

**Report produced for Griffiths and Hughes: Location  
establishment report into three cities worldwide:  
Asian, African and South American Cities.**

By

**James Scorgie**

**Student Number: 2113853**

**Student Email: 2113853@student.uwtsd.ac.uk**

**Course Number: ACPA7003**

**A Business Case**

Submitted to

**The University of Wales Trinity Saint David**

in partial fulfilment of the requirements

for the degree of

**Master of International Innovation Management**

**08/02/2023**

## Contents

|       |                                                 |    |
|-------|-------------------------------------------------|----|
| 1     | Executive Summary .....                         | 4  |
| 2     | Introduction .....                              | 5  |
| 2.1   | Company Background .....                        | 5  |
| 2.2   | Strategic Future.....                           | 5  |
| 3     | Countries outlined for expansion.....           | 6  |
| 3.1   | Asia – Shenzhen (China).....                    | 6  |
| 3.1.1 | Location Summary .....                          | 6  |
| 3.1.2 | Manufacturing and production.....               | 7  |
| 3.1.3 | Logistics and Transportation .....              | 7  |
| 3.1.4 | Marketing/Business Development Opportunity..... | 7  |
| 3.1.5 | Political Policy and Cultural Impacts .....     | 8  |
| 3.1.6 | Workforce .....                                 | 8  |
| 3.2   | Africa – Tunis (Tunisia).....                   | 8  |
| 3.2.1 | Location Summary .....                          | 8  |
| 3.2.2 | Manufacturing and production.....               | 9  |
| 3.2.3 | Logistics and Transportation .....              | 10 |
| 3.2.4 | Marketing/Business Development Opportunity..... | 10 |
| 3.2.5 | Political Policy and Cultural Impacts .....     | 10 |
| 3.2.6 | Workforce .....                                 | 11 |
| 3.3   | South America – Montevideo (China).....         | 11 |
| 3.3.1 | Location Summary .....                          | 11 |
| 3.3.2 | Iso Standards Accredited/EU recognized? .....   | 12 |
| 3.3.3 | Manufacturing and production.....               | 12 |

|       |                                                                      |    |
|-------|----------------------------------------------------------------------|----|
| 3.3.4 | Logistics and Transportation .....                                   | 12 |
| 3.3.5 | Marketing/Business Development Opportunity .....                     | 12 |
| 3.3.6 | Political Policy and Cultural Impacts .....                          | 13 |
| 3.3.7 | Workforce .....                                                      | 13 |
| 4     | ISO56000 Standards – A recommendation for Griffiths and Hughes ..... | 14 |
| 5     | Conclusions and Recommendations .....                                | 17 |
| 7     | References.....                                                      | 18 |

# 1 Executive Summary

This report is produced for the purpose of the viewing of strategic management within Griffiths and Hughes – including Directors and those involved with the international expansion. Not for external distribution.

The report will examined three countries, one within each targeted region of global expansion: Asia, Africa and South America. The report found that each location has various advantages and disadvantages mainly surrounding: manufacturing within the chosen locations, logistical challenges/advantages, marketing and BD opportunities, political agenda, skill and capabilities of the workforce & brief competitor evaluation.

The research found that the three most appropriate cities for the expansion of the company were Shenzhen (China, Asia), Montevideo (Uruguay, South America) and Tunis (Tunisia, Africa). These locations were selected based on the examined characteristics of each city. Research found that Shenzhen should be prioritised for expansion due to the large availability of expert manufacturing and the large domestic business development opportunities that may be available for Griffiths and Hughes products within China.

Further recommendations are given for Griffiths and Hughes to aim to achieve both ISO9001 and ISO56000 accreditations in order to provide the correct business infrastructure for the new global operations for the company. This should be achieved prior to establishment of any new location and would also serve as additional reputation enhancement for areas of the world where the company will be effectively a new start up to those unaware.

## **2 Introduction**

This report is produced for the purpose of the viewing of strategic management within Griffiths and Hughes – including Directors and those involved with the international expansion. Not for external distribution.

The report will examine three countries, one within each targeted region of global expansion: Asia, Africa and South America. The report will evaluate the current manufacturing within the countries, logistical challenges/advantages, marketing opportunities, political agenda, skill and capabilities of the workforce & brief competitor evaluation.

### ***2.1 Company Background***

As a company, Griffiths and Hughes are proud of their home grown expertise & innovation culture at Griffiths and Wales, with a wide range of security products suited to a variety of different markets and applications. As part of the global COVID-19 pandemic the company has manage to sustain further growth as part of one of our signature products developed – the body temperature scanner. The success of this product is in no part down to the global outbreak in COVID-19 and the global slowdown in international connectivity when it comes to product sourcing (Sarfraz et al., 2021), this is most clearly evidenced in the global race for ventilators seen in the UK and around the world (Iyengar et al., 2020; Ranney et al., 2020; White & Lo, 2020) – with the worst hit sectors being the tourism and leisure industry (Carter et al., 2022). This has led to the increasing adoption and development of company processes inline with Industry 4.0 technology, and is potentially heralded by some as the early beginnings of the next Industrial Revolution (Sarfraz et al., 2021).

