



**University Kempten
Institute for the Industrialization of
Africa**

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Introduction

This research paper is conducted by a group of students from Kempten University in Germany, in the course of global business development. FESTO is interested in establishing an educational for Africa on Tenerife. The aim of this study is to create a brief overview of Africa and to introduce several strategic options of how FESTO's institute for the industrialization of Africa could look like.

1. Status Quo

The Marshall plan for Africa, founded by the 'Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung', promotes that "There is not ONE solution, ONE plan, ONE best way of responding to the challenges that Africa faces". Therefore, this analysis focuses on several aspects of Africa itself, but also on influences from abroad. This includes an overview about Africa, several funding systems from Tenerife, Spain, the European Union, important strategic partners and options to consider.

1.1 Africa

With regards to the strategic analysis of a potential target region for FESTO Didactics, a crucial point is, that Africa is a continent with around one billion inhabitants and 54 countries, speaking many different languages and including multiple cultures. Prior to the market analysis, it is essential to concentrate on specific market regions. Due to recent developments regarding the Marshall Plan, the following countries had been considered in this paper: Tunisia, Morocco, Ghana, Cote d' Ivoire and Senegal. The three columns of the plan are firstly economy, trade and employment, secondly peace, security & stability and finally democracy, rule of law and human rights. The prior focus lies on the deepening of economic cooperation. Tenerife holds diplomatic relations with some more African states, e. g. Mauretania and Cape Verde, which could also be considerable for further research.

Tunisia is a pluralistic democracy which gained independence of France in 1965. It operates mainly in textile and leather business and Germany is the third-biggest trade partner. The GDP per capita amounts to \$ 3.730. Tunisian-Arabic and French are Tunisia's official languages where 98 % of the population is Islamic. With 80 % literacy rate the 11.2 million inhabitants are relatively well-positioned. Many people from other African states go to Tunisia to study because the university structures are very well. Due to the good infrastructure, travel via landside is easy to handle. In general, this country has a high phosphate occurrence.

Senegal holds a stable democracy and is on the 55th place of the corruption index. Its main business sectors are oil and iron production but mainly agriculture. The GDP per capita

amounts to \$ 1.033. The primary religion is the Islam. Besides that, Senegal was a former French colony. Over 60 % of the population is under 25 years old and the population is growing. It counts 16 million inhabitants with a 34 % unemployment rate and there are high government debts and a relatively poor population. The energy development plan consists of a 60 % electrification by 2019. It is known for a partly non-transparent and corrupt government.

Cote d' Ivoire is a republic and the primary economic sector focuses on cacao, coconut and banana plantations. The official language of the 24 million inhabitants is French. They have a high child labor percentage. The infrastructure is good, and they have a strong energy grid and internet connections. The country is basically secure, but there is still a high crime rate.

Morocco is a kingdom and its primary business sectors are tourism and agriculture. Besides a strong middle-class, the population also has a very poor class. There are high similarities to Europe regarding standards. The perception of women is liberal, with Islamic values. There is a compulsory school system similar to Europe. 56 % of the population lives in big cities. The country faces a 48 % literacy rate and 11 % of unemployment, which mainly concerns young people. Internet and telecommunication infrastructure are good. Morocco has a high phosphate occurrence, but also oil and gas. The French legal system is predominant.

Ghana is a democracy since 2000, with a stable government but poor infrastructure and high inflation rate and unemployment. It heavily depends on international financial and technical assistance. Agriculture produces 1/3 of GDP. Gold and cacao are the primary export products, which are expected to have a significant growth within the next years. Industries are receiving little support from the government due to the lack of expendable resources. Hierarchy is an important concept. There is an underdeveloped technical infrastructure, but mobile telecommunication is experiencing growth. Main resources are forestry and mining, gold and cacao, metals and minerals, but there is also oil occurrence. Ghana has a legal system, based on the British common law system with a high competence of judges.

