

Dossier

Team Bohr



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1. Introduction

Team Bohr's challenge deals with professional, practical, social and personal issues associated to international experiences in the scope of labour mobility. It arises from Italian Ministry of Labour and iConsulting (Italian company engaged in solving complex problems with good data and right technologies).

Initially, the challenge was stated as: "How might we increase labour mobility within EU by supporting the workers with useful and actionable information, drawn from big data?"

In order to understand reach and implications of this challenge, research was performed on current situation of the topic, associated needs of the possible users and existing solutions. Conclusions of this research are presented in the present report.

Moreover, research lead to redefinition of proposed challenge, obtaining the following formulation: "How might we increase labour mobility within EU by supporting workers with relevant information?"

This redefinition aims to highlight that information must be personalized for every individual, so as to make sure that their particular needs are covered; and that it is not exclusively obtained from big data, but also from personal and direct experience transfer.

Several stages of ideation and prototyping were performed, which are reviewed in this report; and convergence towards business idea and final prototype implementation are explained in detail.

In addition, contribution of external experts on the definition of final solution, including role of CERN experts, is stated. Finally, limitations of present solution are considered and lines of further development are analysed.

1.1 Acknowledgements

Andrew Branson (CRISTAL CERN)

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2. Team Bohr

Niels Bohr (1885-1962) won a Nobel Prize in Physics in 1922 for his work on atomic structure and quantum theory, and he was involved with the establishment of CERN. In addition, during the 1930s, he helped scientist refugees from Nazism to find a place where they could develop their activities and live in freedom.



We consider that this human side of helping people to start a new life abroad goes hand in hand with our challenge definition, so we named our team after this scientist to honour his role in the process.

Team Bohr integrates business, communication, design and engineering skills in an international environment. Skills are represented by our members.



Dossier_Team Bohr_2. Team Bohr



*"I have no special talents,
I'm passionately curious"*

Alfredo Adinolfi

Master degree in Industrial Engineer - UNIMORE (Italy)

He has contributed to trend research, benchmarking and need finding sections, as well as to the definition of user journey when entering our prototype stand. He has also interviewed advisors from iConsulting and Italian ministry.



"I am a curious person"

Núria Egidós

Master of Science of Electronics Engineering - UPC (Barcelona)

She has played the role of group organizer and algorithm developer simultaneously. Her contribution also includes definition of business idea, interviews to cover technical issues and business feasibility.

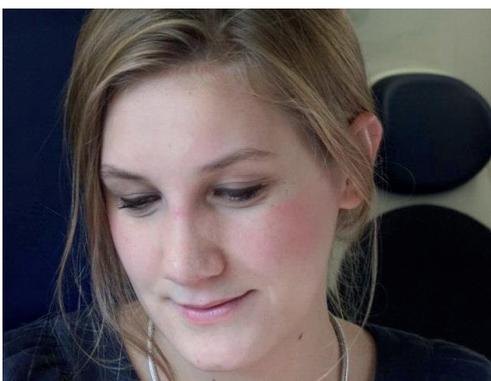


*"I'm trying living
and not surviving"*

Matteo Guarnaccia

Product Design - IED (Barcelona)

He has defined group identity with his designs for presentations, videos and corporate image. He has also contributed to idea definition and feasibility studies, as well as to the implementation of prototype stand.



"I would like to explore the world"

Nicoletta Marangoni

Master Degree in Product Service System Design - Politecnico di Milano, UNIMORE (Italy)

Her tasks on design include posters, videos, document layout and user interface. In addition, she has also contributed to ideation and prototyping, as well as to definition of the final idea.



Daniel Pinilla

Full Time MBA - ESADE Business School (Barcelona)

He has led the team, especially in the final, conclusive stages. His contributions on financial and business idea sections have been decisive, and he has also interviewed several users during the need finding stage.

"Status quo: a trap I want to avoid by challenging myself and taking risks every day"

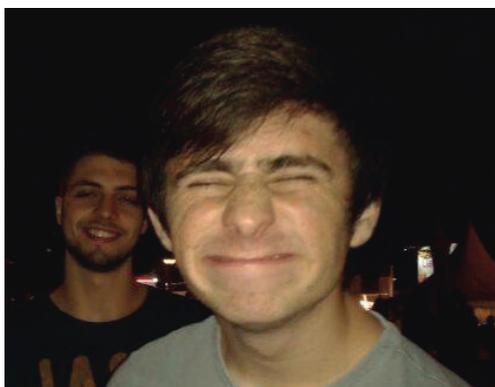


Nicola Puliafico

Master degree in Management and Business Communication - UNIMORE (Italy)

His main tasks involve trend research, benchmarking and need finding, as well as the implementation of the prototype stand. He has also interviewed advisors from iConsulting and the Italian ministry.

"Life without challenges becomes a routine"



Alejandro Woodward

Degree of Telecommunications - UPC (Barcelona)

As an engineer, he has implemented the technological back-end of the prototype, and he has also taken part in the definition of the business idea and interviews during the need finding stage. His contribution towards idea convergence and prototype design has been decisive.

"Don't worry, be happy"



Fabrizio Zucchini

Communication & Economics - UNIMORE (Italy)

He has contributed to trend research in the early stages of the project, as well as to discussions on idea definition and convergence.

"No way to find, some ways to research"

3. Research findings

1. Trend Research outcome

1.1 EU labour context

“Labour mobility is considered the key to increase Europe’s competitiveness growth and employment”.

Starting from this assumption the trend research has confirmed that the European labour market is still not unified.

The data that emerges incontrovertibly is that in the EU where the workforce is 242 millions there is a vacancy rate of 4.1 millions. On the other hand while there are a several number of EU citizens who want to work abroad, only 2.5% are currently living in another EU member state.

The five EU Member States countries with the largest numbers of working-age movers were Germany (2.6 million), the UK (1.9 million), Spain (1.4 million), Italy (1.3 million) and Switzerland (934,000).

Movers have a higher employment rate than nationals in most EU Member States countries. However movers are significantly over-represented in elementary occupations. Among recent active EU movers, highly educated people were slightly more likely to move (2.3% have moved) than the total active population of working age (1.9%). This is true for most EU Member States and the positive difference is particularly high for Austrian and Italian (highly educated were around three times as likely to move as the average) active movers. On the contrary, in some Eastern European countries persons with lower educational levels seem to be more likely to move than highly educated persons.

1.2 Small and Medium Enterprises

One of the reasons that appear to be the cause of this imbalance is represented by the peculiarity of the European market, made up for 99,8% of SMEs. Small and Medium Enterprises in EU are 22.4 million, employ 90 million people, 67% of total employment and generate more than 3.7 trillion in value added.

Micro SMEs accounted for 29,2% of total employment, and small and medium-sized SMEs for 20,4 % and 17,3% respectively.

According to the assertions of the SME’s annual report 2014/15 of Eurostat this data looks set to rise in number in the near future. Medium-sized SMEs are forecast to do slightly better than small and micro enterprises in 2016.

The structure and size of the SME does not allow these to be able to easily reach workers throughout Europe, this just has to be considered one of the causes of the high Vacancy rate (4,1m) in the EU.

1.3 Job Portals statistics

Also the channels used by companies and workers reflect an information asymmetry.

On the one hand there are the workers who are actively seeking work on the main Job portals, just think that 150m workers have a CV online, and platforms such as LinkedIn, infojobs, Clicklavoro is used by hundreds of thousands users every month.

On the other hand there are the companies that are still reluctant, for problems related to the lack of knowledge and lack of trust of the medium, to rely on job portals to publish their vacancies, 66% of the european companies don’t post their job offers in internet.

2. Identified Needs and Personas

Starting from the re-definition of our challenge we have come to identify two possible user of our service and their related needs.

2.1 Personas

We have identified the following personas:

- Recruiter



“I want to bring different approaches for problem solving and innovation in my company. It is enriching from a personal and professional point of view”

Maria Montes De Oca

Maria is a recruiter who works for account of a medium company always looking for new workers carriers of know-how and new ideas from abroad.

The recruiter needs a system that allows him to reach as efficiently and effectively as possible the workers it needs and that perfectly fits company’s needs, minimizing the possibility of failure in the selection process.

She also needs to meet the needs of workers and to support them during their relocation and their integration in the new contry, even if the company doesn’t have a special office or staff dedicated to this.

- Potential worker



"I want to open my mind, have different perspective and improve my profile"

Carolina Peri

Carolina is an Italian engineer, she is looking for new growth opportunities to improve her profile and CV.

She needs to find a job that interests and incentivizes her in a company that is safe and reliable. Equally important to her are the needs that will arise once hired. Carolina will need support during integration into the new reality both in company life and in country and community life.

3. Benchmarking

3.1 Research methods

The analysis was carried out using traditional research methods supplement with a field research. Several interviews have been made with recruiters, workers and other potential interested users, identifying those already users of similar services. The interviews have allowed us to identify and learn more about existing solutions that respond to the needs identified above.

3.2 Existing solutions

Existing solutions identified can be divided into two main categories:

- *Solutions for Recruiters:*

It revealed that although there are solutions that allow Human Resources to publish and disseminate broadly new job positions open, hardly these services have an European dimension.

At the same time it appears that existing solutions are limited to make the match between company and worker, without offering any additional support to companies that want to hire a worker from abroad.

- **LinkedIn:** Business oriented social network, mainly used for professional networking.
- **BroadBean:** Platform help recruiters to reach candidates in a fast, effective and efficient way, spreading job offers to multiple online job portals.
- **Infojobs:** Job portal allow companies to post job offers.
- **Eures:** The European Job mobility portal, allow people and companies to find the best opportunity in EU.
- **Glassdoors:** Job search engine and review sites, allowing people to review their company

- *Solutions for Workers:*

From the point of view of the workers it showed that despite the existence of numerous job portals dedicated to job search and numerous social network dedicated to creating a community in the new country, feels the lack of a structured and reliable service that support the workers during all the hard phases of moving.

- **LinkedIn:** Business oriented social network, mainly used for professional networking.
- **Jobyourlife:** web-recruiting platform that use cv geo-localitation to allow people to find the ideal job where they desire.
- **ShareEurope:** Comunity were it's possible to find experiences of other expats.
- **Expats Blog:** Blog that allow people to get info from people already had "moving" problems.
- **Meetup:** Network that make easy to everyone to organize local group in order to spend time with other expats.
- **InterNations:** Network for expats to exchange bureaucracy tips.