### ***2.2 Strategic Future***

As the new product that Griffiths and Hughes have successfully marketed domestically in Wales and the wider United Kingdom has been a great success in aiding the UK's response to the COVID-19 pandemic, it is hoped by the Directors and Senior management that the company will be able to take the it to global markets, this report from Conwy Consulting will assist in identifying countries and providing a brief strategy for further assessment in future reports.

This future of the company and the product will see the Griffith and Hughes' successful product (the body temperature scanner) taken to global markets, with the new and additional capabilities of facemask detection and active retina scanning to allow employees,

registered persons, etc. to be identified when passing a body camera control gate. Whilst retinal scan and iris recognition is no new technology, the implementation of the scans has been slow and the product developed by Griffiths and Hughes bridges that – providing quick, reliable and accurate retinal scanning results (Cui et al., 2017).

### **3 Countries outlined for expansion**

As part of our recent research into suitable locations, the following cities are selected: Shenzhen (China), Durban (South Africa) and Buenos Aires (Argentina). These cities cover the three target areas of the world (Asia, South America and Africa) that Griffiths and Hughes have stated are target areas.

The suitability of each location is evaluated based on the following:

- Manufacturing and production infrastructure
- Logistical connections
- Marketing and business development opportunities
- Political stability and culture
- Workforce availability and education
- Accreditation to ISO/EU standards

The following research is presented to Griffiths and Hughes.

#### **3.1 Asia – Shenzhen (China)**

##### **3.1.1 Location Summary**

Shenzhen is a country located in South China, with a historically rich innovation and manufacturing history since the 1980s. The town has in the past ten years become the technological mecca of China when it comes to manufacturing technology and has been known to pioneer Industry 4.0 technologies & industrial areas.

Having been referred to as the ‘Chinese Silicon Valley’, it would make an ideal area of Asia for Griffiths and Hughes to start to establish themselves in the region, with strong links internationally thanks to the Port of Shenzhen & bordering Hong Kong another pioneer in technology. It is recommended that Shenzhen should be a priority location for initial expansion due to the reasons outlined below.

##### **3.1.1.1 Advantages**

- **Manufacturing background.**
- **Chinese ‘leader city’ when it comes to innovation and technology.**
- **Leading manufacturer of technology worldwide.**

- **Culturally Chinese Government in favour of such technologies.**
- **Logistical infrastructure already in place.**

#### 3.1.1.2 Disadvantages

- **Long travel distance from head office (an issue anywhere in Asia).**
- **Would potentially require a translation service.**
- **IP protection would be challenging when manufacturing.**

### 3.1.2 **Manufacturing and production**

As Shenzhen currently produces 90% of the world's electronics (Fallows, 2007; Lindtner et al., 2015), it is anticipated that finding a local manufacturer will be no challenge. In recent years the increased skill of the local workforce has seen the emergence of manufacturing design teams in the city (Fallows, 2007).

#### 3.1.2.1 Iso Standards Accredited/EU recognized?

Whilst Chinese manufacturers often quote a 'CE' mark on their products, this is often different to the European 'CE' mark and has no real value or meaning. Despite this there are several reputable consultancies based in Shenzhen that are able to audit manufacturers to ensure that Griffiths and Hughes are not compromising ISO or EU/British Standards (e.g. ISO/IEC 30137-1:2019, ISO 22311:2012) due to lack of conformity. One such company is SGS, <https://www.sgsgroup.com.cn/en/consumer-goods-retail/electrical-and-electronics-total-solution-services/audio-video-and-household-appliances/certification/ce-marking>.

### 3.1.3 **Logistics and Transportation**

Logistics can be challenging to manufacturing and production within China, however, the Port of Shenzhen is located in the city and is the 4<sup>th</sup> busiest port in the world (Senarak & Mokkhavas, 2022). Since 2019 the port has been designated as a 'free port' meaning the area is exempt of import and export tax (Liu et al., 2021; Senarak & Mokkhavas, 2022)

### 3.1.4 **Marketing/Business Development Opportunity**

From a business development perspective, China itself is a large market suiting our product. With the Chinese government currently deploying similar technologies in some of their urban regions including Hong Kong (Lu, 2020; Peterson, 2020). Such technology is deployed to surveillance the population for crime and to prevent the spread of COVID-19. As our technology will be able to identify individuals this will be of interest to the Chinese authorities.

