

# Fighting the odds

*A deep dive into the "war on talent" in Amsterdam's tech scene  
and the role of local government*



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amsterdam  
economic  
board

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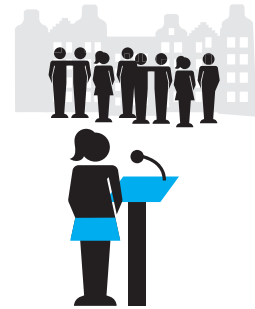
*Thank you*



The research and resulting white paper serve three main purposes:

1. **Inform stakeholders** on the status quo of demand and supply of tech talent in Amsterdam Metropolitan region (AMA)

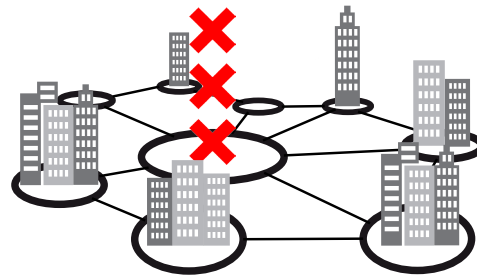
*Fact: There is a shortage of tech talent in the Amsterdam Metropolitan Area (AMA), as is in other major European cities. This research digs into the shortage and addresses it from the perspective of Amsterdam's most promising tech startups/scale ups and multinationals.*



2. **Look into what the AMA can do** to address this issue. The city has launched and participated in a range of new initiatives over the past 5 years. This research explores opportunities for new actions from the city – resulting in specific project proposals, some of which are launched as we speak - and provides input to initiatives that are already taking place.



3. **Last, this is to inform other cities**, within the Netherlands and abroad, about the status of Amsterdam's tech scene, but more specifically to inspire them by providing possible solutions to decrease the demand – supply gap of tech talent in their respective cities.



## General Findings

Finding qualified tech talent is a global issue for organizations. There is a small pond to fish from. Since this sector is growing rapidly the challenge is becoming more and more severe.

When interviewing the Amsterdam tech-sector, we found this to be more than true. These companies are struggling to find the right additions to their tech teams.

When scouting for talent, there is **strong competition with other tech hubs**, especially foreign regions based elsewhere in Europe. The biggest competition for the AMA comes from **London** – with its bigger tech scene and higher wages - and **Berlin** – with its “sexy” image and affordable housing. Other upcoming competitors proved to be **Paris** (very much on the rise), Lisbon, Stockholm, Munich and a few other cities.

Most wanted are **developers and data scientists**. Front and back end developers are at the core of every tech team and this will stay for years to come. Tech companies indicate that a good data scientist is nearly impossible to find. Developer and data scientist vacancies are constantly open and it usually takes up to **more than 12 weeks** to fill these vacancies.

Many of the large tech firms have over **70% non Dutch** employees in their tech teams. This means that they immediately (have to) recruit across the border and when they hire someone, the employee has to be relocated to Amsterdam, or to the metropolitan region. Therefore, in almost all the tech-companies in Amsterdam, the main language has become English.

Furthermore since the rapid pace of growth, most companies hire a significant amount of **medior or senior talent**. They don't have time to train and monitor juniors that are not able to fully understand the systems, techniques and development languages.

The largest **barriers** when attracting talent, apart from the obvious scarcity, showed to be **housing, local competition and cultural fit**.

On the bright side, **the quality of life, tax advantages, and international orientation** make the AMA attractive for businesses as well as talent.

In addition the research shows that there exists a **gap between education and the labor market** in the tech-sector. First of all, the amount of students that pursue a tech-education is relatively low. Secondly, tech-oriented curricula do not always match the skills that are requested in practice. For example, on Universities you learn coding in one language, however there is great variety of relevant coding languages for tech companies. Thirdly, the tech companies in Amsterdam have difficulties finding the right graduates. They do not always know where to look and would prefer more contact moments and possibilities. Tech companies wish to attract students from different fields toward their sector and are experimenting with different ways to do so, but these practices still take place on a small scale and in a relatively unorganized manner.

