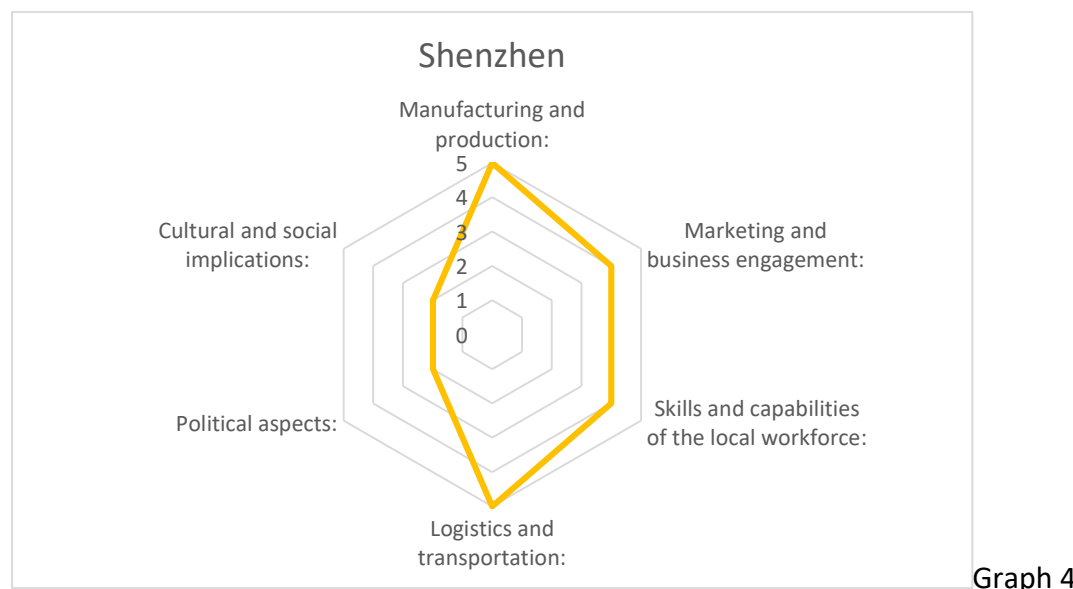
Shenzhen is clarified as an innovation hub for China and has an extensive consumer market. Shenzhen also has excellent access to the international market. However, with such a large manufacturing presence there is a lot of competition to reach customers.

The local workforce has extensive education and technical training however, as unemployment is low the competition for talented individuals is high.

Shenzhen benefits from a modern infrastructure system including roads, airports and seaports. As with many cities of this size, congestion is an issue especially during peak hours.

Shenzhen is a dynamic city that supports a productive business environment however, political stability is of concern. With a political agenda differing to that of most western nations, political friction is a real concern.

There can be challenges for Western companies in adopting the local customs and cultural norms. Caution must be taken to ensure that local customs are observed to avoid causing offence.



Mumbai (India) has a large industrial presence with extensive facilities providing manufacturing location and support for business. Due to the high industrial demand, the cost of setting up a production facility can be high and difficult to broker.

Mumbai is considered an international business hub benefiting from an extensive and diverse consumer market. To a new manufacturing site this is a marketing opportunity.