As well as the Government opportunities, Shenzhen is well placed for a variety of technology conferences, including the 1st International Conference on Artificial Intelligence Based Control with Industrial & Biomedical Applications (ICAIC-IBA) (see <http://www.icieis2022.com/>). Within Shenzhen itself there are many technological conferences throughout the year. Shenzhen itself is only located around 4 hour flight time from other technological centres in Japan and South Korea, meaning that it would be an ideal base of operations for a new location within Asia.

### **3.1.5 Political Policy and Cultural Impacts**

Political policy within China means that China is one of the most heavily watched countries in the world, with a countrywide network of surveillance and monitoring of citizens being deployed. As China has successfully used similar facial recognition software of citizens combined with body temperature scanners during the COVID-19 pandemic, the Griffiths and Hughes product would likely be welcomed into the country by lawmakers.

Aside from the product likely being favoured in China, the Chinese Government have designated Shenzhen as a 'Special Economic Zone' and the Port of Shenzhen a Freeport. This is to encourage international development in the area.

### **3.1.6 Workforce**

Shenzhen locally has a population of over 17 million people, with two technology universities serving the wider city area: the Shenzhen Technology University and the SUSTech University. Both are two of the top universities in China, with the Shenzhen Technology University being ranked 500<sup>th</sup> in the world (this ranks within the top 2% of universities worldwide). Courses are taught in English and the city is known for its wide availability of graduates being unable to find suitable employment in their specialist areas due to a large supply of graduates (Kang & Xiong, 2021).

## **3.2 Africa – Tunis (Tunisia)**

### **3.2.1 Location Summary**

Tunis is a country located in Northern Tunisia (northmost Africa), which is known for its plush beaches and old Middle-Eastern architecture. In the past 5-10 years the city of Tunis has started to develop as a manufacturing hub in Tunisia, specializing in the manufacturing of electrical components.

Whilst the country has been dogged in recent years by political instability, the new Government has seen terrorism decrease significantly and foreign investment return to the country. It is the aim of the Tunisian government to increase the manufacturing capabilities of Tunisia (AFDB, 2022; Harbi et al., 2009), in order to boost foreign trade and develop the economy. Grants are potentially available to establish in Tunisia.

#### 3.2.1.1 Advantages

- **Logistically easy to travel to from the UK, allowing for staff visits.**
- **Up and coming manufacturing century with grants to enter.**
- **Well placed for worldwide distribution, with access to local ports.**
- **A growing and forward thinking electrical manufacturing centre, with close links to Europe compared to other manufacturers worldwide.**

#### 3.2.1.2 Disadvantages

- **Manufacturing region only recently established in Tunis.**
- **Potential for civil unrest/terrorism.**
- **Local workforce is still developing.**

### 3.2.2 Manufacturing and production

Although manufacturing and electrical manufacturing development is no where near the levels seen in the previously discussed Shenzhen (China), Tunis has come on leaps and bounds in the past ten years. With foreign investment from countries such as the UK, Germany and France, Tunis is now home to over 200 electrical manufacturing companies (Oxford Business Group, 2019).

In 2019, the ELENTICA group was formed to further promote the manufacturing and technology industry within Tunis to a worldwide audience – composed of over 70 companies with offices in Tunis. As well as this the ‘Electronics Cluster’ aims to boost investment in the industry sectors and to further grow the industries (Oxford Business Group, 2019).

#### 3.2.2.1 Iso Standards Accredited/EU recognized?

Due to the relatively recent establishment of manufacturing and technology in Tunisia, there is currently little to no mechanisms to ensure that certifications are adhered to during manufacturing.

However, in the past 10 years, the EU has been working with Tunisian authorities to establish such mechanisms and ensure Tunisian produced products are compliant to internationally recognised standards (TUNISIA - EUROPEAN UNION, 2010).

### **3.2.3 Logistics and Transportation**

Tunis is well placed, being at the northmost point of Africa, it is close to several major African and Middle Eastern nations, including: United Arab Emirates, Saudi Arabia, Egypt and Nigeria. As well as this, the major ports of Radés and La Goulette, and provide ample links to worldwide cargo lines, predominantly France and other European Countries including the United Kingdom. However, it should be noted that size of cargo vessels to the region is limited due to port constraints, although a new ‘deepwater’ port has been commissioned by the Tunisian Government.

As well as this, Tunisia itself is only a 4-hour flight (average) from the UK, which would allow for company representatives of Griffiths and Hughes to visit for training, manufacturing visits or business development with relative ease. This would not be possible if located in either Durban (South Africa) or Zimbabwe.