4. Development

Name	Explanation	Stages reached	Selected/Discarded Why
FriendHub 	<p>A platform to put in touch people who:</p> <ul style="list-style-type: none"> - move to the same country - want to know about culture in the destination country - come from the same country (start community from home country and share whole experience) - come from different countries (create a community already in the destination country) - can share common interests, dates of moving... (several filters to select search criteria) 	<p>Projected</p> <p>Prototyped</p> <p>Tested</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - People feeling the need to talk/interact with people before be engaged in a group. - Difficult to define the metrics to find similarities among the users - Groups are too strict, maybe a group could be guided by more drivers
MoveOut 	<ul style="list-style-type: none"> - An application to help people that have the possibility to move to another country but haven't got enough motivation. <p>The way of doing this is by:</p> <ul style="list-style-type: none"> - Searching for a country and a city or getting inspired by the application looking in a random way new cities. - Showing chart, information, pictures, and videos so the user can learn easily about the place he/she wants. - Giving tips, informations, to do list and comparing the different country. 	<p>Projected</p> <p>Prototyped</p> <p>Tested</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - The app isn't enough empathic
AroundYou 	<ul style="list-style-type: none"> - Overview of how would be settled your daily life - Provide the user with useful information on practicalities and facilities <p>Integrate information about housing, facilities (schools, offices, banks, hospital,..) and transportation between them.</p> <p>Benchmarking of different lifestyle in the different country</p>	<p>Projected</p> <p>Prototyped</p> <p>Tested</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - Too many steps, they can be compressed - The user can select what he's interest to check without specifying how many kids he has - The visualization of the facilities should be before the selection of the accommodation

Name	Explanation	Stages reached	Selected/Discarded Why
<p>Swap YourLife</p> 	<p>Provide the user an experience for going in another country swapping work and daily life</p> <ul style="list-style-type: none"> - We can guarantee: <ul style="list-style-type: none"> Professional opportunities Social contacts Accommodation Generic facilities 	<p>Projected</p> <p>Prototyped</p> <p>Tested</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - Hard for someone who wants to swap, to leave his private things to someone else (pets, car, friends...)
<p>Workinder</p> 	<ul style="list-style-type: none"> - App in which both employers and potential employees can interact and look for a “match” putting together the interests of the person and the requirements of the employer. - Aims to generate motivation of people to live abroad for a short period of time and experience what it is like - Focused on short term opportunities (1-6 months) - Focused more on hobbies and activities that aren't necessarily part of the professional background of the person - Source of motivated labor force for specific tasks on small companies/businesses <ul style="list-style-type: none"> - internships, vs youth unemployment - Motivation should make people more open to go abroad again! - in the line of erasmus, but accessible for all people, even if they're not at university - users: companies posting the jobs, final user, government 	<p>Projected</p> <p>Prototyped</p> <p>Tested</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - Reliability of information - More detailed info about job offerings and profile of people - People has mind paradigms about only searching what they like, and not opening to new unknown experience
<p>TalentHub</p> 	<p>Optimal matching of highly qualified workers and open positions in Europe using big data and existing online platforms, thus encouraging labour mobility and talent exchange from the hand of partners with a consolidated presence</p>	<p>Projected</p> <p>Prototyped</p> <p>Tested</p> <p>Business Model</p>	<p><i>Discarded</i></p> <ul style="list-style-type: none"> - Identify filters to calculate mobility potential: based on former experiences of potential workers abroad, personal preferences, family, online activities, etc., we obtain a ponderation regarding how much is this person willing to go abroad, and apply this as a filter in our crawling- guarantee success of selection both in technical and personal aspects - How to attract our customers - Which filters to apply when crawling information, so that they are relevant for selection, but don't lead to unresolvable systems?

Name	Explanation	Stages reached	Selected/Discarded Why
<p>GlobHub</p> 	<p>App to create the best matching between the recruiters' needs, and the workers' needs.</p> <p>For the recruiter's side:</p> <ul style="list-style-type: none"> - efficient recruitment system - reach international profiles - Increase success rate <p>For the worker's side:</p> <ul style="list-style-type: none"> - Practicalities and bureaucracy support - Join a community - Receive more information - smooth integration into the culture 	<p>Projected</p> <p>Prototyped</p> <p>Tested</p> <p>Business Model</p> <p>Financial Plan</p> <p>Presentation to the investors</p>	<p><i>Selected</i></p>

5. Project proposal

Performed research has shown that there are 22.4M SMEs (50 to 250 employees) in UE willing to grow with the incorporation of international talent [1]: hiring workers from abroad comes hand in hand with knowledge, new perspectives and creativity; and it supposes a wider pool of profiles to find the exact skills they require.

At the same time, they need an efficient recruitment both in terms of time and budget, for cost of selection process is limiting for SMEs. And their investment must be protected: once they hire a candidate coming from abroad, there must be a guarantee that he/she will perform satisfactorily in the firm and will integrate into the new country, thus willing to stay in the firm instead of going back to the home country.

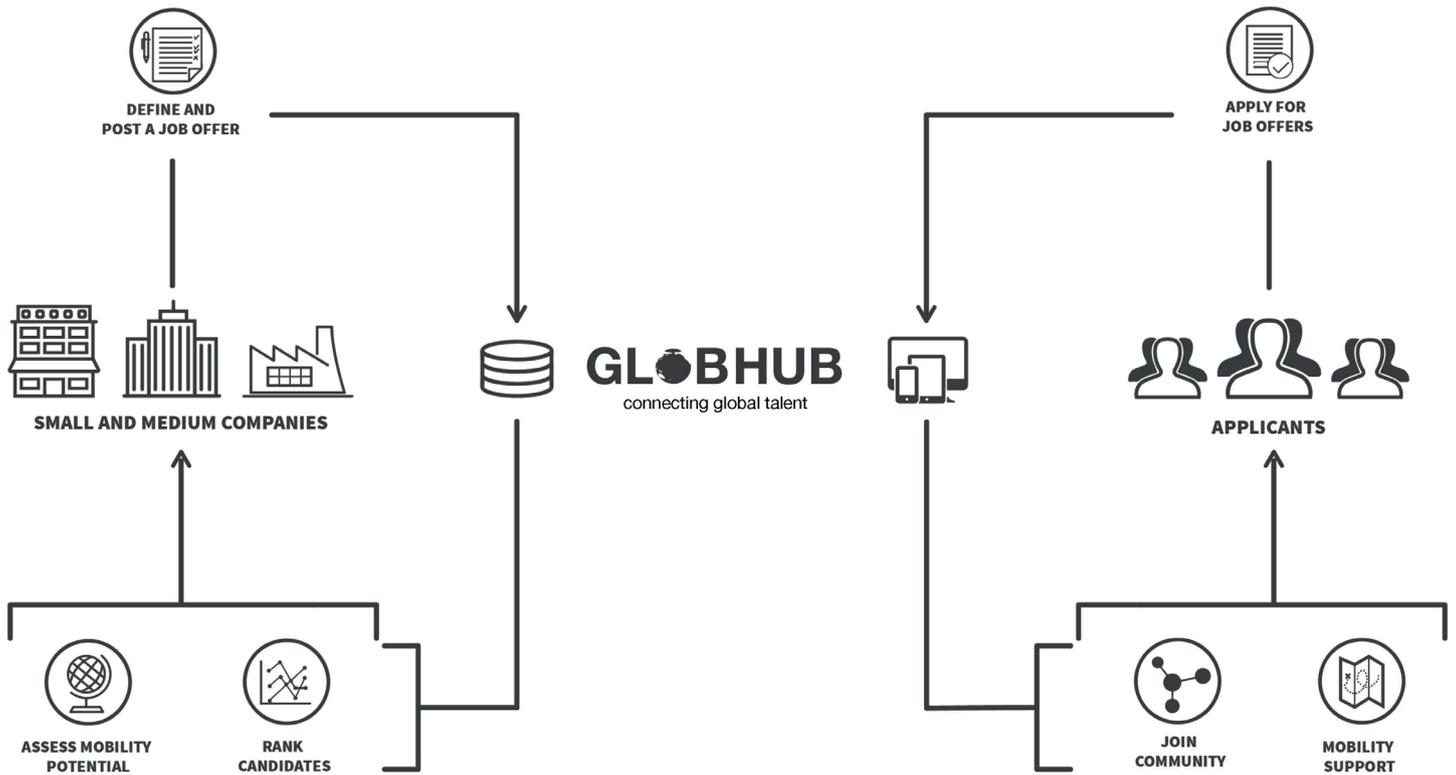
In parallel, there is a significant labour force looking for a job (242.3M seekers [3]), and more than half of them (150M seekers [2]) leverage on online platforms to spread their profile and increase their possibilities.

In addition to finding a job, they pursue professional growth by means of an internationalization of their profile. This will eventually imply moving to a new country, so they will also need relevant information about accommodation, healthcare, bureaucracy and other practicalities, and most important: the reassurance and support of equals when moving abroad.



It is clear that there is a point where both sides come together to fulfil their mutual needs, and this is the main goal of our solution: GlobHub is an online platform which aims to connect international talent with seekers of those profiles.

GLOB HUB
CONNECTING GLOBAL TALENT



From the recruiters' perspective, they can reach international talent and find best profile for their needs. We provide them with a ranking of candidates considering profile suitability and mobility potential, to make sure that workers coming from abroad will adapt to the country. Ranking is performed automatically, which shortens the process and improves recruitment efficiency.

From the candidate point of view, they can receive offers from all over Europe, which opens the door towards an international career and professional growth. Additionally, we provide them with relocation support, and we host a community of equals who can accompany them during mobility experience. In addition, for candidates who are not selected, we offer feedback on their mismatch for this selection process

Finally, we collect feedback both from recruiters and candidates, which we use to improve internal operations for ranking the candidates.

Together with the present document, two videos have been provided; they illustrate GlobHub operation principle, showing the personal journey of both candidate and recruiter when they choose our solution and how we can cover their needs while providing an enriching user experience.

6. Business model

The Business Model for GlobHub is described using the Lean Business Model Canvas, to have an overview of all the characteristics and parts involved, which allows to better identify and describe the business opportunities.

<p>PROBLEM</p> <p>1. HR Recruitment challenges Many critical roles to fill fast Manual processes Need to look for specialized profiles outside local market</p> <p>2. SMEs challenges Low budget Many critical roles to fill fast Manual processes Not proper HR departments</p> <p>3. People looking for jobs Concern for career advancement Fears to look jobs abroad</p> <p>4. Mobility demographic studies take months/years Information is rapidly outdated</p>	<p>SOLUTION</p> <p>1. Collecting job offers from companies and posting them in online job platforms. (bold keywords)</p> <p>2. Collecting applications from candidates and processing them with skills and mobility algorithms</p> <p>3. Providing HR/Recruiters with best candidates for each job offer</p> <p>4. Relocation Program to every hired candidate giving all the information to live in the new country, in a customized way.</p> <p>4. Feedback and follow-up to both candidate and company about the recruitment process</p> <p>KEY METRICS # Registered Recruiters # Responses/Job offer # job offers/month # candidates selected per job portal # international recruitments #clicks/month</p>	<p>UNIQUE VALUE PROPOSITION</p> <p>1. Improve international talent hiring for european SMEs and HR companies, enhancing recruitment through metrics related to mobility and professional fit. Save time and money per recruitment process</p> <p>2. allow candidates to access a formerly unreachable international job pool, receiving personal feedback for each process and relocation support when hired.</p> <p>3. On-demand report about labour mobility statistics</p>	<p>UNFAIR ADVANTAGE</p> <ul style="list-style-type: none"> - Algorithm to match company with worker and obtain "mobility potential" ranking - Relocation support - Community engagement <p>CHANNELS</p> <p>GlobHub portal</p> <ul style="list-style-type: none"> - Differentiated for recruiters and job applicants 	<p>CUSTOMER SEGMENTS</p> <ol style="list-style-type: none"> Recruiters Medium sized SMEs (between 50 and 250 employees) People looking for jobs through online job portals
<p>COST STRUCTURE</p> <ul style="list-style-type: none"> IT maintenance Advertising Job posting in platforms (LinkedIn, Infojobs, etc) Website/domain management and storage Office fixed costs Salaries 		<p>REVENUE STREAMS</p> <p>Recruiters: Commission fee per job offer + relocation packages</p>		

1. Problem

How to increase labor mobility is a major topic for which we decided to break it down according to the customer segments we are focusing, so for each segment there is a problem identified we want to solve.