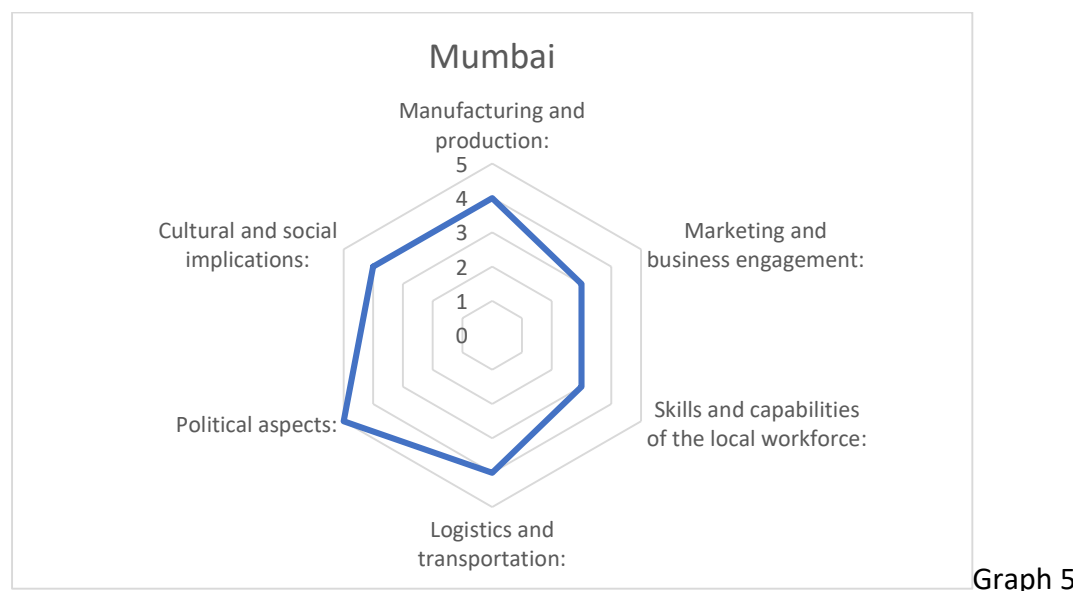
Competition within the city is high and the regulations that need to be complied to are complex. Advertising is also expensive due to the high quantity of business competing for the available business.

Mumbai's workforce has a diverse range of skill available to support businesses operating in the area however, due to the high cost of city living and the demand for skilled personnel, skilled labour costs are high.

The city benefits from an infrastructure system with multiple modes of transport available. Businesses are able to choose the most efficient form of transport to best suit their application. Due to the high demand for transport within the city, logistic costs are high. Additionally, the demand on the city infrastructure frequently results in transport disruptions.

Mumbai has a stable political system and is considered the financial capital for India. This helps to provide a stable and supportive environment where businesses can plan and thrive. The legislation and process of setting up a company in Mumbai is complex and requires considerable resources. The legal system within India is fundamentally based on the British system and shares many parallels.

Mumbai has an expanse of cultural history and has a vibrant cultural scene. Businesses that are able to tap into this pool of creativity often are given a competitive edge. Due to the dense population, the cost of living in Mumbai is very high, making it difficult to retain staff. Also, a company needs to have the ability to navigate the complexities of the diverse culture to ensure success.



Taipei (Taiwan) benefits from an established industrial sector, including reliable and established supply chains. Taipei has traditionally been at the forefront of electronic technology. Taipei is situated on the island of Taiwan, a densely populated area where the

availability of land is limited, resulting in high property pricing. This also contributes to a high cost of living and high workforce costs.

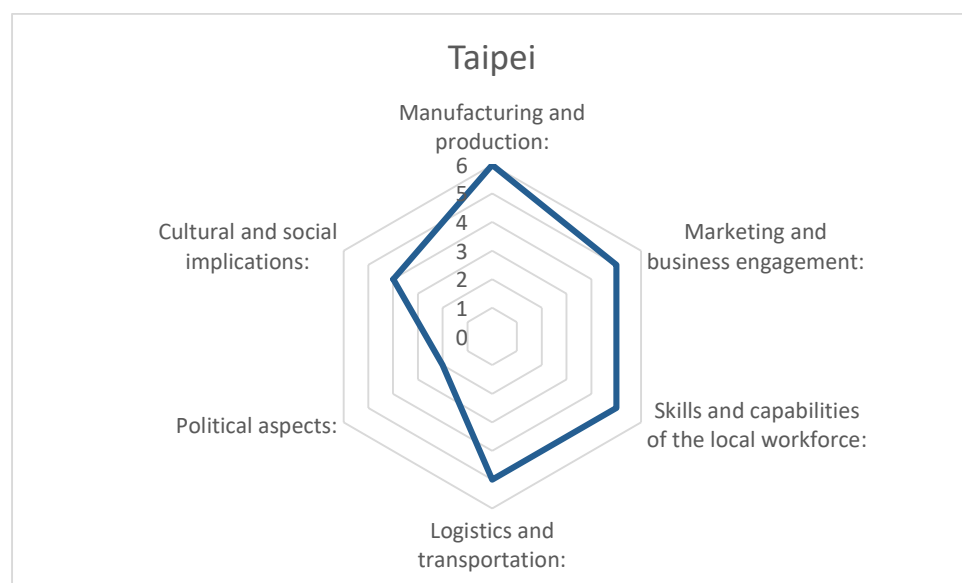
Taipei is considered a hub for innovation and has excellent support for networking and business engagement. The population of Taipei have a high standard of living and a large population, providing ample opportunity for consumer-based businesses. However, a fierce market has developed resulting in competitive pricing, making it difficult for high price, premium brands to take a market share.

