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1. EXECUTIVE SUMMARY

Italian hand-made tailored shoes are world renowned in the global shoe market for their style, attention to detail, the Italian leather used and the skill of the shoe makers. However, there is no easy and continent way to order a pair of custom hand-made Italian shoes without visiting the shoe maker in person to measure your feet. This means that the process of purchasing a pair of these shoes is very time consuming and very costly.

Made To Fit (MTF) offers a user-friendly, cost effective and time saving solution from your smart phone. Using computer vision and 3D printing, Made To Fit can open the door to international markets for Italian shoemakers.

Our customers are the Italian shoemakers who want to expand their market worldwide. To keep in line with the growth of the global market of leather footwear and formal shoes

Based on market analysis and carful financing calculations, Made To Fit is in a position where the initial capital investment will be funded by the founding team members. This self-funding will be enough to start the business and allow it to grow without the need of external investment.

The founding team includes four Automation Engineers who have the technical skills and ability to bring Made To Fit to life. The last team member is a Management Engineer who brings experience in financial and logistics areas complete a strong team that will succeed in bringing the Italian hand-made shoe market to being globally accessible.

2. INTRODUCTION

2.1 THE MARKET PROBLEM

With the current process, the client will need to visit the shoemaker's workshop to get their feet measured. The shoemaker then needs to make a shoe last based on the shape and measurements of their client's feet. This is a very time-consuming procedure. The shoe last is then used as a template to make the custom shoes.

It is also common for the shoemaker to make a prototype pair of shoes and call the client back to the store to try the fit of the shoes. If it is necessary, the shoe maker will make updates to the shoe lasts. Then, with the updated shoe lasts, the shoemaker will continue to work on the shoes for his client.

2.2 OUR SOLUTION

We are offering a service to shoemakers where we eliminate the need for their clients to go to the shoemaker's shop in person. Through the shoe maker's website, the client will be able to upload a video that they take of their feet with their phone. With this video, our algorithm will build a 3D model of the client's feet. Using this model, we generate a unique shoe last for the client, 3D print the last and send it to the shoemaker. With this new method, it's possible to resolve the difficulties of a small local shoemaker to expand their market. Customers will be able to satisfy their craving for branded "Made in Italy" shoes without the necessity to travel to Italy from far away countries.

2.3 WHAT DO THE SHOEMAKERS THINK

With the objective of gathering information and possible customers, we interviewed three shoemakers located in Bologna. Each shoemaker showed a lot of interest in our proposal. One of them had already tried to use the 3D printing technology but he stopped because it was too difficult without a technical background. The other two are in the process of creating a website for online shopping.

All of them have foreign customers and they described to us how the process of catering to these foreign clients were long and complicated. The need for them or their customers to travel is bothersome. So, the majority was eager to the possibility to use our solution. One shoe maker expressed some doubts about finding new clients with our service. He was worried thinking that some customers are interested to have a contact with the shoemaker and seeing him work. But, by our market research, we know that if some customers want this kind of work a lot of other customers are discouraged by the complex method to obtain a pair of Italian tailored shoes. However, to respond the doubts of the shoemaker Made To Fit will charge them only when we will receive an order. In the unlikely event that no one uses the service, the shoemaker will lose nothing. Made To Fit will only increase the possible revenue.

3. MARKET

Our business is a business to business model, where our customers are established tailored shoemakers. The identikit of the best partner for Made To Fit is a traditional shoemaker who can't afford having showrooms in several cities worldwide.

One of the problems faced by custom shoemakers is that in order to produce a pair of shoes, the client must call into their shop in person to get their foot measured. This limits their market to the people in the locality or people willing to travel. With our solution these clients will no longer need to call into the shop to get their feet measured. This enables the shoemakers to grow their business outside of their locality and internationally if desired.

3.1 SIZE OF THE MARKET

It is difficult to find precise data for tailored shoes because of the nature of the product, but it's possible to look at the generalized category of leather shoes (the most common tailored footwear).

TABLE 1 MARKET REVENUE IN BILLION EUR

Category	2017	2022	CAGR[1]
footwear global	301,0	369,7	4,2%
leather footwear	161,4	187,0	3,0%
luxury footwear	21,9	26,0	3,5%
men formal footwear	6,4	8,7	6,2%
e-Commerce footwear	83,7	135,0	10,0%

[1],[2] CAGR - Compound annual growth rate

The Footwear market realized a total revenue of EUR 301,0 bn in 2017, representing a growth of 4.2% compared to the segment of leather footwear which is accounted for 54% of the worldwide footwear revenues (EUR 161,4 bn) and 37% of volume sales in 2017 (4,0 bn pairs). Regarding the CAGR the market revenues increased by 3.3% from 2010 to 2017. Switzerland (EUR 203 bn) and Norway (EUR 139 bn) have the highest annual revenues per capita of leather footwear. Comparing the Evolution of leather footwear volume sales 2016/2017 Europe remained stable, the US decreased by 4.5% and China increased by 6.5%. Considering the Global men formal shoe market which is more likely the market where our supposed clients are active on, it can be said that according to estimations it will grow at a CAGR of 6.2 from 2016 to 2022, to reach EUR 8.7 bn by 2022.