1.2 Tenerife

The Canary Islands are of volcano origin, located of the cost of Spain. The major islands are Tenerife, Gran Canaria and Fuerteventura. Tenerife is the largest and most populated island. It consists of 2.034.38 square kilometers and has 933.419 (2018) inhabitants. The capital of Tenerife is Santa Cruz with 221.956 living on it. In addition, Tenerife has the highest GDP on the Canary Islands. Due to the diverse landscape and its natural attractions e.g. the Teide National park, Tenerife is the most popular island for tourists. Therefore, the service sector, including tourism plays a crucial role in the economic system of Tenerife. The vast majority of

its total production capacity is made by the service sector with 78 %. But in order to drive the production development, other economic sectors can be of important value.

ZEC stands for Zona Especial Canarias it is the Canary Island special zone. It was created within the framework of the Canary Island Economic and Tax Regime (REF) and was established by the European Commission in 2000.

Within this zone a tax benefits are given. The VAT (Value Added Tax) is reduced to 7 % and the corporate income tax is lowered to 4 % compared to European average of 20 %. To become a ZEC entity special requirements need to be fulfilled. First of all, the company has to be founded, with its headquarters on the Canaries. Secondly, one administrative member must be a resident on the islands. The minimum investment is 100.000 Euros. Thirdly, it is necessary to create five jobs during the first six months and this average needs to be maintained. Finally, the business must operate in the specific field of activities. This includes the food, textile, chemistry or pharmaceutical industries or legal and accounting industries.

1.3 Spain

Within Spain, there are different funding programs, for example the CDTI or the ICEX project, which offer funding in various areas. They offer a wide range of funding, but they are not one hundred percent fitting to an education hub. Also, the European programs are competing with the Spanish funding options. The European funding programs have a wider range than the Spanish contracts and are easier to access. Therefore, it is to suggest choosing European support. When applying to Spanish authorities language problems could be identified. The websites are mostly available in Spanish, consequently they are not addressed to international investors.

A big problem of Spain is the language barrier, which exists with Western African. Besides French, there are some African languages. Sometimes they are not willing or are able to learn either English or Spanish. Consequently, it is very hard to communicate with them. Most of the western African countries were colonized by France. There is a cultural clash between Spain and those countries. The people are closer in mind to French than Spanish societies.

1.4 European Union

The European Commission offers several funding programs which will be outlined in this chapter.

Horizon 2020, it is the biggest EU Research and Innovation funding pool in the European Union with 80 billion Euros. Aiming to link academia and industry. The program started in 2014 and lasts until 2020. It is determined to secure Europe's global competitiveness and help to implement the Innovative Union. The funding purpose is to support EU political priorities and

to address the societal challenges. It supports research infrastructures needed to gain leadership in the industrial and enabling technologies. The program aims to foster leadership skills in enabling industrial technologies. Public private partnerships (PPPs) are vehicles to implement technological roadmaps areas and achieve leverage of private funding. Another issue of the program is to secure, clean and efficient energy. Horizon2020 promotes the support of renewable energy and technology connected to development.

Erasmus+, the European Union program for education, training, youth and sport. It runs for seven years (2014 to 2020) and commands 14,8 billion Euros. Erasmus+ aims to modernize education, training and youth work across Europe. The program is limited to EU countries. Companies wanting to participate in Erasmus+ may engage in several development and networking activities. These include strategic improvement of the professional skills of staff, organizational capacity building, and creating transnational cooperative partnerships with organizations from other countries in order to produce innovative outputs or exchange best practices. Therefore, it is conceivable that the Erasmus+ program can be applied to the FESTO case.

COSME, is a funding program of the European Commission to strengthen the competitiveness of SMEs across Europe and in countries, which are included in the European Neighborhood Policy. It holds a 2.3 billion Euros budget. The program runs from 2014 to 2020. COSME helps businesses to access markets in the EU and beyond. It funds the Enterprise Europe Network that helps SMEs find business and technology partners and understand EU legislation. The Your Europe Business portal provides practical information on doing business within Europe. Referring to FESTO, COSME supports entrepreneurs by strengthening entrepreneurship education, mentoring, guidance and other support services. The program also aims to help businesses access opportunities offered by digital technologies.