Conclusively, the market is mainly dominated by **HBO or WO backgrounds**. However at some companies a shift is occurring. Since the sector is further professionalizing, there is an increase of relatively simple tasks. These tasks are too expensive for the HBO and WO employees and therefore chances for MBO backgrounds are slowly growing.

### Initiatives:

#### - Stronger link with traditional education

CTO's in advisory boards of educational institutions and the creation of a guest lecture platform.

#### - Tech house

a soft landing place that provides accommodation to foreign tech talent in the city where newcomers can connect with their peers.



#### - Reschooling

look into the options to include those of lower education in tech reschooling programmes.

#### - Project A

a new campaign to get talent to move to Amsterdam. Flying in 20 talents to meet with 10 tech companies that offer unique projects in emerging tech fields.



#### - Infographic for recruitment

Highlight the life quality in Amsterdam and the region, and also provide insights in prices and housing. As a tool that tech companies can use.

More of these initiatives at the end of this paper.



## Introduction

*“Dutch tech firms are fighting over a small pool of talent. This cannot go on for ever”  
- Steven Schuurman, founder of Elastic*

The European Commission states that Europe lacks digitally skilled persons to fill job vacancies, despite high unemployment rates. There may even be lack of up to 500,000 ICT (Information and Communication Technologies) professionals in 2020.

Furthermore the CBS provides us with the following graph:

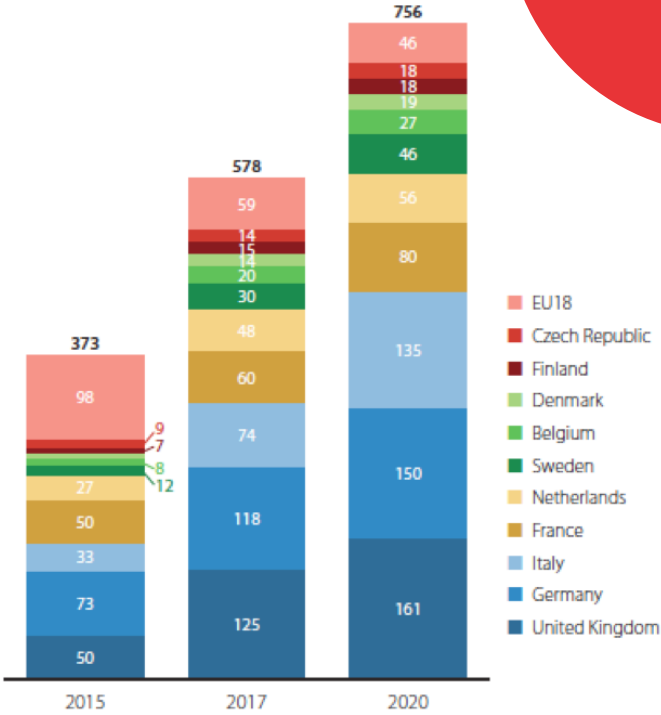


Within the Netherlands, the deficit for employees in the third quarter of 2016 is the biggest in the ICT sector. If we zoom in, we can conclude that in the Randstad (the largest Dutch urban region including the major cities) 5 out of 6 jobs openings are not filled (Sterksen, 2016).

These graphs and facts are worrying and cannot be ignored. Especially since the ambition of the AMA is to strengthen the technological ecosystem.

**26**  
vacancies per  
Junior IT Talent  
(Intelligence Group,  
2017)

**Forecast of ICT professional vacancies,  
2015–20 (1,000s)**



Source: Empirica 2015, in European Commission (2016), A new skills agenda for Europe: Skills and digitisation. #EU SkillsAgenda Factsheet.

As stated above, this white paper addresses the mismatch between demand and supply of tech skills in Amsterdam and proposes recommendations of how to deal with this mismatch.

Startup Amsterdam and the Amsterdam Economic Board joined forces and interviewed 25 tech-companies in Amsterdam. The collective intelligence of these companies is used as a resource for addressing this challenge. We used the following definition to define the scope of the research: **digital tech business** are businesses that provides a digital technical service/product/platform/hardware or heavily relies on it as a primary revenue source.