According to OEC (Observatory of Economic Complexity) in the 2016 [3], Leather Footwear is the 48th most traded product with an export value of $51.9 bn and the 992nd most complex product according to the Product Complexity Index (PCI). The top exporters of Leather Footwear are China (USD 13.1 bn), Italy (USD 7.34 bn), Vietnam (USD 6.09 bn), Indonesia (USD 2.73 bn) and India (USD 2.43 bn). The top importers are the United States (USD 11.6 bn), Germany (USD 4.67 bn), France (USD 3.55 bn), the United Kingdom (USD 3.38 bn) and Italy (USD 2.85 bn).

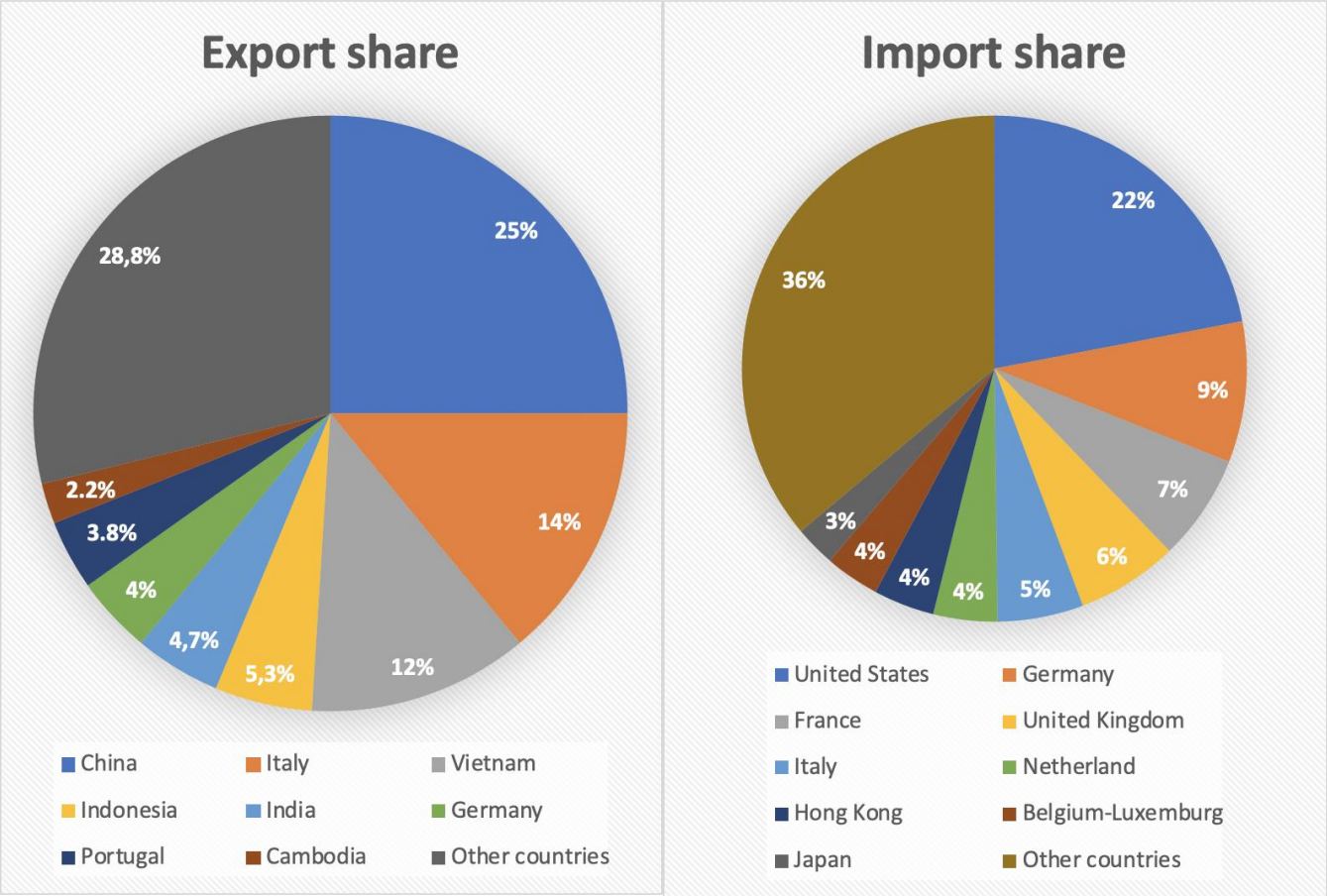

FIGURE 1 COUNTRYS SHARES FROM EXPORT AND IMPORT OF THE LEATHER FOOTWEAR

TABLE 2 DESCRIPTIVE TABLE OF EXPORTED SHOES FROM ITALY TO DIFFERENT DESTINATIONS

Export from Italy				
Country	Share of the total export	Value	Increase value in 5 years	Increase with respect to the actual value
US	15%	1.07B	156M	14.6%
Canada	1.9%	141M	51.1M	36.2%
Hong Kong	6%	438M	187M	42.3%
China	3.5%	259M	83.7M	32.3%
Japan	3.5%	254M	-10.1M	-4%
South Korea	2.6%	188M	86.7M	44.5%
United arab emirates	2%	148M	49.9M	33.8%
France	15%	1.09B	-51.9M	-4.7%
Germany	8.8%	645M	-156M	-24.2%
United Kingdom	7.1%	518M	95.6M	18.5%
Switzerland	5.1%	371M	58.1M	15.6%
Netherlands	2.8%	203M	-66.6M	-32.8%
Spain	2.5%	184M	-27M	-14,7%