EU Program for Employment and Social Innovation (EaSI), brings together three EU program managed separately between 2007 and 2013: PROGRESS, EURES and Progress Microfinance. The total budget for 2014 - 2020 is 919 billion Euros. EaSI supports the modernization of employment and social policies with the PROGRESS axis (61 % of the total budget); job mobility with the EURES axis (18 % of the total budget); and access to micro-finance and social entrepreneurship with the Microfinance and Social Entrepreneurship axis (21 % of the total budget).

1.5 Partners

The potential partners for FESTO Didactics can be classified into four categories: political, educational, commercial partners and cooperation with humanitarian organizations. These are relevant to ensure a global view to push forward the industrialization of Africa in a sustainable framework.

Political partners, include several ministries of education of different countries, e.g. the German ministry of education, because FESTO is based in Germany. The ministry of development is included, because it is as a strong supporter of the industrialization of Africa. In addition to this, the ministries of education from France and Great Britain should be considered due to their history and experience in African countries.

Educational partners. Local partners could be: EVM, a canarian consulting firm and the University of la Laguna. It is very important partner due to its contacts and experience. Additionally, the Humboldt Multiversity can act as a networking and informational exchange partner.

Commercial partners. Through EVM and Colegio de Ingenieros Industriales de Tenerife different partners were identified: Geo imaging, Intrasoft, Achiveeon, Projektura, AVG Consulting etc. Furthermore, we learned that INTECH could be an interesting partner in the fields of technological development, usage of renewable energies, development of IT software solutions and programming. Additionally, the Teide HPC could be a component of the project.

Humanitarian partners, these should not be forgotten since they are relevant to the development of African countries. Potential partners can be Instituto Pedro Nunes, UNICEF, UN, iMinds, Bill and Melinda Gates foundation or the Bosch foundation.

2.Target Groups

Target group analysis, customer and prospect mapping with geomarketing allow you to discover buying patterns within your distribution areas and to identify new customer potential, cross- and up-selling opportunities. We have created five different personas identifying their personal habitats, life expectancy, possibility of their most important economy sectors and connected them to the aim of FESTO's educational establishment opportunities in Tenerife.

Persona: *Youssef from Tunisia*

Youssef is a 35-year old Tunisian living in the capital Tunis with his wife and three children. He speaks Tunisian Arabic and French. After his primary education he started an apprenticeship as a technician in manufacturing systems engineering. As the Tunisian society is relatively well educated in comparison to other African states, he received a good basic knowledge but could not start a university degree because of a lack of money in his family. In his free time, he likes to go to Cafés and meet with his male friends. He does not spend a lot of time at home, because his wife is in charge of all areas, the childcare, education and household.

After his secondary education he began working in a textile company focused on leather products. As he already worked there for several years, he gained a lot of specific knowledge and currently became the department manager for the leather jacket production. His position includes the steering and coordination of production personnel and on the other hand the communication and reporting to the upper management.

As the company struggles with a lot of competition of Egypt and the Far East a digitalization strategy was created by the upper management to lower costs and become more competitive. The strategy includes to renew and replace existing production machines to lower the fixed costs and automatize production processes. The required parts for it are demanded internationally and therefore English and intercultural communications become more relevant. This creates a high insecurity for the staff as they are used to old processes and machines and are afraid of being replaced soon. Youssef is responsible for implementing the new strategy and is insecure about his competences for leading the change. He is afraid that his employees are not willing to follow the strategy and his decisions and are not ready yet to leave the beaten path. Conflicts may appear due to the different perceptions of the upper management on the one hand and the insecurity of the production personnel on the other hand. His prior objective is to obtain job security for keeping his position in the company.

He wants to ensure the quality of his life and guarantee a high living standard for his family. This includes living in a nice flat and financing the education of his children. Secondly, he wants

to meet the expectations of the upper management board, to fulfil the task of leading the digitalization of the production. Additionally, his employees should work as a team and should not be worried about the change. Moreover, their mindset needs to be changed in terms of taking it as a chance to develop their skills and make themselves more valuable for the company, especially in times of suffering textile industry.