The Taipei workforce is known for their strong work ethics and high levels of productivity. This is further supported by higher education and experience levels, especially in electronics. With a strong industrial presence, competition for skilled workers is strong, making it difficult and expensive to employ skilled workers.

Taipei and the wider area of Taiwan has an excellent transport network including airports, seaports and roads. The location of Taiwan makes it a strategic position to support the Asian market as a whole. Being an island location, logistics will have limited options to support the wider Asian market. Additionally, air quality in the area is a key issue as a result of pollution.

Taipei benefits from a stable and long-established legal system that provides stability for businesses setting up in the area. In addition, the area has a democratic government. The relationship between Taiwan and Japan, South Korea and US, supports businesses looking to trade into these regions from this one location. The tension between Taiwan and China could be a challenge as China claims Taiwan as part of its territory and this is still in dispute.

Taiwanese people are known for their hospitality and friendliness however, they can often be reserved and it takes time to build good business relationships. While the area has a rich social scene, the society has a hierarchical system that is also found in business. To be successful in this area, the hierarchical system must be observed. The native language of the area is Mandarin and is often considered very difficult for Western visitors to learn, making the transfer of knowledge difficult at times.



Graph 6

Africa

Durban (South Africa) has an established manufacturing base with excellent access to supplies and a skilled workforce. The city also has a large, well-established port making the import and export of goods / supplies seamless. The ease of transport has attracted many manufacturing businesses to the area creating stiff competition. Additionally, the area's utilities such as gas and electric are much higher than the surrounding area, increasing the cost to manufacture goods.

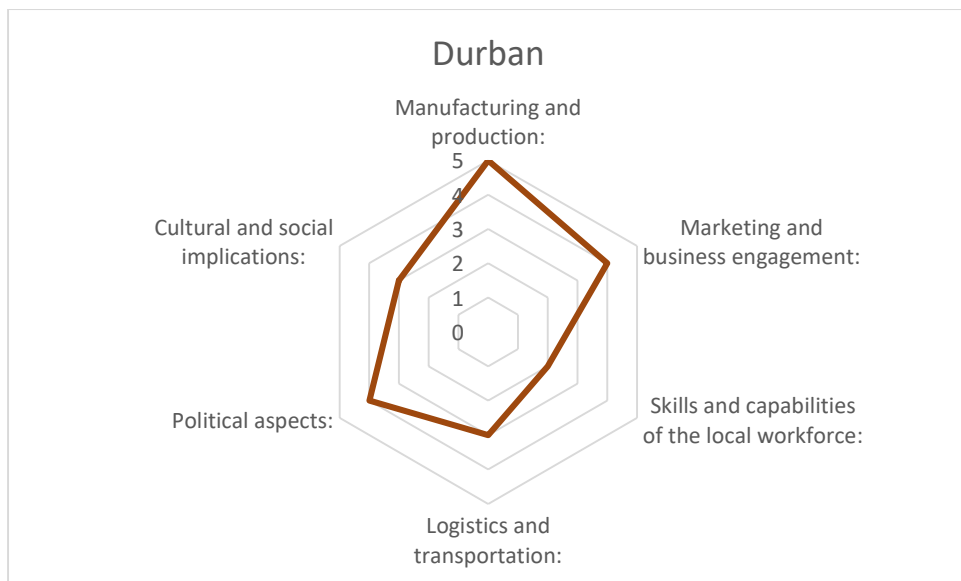
Durban has a growing market especially in tourism. This has provided opportunities within the local area, including the opportunity to grow the brand. The local economy has faced challenges with high unemployment and social inequality that hinders customer spending.