- HR Recruitment challenges: Refers to small headhunters which have a high demand to seek for candidates in a fast way, but lack of technological tools. Most of its recruitment processes are done with labor force dedicated to go to job fairs, talk to universities, screen CVs manually, etc. For candidates in foreign countries, time is spent in telephone/skype interviews to do a first screening. When people from outside is hired, there's a high risk of people not adapting to the new country/culture and returning to their home countries in a few months, making the headhunter to lose a client, and everyone losing time and money.

- SMEs (50-250 employees) challenges: Not proper HR departments established so many times they outsource those services, spending time and money in it, and in many cases there is no use of technological tools (job portals, job posting, etc) but manual processes such as participating in job fairs, looking for interviews with universities. Not in control of the recruitment process as they want.

- People looking for jobs: Spread information in different portals around Europe, difficult to find in one place different opportunities. When moving abroad, the information to move is not available always, and not all hiring companies have a "social affairs" office to help new employees with relocation. They feel alone in the process of cultural adaptation.

2. Customer Segments

As we described in the needfinding section, there are two sides of the labor mobility dynamics: the companies looking for employees and the people looking for jobs. The side of the companies we divided it in 2 subsegments, Small HR (recruiting) companies, and SMEs with 50-250 employees. This selection of segments derives from the fact that the SMEs of that size are big enough to recruit people from abroad, but small enough to have proper HR departments and specialized people to perform selection and recruitment processes. The size of this market is 2.2 million in Europe

The last segment is the people itself looking for a job, from which in Europe, from a labor force of 242 million people, 150 million have their CVs in at least one job portal. This brings us a big market to pursue.

3. Solution

The solution describes the main features in how the platform addresses all customer segments in one solution, allowing recruiters to seek for candidates all across Europe with a high reliability on the mobility information, and the skills expected. For the people, a centralized marketplace where they can find information about the company and the country, and if hired, a relocation program in which they will be supported with the information they need to move in a smooth way to the new country and furthermore, enable communication channels with people living similar experiences who can share them and build a community around the platform and people moving abroad.

4. Unique Value Proposition

States the added value for each customer:

Recruiters: Select better people, not only locally but internationally, with a better assessment about how each candidate would move abroad according to the mobility index. Save time, 30% less in the first pre-selection of candidates, with more accurate selection and as well money spent in human resources scouting manually the candidates.

Candidates: Access to an international pool of job opportunities in a fast way, obtaining immediate feedback of the fit with the job offer, and further feedback of the selection process improving the recruitment experience. Relocation support when hired abroad, to live a smooth transition to the new country, with all the information and putting them in contact with people living a similar experience in that country.

5. Unfair Advantage

The competitive advantages of GlobHub are both in terms of the technology used and the services provided to the customer. This is the algorithm to make the matching process with the job offer and the mobility index. The relocation support and the community engagement through the tools (blog, chat, email) to contact people who is living a similar experience in the same country.

6. Channels

GlobHub is a platform accessed via internet, so from any computer, laptop, notebook or smartphone the customers can use it.

7. Cost Structure

The costs are low due to the fact that it is a platform with no manufacturing process and with no inventories. The fixed costs are mostly to develop and maintain the platform, run the office, marketing and salaries.

8. Revenue Streams

Recruiters are the ones defined to pay for the service. They will be charged per job offer with its correspondent relocation support for the candidate hired. The payment will be on average a 6.2% of the annual salary for the job offer. This percentage comes from an industry analysis on how much headhunters charge companies for their services, the type of job offer (senior or junior) and how likely is to hire a senior or a junior profile for the segment of SMEs.

7. Technical report

1. General idea of the prototype

Present prototype is focused on candidate ranking section of the total solution; it does not implement relocation support network. Its main operation principle is depicted at Figure 1, and its technological backend is implemented using AWS [1]:

- Information (mainly user profiles and internal computation results) is stored in a relational database managed with MySQL.
- Computation is performed using an EC2 instance of Amazon Cloud Services. The HTTP requests are served with an Apache server that also runs on the EC2 instance.

It consists of two sections that run in parallel: on the right side at Figure 1, a candidate with a sample profile finds a job offer in LinkedIn and applies for it. This leads to an application process which includes professional and mobility questions - the last will define this person's potential to have a successful integration into the country where the firm is located, in case of being a foreigner.

Answers are stored in the database and used for internal computations, which will lead to determine candidate's mobility index and suitability for firm's offer. Finally, mobility potential is presented to the candidate, as well as useful information about the country where offering firm is located, so as to encourage his/her interest.

On the left side, a recruiter from a sample firm posts that job offer and checks applicants' profiles, which have been stored and are presented in a ranking regarding their suitability for the offer.

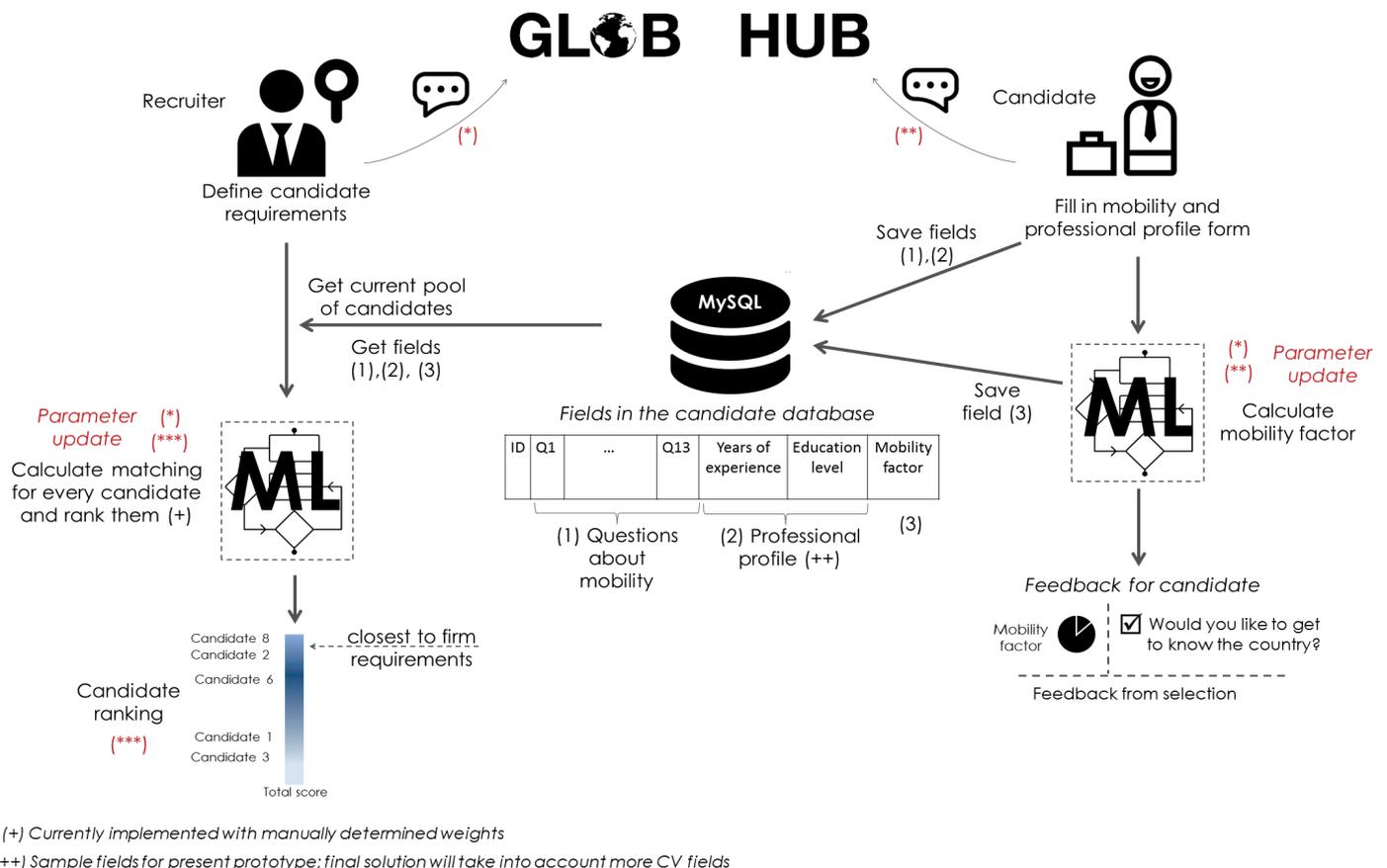


Figure 1. Operation principle of GlobHub prototype

In the coming sections, both users will be explained in detail and implemented algorithms will be presented. For the present prototype, algorithms operate with manually determined parameters, obtained from needfinding research and European demographics ([4]-[6]).

In further versions, these parameters will be automatically and optimally tuned using machine learning techniques, which are introduced.

2. GlobHub for candidates

A sample applicant (a microelectronics engineer) can reach GlobHub following a standard application process. In the present prototype, he/she will find a job offer in LinkedIn (see Figure 2).

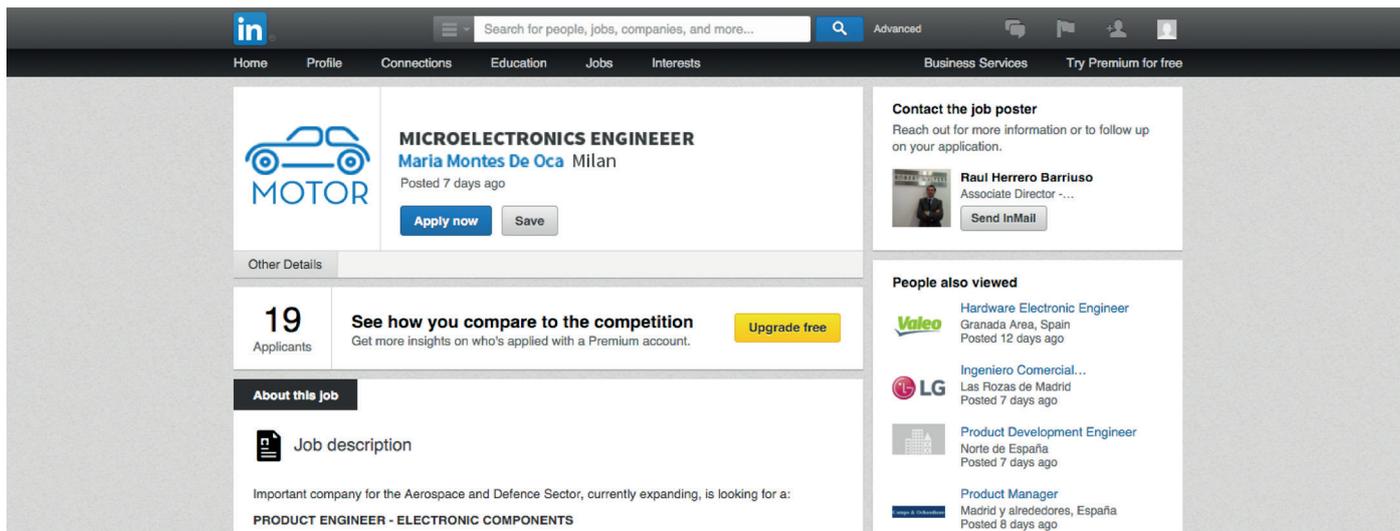


Figure 2. Application via LinkedIn

Applying in this portal redirects the candidate to firm's application form: user interface can be seen in Figure 3, and form can be filled in in [7]. Questions to be filled include professional fields (years of experience, education level) and mobility questions.