FESTO could offer a variety of services that could help the companies in Tunisia especially in the textile industry. For this case, we figured out some exact services that will follow later. Referring to the economy and the good education, Tunisia is already well developed. There are already a lot of great universities and schools in the country, that have a great reputation also in other countries. So, the basic knowledge as well as the professional knowledge is already ensured. Since the largest industry in Tunisia is the textile industry, the real problem this country is facing, is the competition from Far East. Therefore, in our opinion it is not that necessary to invest with Festo Didactics in this country, but on the other hand the companies will need a lot of new and good machines and more automatization to still be competitive. Because of that, it is possible for the technical part of Festo to and sell machines to these companies in Tunisia. In this context, it would definitely make sense to offer courses like “training on the machine” to train the employees on the Festo machines. Another possibility would be to send Youssef to another institution for example in the South of Spain, since it is a lot closer. In this case, short courses, for example on a weekly basis could be a good option.

Persona: *Aku from Ghana*

The population in this Western African country is mainly concentrated in the southern half of the country. The educational level as well as living standards are higher than in the north of the country. This is the reason, why we created Aku Wulkuada as a persona that presents the target group for our FESTO project. She matches to the average of the population statistics from Ghana.

Aku Wulkuada, born in the north Ghana, is 30 years old and lives in the capital city, Accra. Her mother is from Nigeria, who came to Ghana in the 60s, because of the bad economic and social conditions in Nigeria. She is catholic (13,1 %) and belongs to the ethic group Akan (47,5 %). She speaks Asante and English, which is the official language of Ghana. She is teacher in the secondary school with specialization on physic, chemistry and mathematics. Her salary is around 700 Cedi per month (126 Euro per month). We can describe her as a modern, open-mind, well-educated with a university degree. She is married and has two children. Her big dream is to open school back in her home town in north Ghana, so the economic and social conditions (e.g. infrastructure) will improve also in this part of the country. The girl school will

specialize in IT and technical education. Aku can imagine that the school will have full service for the teachers and kids (all day care for the teacher' children and school doctor for everyone).

Even though that she really dreams about this school, there are many problems and challenges that she faces. There are not enough technological infrastructures, no reliable internet (0,3 internet at home/100 people) and computers (1,08 computer/100 people). She does not know how she can start this project. There is also a problem that mainly in the north, there are not enough qualified teachers, no stable energy and no internet access.

The gains that Aku wants to achieve are schooling possibilities for everyone with international recognized degrees, flexible educational offers. At the end the north of Ghana will be an interesting place for foreign investors with enough well-educated employees.

Persona: *Ahmed from Morocco*

We created Ahmed as a representative of our target group. He – as common in Morocco – has a bigger family with at least 5 siblings and is under 24 years of age. The social status is at a low level, meaning that the parents are working in the primary sector, which is the largest in this developing country in terms of the population share working in this sector. Ahmed at the age of 22, is living in the capital of Morocco called Rabat and he is Muslim. He is living at his parents' home, because he did not find a job after graduating from school when he was 15 years old. That is why he needs to support his parents at home in their daily tasks. Due to this fact he could not work in the sector he wanted, as many young people under 24 living in Morocco. Ahmed wants to work in another job to be independent. When he has a stable income, he can marry and create a family with his wife. Moreover, he can support his family with his income and influence his siblings to get a better life. Ahmed has a big incentive to do an apprenticeship to get a little income to finance himself and to give money to his family. Generally spoken he wants to develop a structured life with a stable income. Ahmed is financially not stable enough to leave their parents' home to get married. He stays dependent on their family in terms of workforce in the primary sector.

They need to gain an income to support their family as well as start living their own life without any dependence. A side effect would be the diversification of the families' income which are working in the primary sector. The younger siblings would have better possibilities in terms of the living standard in the future as well.