From the Figure 1, we see that Italy is the second highest exporter, only after China the most populous country. The first-place country is not so well known for producing a quality product, an important characteristic for a luxury product. The most important Italian shoes importers are France, Germany and United States. Moreover, in the last 5 years we have seen an important trend; the export in European countries is decreasing meanwhile the Asian and U.S. markets is increasing. So, the most difficult countries to reach for local shops are also the hungriest for Italian shoes.

3.2 GROWING AND TRENDS OF THE MARKET

According to a study by Issuu [4], the global footwear market was USD 60 bn in 2016 which is predicted to rise to USD 92 bn by 2024. Numerous other studies show that, online shopping is growing while the traditional brick and mortar shop sales are slowing. IBISworld [5] claims that online shoe sales will grow by 9.2% whereas traditional brink and mortar shoe sales will only grow by 1.2% by 2021. They claim with the reduced number of people using traditional brick and mortar shops some shops will struggle to make a profit and keep their shop open.

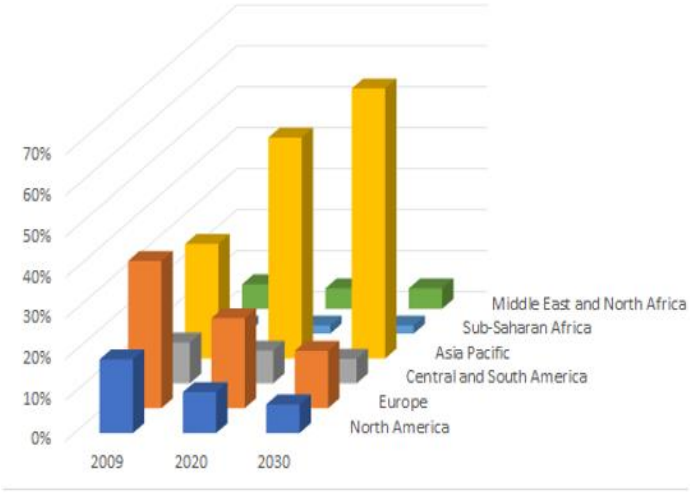

FIGURE 2 DISTRIBUTION OF THE MIDDLE CLASS POPULATION BY REGION

The graph indicates a significant shift in the world's growing middle-class population. Of course, the number of people within the middle class does not directly capture the spending power of this group but economic growth in emerging countries leads also to a consumption and spending power shift. This dynamic evolution has an impact for companies and brands worldwide and should be considered as an opportunity to expand or to preserve a business even for a little Italian shoemaker. Moreover, cultural globalization has an Impact on the fashion industry. In most countries of the world, people who are born in the '90s and especially in the 2000s will have a tendency to naturally think and act globally. These young people feel and act like citizens of the world. Regarding an ongoing movement in Urbanization, consumers live in cities, where fashion and image are key elements in people's lives, consumption will become more style sensitive. An increased demand for western brands can be witnessed all across Asia Pacific providing opportunities for established and new footwear brands. Furthermore, a surge in adoption of online shopping among customers of Asia-Pacific boosted prospects for online sales of footwear in the region. Online presence, online as a sales channel and Online as a marketing tool, becomes more relevant and the world wide web offers worldwide access for small businesses and very specific segments and provides a potential to create a global network of new customers. Additionally, Sustainability becomes more important. The consumer demands information about the supply-chain, wants to be informed about working conditions and is not only interested in style and prices. Besides that, the focus of the footwear consumer community was again redirected towards mission-driven products like eco-footwear and a demand for personalized footwear in recent years. Moreover, a return to timeless classics, like Oxfords and Derbies for men and simple black pumps for women can be seen.

3.2.1 E-COMMERCE

Fashion is the biggest segment in eCommerce with revenues of EUR 408.07 bn in 2017 and the CAGR seems to continue at a high level (11,8%) until 2022. Fashion generates 28% of total eCommerce revenue. China (EUR 182,2 bn), USA (EUR 84,2 bn) and Europe (EUR 83,51 bn) have a share of 85% of the world market. Within this segment, Footwear accounts for 20.5% (EUR 83,7 bn) and its CAGR is expected

to be a little bit lower (10.0%) compared to the one forecasted for Fashion in total. The most remarkable growth will take place in the Asian region.

3.2.2 KEYWORD DATA RESEARCH – MONTHLY KEYWORD SEARCH VOLUME

To get a better feeling about the relevance of personalized and Italian footwear we made Data and Keyword Research – with the help of dragon metrics [6] - in US, China, UK, Germany and South Korea considering the most common search engines in their respective region. Those regions represent big economies and have big Impact on the market and its development.