A screenshot of an application form titled "Application form for MOTOR". The form asks for the candidate's name and surname, and includes four questions about their background and mobility preferences. The questions are: 1. Which European country are you from? 2. In which European country do you live in the present? 3. How satisfied are you with quality of life in the country where you work in the present? 4. What are the chances for you to find a job abroad compared to chances of finding a job in the country where you work in the present? Each question has a dropdown menu or radio button options.

Figure 3. Application form

The last are used to compute mobility index (applicant's potential to have a successful integration into the country where the offering firm is located), which is used to rank the candidates in the recruiter side.

The set of mobility questions has been determined from needfinding research and European demographics ([4]-[6]). A complete list of these questions can be found at Appendix I; and algorithm developed for mobility index calculation, which is depicted at Figure 4, will be explained next.

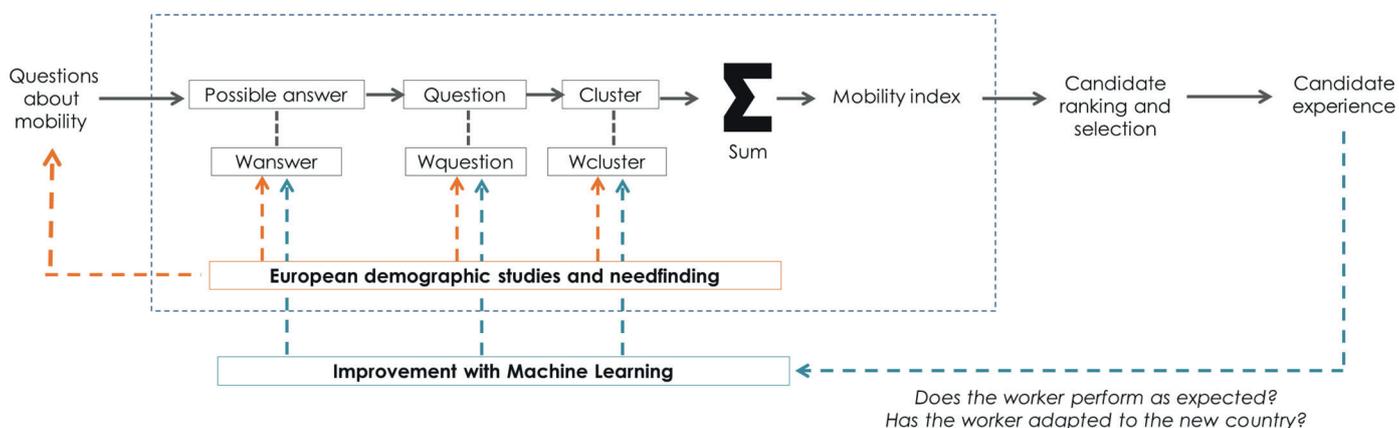


Figure 4. Algorithm to determine mobility index

Mobility questions can be grouped thematically in clusters, and they have a set of possible answers. This allows defining three types of weights (one per cluster, one for each question within the cluster, and one for every possible answer) to scale the corresponding level; then, ponderated results are added to obtain the global mobility index.

In the present solution, these weights have been experimentally determined (they are listed in Appendix I) based on European demographics ([4]-[6]), and aiming to obtain coherent results with available profiles (mainly IdeaSquare fellows and attendants to the exposition session).

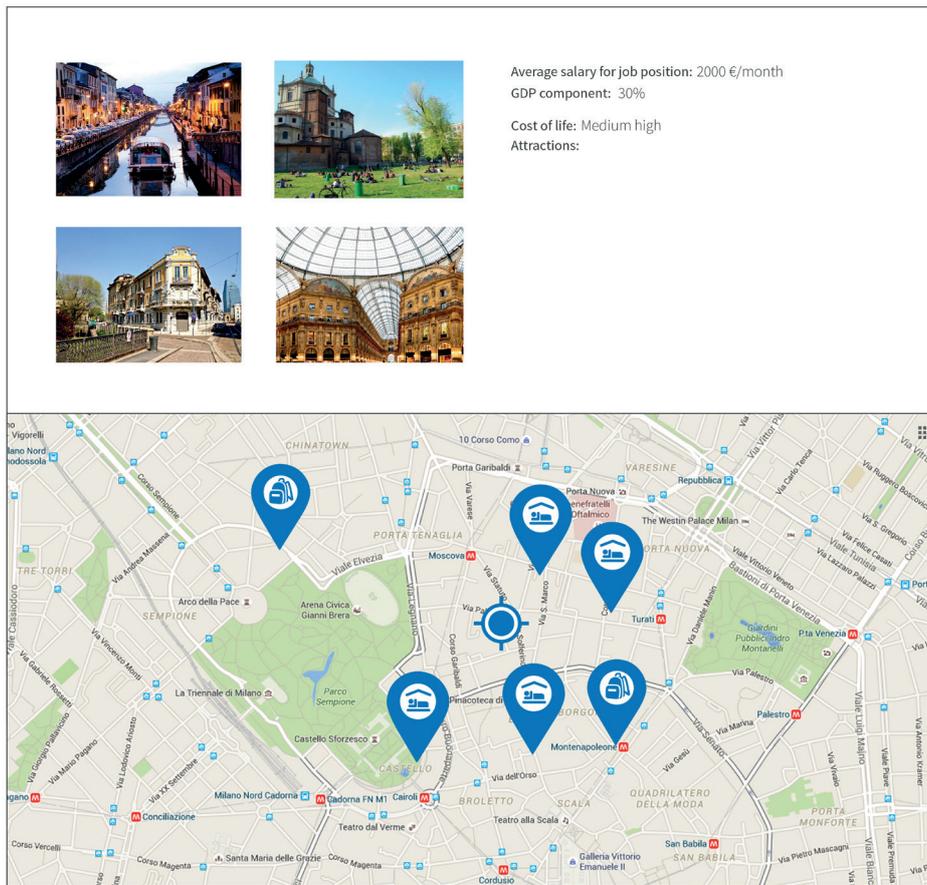
With the perspective of a further development, weights can be automatically and optimally tuned using machine learning techniques, as explained in coming sections.

Answers to application form and computed mobility index are stored in the database (as shown in Figure 1) as candidate's profile, to be later used in the recruiter side.

Still in the candidate side, it is important to mention that GlobHub is transparent until this point, that is, application takes place in the firm's official website. This is done to provide the candidate with a familiar, reliable interface.

Once application is complete, GlobHub is introduced to the user (see Figure 5): useful information is provided about the country where firm offering the job is located, to encourage candidate's interest. In addition, candidate's mobility index is presented, as an indicator of his/her current potential of success when moving to that country.

DISCOVER MORE ABOUT MILANO



MOTOR, Via Solferino 32

- FACILITIES**
- Available Accomodations
 - Markets
 - Parks
 - Schools
 - Transportations

Figure 5. Personalized, relevant results related to firm location

In further versions of the solution, candidate will be able to register in the platform and obtain additional services, such as:

- Feedback on selection procedure in case of not being selected
- For selected candidates, relocation support (if offering firm has contracted this service)
- Post personal feelings and impressions about mobility experience, impressions on the new firm, etc.
- Join a community of GlobHub members to share mobility experiences, receive and give advice, obtain and provide first-hand information
- Questionnaire covering impressions about selected candidate, so as to assess accuracy of our ranking algorithms and update their parameters accordingly to their performance

3. GlobHub for recruiters

Recruiter from a sample firm (automotive company MOTOR) can use GlobHub to ease and optimize recruitment. Available options provided by the prototype are shown in Figure 6.



Figure 6. Available options for a recruiter

First, recruiter will specify job characteristics by means of the form depicted at Figure 7, which can be filled in at [8]; then, the offer can be posted in several job portals - implemented option for the present solution is LinkedIn.

GlobHub. Define job offer
Please, fill in the following questionnaire about desired profile

1. Required languages for the candidate

- English (vehicular language)
- Italian (local language)
- Spanish
- French
- German

2. Required years of experience for the candidate

3. Required education level for the candidate

- Degree
- Master
- PhD
- Beyond PhD

Figure 7. Job offer form

After that, candidate profiles are retrieved from the database to rank them regarding their suitability with regards to published job offer. Algorithm to perform this ranking is depicted at Figure 8.

First, distance between stored professional profiles and specified requirements is computed. Then, these distances and mobility index (calculated for every candidate) are scaled times the corresponding weight and added, which provides a global suitability factor. Finally, candidates can be ranked using this factor: best matching for firm specifications is the candidate with a highest score.

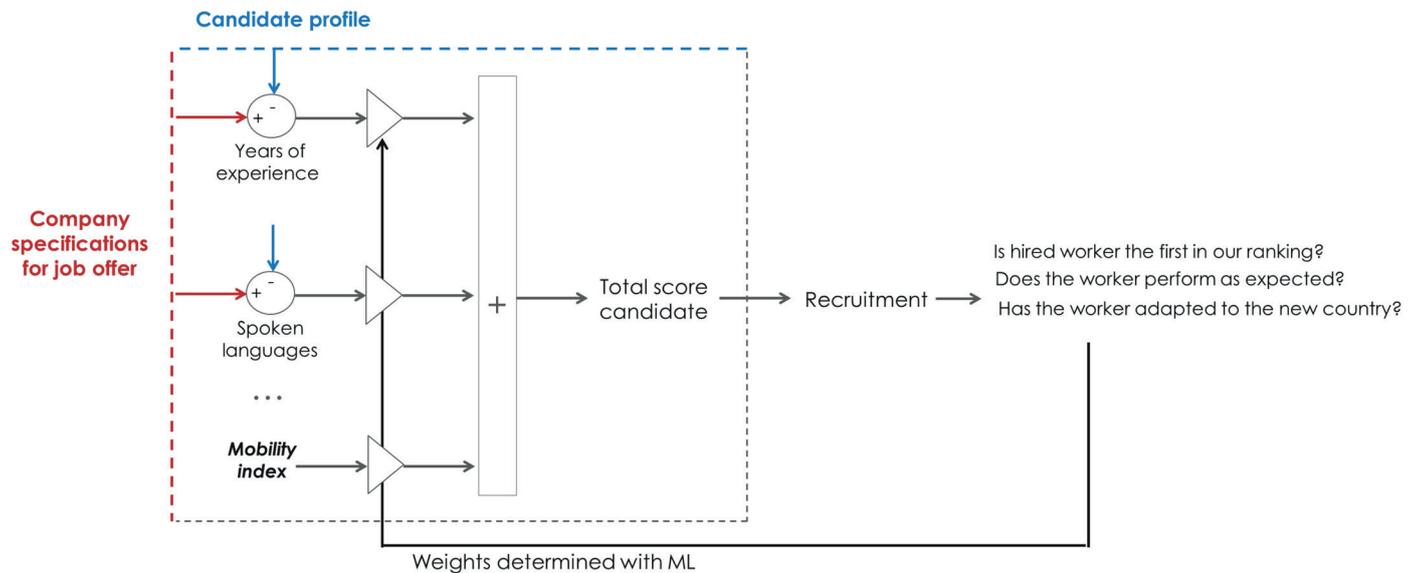


Figure 8. Algorithm to rank candidates

In the present solution, weights for ranking algorithm have been manually determined, but in further stages they can be automatically and optimally tuned using machine learning techniques, as explained in coming sections. Actually, using machine learning for candidate ranking is an existing solution [3], which supports feasibility and interest of application of this option.