Persona: *Arthur from the Ivory Coast*

Arthur Awolowo is a 27 years old man, born and raised in the African country of Cote d'Ivoire. After growing up in a small village he now lives in a small apartment close to Yamoussoukro, the capital of Cote d'Ivoire. As most inhabitants Arthur's mother tongue is French, and he has basic knowledge in English. He got married at a young age and now has three children between the age of two to seven. Arthur is responsible for making the money for the family while his spouse is a housewife, taking care of the kids. Arthur was able to enjoy four years of education in primary and high school, where he gained the ability to write and read, as well as basic mathematic skills. While being a student he started working as a harvest worker on one of the many cacao plantations in the region to support his family financially. Because Arthur has always been keen to learn new things and to educate himself, he was promoted to become a regional sales assistant in the headquarter Yamoussoukro at the age of 23. He likes and enjoys his job, but he has the feeling that this is not the final place to be, Arthur would like to drive forward his career to once become an international sales manager.

Arthur lives by the motto to always put the wellbeing of his family first. He wants to be a role model for his kids and to be able to offer them a good life and the chance to undergo a good education, by his personal and financial support. Arthur likes to spend his time with family and friends, and he likes to educate himself by reading the newspaper and via online media.

Even though he has a great family and is generally happy with his life, Arthur has one big obstacle, which he would like to overcome to develop personally and professionally. Arthur only has basic English skill. He would like to improve his level of written and verbal English skills for many reasons. His aim is to become an international sales manager and thereby to communicate with people from different countries. Right now, he doesn't fulfil the requirements to be taken into consideration for the job promotion because of his insufficient English skill. Not having a promotion opportunity not only affects him but also his kids, for whom he wants to be a role model and provide them with the financial aid they need.

When Arthur gets the chance to improve his English skills, he will experience many gains. He will be able to communicate with people in an international setting, putting himself in a better position for a professional promotion. Because of the potential promotion he might earn more money and thereby being able to care better for his kids and family and being a better role model. Also because of language certificates he might have a higher job security in his firm but might also be an interesting potential employee to other companies in the industry. All these aspects would increase his self-esteem, monetary position and appreciation in the workplace.

Persona: *Loretta from Senegal*

Loretta Azikiwe from Senegal represents the target group of highly skilled government representants in West Africa. She is 45 years old, muslim and lives with her husband and her three children in Dakar – the capital of Senegal. Her mother tongue is French, but she is fluent in English as well. Loretta successfully graduated in her Master studies in energy development and is currently working as Technology Referent in the Senegalese Ministry of Development, where she tries to improve the industrial and digital situation of her country. Furthermore, related to this job, Loretta is member of the Supervisory Board of Senelec – the national monopolist in energy providing in Senegal. In this position she influences the future direction of the company.

Each day, Loretta works hard in order to improve the development of her country but she faces some obstacles she needs to overcome. Many rural regions in Senegal are not provided with electricity. As a consequence, the basis for further digitalization and industrialization is missing in most areas of the country. In the next years the government would like to increase the percentage of the electrified regions to 60 %. The majority of the Senegalese energy comes from fossil resources. It is Loretta's goal to increase the amount of renewable energies contributing to the energy supply, because she fears that her children could suffer from a decreasing energy resources in the future. However, she has a lack of competences concerning this topic, so she needs to gain more specific and technological knowledge about this. In addition, Loretta faces problems in combining her private life and family with her sophisticated work in the ministry. Inequality between men and women is also a struggle she is in during her working life. To be able to change the industrial situation and to set up a successful strategy for her country, Loretta needs advanced skills in management, leadership and project management which she does not have so far.

In conclusion, Loretta's situation could be increased by getting more specific knowledge about renewable energies and their technological implementation. She also needs to reach a higher level of management skills in order to proceed the electrification strategy of her country in the departments of her ministry and to lead her team successfully. Loretta would also like to have better compatibility of her family and work and more appreciation in her job although being a woman.

3. Generated Value

After elaborating the target groups for this project, potential products and services will be explained in the following.

3.1 Executive Education Toolbox – Modular intense course

The product suggestion of “Executive Education” was developed out of the perspective of the persona Youssef in Tunisia who has the ambition to create a digitization change within the main industry, which is the textile industry. The industry is facing high global competition and will be able to maintain global competition by lowering production costs and increasing efficiency of their production. Therefore, they need to buy parts from global automation and IT suppliers. There might be the need for new machines as well.