The Keyword Ranking below shows the monthly search volume for each Keyword and indicates consumer interests in more specific footwear, especially in terms of custom shoes. Regarding bespoke shoes, handmade shoes and Italian shoes are of rather high interest can be seen in western regions taking the countries' population into consideration. These results may show that marketing and reputation of handcrafted and Italian shoes aren't quite relevant in eastern markets. But in conclusion, the monthly search volumes show evidence for interest in customized footwear and visualizes the most potential markets. With an existing service like the one we want to provide and with marketing, the numbers especially in China, should increase.

3.3 BEING COMPETITIVE IN THE MARKET

Our business will capitalize on the strong trends of the market. With the increase in online shopping, the traditional method of shoemaking risks to lose importance. The shoemakers will need to innovate or fail. A strong point of our start-up will be to be born in Italy, something that is often considered a disadvantage but for us, there isn't a better place to start. The made in Italy shoes are famous globally and the country is according to data; the second highest exporter. Another important fact is how the production of footwear, especially in Italy, is increasing the focus on far away markets, like the US and the Asian countries. But for the small shoemaker capable of high quality and a desirable product is difficult to follow this trend. Only our technology can fill the gap between this new clients and shoemakers.

TABLE 3 KEYWORD RANKING

Keyword	Translation	Search Engine	Search Volume	Region
custom shoes		Google us-EN	60.500	United States
custom-made shoes		Google us-EN	5.400	United States
italian shoes		Google us-EN	5.400	United States
italienische schuhe	italian shoes	Google de-DE	4.400	Germany
custom shoes		Google uk-EN	3.600	United Kingdom
手工鞋	handmade shoes	Baidu cn-ZH-CN	2.340	China
handmade shoes		Google us-EN	1.900	United States
bespoke shoes		Google us-EN	1.600	United States
handmade shoes		Google uk-EN	1.600	United Kingdom
custom shoes		Bing us-EN-US	731	United States
bespoke shoes		Google uk-EN	590	United Kingdom
handgemachte schuhe	handmade shoes	Google de-DE	590	Germany
tailored shoes		Google us-EN	590	United States
定制鞋	bespoke shoes (mandarin)	Baidu cn-ZH-CN	510	China
custom-made shoes		Google uk-EN	480	United Kingdom
handgefertigte schuhe	handmade shoes	Google de-DE	390	Germany
意大利鞋	italian shoes (mandarin)	Baidu cn-ZH-CN	180	China
handcrafted shoes		Google us-EN	170	United States
maßgeschneiderte schuhe	bespoke shoes	Google de-DE	170	Germany
italian shoes		Bing us-EN-US	119	United States
custom shoes		Naver kr-KO-KR	110	Korea
맞춤 신발	bespoke shoes (korean)	Naver kr-KO-KR	70	Korea

4. THE INDUSTRY

4.1 STRUCTURE OF THE INDUSTRY

The structure of the industry is relatively unchanged from when it started. A shoemaker will have his shop where he makes the shoes. The clients will call into the shop to have their feet measured by the shoemaker in order to make a custom pair of shoes for them. According to the shoemakers in contact with us, for customers abroad, the process is a bit different. They wait until a certain number of customers are accumulated in a certain country and then they travel to the place, trying to measure all the possible clients' feet. This method is very demanding for the shoemaker and increases time and cost for the footwear.

4.2 HOW THE INDUSTRY WORKS

From the explanation by the shoemakers and our research [7] the current process for making a custom shoe is:

1) Customer goes to the shoemaker's workshop or the shoemaker travels to the customer.
2) The customers' feet are measured. Based on these measurements, the shoe lasts are made. This is usually done by carving out a block of wood or by outsourcing to a company. In the latter case, the price varies between EUR 100 to EUR 200 for a pair of lasts.
3) A pattern is traced on a paper placed on the wooden last.
4) The leather for the shoe is cut out based on these traced patterns.
5) The last, patterns and cut leather are given to the closer, a craftsman who puts the shoe together.
6) A prototype shoe is made and the customer returns to the shop for a fitting.
7) Any errors from the fitting of the prototype shoe are corrected by updating the shoe last.
8) Making of the final shoe is started using the updated shoe last.
9) When the upper part of the shoe is made it goes back to the last maker to add the toe and heel.
10) Shoe then goes to be finished where it is smoothened and polished.

4.3 KEY PLAYERS IN THE INDUSTRY

At the moment, there are no other services like ours. Some shoemakers allow the customers to measure their feet and enter the measurements on their website for them to make a shoe. But this method is open to errors as the customer may not take the necessary measurements accurately.

Other companies offer an app-based service where the user takes a picture of their foot and it recommends shoes for them based on their foot length only. Some of these companies also offer custom-made shoes, but these are not custom-made by skilled shoemakers, so they lack the quality and the accuracy because usually they only work off the length and width measurements of the foot. Besides that, the need for building a pair of lasts still exists.