As a result from the algorithm, recruiter can see candidates ranked regarding their suitability for the posted job offer and potential to integrate into the country. In further versions, a longer list of features will be provided, including the following options:

- Define feedback on selection procedure if candidate is not selected
- Relocation support for selected candidates
- Questionnaire covering impressions about selected candidate, so as to assess accuracy of our ranking algorithms and update their parameters accordingly to their performance

4. Further steps: machine learning

Algorithms presented so far operate with fix parameters or weights, which have been manually determined regarding needfinding results and European demographic statistics ([4]-[6]). This approach presents two main limitations:

- Accuracy: it is very difficult to adjust parameters for the optimal result, that is, to obtain a mobility index and candidate ranking which actually match candidate profile and firm's needs
- Scalability: readjustment of all parameters is rather painful when some of the fields is changed or if more fields are to be taken into account to obtain a more accurate model

Machine learning (ML) techniques can solve these limitations, providing automatic and optimal parameter tuning. In particular, desired functionality can be obtained with a supervised machine learning predictor followed by a linear classifier [2].

4.1. Fundamentals of GlobHub solution using ML

Operation principles of this solution are depicted at Figure 9, comprising three main blocks:

1. System input: answers to fields in the application form (both to mobility and professional profile questions), which applicant fills during application process
2. Predictor output: mobility index or candidate ranking, depending on the corresponding algorithm
3. System output: rate of (un)suitability of the candidate to the new country or rate of (mis)match with regards to firm's needs, depending on the corresponding algorithm

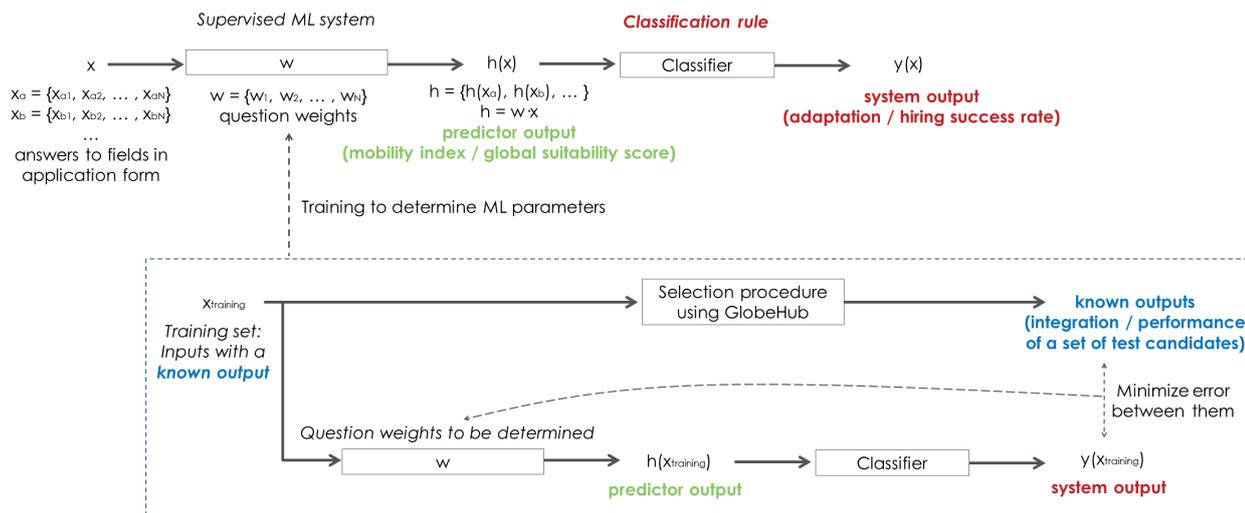


Figure 9. Fundamentals of supervised machine learning and linear classifier, applied to GlobHub

One experiment (candidate application) provides a set of answers that can be represented as a vector (x_a in Figure 9, for instance); so the system input is a compendium of those vectors of answers ($x_a, x_b \dots$), obtained from applicants via the application form.

GlobHub operates on each vector applying a set of weights to provide a scalar output for each vector (predictor output, that is, mobility index or global suitability score, depending on the algorithm).

Each vector of hired candidate will lead to a worker experience (system output), which can be measured as the rate of adaptation to the new country or matching to firm's expectations, depending on the algorithm. Quantification of this experience is provided by the linear classifier.

The goal of the system is to optimize adaptation and maximize hiring success rate, which means predictor weights shall be automatically and optimally adjusted both for mobility index and candidate ranking algorithms. This leads to the key questions that define GlobHub operation:

- How is parameter (predictor weights) adjustment performed?
- How is adaptation or hiring success (classifier output) determined?

Next section aims to answer them.

4.2. Further analysis of GlobHub solution using ML

As depicted at Figure 9, supervised machine learning requires a training set to adjust predictor parameters, that is, a set of inputs with a known output. Weights are initialized and updated in successive iterations, until error between known output and actual output is minimized. In conventional ML systems, minimization occurs at predictor's output; in the present system, since known outputs are directly candidate experiences, error is minimized at system output.

Training set usually consists of half of total inputs, and the next half is used to verify parameter adjustment [2]. For a proper operation, ten input samples are required per parameter to be adjusted; this is translated into thousands of applicants in the scope of GlobHub, so that hundreds of profiles can be used as training set. In order to enhance system accuracy, weights are updated with successive "bunches" of candidates, and update is performed by means of feedback obtained from applicants and recruiters registered in the platform.

As an example of training set, students enrolled in a mobility program in their university could be monitored in their last years of study and early professional career, to evaluate their integration into foreign countries and matching with firm's expectations when they use GlobHub; this experiment should be repeated in several universities around Europe to obtain relevant results.

This system will gain in accuracy over time, inherently leading to an increment in mobility and hiring success for users. However, algorithm convergence and improvement of accuracy could be difficult to achieve, for a large number of candidates shall be monitored during a long time to obtain training sets required for parameter update. Solution limitations will be addressed in the limitations section.

8. Role of external experts

This section is a breakdown of experts interviewed as consultants for technical and business advice, and their contribution to the present or future stages of the project is stated.

1. Connection to CERN technologies

Experts from INVENIO [3], CRISTAL [1] and ROOT [4] experiments have been interviewed at early stages of the project, obtaining valuable advice on fundamentals about databases and handling large amounts of information. In despite of being interesting contacts, technology of those experiments was not directly applicable to our solution, so this line of collaboration was abandoned.

As the project evolved, the use of Machine Learning techniques was introduced. In this field, TMVA section [5] of ROOT experiment seems suitable for our purposes, for it consists of a toolkit of classification algorithms based on machine learning techniques. Therefore, we could leverage on their expertise on further stages of the project to implement and enhance technological aspects of the project.

2. Feedback from companies

2.1. Execus

Jordi Gili (President at World Sales Congress, Managing Director at Execus Social Selling [2], Speaker and Author) was interviewed to determine the feasibility of establishing a partnership with LinkedIn to obtain professional information about users. He discouraged this approach and advised an independent platform which could leverage on LinkedIn profiles, but not depend on them.

This interview lead to the conclusive redefinition of business idea and paved the way towards final idea definition presented at IdeaSquare.

2.2 BEN Europe

Manuela Montesinos - Founder and HR Head

We had the opportunity to interview Manuela Montesinos, the founder and HR head of the headhunter BEN Europe, a company sponsored by the EU Commission in Germany to seek for young talent, mainly engineers, from Italy and Spain to offer them different kind of jobs, internships, full time jobs, in different German cities. She told us that the awareness about the benefits of hiring people from abroad is high, but to take that into reality is not that easy. Specially for her, she works recruiting young engineers directly from the universities and job fairs for which she has a team of people dedicated to do that work, with a very high quality due to the responsibility she has with her customers, mainly german companies who look for engineers. As a headhunter, she has to present the best candidates and make sure that the ones selected are highly likely to fit with the job offer not only from a background and skills point of view but also from a cultural and social perspective. This is what she finds more tricky because is very subjective so she has to do a manual process of going and pick every candidate selectively and perform a personal interview to have a first approach and get to know the candidate, and the real possibilities of moving to Germany. While this stage is completed, she is discarding candidates and presenting other ones to the client for them to do the job interviews, until the desired profile is found. The whole process is between 1-4 months.

She has detected that the use of job portals to select people will minimize time to look for candidates, but losing in a sense, the face to face identification. The company doesn't have expertise in the use of these kind of tools to recruit and are planning to begin doing something the following years, so when she knew about GlobHub she showed a lot of interest in using these kind of tool and knowing more how technology can make her work easier and saving both time and money. For her, reducing time to find candidates will improve the image with her clients and if the quality of the candidates is better, they will also reduce time selecting the final one.

Manuela shared with us her perspective and is conscious that the trend of using big data, technology, social media, etc is growing and for her to keep up to date, she needs to get involved with it. She told us how she manage to do the hiring process, which questions to ask to the candidates to assess their mobility to Germany, and with all that information we were capable of designing a better solution and close to what the customers like Manuela would like to have. This is why Manuela is very interested at this point, to make some pilot tests with GlobHub, and we are looking forward to test the platform with her, looking for candidates for a given job offer she give us.

9. *Limitations and further development*

1. *Technological aspect*

Present prototype is functional, yet improvable. In terms of algorithm for the calculation of mobility index, we have observed the following points which should be improved:

A) Mobility questions (to determine mobility index)

- Reliability of answers should be assessed, a verification system should be provided to guarantee that user answers are true and not faked to obtain a higher score in candidate ranking
- There is a complex correlation among identified questions, which should be taken into account to adjust algorithm parameters
- Results present a high degree of variability depending on personal situation of the applicant, so a more objective criteria to rank results should be defined
- More questions should be used to cover further mobility scenarios
- A psychologist expert in social needs will be eventually hired to assess the validity and weight of the mobility questions. This was a recommendation of Anna Cook (Head of HR at CERN) in order to obtain a more reliable and feasible solution

B) Social aspect: two main services beyond candidate ranking are provided, so their implementation must be addressed.

- On the one hand, it is necessary to develop the relocation support, both in terms of providing relevant information for a particular candidate (selecting housing, hospitals, groceries, etc.); and being the link between candidate and service providers (real state agencies, insurances, etc.)
- On the other hand, GlobHub community must be started, which includes technological support and maintenance of a social network; selection of locals who could support the user; and selection and proposal of activities which could help the user to integrate into the new culture

C) Machine Learning

- In the present solution, a supervised predictor followed by a linear classifier is implemented. For a proper operation, a larger set of system inputs with known outputs (training set) should be defined to train the system and determine algorithm weights.