Executives & government members

For Festo there is the main objective to bundle the “Executive Education” with their machine and IT-solution. The product is a modular-structured concept where individually required modules can be chosen. It can be used to train executives as well as government members to provide the practical and detail knowledge which is the basis for their consulting activities within the government and the consequent decisions.

Executive Education Toolbox

The product is an intense course containing different elements in terms of technical education and management, which is conducted through a “*train-the-trainer*” principle.

Technical education

First of all, all employees need to get access to IT knowledge. There is the need to extend the knowledge regarding industry 2.0 to industry 4.0. Depending on which status there is a need to change towards automatization or digitalization. The main theoretical aspects are delivered within the course and will be continuously provided via e-learning.

Management training

Furthermore, there is the need of knowledge in change management. As the trained people are meant to become leaders of the whole change process, they need to be able to convince their colleagues and employees. That finally creates motivation and removes fear of change. This means particularly to conduct management, leadership and team building workshops.

Another essential aspect is the training on FESTO machines and their automatization solution. Additionally, the service includes a module of e-learning to improve the technical English, French or Spanish vocabulary. In reference to the aspect “persona Youssef” there is the value proposition consisting out of the combination of pain relievers and gain creators.

The Pain Relievers are the multiplier for new knowledge, gaining “ambassadors for digitization” and the Gain Creator. In this context education on required technical subjects will be provided via e-learning. The basis for the conduction needs to be further elaborated by considering the target countries and existing flight connections. In terms of Tunisia there might be better and quicker flight connections towards Italy, where the headquarters in Italy could be used as a training center.

3.2 Curricula for language education

The idea is to increase the language skills of the population to a level that allows international trade and to be able to communicate across nations and cultures. Depending on the existing previous knowledge, language courses are offered at different levels, comparable to the levels at German universities. A certain kind of accreditation and issuing of certificates for the standardization of the knowledge becomes necessary (TOEFEL, A1-C2, etc). English can be differentiated in advanced courses in Business and Technical to meet specific professional needs. The language training acts as a gain creator to promote the contacts with other language groups or nations. In addition, the trained staff will add value to the business in the long run as it can grow and participate in international activities. Indirectly, the language training also acts as a Pain Releaser, as the employees can count on increased salaries due to the qualification and can thus provide themselves better.

The training can be realized by trained language teachers who have gained their knowledge in, for example, a hub in the Canary Islands. Furthermore, a language teacher can also be trained to train further language teachers. This idea summarizes the “Train the Trainer” concept as a multiplier of knowledge. A concrete implementation of the “language school” would be conceivable in premises made available by the companies on site in order to minimize the investment. The training of the employees would most likely be offered as part-time working day to prevent loss of earnings. Specifically, this could be done with hours of class after work. It would be conceivable to support learning the offer of an application for smartphones. As smartphones become more and more popular and the cost of acquisition is decreasing, they are a good tool to cover a broad mass. The application could be specifically adapted to the educational offer in order to repeat the learned content and thus to consolidate. The financing of the app could be done either by the employer or the user (“student”) itself. However, the costs would have to move in a very small framework, which, in the end, add up due to the widespread distribution.

In addition to language training, content that supports the running of a business, such as experts in setting up the IT infrastructure and digitizing work processes, could also be trained. Rudimentary knowledge in agile project management or general courses in management skills would be equally conceivable.

3.3 Educational shipping containers

The business model of the container school relies on a service offered by FESTO, which allows interested parties to lease educational shipping containers. It represents an agile way of education since the containers can be build up very fast and in almost every location. These are equipped with basic furniture as tables and chairs.

Many parts of Africa suffer from a shortage in educational facilities. In addition to this, the internet network is not stable and developed. This is where the shipping containers offer an agile solution. They are easy to transport and can be installed almost everywhere. Due to this, we can easily bring education closer to people who would not have any access to schooling.