4.4 COMPETITOR COMPARISON

4.4.1 APP BASED COMPETITORS

Company	Feet it	Right shoes	True Gault
How does it work	• The user downloads the app • Steps on the a piece of A4 paper and takes a picture of the top and side of their foot	• User downloads the app and needs to purchase a special mat and socks (€40). While wearing the socks, the user steps on the mat the takes a picture or a video of their feet	• The user downloads the app • Steps on the a piece of A4 paper and 3 pictures of their foot
What results do they give	• Gives you a foot I.D • Recommends shoes based on your foot size • Can make custom shoes (not by Italian shoe makers), but it is not accurate (±0.5 foot size) and is an iterative process	• If user take a picture measurements of their foot are outputted (length and width) • If user takes a video, a 3D model of their foot is generated	• Generates a model of the users feet to allow for custom shoes to be made
Advantages	• Easy to use • Minimal extra equipment needed	• Relatively easy to use	• Easy to use • Minimal extra equipment needed
Disadvantages	• Not very accurate (±0.5 foot size) • Doesn't give a good fitting custom shoe	• Need to purchase extra equipment. • Doesn't partner with any shoe makers for custom shoes • Only available for iOS	• Only for women for high heels • Only available for iOS

[8],[9],[10]

4.4.2 SHOEMAKER'S WEBSITE BASED

Company	itailorshoes	Awl & Sundry
How does it work	• Website based, relays on the user to measure the length and width of their own foot and input the measurements	• Asks the user to measure and input 6 different measurements of each foot
What results do they give	• Results are only the measurements taken by the user	• Results are only the measurements taken by the user
Advantages	• Allows user to customize their shoe in detail	• Can be done at home, don't need to call in store
Disadvantages	• It is not really a true custom shoe as only two measurements is not enough	• If user is not experienced in taking measurements, it may lead to incorrect shoes being made

[11],[12]

4.4.3 FAILED BUSINESSES

Company	MADE	Barron & Co.
How does it work	• User downloads the app the needs to purchase special socks. While wearing the socks, another person needs to take several images of the persons feet	• User inputs shoe size and selects the design they like from the website of Barron & Co
What results do they give	• The app generates a 3D model of the user's foot	• No results
Advantages	• Can be done at home • User can customise their shoe with different shapes and materials • Fast turnaround time, usually 8 weeks	• Aims to make handmade shoes available at a more affordable cost • Uses Italian leather
Disadvantages	• Shoes are made in China	• Shoes are not custom made
Funding raised from crowd funding	• $37311 • Goal $30000	• €7619 • Goal €12662
Reason for failure	•Some the reasons for failure that MADE highlighted are: • Lack of human, financial manufacturing capital • Sizing algorithm had some bugs leading to the 18% mis-sizing • Underestimating costs • High amounts of rework due to mis-sizing defects from the algorithm	•Did not reach the required funding from crowd funding campaign

[13],[14]

4.5 CLOSE COMPETITORS

4.5.1 LEARNING FROM FAILED BUSINESSES

One of the competitors with the closest idea to ours was MADE [13]. It was funded-on Kickstarter and received USD 37 311 from a goal of USD 30 000. But MADE failed despite reaching the necessary funding. While their business was similar to ours in using the camera on your phone to take a series of pictures or a video to be used to create a shoe last for your feet, their shoes were made in China and lacked the authentic Italian hand-crafted shoes attraction. The founder highlighted some of the reasons for failure was the lack of human, financial and manufacturing capital. Made To Fit over comes each of these potential issues. Firstly, human capital, our business does not need a lot of human capital to operate. Once the algorithm is made the majority of the process can be automated. The human capital needed to make the shoes are already established shoemakers. Secondly, financial capital, as highlighted in Section 8, financial capital needed to get Made To Fit started is very small and presents a very low risk of being a potential issue for us. Thirdly, manufacturing capital, MADE had this issue because they are making the shoes in one factory in China, where Made To Fit is a business to business model and manufacturing capital lies with already established shoe makers. While we will need to be able to print and provide the shoe lasts to the shoe makers 3D printers are relatively low cost and we can quickly ramp up our production by purchasing more printers or out sourcing some of the printing to many printing service companies, minimising the potential of lack of manufacturing capital.

MADE also highlighted issue in mis-sizing shoes from their algorithm as a contributing reason for their failure. In Section 7 we discuss the roadmap to launch Made To Fit, we have given 6 months to the development and testing of our algorithm.

4.5.2 HOW ARE WE DIFFERENT

By providing our service to shoemakers offers their customers the possibility to order a pair of shoes from them from any location in the world. We provide a precise 3D print of a perfect shaped last for the manufacturing process to save time and money. We differ from other businesses that tired a similar idea by partnering with real Italian shoemakers with years of experience of making shoes. Therefore, our shoes are truly made in Italy.

4.6 MAKING IT DIFFICULT FOR OTHERS TO COPY US

We will be first to market with using the technology in this way. We will quickly build relationships with shoemakers in the Emilia-Romagna and supply them with our service during the early months of our launch. We will then expand a wider area over Italy in the first and second years of trading and moving internationally after that. This fast growth and expansion will make it very difficult for another company to develop a similar algorithm and printing process in time to compete with us. Moreover, we have a big margin in pricing which allows us to decrease the price tag in order to keep the competitors away from our clients.

5. SERVICE OFFERING

Hand-crafted Italian leather shoes are famous worldwide for their style, elegance, comfort, superior materials, and the old traditional handcraft methods used in making the shoes. While being globally recognizable it does not mean that they are globally accessible. To acquire a pair of hand-crafted shoes requires the shoemaker to take measurements of your feet. To do this you need to visit the shoemaker's shop or have the shoemaker visit you to measure your feet. This requirement means that custom-made shoes may not be available to anyone who wants to purchase a pair. This is where Made To Fit can make custom made shoes available to anyone, anywhere on the global with an internet connection.