### **3.2.4 Marketing/Business Development Opportunity**

Tunis is well placed for marketing and business development across Africa. Despite Tunis itself not entertaining many local conferences, the local city of Hammamet is only 1 hour’s drive from the centre of Tunis and has many medical technology conferences per year. As well as this, Tunis is only a 5-hour flight time from Dubai and Durban (South Africa) which allows for representatives of the new business hub to travel to.

### **3.2.5 Political Policy and Cultural Impacts**

Currently Tunisia’s government is seeking to encourage more manufacturing and development to occur in Tunisia, with Tunis being one of the main benefitting cities from such policies (AFDB, 2022; Boujelben & Fedhila, 2010; Harbi et al., 2009; Nabli & Nugent, 2014).

However, despite this, the potential for civil unrest and concerns over foreigner safety cannot be ignored, as little as four years ago it was the advice of the United Kingdom foreign office for British Citizens not to travel due to the threat of terrorism and kidnapping. This threat has been lowered in recent years, but such events could cause disruption to business for company representatives being unable to visit (Andersen & Brym, 2017; Arieff & Humud, 2014).

### **3.2.6 Workforce**

Although the local workforce in Tunis is dominantly composed of a mix of low to high skilled, the literacy rate in Tunisia is high at ~80% (Source: UNESCO). In recent years there have been efforts to further increase the education levels of the localized workforce, however, research has shown that whilst historic investment was made for this it did not impact the education level of the workforce as much as years where trade increased (Ghazali, 2012). Recent collaboration with countries such as Germany and France, as well as private companies such as IBM, Apple and Microsoft have continued to assist Tunisia in further developing the local workforce.

Research has shown that technology companies based in Tunis have high productivity and employee groups that 'encourages innovation' (Amara & Thabet, 2019).

## **3.3 South America – Montevideo (China)**

### **3.3.1 Location Summary**

Montevideo is a city located in South Uruguay and is the largest city in the country. The city ranks as the 9<sup>th</sup> largest city in terms of economies in South America and is frequently ranked as the highest quality for life and opportunity in South America (Tanco & Escuder, 2021).

In the past 20 years, the Uruguayan government has sought to encourage innovation, science and technology industries within the country with a robust innovation framework and the creation of an 'Innovation Minister' (Lemarchand, 2010). Part of this has seen the creation of several technological societies/public industry bodies to encourage further development in the area (listed in Lemarchand, 2010).

#### **3.3.1.1 Advantages**

- Government encourages an innovation society and seeks to aid innovation with policies surrounding grants to businesses and universities.
- Large skilled workforce at the disposal.
- Port of Montevideo provides external logistics to ports.

#### **3.3.1.2 Disadvantages**

- Large travel distance from Wales Headquarters.
- English is unlikely to be spoken by workers in the region.
- Little domestic market

### **3.3.2 Iso Standards Accredited/EU recognized?**

As Montevideo is a city within Uruguay they have the benefit of being a member Mercosur and subsequently a member of the EU- Mercosur Trade Agreement that facilitates free trade between the EU and the South American trade block of Mercosur (Baltensperger & Dadush, 2019; Estevadeordal & Suominen, 2004; Terra, 1998).

Due to this trade agreement, products exported from Uruguay are required to comply with EU product standards and legislation in order to comply with the EU- Mercosur free trade agreement (Baltensperger & Dadush, 2019).

### **3.3.3 Manufacturing and production**

The city of Montevideo is well placed as Uruguay is commonly known as the 'manufacturing hub of South America' (Legal Team Uruguay, 2021), with many grants given to foreign businesses looking to establish manufacturing in the region.

As well as this, close trade links to China could facilitate cooperative manufacturing between centres in Shenzhen and Montevideo that would be a benefit to both business centres.

### **3.3.4 Logistics and Transportation**

Logistically, Montevideo is currently a 1-stop flight away from the United Kingdom with many flights being routed via Madrid (Spain) with a total travel time of 15-20 hours. This could prove challenging for UK representatives to visit. One major drawback of Montevideo is that the first language is Spanish with many Uruguayans being monolingual which may hamper communications between the various offices.

Despite this, the city of Montevideo has excellent trade links with the wider world thanks to the Port of Montevideo, which continues to receive investment from the Uruguay government.

### **3.3.5 Marketing/Business Development Opportunity**

In terms of the marketing opportunities within the country, Uruguay is unlikely to require any technologies in order to monitor their citizens as they operate as a free and open democracy. Despite this, the country is still in the process of relaxing COVID-19 restrictions and may be open to acquiring the standard body temperature scanner product.