The containers are equipped with basic furniture needed to ensure learning, as tables, chairs and air conditioning powered by solar energy. Moreover, they will include IT equipment, to promote digital education within the country. The containers can be used to promote teaching on an elementary and secondary level, but also to, on a first basis, offer training to new becoming teachers. They would later be able to educate many students on different topics within the same facilities.

The leasing model is oriented on micro financing. It gives interested parties to opportunity to acquire well-equipped educational facilities to a reasonable price. They could refinance their investment trough small school fees, which can be demanded from the potential students.

Besides increasing the educational level in countries, it will increase and will create new jobs. Data information will be collected through the computers and will in the long term the development of the internet will be pushed.

Education container offer a sustainable, agile and cheap way of education in combination with monetary incentives for investors and other third parties. Through this business model, the industrialization of Africa will be triggered and developed.

3.4 Symposia

A possible education platform of Festo Didactics could be a Symposia. A meet up point on the Canaries would be a possible forum for sharing knowledge and experience, establishing

partnerships, and developing solutions to stimulate the growth of industrialization in West Africa. In that context FESTO could push industrialization, networking and future cooperation. An invitation of enterprises and policy makers promoting entrepreneurship for sustainable development would be possible. A dynamic private sector driven by industrial enterprises creates jobs, stimulates local economies and strengthens communities. These enterprises not only spur development and market growth through the provision of innovative goods and services, but also ensure the preservation of the very foundation of national economies.

Industrial enterprises create a lasting collective impact for marginalised communities. They include the poor population along their value chain, working with them as suppliers, distributors or consumers. Through the provision of sustainably produced consumer goods and services, they avert environmental degradation and pioneer business models which are based on sustainability.

The demographic boom and urbanization in West Africa, coupled with growing demand for more inclusive growth, are key drivers of economic transformation in the region. Natural resources exploitation is no longer sufficient in order to meet employment and social inclusion expectations, particularly amongst youth.

To reverse the trend of deindustrialization, countries of the region need to remove the obstacles to industrialization as well as domestic and international investments, including the lack of transportation and logistics infrastructures, industrial facilities obsolescence, energy shortages, inadequately qualified workforce for industrial jobs, lack of access to finance, and uncompetitive business environment. They must build together a productive space and a sizable regional market through common policies focused on standard convergence, free circulation of goods and persons, financial integration, and human capital formation. These must be designed to strategically position the region within the global industrial landscape, which offers numerous opportunities but is ruled by more and more complex determinants of competitiveness.

3.5 Training Apps

With a more than 80 % penetration rate of mobile subscriptions among the continent's population, the ways in which education can be provided are changing. In a digital age, the usage of mobile applications for this purpose seems reasonable. Applied to FESTO's desire of supporting the industrialization of Africa, there are several formats to do so.

Language course

The first of three options would be an app for language learning and training on a train-the-trainer foundation. Students should be able to present their knowledge gains towards possible

employers or to institutions of higher education. Therefore, a certificate should be made available at the end of a successfully completed course.

Support for a dual education system

Another possibility of an integrated education program could be the development of a dual system, in which students learn about a technical or IT-related occupation on an independent basis. This theoretical learning is happening via a curriculum which is presented by easy steps given through the application. Those steps could be put into practice in special learning centres, where contact persons are there to support. To make it a dual system – and by doing so, being independent thanks to compensation – the students would additionally apply their gained knowledge in partner companies. Thus, a basis for future employment can be provided without hesitations of prospective students to lack as support for their families.

Support for Management Courses

In form of a blended learning concept, an intensive management course, which is taking place within a condensed time span, could be supported afterwards by giving updates via an application. Combined with those, there could communities of practice be installed for long lasting learning and exchange. Possible topics in this case could include digitalization, renewable energies, agility, leadership in general and many more.

3.6 Government Consulting

One product idea for the institute in Tenerife is government consulting. This was chosen because of the special expertise of FESTO Didactics and the infrastructure of the Canary Island Tenerife. The concept is to help governments finding the right tools and skills to develop industrialization in West Africa, by not only share special knowledge but also give tools to really implement those innovations. Problem solving is another big issue. The institute should be a hub for any kind of questions that might occur.