- Feedback to update algorithm parameters is obtained from recruiters' and workers' opinion collected in the platform. In addition, we also take into account if hired candidate was the one on top of the ranking we provide (that is, parameter adjustment was correct) or in another position (and thus parameters should be readjusted).

As a complement to this feedback, information on worker performance and implication on social activities in the new country could be collected to strengthen assessment of algorithm performance.

In conclusion, feedback is one of the critical points of this system, for it is required in a variety of aspects and in a long-term basis.

- In further stages of the system, complexity and variability of involved parameters will increase. As a consequence, more complex tools will be required. For instance, we have identified advanced solutions on supervised and unsupervised machine learning which are suitable to identify key features from heterogeneous variables, such as neural networks [6], deep learning [3] or Support Vector Machines and Support Vector Clusters (SVM/SVC [9]).

D) Long-term scalability and maintenance: on the one hand, a higher computational power and storage capacity will be required as number of users grows; this can be obtained by upgrading contract with AWS [1]. On the other hand, a more complex database structure will be required to hosts sections personalized for every customer firm.

2. Business Further Developments

From the business perspective, GlobHub has many opportunities to grow. Now at this early stage it has the limitation that the business depends only in the revenue coming from companies paying for its job offers (including the relocation support for the hired candidate). From the point of view of the companies, they are the most benefited if the people they hire are happy and willing to stay working for a long period of time, so giving them the support to make a smooth cultural and social adaptation is key. The market size is big enough to gain quick traction and inertia involving more companies and building the communities with the people that begin to be hired, with other people outside the network in the first place, but then everyone as part of GlobHub as the platform that helped them in the transition to a new country. Other revenues that will help boost the business are advertising from local restaurants, shopping malls, retail stores, and so on, which are also willing to sell their services inside a growing community.

When the community is big enough, in 2 years approximately, the business should be able to generate other revenues from internal developments such as games, trivias, and tools related to social interaction in which the people, freely, would have access to more entertainment and opportunities to network. As well, a “high-end” relocation program is going to be offered to the companies for those positions that are for senior candidates, in which the customization of the relocation support is much higher. It would be more personalized and with more features for the candidate and family such as finding job for the spouse, extracurricular activities for the children, and differentiated housing and car buying options, even with the possibility to pick the candidate at the airport when arriving and giving the keys of the car or house.

Those different and additional revenue streams will strengthen the business with the same community and not depending only on new job offers every time, but with a recurrent customer base buying different services.

10. Appendix

Appendix 1. Business Model Financial plan

1. Hiring plan

Introduction: Plan of incentives

Founders	Base Salary	Benefits	Total Expense	Assumption
Salary per founder	€ 1,500.00	€ 375.00	€ 1,875.00	Base salary for all founders

Engineering - Prod. Develop	Base Salary	Benefits	Total Expense	
Full Timer	€ 3,333.33	€ 833.33	€ 4,166.67	http://www.salaryexplorer.com
Part Timer	€ 1,666.67	€ 416.67	€ 2,083.33	http://www.uhy.com/employers-now-pay-average-employment-costs-worth-nearly-25-of-employees-salaries/
Interns	€ 600.00	€ 150.00	€ 750.00	
Full timer boni:	0%			

Sales & marketing	Base Salary	Benefits	Total Expense	
Full Timer	€ 3,333.33	€ 833.33	€ 4,166.67	
Part Timer	€ 1,666.67	€ 416.67	€ 2,083.33	
Interns	€ 600.00	€ 150.00	€ 750.00	
Full & part-timer sales bonus of ne	5%			

General & Admin	Base Salary	Benefits	Total Expense	
Full Timer	€ 3,333.33	€ 833.33	€ 4,166.67	
Part Timer	€ 1,666.67	€ 416.67	€ 2,083.33	
Interns	€ 600.00	€ 150.00	€ 750.00	
Full & part-timer sales bonus of ne	5%			

Design Area	Base Salary	Benefits	Total Expense	
Full Timer	€ 3,333.33	€ 833.33	€ 4,166.67	
Part Timer	€ 1,666.67	€ 416.67	€ 2,083.33	
Interns	€ 600.00	€ 150.00	€ 750.00	
Full & part-timer sales bonus of ne	5%			

Year 1

Month:	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Nr of founders	8	8	8	8	8	8	8	8	8	8	8	8
Founders Compensation	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00
Boni Founder	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Engineering												
Nr. Of Founder in Engineering	2	2	2	2	2	2	2	2	2	2	2	2
Nr. Of Full Timer (non-founder)	1	1	1	1	1	1	1	1	1	1	1	1
Nr. Of Part Timer	0	0	0	0	0	0	0	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0	0	0	0	0	0	0	0
Base Expense Full timer	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Sales & marketing												
Nr. of founders doing marketing & sales n	1	1	1	1	1	1	1	1	1	1	1	1
Nr of founders doing sales	2	2	2	2	2	2	2	2	2	2	2	2
Total nr. of founders in sales & marketi	3	3	3	3	3	3	3	3	3	3	3	3
Nr. Of Full Timer (non-Founder)	2	2	2	2	2	2	2	2	2	2	2	2
Nr. Of Part Timer (non-founder)	0	0	0	0	0	0	0	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0	0	0	0	0	0	0	0
Base Expense Full timer (non-founder)	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33	€ 8,333.33
Boni Full timer (non-founder)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00

Month:	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
General & Admin												
Nr. Of Founders in General & Admin	1	1	1	1	1	1	1	1	1	1	1	1
Nr. Of Full Timer	1	1	1	1	1	1	1	1	1	1	1	1
Nr. Of Part Timer	0	0	0	0	0	0	0	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0	0	0	0	0	0	0	0
Base Expense Full timer	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense Interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00
Design Area												
Nr. Of Founders in Design area	2	2	2	2	2	2	2	2	2	2	2	2
Nr. Of Full Timer	1	1	1	1	1	1	1	1	1	1	1	1
Nr. Of Part Timer	0	0	0	0	0	0	0	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0	0	0	0	0	0	0	0
Base Expense Full timer	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67	€ 4,166.67
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense Interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
SUM												
Nr. Of Founders	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Nr. Of Full Timer (excluding founders)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Nr. Of Part Timer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nr. Of Interns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Founders Compensation	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00	€ 15,000.00
Base Expense Full timer	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33	€ 20,833.33
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense Interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense Independent contractors	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00	€ 800.00
Boni	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
TOTAL HR EXPENSE	€ 36,633.33											

Years 2-5

Month:	Year 1	Year 2	Year 3	Year 4	Year 5
Nr of founders	8	8	8	8	8
Founders Compensation	€ 180,000.00	€ 189,000.00	€ 198,450.00	€ 208,372.50	€ 218,791.13
Boni Founder	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Engineering					
Nr. Of Founder in Engineering	2	2	2	2	2
Nr. Of Full Timer (non-founder)	1	2	3	3	4
Nr. Of Part Timer	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0
Base Expense Full timer	€ 50,000.00	€ 105,000.00	€ 165,375.00	€ 173,643.75	€ 243,101.25
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Sales & marketing					
Nr. of founders doing marketing & sales n	1	1	1	1	1
Nr of founders doing sales	2	2	2	2	2
Total nr. of founders in sales & marketi	3	3	3	3	3
Nr. Of Full Timer (non-Founder)	2	4	8	16	32
Nr. Of Part Timer (non-founder)	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0
Base Expense Full timer (non-founder)	€ 100,000.00	€ 210,000.00	€ 441,000.00	€ 926,100.00	€ 1,944,810.00
Boni Full timer (non-founder)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00

Month:	Year 1	Year 2	Year 3	Year 4	Year 5
General & Admin					
Nr. Of Founders in General & Admin	1	1	1	1	1
Nr. Of Full Timer	1	1	1	1	1
Nr. Of Part Timer	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0
Base Expense Full timer	€ 50,000.00	€ 52,500.00	€ 55,125.00	€ 57,881.25	€ 60,775.31
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 9,600.00	€ 10,080.00	€ 10,584.00	€ 11,113.20	€ 11,668.86
Design Area					
Nr. Of Founders in Design area	2	2	2	2	2
Nr. Of Full Timer	1	1	1	1	1
Nr. Of Part Timer	0	0	0	0	0
Nr. Of Interns	0	0	0	0	0
Base Expense Full timer	€ 50,000.00	€ 52,500.00	€ 55,125.00	€ 57,881.25	€ 60,775.31
Boni Full timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Independent contractors	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
SUM					
Nr. Of Founders	8.00	8.00	8.00	8.00	8.00
Nr. Of Full Timer (excluding founders)	5.00	8.00	13.00	21.00	38.00
Nr. Of Part Timer	0.00	0.00	0.00	0.00	0.00
Nr. Of Interns	0.00	0.00	0.00	0.00	0.00
Founders Compensation	€ 180,000.00	€ 189,000.00	€ 198,450.00	€ 208,372.50	€ 218,791.13
Base Expense Full timer	€ 250,000.00	€ 420,000.00	€ 716,625.00	€ 1,215,506.25	€ 2,309,461.88
Base Expense Part timer	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense interns	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Expense Independent contractors	€ 9,600.00	€ 10,080.00	€ 10,584.00	€ 11,113.20	€ 11,668.86
Boni	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
TOTAL HR EXPENSE	€ 439,600.00	€ 619,080.00	€ 925,659.00	€ 1,434,991.95	€ 2,539,921.86

2. Sales plan

Sales Metrics

Job Postings (revenue per post)	Assumptions
Working day to sales day ratio:	50% Talked to HR companies/depts
Customer visits/skype calls per day	2.50 Own sales experience
Average visits/calls per customer	4.00 Talked to HR companies/depts
Ratio of prospects to buying customers	30% Industry estimate
Average size of european SMBs (medium siz	150 Industry reports
Average job postings per year (as %of emplo	30 Industry estimate is 20%
Average annual salary per job offer	€ 50,000 Avg for targeted companies
Selling price per job offer	6.20% 80% junior 20% senior jobs, and half of what hr agencies charge

Expected performance of sales persons in tra	0% Talked to 5 HR companies/depts
Expected performance of first year sales pers	50% Talked to 5 HR companies/depts
Expected performance of first three year sale	90% Talked to 5 HR companies/depts
After three years of sales experience in the c	
Market Size of European SMBs	22.3 million SMEs (99.8 %) of enterprises active within the EU-28's: employed almost
Only Medium sized (between 50-250 employi	10% 2,230,000