Wider afield, as Uruguay is a member of Mercosur, member states such as Argentina, Chile and Brazil which are currently experiencing bouts of civil unrest may lead the Government's

to prove as large potential customers of the upcoming retinal scanning product. As competitors such as Huawei and Dahua are already marketing similar products in the region, this presents an opportunity for Griffiths and Hughes to quickly establish themselves as the superior product of choice (Schwartz, 2021).

### 3.3.6 Political Policy and Cultural Impacts

Politically Uruguay is a stable country and has sought to enact policies to encourage the establishment of foreign businesses and to increase the size and quality of the manufacturing industry in the region (Legal Team Uruguay, 2021; Lemarchand, 2010). In the late 2000s. The creation of the Ministerial Cabinet for Innovation (GMI) in 2005 was ahead of the curve of even some European Countries (with the UK's former Department for Business Innovation and Skills only forming 4 years later in 2009). The agency is formed with members of other private and public cabinets that all cooperate to assist with the furtherment of business and innovation in Uruguay (see Figure 1).

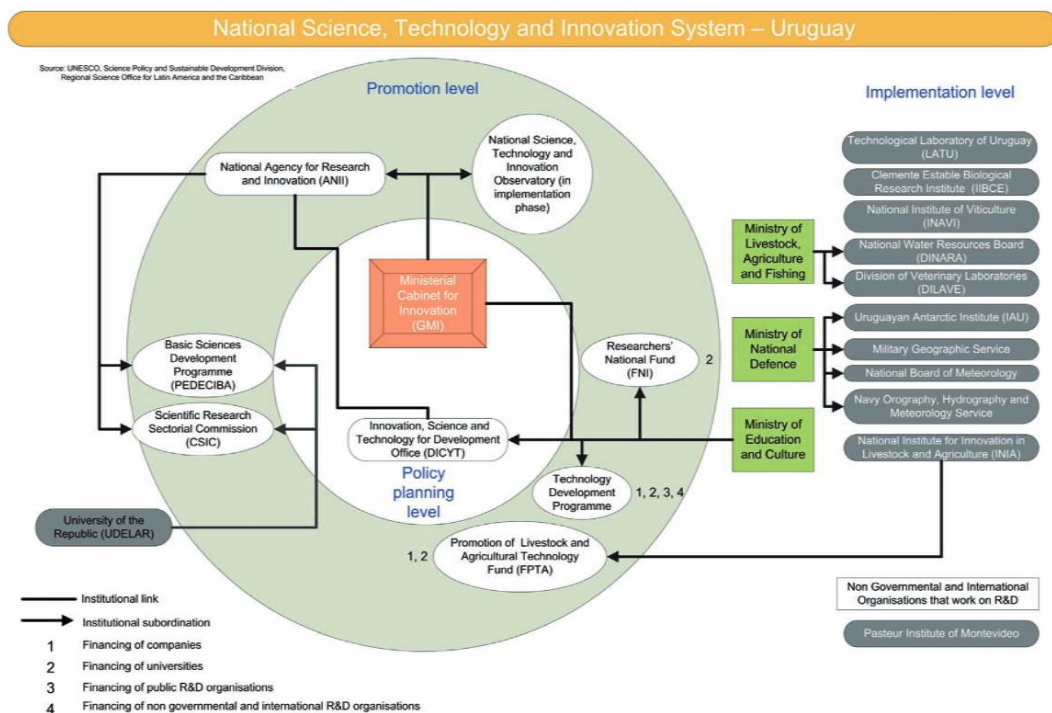


Figure 1 Uruguay Innovation Framework – composition of ministerial cabinet and interesting parties to further innovation, science and business in Uruguay (Lemarchand, 2010).

### 3.3.7 Workforce

Montevideo has an extremely high-skilled workforce, with funding from the Government in the past 20 years, there is a wide range of funding available to assist students through Undergraduate to Postgraduate degrees in various sectors (Lemarchand, 2010).

According to the world bank the literacy rate is over 97% in Uruguay, comparable to other parts of the world including the vast majority of European countries. Within Montevideo itself there are no fewer than 6 top rating universities, with the Universidad de la República rating as the highest within Uruguay (Source: <https://www.4icu.org/reviews/4841.htm>). They operate numerous courses including electrical engineering, mathematics and a host of other degrees relevant to Griffiths and Hughes. As well as this, funding offered by the Uruguayan government could see there to be potential for innovative collaborations between Griffiths and Hughes & the universities further strengthening the appeal to the area.

## 4 ISO56000 Standards – A recommendation for Griffiths and Hughes

ISO56000 Series Standard is an International Standards Organization guidance released in 2021 that aims to aid organisations to foster innovation and target their growth through the creation of an IMS – ‘Innovation Management System’ (International Standards Organisation, 2021).