Our service will open up the international markets and eliminate the need for the shoemaker to make measurements of their customer's feet. It ensures no errors are made in the construction of the shoe last. We will build an app to consolidate all the shoemakers using our service into one place, allowing for potential customers to browse through the different shoemakers and select their favourite one, further growing the shoemakers' potential clients.

Step 1	Customer orders a pair of shoes from their preferred shoe maker's website and uploads a video of their feet
Step 2	We take the video, run our algorithm and generate a unique shoe last for that customer
Step 3	We print the shoe last
Step 4	We send the shoe last to the selected shoe maker
Step 5	Shoe maker, using the printed shoe last makes the custom pair of shoes
Step 6	Shoe maker sends the shoes to their new customer
Step 7	Customer receives their new hand crafted custom pair of shoes.
Step 8	Happy Customer!

FIGURE 3 SERVICE OFFRING STEP BY STEP

5.1 BRIEF OVERVIEW OF THE TECHNOLOGY

Our service will allow people to take a video of their feet and allow it to be used to generate a unique shoe last for each foot. To achieve this, we will first have to build a video processing program where the output will be a series of points in a 3D space. We will need a reference in the video for accurate measurements, so we will be asking users to stand on a A4 sheet of paper while taking the video. We will then use the known measurements of the sheet of paper to extract and build a matrix of 3D points which will plot the outer surface of the foot. This matrix will then be the input to the CAD program.

The program will have a reference model of a shoe last which it will scale based on the input points of the foot. The shoe last will be modeled based on a number of points in 3D space connected by surfaces in CAD. These 3D points that the shoe last is built on will be adjusted to the new inputted points from the scanned foot and a unique shoe last for these inputted points will be created. The CAD software will then output a .slt file of the unique shoe last for printing.

6. BUSINESS MODEL

First, we offer a business to business service, where we will use the shoemaker's website to make our service available to their customers. When the customer decides to purchase a pair of shoes from their chosen shoemaker, they will upload a video of their feet to the shoemaker's website and we take it from there.

When we have partnered with enough shoe makers, we will build and launch an app where users can search all the shoe makers using our service and order a pair of shoes from the app. Using the app, the user will take a video of their feet and we will use that video to run our algorithm and generate a unique shoe last for the user and sent the last to the chosen shoemaker. The chosen shoemaker will be notified once the user has selected them. This app will change our business from business to business to consumer. However, we will continue to offer the service on the shoemakers' websites.

For Made To Fit to deliver this service, our costs are very low. We have enough expertise within the team to develop and test all the software needed to create this platform. The biggest portion of the capital investment will be used for purchasing the printers and raw material.

7. OPERATIONAL ROADMAP

7.1 STARTING UP

There are two paths that will run in parallel to get us to the stage of being able to offer our service to shoemakers. The first path is the software path, this is where we develop the algorithms needed to allow us to carry out the scanning of the feet and convert the scan into a 3D model. From this 3D model we will generate a unique shoe last that will be 3D printed.

The second path is the selling our service path, where we will reach out to and sell our service to and partner with as many shoe makers as possible.

7.1.1 SOFTWARE PATH, STEPS:

1) Develop the algorithm that will take in the video of a foot and convert it to a 3D model via photogrammetry and point clouds
2) Develop a CAD software procedure to repair any issues with the created 3D model of the foot
3) Develop a CAD algorithm to create a unique shoe last of the foot
4) Using the CAD software export the 3D file of the last for printing

7.1.2 SELLING OUR SERVICE PATH, STEPS:

1) Contact all the shoemakers in Bologna and pitch our idea to them, trying to secure and partner with as many as possible. While also listening to any suggestions of improvement they might have
2) When all shoemakers in Bologna have been contacted, we will continue to sell our service to shoe makers in Emilia-Romagna
3) We will offer our service to shoemakers around Italy and eventually internationally