Durban has a large pool of talent due to the vast manufacturing sector in the area. The area also has several universities and technical colleges making access to higher education for the workforce easier. The area has a large amount of unskilled and unemployed people, meaning finding skilled staff is often difficult. To hinder the issue further, the education system in the area has been suffering from a multitude of issues including lack of teachers, funding, equipment etc. The lack of resources within the education system has resulted in inconsistent education levels within the workforce.

Durban is situated in a stable democratic government with an established legal system. This provides a predictable environment for business in the area. The wider political arena in South Africa suffers from large amounts of political corruptions, resulting in limited accountability and no transparency hindering a productive business environment.

Durban is considered a major transport hub with a large seaport and multiple airports, making the import of resources and exporting finished goods to multiple markets easier. The wider area around Durban suffers from poor infrastructure, with limited or no public transport. Roads that are available for transport use are unmaintained or are simple dirt roads. Should it become necessary to use these road networks, logistics and transportation will suffer.

The area has a rich history and vibrant culture that has contributed to the growth of the tourism industry. This has been overshadowed by social inequality resulting in a high crime rate, limited access to basic services, poor housing, social tension etc. These factors can hinder a business' ability to operate effectively.



Graph 7

Bulawayo (Zimbabwe) Is Zimbabwe's second largest city with a large established industrial industry. Benefiting from an abundance of natural resources and strategic location, Bulawayo have seen a growth in size and population. However, the area's infrastructure is struggling to support the increasing demand and the cost supply of basic amenities, such as electric and water, have increased.

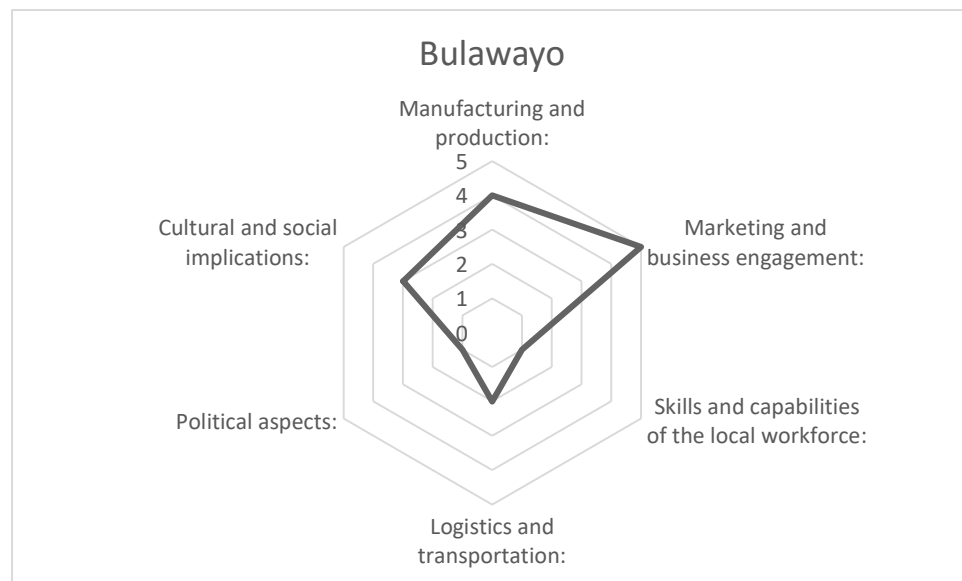
With the increase in population, Bulawayo has seen an ongoing increase of middle-class population, increasing the consumer market. This in turn has seen an increase of the use and sale of digital technology. Additionally, the government are providing incentives and support for SME's. This recent growth has also resulted in a lack of business culture and networks hindering growth with limited access to funding / investment in the area.

While Bulawayo has an abundance of labour to support a new business, skilled individuals are lacking and the vast number of unemployed people in the area are unskilled. The recent growth has resulted in a lack of experience in the area of innovation and whilst the government offer support for training, the lack of specialized skills in the area make finding training difficult.

While considerable investment is being made to improve the logistics network, the current systems in place are poor and with limited capacity, limiting the efficiency of any supplier or exports the company wish to make. While Bulawayo has a strategic location to support the wider region, the customs fees and high cost of shipping will make a low-cost manufacturing site much more expensive.