Year 1

Month:	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Nr. of working days	22	22	22	22	22	22	22	22	22	22	22	22
Nr. of sales days	11	11	11	11	11	11	11	11	11	11	11	11
Potential prospect visits/skype calls	28	28	28	28	28	28	28	28	28	28	28	28
Nr. of clients with full sale cycle	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88	6.88
Target sales (new companies) per sales p	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Total clients with job post sold	0.00	0.00	0.00	2.06	4.13	6.19	8.25	10.31	12.38	14.44	16.50	18.56
Nr. of job posts sold per client	0	0	0	1	1	1	1	1	1	1	1	1
Average gross sales price (unit)	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00	€ 3,100.00
Average gross sales per sales person (tar	€ 0.00	€ 0.00	€ 0.00	€ 6,393.75	€ 12,787.50	€ 19,181.25	€ 25,575.00	€ 31,968.75	€ 38,362.50	€ 44,756.25	€ 51,150.00	€ 57,543.75
Nr. of sales-persons	4	4	4	4	4	4	4	4	4	4	4	4
Nr. of sales persons in training	4	4	4	4	4	4	4	4	4	4	4	4
Nr. of sales persons not in training with le	0	0	0	4	4	4	4	4	4	4	4	4
Nr. of sales persons with more than one y	0	0	0	0	0	0	0	0	0	0	0	0
Nr. Of sales persons with more than three	0	0	0	0	0	0	0	0	0	0	0	0
Nr. of fully performing sales persons - Job	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Nr. of Job Posts sold per month (year)	0.0	0.0	0.0	4.1	8.3	12.4	16.5	20.6	24.8	28.9	33.0	37.1
TOTAL GROSS REVENUES	€ 0.0	€ 0.0	€ 0.0	€ 12,787.5	€ 25,575.0	€ 38,362.5	€ 51,150.0	€ 63,937.5	€ 76,725.0	€ 89,512.5	€ 102,300.0	€ 115,087.5
TOTAL NET REVENUES	€ 0.0	€ 0.0	€ 0.0	€ 10,741.5	€ 21,483.0	€ 32,224.5	€ 42,966.0	€ 53,707.5	€ 64,449.0	€ 75,190.5	€ 85,932.0	€ 96,673.5

Years 2-5

Month:	Year 1	Year 2	Year 3	Year 4	Year 5
Nr. of working days	264	264	264	264	264
Nr. of sales days	132	132	132	132	132
Potential prospect visits/skype calls	330	330	330	330	330
Nr. of clients with full sale cycle	82.50	82.50	82.50	82.50	82.50
Target sales (new companies) per sales p	24.75	24.75	29.70	35.64	42.77
Total clients with job post sold	92.81	43.31	51.98	62.37	74.84
Nr. of job posts sold per client	1	3	9	15	24
Average gross sales price (unit)	€ 3,100.00	€ 3,255.00	€ 3,417.75	€ 3,588.64	€ 3,768.07
Average gross sales per sales person (tar	€ 287,718.75	€ 422,946.56	€ 1,598,738.01	€ 3,357,349.81	€ 6,768,417.22
Nr. of sales-persons	4	6	10	18	34
Nr. of sales persons in training	0	0	0	0	0
Nr. of sales persons not in training with le	4	2	2	0	0
Nr. of sales persons with more than one y	0	4	4	2	2
Nr. Of sales persons with more than three	0	0	0	4	4
Nr. of fully performing sales persons - Job	2.0	4.6	4.6	5.8	5.8
Nr. of Job Posts sold per month (year)	185.6	597.7	2151.8	5426.2	10418.3
TOTAL GROSS REVENUES	€ 575,437.5	€ 1,907,191.7	€ 7,277,469.8	€ 19,357,541.4	€ 39,103,369.9
TOTAL NET REVENUES	€ 483,367.5	€ 1,602,041.0	€ 6,113,074.7	€ 16,260,334.8	€ 32,846,830.7

3. Profit and loss

Year 1

	Assumptions	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Revenues													
Nr. of fully performing sales persons - Job Posts	See 2.SalesPlan	0.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Nr. of Job Posts sold per month (year)	See 2.SalesPlan	0.0	0.0	0.0	4.1	8.3	12.4	16.5	20.6	24.8	28.9	33.0	37.1
TOTAL GROSS REVENUES	See 2.SalesPlan	€ 0.0	€ 0.0	€ 0.0	€ 12,787.5	€ 25,575.0	€ 38,362.5	€ 51,150.0	€ 63,937.5	€ 76,725.0	€ 89,512.5	€ 102,300.0	€ 115,087.5
TOTAL NET REVENUES	See 2.SalesPlan	€ 0.0	€ 0.0	€ 0.0	€ 10,741.5	€ 21,483.0	€ 32,224.5	€ 42,966.0	€ 53,707.5	€ 64,449.0	€ 75,190.5	€ 85,932.0	€ 96,673.5
Cost of Revenues (COR)													
Salaries + Benefits related to mktng and sales	based on Industr	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33	€ 13,958.33
Software/Platform development costs	No payable, dev	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Software Licenses		€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
LinkedIn job posting service	€ 140 linkedin prices ht	€ 0.00	€ 0.00	€ 0.00	€ 577.50	€ 1,155.00	€ 1,732.50	€ 2,310.00	€ 2,887.50	€ 3,465.00	€ 4,042.50	€ 4,620.00	€ 5,197.50
Infojobs job posting Service	€ 275 Infojobs prices, h	€ 0.00	€ 0.00	€ 0.00	€ 1,134.38	€ 2,268.75	€ 3,403.13	€ 4,537.50	€ 5,671.88	€ 6,806.25	€ 7,940.63	€ 9,075.00	€ 10,209.38
Other job postings in european and local portals	€ 1,500 Industry prices	€ 0.00	€ 0.00	€ 0.00	€ 6,187.50	€ 12,375.00	€ 18,562.50	€ 24,750.00	€ 30,937.50	€ 37,125.00	€ 43,312.50	€ 49,500.00	€ 55,687.50
PR	Meetings with cit	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00
HR International fairs	€ 1,000.00 4 fairs per year, 2	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 2,000.00	€ 0.00	€ 0.00	€ 2,000.00	€ 0.00	€ 2,000.00	€ 0.00	€ 2,000.00
Internet marketing	€ 0.10 1000 Monthly cli	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00
Mailing	€ 1.00 DB costs 1000, w	€ 1,100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00
Credit card transaction, paypal, international bank transfer fee	3% Standard process	€ 0.00	€ 0.00	€ 0.00	€ 322.25	€ 644.49	€ 966.74	€ 1,288.98	€ 1,611.23	€ 1,933.47	€ 2,255.72	€ 2,577.96	€ 2,900.21
TOTAL COSTS OF REVENUES		€ 15,658.33	€ 14,658.33	€ 14,658.33	€ 22,879.95	€ 33,101.57	€ 39,323.19	€ 47,544.81	€ 57,766.43	€ 63,988.05	€ 74,209.67	€ 80,431.29	€ 90,652.91
Gross Profit		-€ 15,658.33	-€ 14,658.33	-€ 14,658.33	-€ 12,138.45	-€ 11,618.57	-€ 7,098.69	-€ 4,578.81	-€ 4,058.93	€ 460.95	€ 980.83	€ 5,500.71	€ 6,020.59
Gross Profit Margin	Compares to X%	0.00%	0.00%	0.00%	-113.01%	-54.08%	-22.03%	-10.66%	-7.56%	0.72%	1.30%	6.40%	6.23%
Fixed business expenses													
Engineering - Product Development													
Salaries + Benefits	alquiler servidor/	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67
Boni	€ 0.01	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Travel	mantenimiento	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Tech Supplies	€ 1,500.00 8 laptops	€ 12,000.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Cloud services (servers, maintenance, database, etc)	€ 0.10 Amazon services	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00	€ 72.00
Total Engineering		€ 19,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	73.70%	36.85%	24.57%	18.43%	14.74%	12.28%	10.53%	9.21%	8.19%
General & Admin - Barcelona Office													
Salaries + Benefits		€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67	€ 6,841.67
Travel to HR fairs expenses	€ 1,000 two people going	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 2,000.00	€ 0.00	€ 0.00	€ 2,000.00	€ 0.00	€ 2,000.00	€ 0.00	€ 2,000.00
Legal	External lawyer: d	€ 5,000.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Rent of shared workspace for 8 people	€ 160	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00
Utilities	€ 0 Included in co wo	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Insurance (Liability and Property)	Included in co wo	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Office Expenses & Supplies	Stationery (not a	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00
Telephone, Internet & Postage	€ 50.00 Mobile phone pla	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00
Board of Directors associated expenses	Local transportat	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00
Total G&A		€ 13,979.67	€ 8,979.67	€ 8,979.67	€ 8,979.67	€ 10,979.67	€ 8,979.67	€ 8,979.67	€ 10,979.67	€ 8,979.67	€ 10,979.67	€ 8,979.67	€ 10,979.67
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	83.60%	51.11%	27.87%	20.90%	20.44%	13.93%	14.60%	10.45%	11.36%
Design Area													
Salaries + Benefits		€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67	€ 7,916.67
Boni		€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Domain for JobHub website	€ 2.00 Godaddy, .com d	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00	€ 2.00
Website storage MB for JobHub website	€ 5.00 http://www.pcc	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00	€ 5.00
Total Design area		€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67	€ 7,923.67
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	73.77%	36.88%	24.59%	18.44%	14.75%	12.29%	10.54%	9.22%	8.20%
Total Operating Expense													
Total Operating Expense		€ 41,820.00	€ 24,820.00	€ 24,820.00	€ 24,820.00	€ 26,820.00	€ 24,820.00	€ 24,820.00	€ 26,820.00	€ 24,820.00	€ 26,820.00	€ 24,820.00	€ 26,820.00
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	231.07%	124.84%	77.02%	57.77%	49.94%	38.51%	35.67%	28.88%	27.74%
Other Expenses													
Depreciation	20% Computers, usefu	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00
Interest		€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Taxes	16%	€ 0.00	€ 0.00	€ 0.00	€ 1,718.64	€ 3,437.28	€ 5,155.92	€ 6,874.56	€ 8,593.20	€ 10,311.84	€ 12,030.48	€ 13,749.12	€ 15,467.76
Total Other Expenses		€ 200.00	€ 200.00	€ 200.00	€ 1,918.64	€ 3,637.28	€ 5,355.92	€ 7,074.56	€ 8,793.20	€ 10,511.84	€ 12,230.48	€ 13,949.12	€ 15,667.76
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	17.86%	16.93%	16.62%	16.47%	16.37%	16.31%	16.27%	16.23%	16.21%
Net Income		-€ 57,678.33	-€ 39,678.33	-€ 39,678.33	-€ 38,877.09	-€ 42,075.85	-€ 37,274.61	-€ 36,473.37	-€ 39,672.13	-€ 34,870.89	-€ 38,069.65	-€ 33,268.41	-€ 36,467.17
<i>in % of net revenues</i>		0.00%	0.00%	0.00%	-361.93%	-195.86%	-115.67%	-84.89%	-73.87%	-54.11%	-50.63%	-38.71%	-37.72%