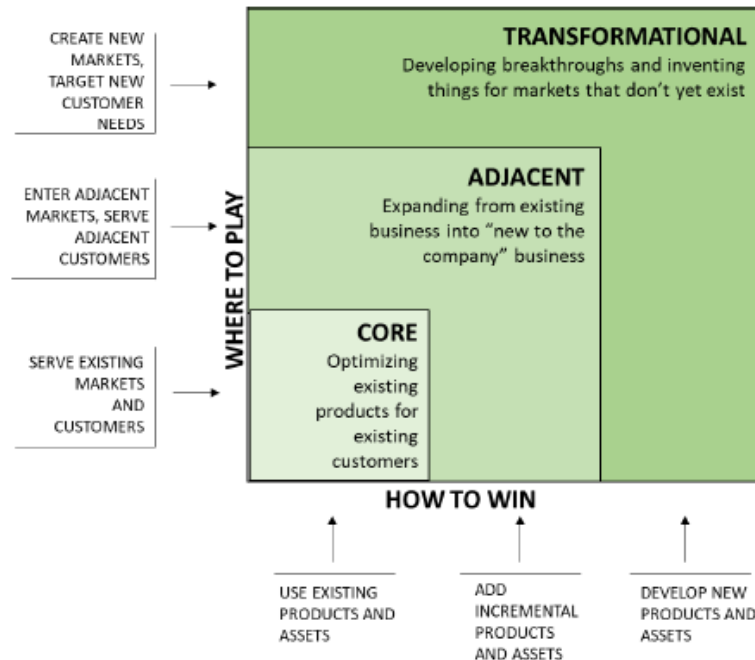


Figure 2 The key aims of ISO56000 and the IMS (International Standards Organisation, 2021)

As shown in Figure 2, the key aims of ISO56000 is to firstly evaluate the core elements of the business, how can we optimise existing products for existing customers? This is done to

protect the core business. Secondly, how can enter adjacent markets, service new adjacent customers (i.e. customers maybe in other industry sectors that may have a use for the products we supply). Finally, the IMS allows companies to transform their businesses. How can a business develop new products? What markets will they serve? And where?

As all of these broad aims are the ultimate goal for Griffiths and Hughes with expansion into global markets (in order to boost worldwide presence, provide markets for new products and **enable companywide innovation**), it is our recommendation that the ISO56000 be fully implemented within the company prior to the decision for overseas expansion being completely signed off on. This is to ensure that the correct mechanisms and structures are in place to work with the company's global sites most effectively and efficiently. As with the questions discussed earlier in the chapter, any questions on innovation/expansion should be directed towards the innovation matrix (Figure 3) to ensure that the company is sustaining innovation by developing new products into new locations and subsequently new markets. Without this the business could be put unnecessarily at risk, as simply establishing a new location, to serve similar clients with the same products would be a poor investment of capital and lead the business down a risky path if the existing markets were to drop. It should be Griffiths and Hughes' priority to ensure that the wider goal of sustaining innovation is met when establishing new locations.

The ISO 56000 series provides complete guidance on how this can be undertaken and will ensure that Griffiths and Hughes is in the best position possible to ensure that global expansion is a success for the company. ISO56000 is seen by some as the next ISO9000/9001 series (quality management systems) protocols, that ensured that globally all companies accredited were conforming to similar sets of audited project management and financial management standards (Harrington & Benraouane, 2022; International Standards Organisation, 2021; Lai, n.d.)

As ISO56000 is written by the same committee group as the ISO9000 series, it is thought by some that the standard will become the new industry standard alongside ISO9000/9001 worldwide for companies that wish to trade globally (Harrington & Benraouane, 2022). With this in mind, Griffiths and Hughes should ensure compliance to both the ISO 9001 series quality management and ISO56000 series to ensure supply assurance of the company's worldwide clients – where clients will be effectively unaware previously of the

business and by having ISO accreditations may be more willing to work with the company for the first time.