While the government are incentivising businesses with support, the legislation needed to establish a company is complex. In addition to the red tape, the government has a history of corruption and security risks. The corruption within government hinders transparency and accountability making business policies unstable.

Despite the high level of poverty, Bulawayo has a diverse culture that has a growing interest in entrepreneurship and an increasing middle class.



Graph 8

Tunis (Tunisia) through textile and clothing Tunis has an established industrial sector. The country is considered a low-cost manufacturing location due to its low labour costs and government supported incentives. Tunis also benefits from having an established trade agreement with the EU, opening up a wider international trade. The bureaucratic process to establish a business can often be difficult.

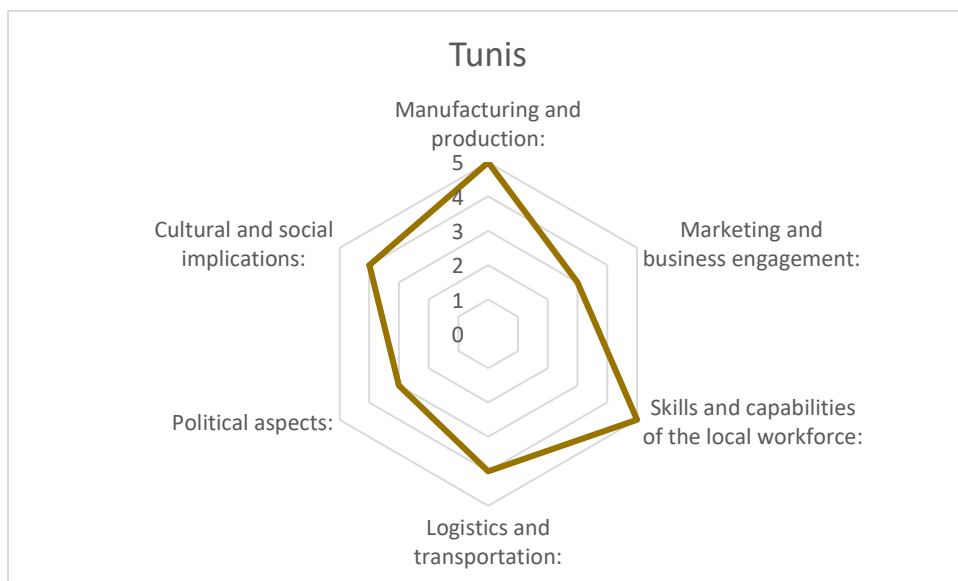
Tunis economy has been growing and an emphasis have been placed on attracting foreign investment. This has been done, in part, by government support to businesses via tax incentives and support in the initial set up. Local markets have limited buying power due to the low wages, this limits the domestic market that can be exploited. In addition, business culture is not as developed as other countries in the area.

Tunis benefits from a highly developed and educated workforce that concentrates on technical and engineering fields. There will probably be a language barrier for any non-Arabic speaking companies and workplace culture can be vastly different to that of Western societies.

Tunis is located in North Africa on the Mediterranean coast. This location not only allows support within the African market, but provides easy access to South/Eastern Europe and the Middle East. An established EU trade agreement further supports the export of goods from Tunis. Tunis has an established seaport and airport and whilst the road network in the city is good, the road area in rural areas can be poor.

Tunisia has a peaceful history despite the transition of power. With the government actively seeking to attract foreign investment, support in company set up and the navigation of the bureaucratic process that is often not clear. The political conditions can be unpredictable at times with protests and strikes not uncommon.

With a welcoming society that is actively seeking to increase tourism, Tunis is considered a very hospitable area. Considerations need to be made with regards to the regions cultural differences that might present a challenge for foreign businesses.



Graph 9

Using ISO 56000 to promote sustainable business growth.

ISO 56000 provides guidance to businesses for systematically managing innovations. The standard prioritises areas that will focus on innovation activities such as the innovation goals and evaluating the results using key measurables. The standard also advises on a company's culture, with regards to innovation and address some of the main concerns raised, being the unknowns and risk management when conducting an innovation task. This improved risk management reduces the likelihood of failure and improving the company's odds of achieving the goals set out.