Years 2-5

	Assumptions	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues						
Nr. of fully performing sales persons - Job Posts	See 2.SalesPlan		4.6	4.6	5.8	5.8
Nr. of Job Posts sold per month (year)	See 2.SalesPlan		597.7	2151.8	5426.2	10418.3
TOTAL GROSS REVENUES	See 2.SalesPlan	€ 575,437.5	€ 1,907,191.7	€ 7,277,469.8	€ 19,357,541.4	€ 39,103,369.9
TOTAL NET REVENUES	See 2.SalesPlan	€ 483,367.5	€ 1,602,041.0	€ 6,113,074.7	€ 16,260,334.8	€ 32,846,830.7
Cost of Revenues (COR)						
Salaries + Benefits related to mktng and sales	based on industry	€ 170,875.00	€ 280,875.00	€ 511,875.00	€ 996,975.00	€ 2,015,685.00
Software/Platform development costs	No payable, dev i	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Software Licenses		€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
LinkedIn job posting service	€ 140 linkedIn prices ht	€ 27,286.88	€ 87,863.74	€ 316,309.46	€ 797,649.93	€ 1,531,487.87
Infojobs job posting Service	€ 275 Infojobs prices, h	€ 53,599.22	€ 172,589.48	€ 621,322.14	€ 1,566,812.36	€ 3,008,279.74
Other job postings in european and local portals	€ 1,500 industry prices	€ 292,359.38	€ 941,397.19	€ 3,389,029.88	€ 8,546,249.25	€ 16,408,798.56
PR	Meetings with cit	€ 499.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00
HR international fairs	€ 1,000.00 4 fairs per year, 2	€ 8,000.00	€ 8,000.00	€ 8,000.00	€ 8,000.00	€ 8,000.00
Internet marketing	€ 0.10 1000 Monthly cli	€ 100.00	€ 100.00	€ 100.00	€ 100.00	€ 100.00
Mailing	€ 1.00 DB costs 1000, w	€ 1,200.00	€ 1,200.00	€ 2,200.00	€ 1,200.00	€ 1,200.00
Credit card transaction, paypal, international bank transfer fee	3% Standard process	€ 14,501.03	€ 48,061.23	€ 183,392.24	€ 487,810.04	€ 985,404.92
TOTAL COSTS OF REVENUES		€ 568,420.49	€ 1,540,586.64	€ 5,032,728.71	€ 12,405,296.59	€ 23,959,456.08
Gross Profit		-€ 85,052.99	€ 61,454.38	€ 1,080,345.94	€ 3,855,038.20	€ 8,887,374.63
Gross Profit Margin	Compares to X%	-17.60%	3.84%	17.67%	23.71%	27.06%
Fixed business expenses						
Engineering - Product Development						
Salaries & Benefits	alquiler servidor/	€ 97,250.00	€ 152,250.00	€ 212,625.00	€ 220,893.75	€ 290,351.25
Boni	€ 0.01	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Travel	mantenimiento	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Tech Supplies	€ 1,500.00 8 laptops	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Cloud services (servers, maintenance, database, etc)	€ 0.10 Amazon services,	€ 1,051.20	€ 1,051.20	€ 1,261.44	€ 1,513.73	€ 1,816.47
Total Engineering		€ 97,250.00	€ 152,250.00	€ 212,625.00	€ 220,893.75	€ 290,351.25
<i>in % of net revenues</i>		20.12%	9.50%	3.48%	1.36%	0.88%
General & Admin - Barcelona Office						
Salaries & Benefits		€ 83,225.00	€ 86,205.00	€ 89,334.00	€ 92,619.45	€ 96,069.17
Travel to HR fairs expenses	€ 1,000 two people going	€ 8,000.00	€ 8,000.00	€ 8,000.00	€ 8,000.00	€ 8,000.00
Legal	External lawyer: d	-€ 1.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Rent of shared workspace for 8 people	€ 160	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00	€ 1,280.00
Utilities	€ 0 Included in co wd	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Insurance (Liability and Property)	Included in co wd	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Office Expenses & Supplies	Stationery (not a	€ 50.00	€ 50.00	€ 50.00	€ 50.00	€ 50.00
Telephone, Internet & Postage	€ 50.00 Mobile phone pla	€ 500.00	€ 500.00	€ 500.00	€ 500.00	€ 500.00
Board of Directors associated expenses	Local transportat	€ 308.00	€ 308.00	€ 308.00	€ 308.00	€ 308.00
Total G&A		€ 93,362.00	€ 96,343.00	€ 99,472.00	€ 102,757.45	€ 106,207.17
<i>in % of net revenues</i>		19.31%	6.01%	1.63%	0.63%	0.32%
Design Area						
Salaries & Benefits		€ 97,250.00	€ 99,750.00	€ 102,375.00	€ 105,131.25	€ 108,025.31
Boni		-€ 1.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Domain for JobHub website	€ 2.00 Godaddy, .com d	€ 24.00	€ 24.00	€ 24.00	€ 24.00	€ 24.00
Website storage MB for JohHub website	€ 5.00 http://www.pcf	€ 60.00	€ 60.00	€ 60.00	€ 60.00	€ 60.00
Total Design area		€ 97,333.00	€ 99,834.00	€ 102,459.00	€ 105,215.25	€ 108,109.31
<i>in % of net revenues</i>		20.14%	6.23%	1.68%	0.65%	0.33%
Total Operating Expense						
Total Operating Expense		€ 287,945.00	€ 348,427.00	€ 414,556.00	€ 428,866.45	€ 504,667.74
<i>in % of net revenues</i>		59.57%	21.75%	6.78%	2.64%	1.54%
Other Expenses						
Depreciation	20% Computers, usefu	€ 2,400.00	€ 2,400.00	€ 2,400.00	€ 2,400.00	€ 2,400.00
Interest		€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Taxes	16%	€ 77,338.80	€ 256,326.56	€ 978,091.94	€ 2,601,653.57	€ 5,255,492.91
Total Other Expenses		€ 79,738.80	€ 258,726.56	€ 980,491.94	€ 2,604,053.57	€ 5,257,892.91
<i>in % of net revenues</i>		16.50%	16.15%	16.04%	16.01%	16.01%
Net Income		-€ 452,736.79	-€ 545,699.19	-€ 314,702.00	€ 822,118.19	€ 3,124,813.98
<i>in % of net revenues</i>		-93.66%	-34.06%	-5.15%	5.06%	9.51%

4. Cash Flow Statement

Year 1

	Assumptic Month											
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Beginning Balance	€ 40,000.00	€ 17,478.33	€ 56,956.67	€ 96,435.00	€ 146,180.95	€ 203,800.78	€ 254,900.72	€ 303,480.78	€ 353,540.97	€ 397,081.27	€ 442,101.69	€ 480,602.24
Operating profit (Net Income)	€ 57,678.33	€ 39,678.33	€ 39,678.33	€ 38,877.09	€ 42,075.85	€ 37,274.61	€ 36,473.37	€ 39,672.13	€ 34,870.89	€ 38,069.65	€ 33,268.41	€ 36,467.17
Depreciation (+)	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00	€ 200.00
Capital Expenses (-)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Corporate Tax (-)	€ 0.00	€ 0.00	€ 0.00	€ 1,718.64	€ 3,437.28	€ 5,155.92	€ 6,874.56	€ 8,593.20	€ 10,311.84	€ 12,030.48	€ 13,749.12	€ 15,467.76
Increase (-) / decrease (+) in accounts receivable	€ 0.00	€ 0.00	€ 0.00	€ 12,787.50	€ 19,181.25	€ 19,181.25	€ 19,181.25	€ 19,181.25	€ 19,181.25	€ 19,181.25	€ 19,181.25	€ 19,181.25
Increase (+) / decrease (-) in accounts payable	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Increase (-) / decrease (+) in prepaid expenses	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Increase (-) / decrease (+) in long term assets	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Cash-flow from other activities	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Sale of stock / stockholder investments (+)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Payments of debt (-)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Dividends paid (-)	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Change in Cash	€ 57,478.33	€ 39,478.33	€ 39,478.33	€ 49,745.95	€ 57,619.82	€ 51,099.94	€ 48,580.06	€ 50,060.18	€ 43,540.30	€ 45,020.42	€ 38,500.54	€ 39,980.66
Ending Balance	€ 17,478.33	€ 56,956.67	€ 96,435.00	€ 146,180.95	€ 203,800.78	€ 254,900.72	€ 303,480.78	€ 353,540.97	€ 397,081.27	€ 442,101.69	€ 480,602.24	€ 520,582.90

5. Balance Sheet

	End Y1
Assets	
Current Assets	
Cash	(520,583)
Accounts Receivable	(166,238)
Prepaid Expenses	-
Other Current	-
Total Current Assets	(686,820)
Fixed Assets	
Equipment	8 computers 12,000
Furniture	Included in c -
Intangible Assets	243,136
	-
	-
Total Fixed Assets	255,136
Less: Accumulated Depreciation	2,400
Total Assets	(434,085)
Liabilities and Owner's Equity	
Liabilities	
Accounts Payable	-
Other Bank Debt	-
Line of Credit Balance	-
Total Liabilities	-
Owner's Equity	
Common Stock	40,000
Retained Earnings	(474,084)
Dividends Dispersed	-
Total Owner's Equity	(434,084)
Total Liabilities and Owner's Equity	(434,085)
Balance	€ 0.00

Appendix 2. Technical report

The following is the list of questions related to mobility aspects, which a candidate using the present prototype will answer during application process. Their answers are used to compute mobility index (applicant's potential to have a successful integration into the country where the offering firm is located), which is then used to rank the candidates.

This set of questions has been determined from needfinding research and European demographics ([4]-[6]). Questions and possible answers are listed next, grouped in thematic clusters, together with parameters used for algorithm computation, that is, weights associated to every possible answer, to every question and to each of the clusters. The more relevant the field, the higher the associated weight.

As it has been mentioned, these weights have been experimentally determined to obtain coherent results with available profiles (mainly IdeaSquare fellows and attendants to the exposition session); but in further stages they would be automatically and optimally tuned using machine learning techniques.

In addition, a psychologist expert in social needs will be eventually hired to assess the validity and weight of the mobility questions. This was a recommendation of Anna Cook (Head of HR at CERN) in order to obtain a more reliable and feasible solution.

Table 1. Mobility questions and associated weights

Cluster	Cluster weight	Question	Question weight	Possible answers
Demographics	1	Q1. In which European country do you live in the present?	1	Western
				Central
	Eastern			
	Northern			
	2	Q2. Where are you from?	2	Western
				Central
Eastern				
Northern				
Engagement	2	Q3. How satisfied are you with quality of life in the country where you work in the present?	1	Very satisfied
				Somehow satisfied
				Neutral
				Somehow unsatisfied
				Very unsatisfied
	2	Q4. What are the chances for you to find a job abroad compared to chances of finding a job in the country where you work in the present?	2	Much better
				Better
				No difference
				Worse
				Much worse

Cluster	Cluster weight	Question	Question weight	Possible answers
Mobility Experience	5	Q5. Do you have prior experiences living/working/studying abroad during a period longer than 3 months?	2	Yes
				No
		Q6. In how many different cities, both inside your home country and abroad, have you lived?	1	1
				2
				3
More than 3				
Adaptation	4	Q7. How many languages do you speak?	2	1
				2
				3
				More than 3
		Q8. From the following list, which languages do you speak?	1	English (vehicular language)
				Italian (local language)
				Spanish
French				
German				
Personal	3	Q9. Do you have any friends or relatives in Italy? (country where offering firm is located)	5	Yes
				No
		Q10. How much engaged do you feel with your relatives?	4	Very engaged
				Somehow engaged
				Neutral
				Low engagement
				No engagement
		Q11. Has someone among your relatives and/or friends ever lived abroad?	1	Yes
				No
		Q12. If you wanted to work abroad, would you move on your own or along with other people?	3	On my own
				With spouse/partner
				Neutral
				With children
With other relatives/friends				
Q13. What is your age?	2	Below 40		
		Above 40		

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