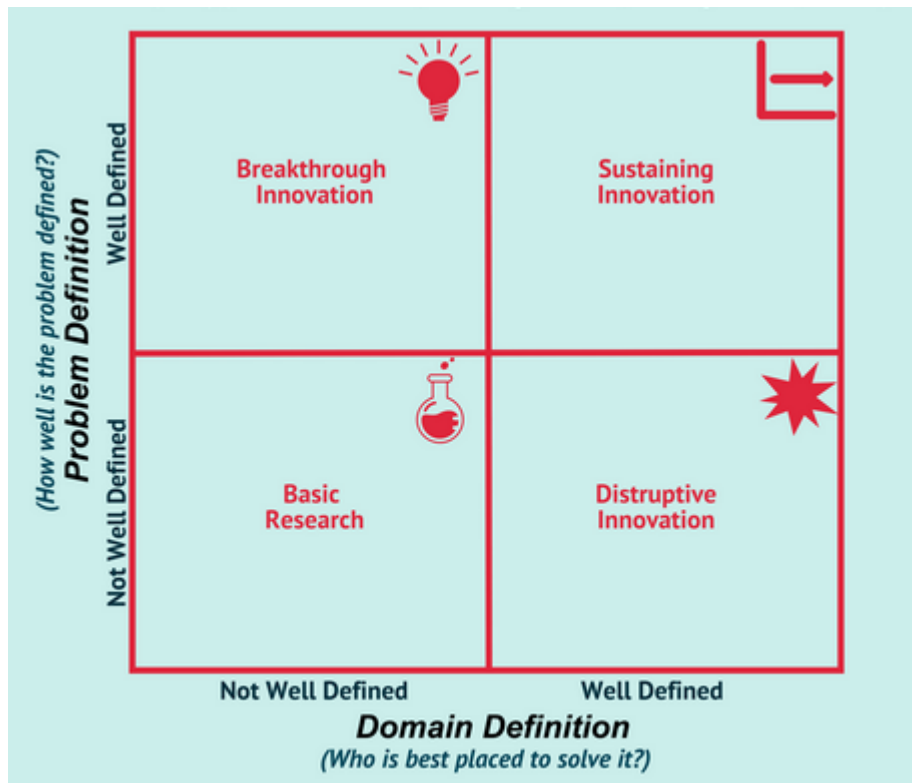


Figure 3 Innovation Matrix - the key to innovation within a company and understanding where a business currently stands (International Standards Organisation, 2021).

## 5 Conclusions and Recommendations

- Research conducted has found that Shenzhen (China), Montevideo (Uruguay) and Tunis (Tunisia) are selected as the three most suitable for worldwide expansion.
- Due to the large amount of technological goods exported from the region and opportunities domestically, emphasis should be placed on establishing an office in Shenzhen prior to those in Montevideo and Tunis.
- Selection was evaluated by a variety of factors, including:
  - o Manufacturing and production infrastructure
  - o Logistical connections
  - o Marketing and business development opportunities
  - o Political stability and culture
  - o Workforce availability and education
  - o Accreditation to ISO/EU standards
- Research found that a city's suitable not only relies on a city's qualities itself (in terms of manufacturing availability, workforce skill availability, proximity to major port infrastructure etc.), but also in terms of a wider political/policy landscape to encourage Griffiths and Hughes to establish a business centre in the forementioned countries.
- Free trade agreements with main markets key to limiting potential costs or import/export issues.
- Efforts should be made by Griffiths and Hughes to become accredited to the ISO56000 standards, to enable smooth and ease of cooperation between the different established business centres across the world to further encourage business development and provide structure for innovation.
- Further ISO9000/9001 accreditation should also be sought in the business to allow for further accreditation and assurance to worldwide clients, as well as providing the backbone for ISO56000 to stem from.

## 7 References

- AFDB. (2022). *Tunisia's new industrialization and innovation strategy supported by the African Development Bank*. AFDB. <https://www.afdb.org/en/news-and-events/tunisias-new-industrialization-and-innovation-strategy-supported-african-development-bank-53301>
- Amara, M., & Thabet, K. (2019). Firm and regional factors of productivity: a multilevel analysis of Tunisian manufacturing. *The Annals of Regional Science*, 63(1), 25–51.
- Andersen, R., & Brym, R. (2017). How terrorism affects attitudes toward democracy: Tunisia in 2015. *Canadian Review of Sociology/Revue Canadienne de Sociologie*, 54(4), 519–529.
- Arieff, A., & Humud, C. E. (2014). *Political transition in Tunisia*.
- Baltensperger, M., & Dadush, U. (2019). *The European Union-Mercosur Free Trade Agreement: prospects and risks*. JSTOR.
- Boujelben, S., & Fedhila, H. (2010). The effect of internal R&D efforts and external technology sourcing on achieving innovations in developing countries: the case of Tunisian manufacturing firms. *International Journal of Business Innovation and Research*, 4(4), 338–357.
- Carter, D., Mazumder, S., Simkins, B., & Sisneros, E. (2022). The stock price reaction of the COVID-19 pandemic on the airline, hotel, and tourism industries. *Finance Research Letters*, 44, 102047.
- Cui, Y., Jones, S. J., Saville, C., Stricker, S., Wang, G., Tang, L., Fan, X., & Chen, J. (2017). The role played by carbonate cementation in controlling reservoir quality of the Triassic Skagerrak Formation, Norway. *Marine and Petroleum Geology*, 85, 316–331. <https://doi.org/10.1016/j.marpetgeo.2017.05.020>
- Estevadeordal, A., & Suominen, K. (2004). *Rules of origin in FTAs in Europe and in the Americas: issues and implications for the EU-Mercosur Inter-Regional Association Agreement (Working Paper ITD= Documento de Trabajo ITD; 15)* (Vol. 15). BID-INTAL.
- Fallows, J. (2007). China makes, the world takes. *Atlantic Monthly*, 300(1), 48–72.
- Ghazali, M. (2012). Trade, technology and the demand for skills in Tunisia, 1998–2002. *Oxford Development Studies*, 40(2), 213–230.