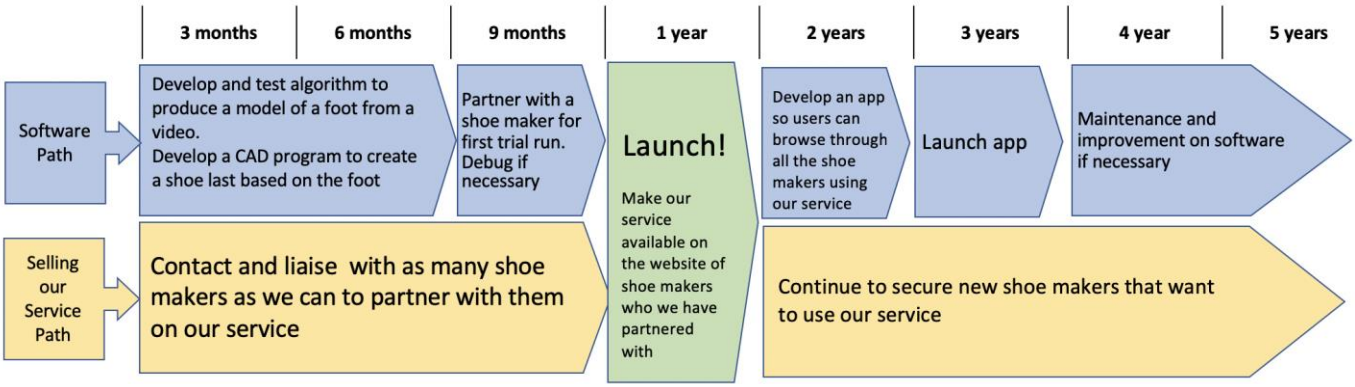

FIGURE 4 DECRIPTIVE FIGURE OF THE OPERATIONAL ROADMAP

7.1.3 MILESTONES

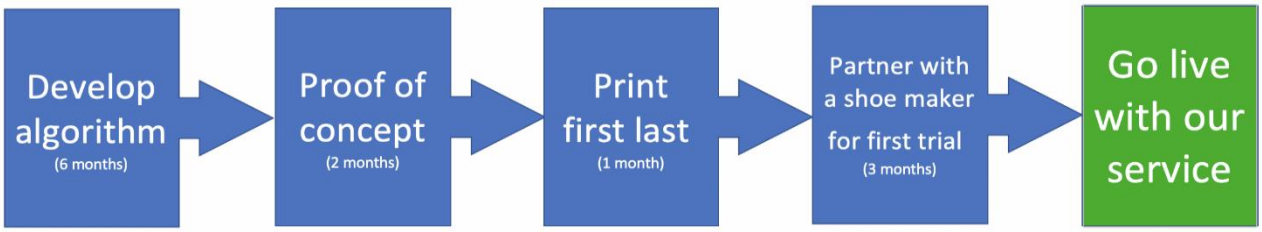

FIGURE 5 DESCRIPTIVE FIGURE OF THE UPCOMING MILESTONES

7.2 GENERATING REVENUE

We estimate six months is needed for the development and testing of our algorithm. While we are doing this, we continue to contact and work with shoemakers in Bologna that have shown interest in our service. Once we have finalised our algorithm, we will need one to two weeks to work with the shoemaker to make it available on their website. Once we have launched it on the shoemaker's website, we will continue to find new shoemakers to partner with.

7.3 DAY TO DAY OPERATIONS

The customer of the shoemaker either travel to the shoemaker to get their feet measured or they will use our service to avoid the need to travel to the shoemaker. In the first case, we don't do anything. In the second case, the customer uploads a video of his feet to the shoemaker's website. We take this video and run our algorithm to generate a 3D model of the customer's foot. With the model we will create a unique shoe last for making of the custom-shoes. We will 3D print the shoe last and deliver it to the shoemaker to allow them to begin working on making the new pair of custom-made shoes for their new customer.

8. FINANCING

8.1 ASSUMPTIONS

- We estimate the printer runs for 6 hours to make a pair of lasts. Accordingly, both energy and material consumption have been calculated. It is considered that we spend EUR 20 of material per pair of lasts.
- We add also the rent as a fixed cost. Additionally, in the best case scenario, it is increasing in the years. This happens because we need more space for the new printers.
- For maintenance we consider to spend each year 25% of the initial cost for every printer.
- We spend EUR 5 on average to send each pair of lasts to the clients.

8.2 TIMING OF EVENTS AND INVESTMENTS

Based on the BEP analysis table, the cost per unit is estimated EUR 25.6. Since already we have no credit in the market, we may buy raw materials in cash. The electricity cost will be incurred every month starting from receiving the first order. Also, to make our service for shoemakers more desirable, we can offer them to pay their bill every month.

EUR 2000 cash will be invested by each team member. As tangible property we only have the printer which costs EUR 400 for each printer. As intangible assets, we need EUR 500 for developing the platform.

We can postpone purchasing of the printer for four weeks before starting the business (start to book the sales) considering the time needed for assemble the printers and test it. The useful lifetime of desktop 3D printers seems quite long, perhaps even ten years. However, it likely will require considerable tuning and repair skills to keep up with newer models.

8.3 FINANCIAL RETURNS/ANALYSIS

i) Break even point (BEP) analysis:

To do the analysis, the followings may be considered:

-We assume to sell 3 pair of shoes per client per month.

-We suppose to buy a new printer each year based on the progress and necessity.

TABLE 4 ESTIMATED COSTS AND ASUUMPTIONS IN 5 YEAR PERIOD

COSTS					
3D PRINTERS	400	400	1200	1200	800
DELIVERY OF SHOE LAST	2160	5760	11520	23040	46080
ENERGY CONSUMPTION	259/2	691/2	1382/4	2764/8	5529/6
MATERIAL	8640	23040	46080	92160	184320
MAINTENANCE	100	300	800	1600	2600
RENT PER YEAR	4000	4000	12000	12000	18000
ASSUMPTIONS					
NUMBER OF PRINTERS	1	2	5	8	10
SHOES SOLD PER MONTH	36	96	192	384	768
PRICE OF A PAIR OF SHOES	150	150	150	150	150
NUMBER OF CLIENTS	12	24	48	96	192