Companies looking to fully embrace ISO 56000 can benefit from improvements within the innovation process. This in turn improves the probability of a project's success and by extension the company's success. As part of the improvements within innovation, the standards look to encourage collaboration. Setting out standards to engage different departments and leaders to better support the innovation process. The improvements with collaboration hinges on transparency and accountability. The standardisation in innovation management supports the project, persons accountability and increased transparency to all stake holders of the innovation. Key amongst the transparency is the improvement in communication. ISO 56000 outlines clear and common language to ensure that all parties understand what is expected of them and outlines how actions are to be recorded.

ISO 56000 also has the implementation of standards that ensure, that any innovation activity conducted is aligned with the organization's goals. This action helps route out rogue projects that do not coincide with the company's long-term objectives and helps route the resources to innovations that will better support the company as it moves forward.

Conclusion and Recommendations

While reviewing each of the potential sites, a score out of 6 was given for each of the following key factors: Manufacturing and production, Marketing and business engagement, Skills and capabilities of the local workforce, Logistics and transportation, Political, Cultural and social implications.

The grading data can be found in Appendix 1

The supporting Graphs provide a pictorial representation where areas are strong and points of concern.

South America

The recommendation site for the South American site is Porto Alegre.

The key factors in this decision:

- Strong established manufacturing industry
- Stable supply chain
- Government business support
- Highly skilled workforce
- Modern and developed transport network
- Stable and non-corrupt government

When reviewing the performance, graph 1 clearly shows that considerations and preparations need to be made towards marketing and business engagement. This has been identified as the sites weakness and plans to mitigate this effect needs to be put in place prior to starting set-up activity's

Asia

The recommendation site for the Asian site is Taipei.

The key factors in the decisions are:

- Established industrial sector, especially in technology
- Reliable supply chain
- Hub for Innovation
- Excellent customer basis
- Trading partners in the US, Japan and South Korea
- Highly skilled workforce
- Excellent work ethic
- Excellent infrastructure including state of the art seaport

While reviewing graph 6, it's clear that this site has been penalised due to political aspects. This is due to the political tensions between China and Taiwan. While the tension between the two countries has had no physical engagement, the risk of a conflict or even war is a real

concern and needs to be taken into consideration. If this should happen, the site would need to be considered a total loss and risk massive disruption to the Asian operation.

Africa

The recommendation site for the African site is Taipei.

The key factors in the decisions are:

- Established industrial sector
- Low-cost manufacturing site
- Government support and incentives
- Highly developed and educated workforce focused on technical / engineering fields
- Ease of access to Africa, South Europe and the Middle East
- Trade agreement with EU
- Stable Government

While reviewing graph 9, we can see areas of concerns around Political aspects and the Marketing and business engagements. While there is little that can be done by the company regarding political unrest, a close relationship with the local government bodies should allow the company to be forewarned should any issues arise. The local market in Tunis might struggle to support the high-tech product on offer however, the site offers gateway to wealthy markets from a low cost manufacturing location. A strategic marketing campaign into these wealthy countries should more than make up for the local market shortfalls.

It's worth noting that before any work is started on establishing the proposed sites above, steps should be taken to incorporate ISO 56000 to the current operations in Wales. This will support transferring a culture to the new sites when it becomes time to start operations. In addition, this will help support the process of establishing a site allowing for innovation considerations to implemented and considered from conception, supporting the long-term viability of the elected sites.

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Appendix 1 – Site review

Review of site suitability	Max score	South America			Asia			Africa		
		Porto Alegre	Montevideo	Buenos Aires	Shenzhen	Mumbai	Taipei	Durban	Bulawayo	Tunis
Manufacturing and production:	6	6	4	5	5	4	6	5	4	5
Marketing and business engagement:	6	3	3	3	4	3	5	4	5	3
Skills and capabilities of the local workforce:	6	6	4	3	4	3	5	2	1	5
Logistics and transportation:	6	5	5	5	5	4	5	3	2	4
Political aspects:	6	5	5	5	2	5	2	4	1	3
Cultural and social implications:	6	4	4	3	2	4	4	3	3	4
Total	36	29	25	24	22	23	27	21	16	24