FESTO Didactics has innovative strength in factory, process automation & competence development. Its partners offer different kind of consulting expertise. There are some examples of locals that could give support building up structures:

- INTECH – Innovation and Technology
 - ITER - sustainable energies and supercomputer/ Big data storage
 - ATOS - software development/ IT solutions
 - ULL - research and development
- astrophysics, tourism, tropical diseases, audiovisual media, biotechnology

- EVM – funding (Spain, Tenerife and Europe)
- GobCan – Network development

There could be additional value created in form of collaborations with the university, so scientific studies could be a basis for decision making processes.

4. Strategic Options

4.1 Risks

A FESTO educational hub for the industrialization of Africa on Tenerife shows a lot of opportunities and potential gains for the company and the African society. However, some potential risks need to be considered regarding strategic options.

The discussion of the research conducted pointed out that potential language barriers might be an issue for the realization of the project. Opening a hub on the Canarian islands proposes that the main language used to teach and organize trainings in the hub would be Spanish, due to local labor force. Considering the African countries chosen, Spanish is none of their official languages spoken. French is widespread, and English is an international language needed for a successful industrialization. Thereby especially the lecture language needs to be taken into account. Employing teachers with local language knowledge or natives especially with French language skills might weaken potential problems. Another opportunity could be language courses, especially in the Train-the-Trainer program.

There are many ways of offering training e.g. in African countries or on Tenerife. However, traveling across continents for educational purposes might be challenging due to visa constraints. It might be reasonable to use the hub on Tenerife mainly as the organizational headquarters and to focus on local educational training centers in Africa. At a later point in time this could put some pressure on European and African politics to simplify visa requirements.

Furthermore, the location Tenerife is attractive because of its unique Canarian funding. But it needs to be taken into consideration that the different funding and tax benefits e.g. 4% tax benefit as well as R&D and technological innovation tax benefits underly strict restrictions and requirements. The educational hub business model on Tenerife relies heavily on the Spanish and Canarian funding possibilities. However, it is not certain that these will be granted for the project. This study and the funding possibilities provide thought-provoking impulses reconsidering if Tenerife is the ideal location for the FESTO educational hub.

Following up the financial location considerations of the hub, FESTO needs to critically evaluate the African countries chosen. Some western African countries seem to suit the program well because of already existing ties, but especially Tunisia, because of its geographical location, flight connections and language, and the Cote d'Ivoire, because of no previous political ties to Tenerife seem not fitting for the purpose. It might be useful to have a look at western African countries, such as Mauritania, with who Tenerife already has strong connections and trust of politicians and society.

FESTO as a German company willing to operate in Africa might face some mistrust of the African society. This could be explained by historical events and the current political situation.

These risks need to be considered when planning FESTO's strategy of an educational hub for Africa in Tenerife.

4.2 Chances

The strategic options which are supporting Tenerife are divided into two main parts. On the one hand Africa has an immense trust in Tenerife. On the other hand, FESTO could connect several of the existing products to a whole system.

Since the ancient years Tenerife has very good connections to countries in West Africa. These connections include political, economic as well as educational networks. Tenerife has existing political connections to countries like Senegal, Morocco as well as Cap Verde. Economical support includes regional projects for a sustainable development in West African countries. Therefore, Tenerife supports countries with goods they need instead of financial aid. The University of La Laguna offers a wide range of exchange programs for African students from different Universities along West Africa. They offer an internship on Tenerife to 40 students per year. The total budget of this program is 600.000 Euro.

The other advantage which can be emphasized is the interlinkage of the different product offers. The products are language class, dual education system, execution education toolbox, symposia, government consulting and container schools.

As container schools are scalable and flexible in its equipment it creates space for integrating language classes, elements of the dual education system and the execution education toolbox. The courses in terms of language knowledge as well as technical theoretical knowledge can be integrated in two different ways. Either by having a teacher present or having a digital, automatic guidance. Especially in terms of technical education it is possible to implement the machines which the people are supposed to get trained on. Overall the digital services which can be used within the container school can be stored on a data cloud platform (for instance, ITER supercomputer) which can be used as Apps.