- Harbi, S., Amamou, M., & Anderson, A. R. (2009). Establishing high-tech industry: The Tunisian ICT experience. *Technovation*, 29(6–7), 465–480.
- Harrington, H. J., & Benraouane, S. A. (2022). *Managing Innovative Projects and Programs: Using the ISO 56000 Standards for Guidance and Implementation*. CRC Press.
- International Standards Organisation. (2021). ISO 56000 Series Handbook 2021. *ISO*, 1.
- Iyengar, K., Bahl, S., Vaishya, R., & Vaish, A. (2020). Challenges and solutions in meeting up the urgent requirement of ventilators for COVID-19 patients. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(4), 499–501.
- Kang, Y., & Xiong, W. (2021). Is entrepreneurship a remedy for Chinese university graduates' unemployment under the massification of higher education? A case study of young entrepreneurs in Shenzhen. *International Journal of Educational Development*, 84, 102406.
- Lai, I. D. L. (n.d.). *Digital Quality Innovation Part 1: From Industry 4.0 to Quality 4.0 in Hong Kong*.
- Legal Team Uruguay. (2021). *Uruguay: The Manufacturing Hub Of Latin America*. BIZ LATIN HUB. <https://www.bizlatinhub.com/uruguay-manufacturing-hub-latin-america/>
- Lemarchand, G. (2010). National science, technology and innovation systems in Latin America and the Caribbean. *Montevideo (Uruguay): UNESCO*.
- Lindtner, S., Greenspan, A., & Li, D. (2015). Designed in Shenzhen: Shanzhai manufacturing and maker entrepreneurs. *Proceedings of the Fifth Decennial Aarhus Conference on Critical Alternatives*, 85–96.
- Liu, J., Wang, X., & Guo, J. (2021). Port efficiency and its influencing factors in the context of pilot free trade zones. *Transport Policy*, 105, 67–79.
- Lu, D. (2020). China uses mass surveillance tech to fight spread of coronavirus. *New Scientist (1971)*, 245(3270), 7.
- Nabli, M. K., & Nugent, J. B. (2014). *The new institutional economics and development: theory and applications to Tunisia*. Elsevier.
- Oxford Business Group. (2019). Tunisia's electronics industry uses collaboration and technical consolidation to boost manufacturing power. *Oxford Business Group*.

Tunisia's electronics industry uses collaboration and technical consolidation to boost manufacturing power

Peterson, D. (2020). Foreign technology and the surveillance state. In *China's Quest for Foreign Technology* (pp. 241–257). Routledge.

Ranney, M. L., Griffeth, V., & Jha, A. K. (2020). Critical supply shortages—the need for ventilators and personal protective equipment during the Covid-19 pandemic. *New England Journal of Medicine*, 382(18), e41.

Sarfraz, Z., Sarfraz, A., Iftikar, H. M., & Akhund, R. (2021). Is COVID-19 pushing us to the fifth industrial revolution (society 5.0)? *Pakistan Journal of Medical Sciences*, 37(2), 591.

Schwartz, L. (2021). *Major surveillance firms are 'gifting' tools to find a foothold in Latin America*. Rest of the World. <https://restofworld.org/2021/surveillance-latin-america-access-now/>

Senarak, C., & Mokkhas, O. (2022). 0 Technology for Port Digitalization and Automation. In *Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0* (pp. 1–14). Springer.

Tanco, M., & Escuder, M. (2021). A multi-perspective analysis for the better understanding of urban freight transport challenges and opportunities in Montevideo. *Case Studies on Transport Policy*, 9(2), 405–417.

Terra, M. I. (1998). *Uruguay en el MERCOSUR: perspectivas del comercio intrarregional*.

TUNISIA - EUROPEAN UNION. (2010). Press Release Tunisia - European Union The National Accreditation Council: Signing of a new bilateral recognition agreement for the accreditation of management system certification bodies. *TUNAC*. <https://www.tunac.tn/webtunac.nsf/0605d49edd28c04a41258174004185dd/eb013e5f9f9c9c7441258175004ee048?OpenDocument>

White, D. B., & Lo, B. (2020). A framework for rationing ventilators and critical care beds during the COVID-19 pandemic. *Jama*, 323(18), 1773–1774.