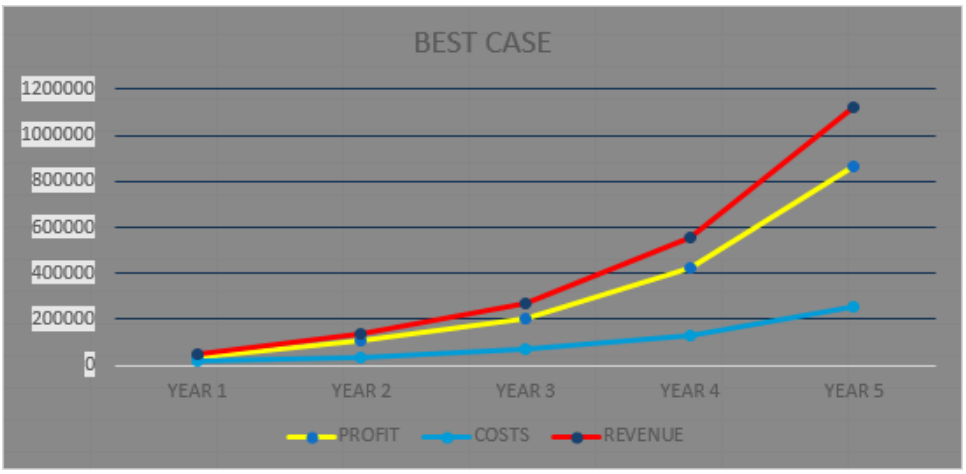

FIGURE 6 EXPECTED REVENUE, COSTS, AND PROFIT IN A 5 YEAR PERIOD

8.4 SENSITIVITY ANALYSIS

Fortunately, the production procedure is not very complicated. Hence, no risk is seen about the sales price feasibility. Therefore, sales volume is not a risky matter for the business too. Also, with the incredible trends of 3D printing [15], in any level, if the business is faced with lack of orders, we can offer printing services to other businesses or even sell the raw material with the retail price to compensate the temporary recessions.

According to the upward trend of the 3D printing industry [16] and enlarging the number of contributing players in the industry, it is very unlikely to have an increment in raw material price. The only remaining scenario which may seem important is what if our hardware get out of service? The quick solution is outsourcing the printings to a local printer to help us to meet our commitments. Buying new printers will be the main solution which is not a very costly solution regarding the price tag of the 3D printers and their trend.

In the worst case scenarios very pessimistic assumptions are considered and the trend of the revenue is presented for the future five years. The main source of possible deviation for the revenue comes

from the number of clients. Here four clients are considered in the first year with the possibility of doubling this number each year. Furthermore, we suppose here to sell just one pair of shoes per client each month.

TABLE 5 ESTIMATED COSTS AND ASUUMPTIONS IN 5 YEAR PERIOD IN THE WORST CASE

COSTS					
3D PRINTERS	400	0	400	400	400
DELIVERY OF SHOE LAST	420	840	1680	3360	6720
ENERGY CONSUMPTION	50/4	100/8	201/6	403/2	806/4
MATERIAL	1680	3360	6720	13440	26880
MAINTENANCE	100	200	400	700	1100
RENT PER YEAR	4000	4000	4000	4000	4000
ASSUMPTIONS					
NUMBER OF PRINTERS	1	1	2	3	4
SHOES SOLD PER MONTH	7	14	28	56	112
PRICE OF A PAIR OF SHOES	150	150	150	150	150
NUMBER OF CLIENTS	7	14	28	56	112

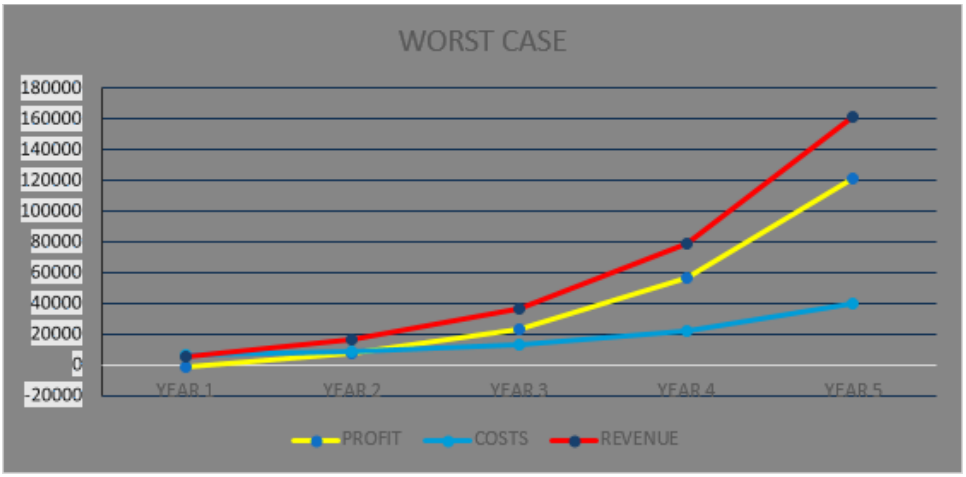

FIGURE 7 EXPECTED REVENUE, COSTS, AND PROFIT IN A 5 YEAR PERIOD

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