Furthermore we choose to interview startups, scale ups and multinationals, to provide a full view on the tech ecosystem.

A questionnaire was constructed to guide the interviews in a structural way (see: <https://startupamsterdam.typeform.com/to/jvABuR>). The interviews conducted were mostly with tech recruiters and in a few cases with CEO's or CTO's.

Please note that the results are a mixture of qualitative and quantitative research. Our questionnaire and interviews, which have been done diligently, have not been tested on any scientific validity, for obvious practical reasons. We are mere civil servants and, like the companies we interviewed, our organizations could use an extra data scientist or two.

In the following paragraphs the most important themes will be elaborated.



## 1.1 Hard to find skills



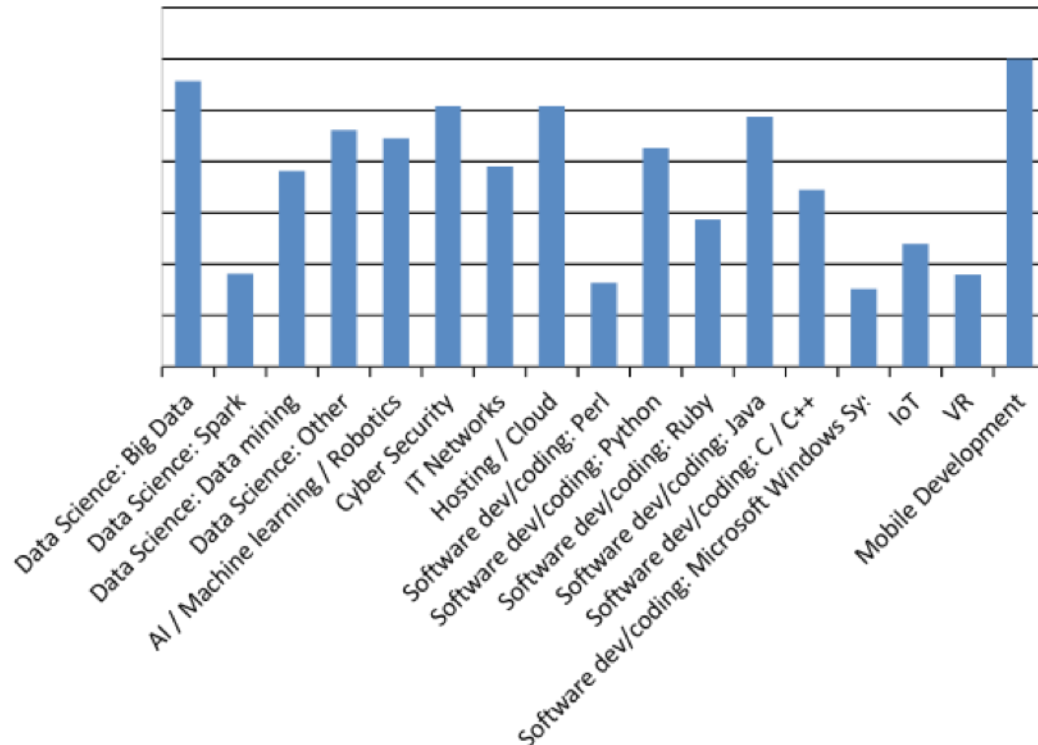
What are the most desired qualities and how difficult is it to find those?

*“People sometimes act as if programming is like becoming an athlete; only the best make it. That is not the case. Everyone can do it. You just have to start.”*  
- Marijn Pijnenborg, founder Funda.nl in “De Telegraaf”, February 2017

As may be expected, prior research into the European tech scene suggests that software engineers are the most difficult employees to attract for European tech firms (Balderton, 2016). We double-checked and found all companies stating it was either difficult or very difficult to attract tech talent. Not one company reported this as a medium, minor or non-existent issue. Following, we looked into what tech and engineering skills specifically prove hard to attract. We found that most demand was for Software Engineers (including mobile), followed by Data Scientists and to a lesser extent Machine Learning and Cloud services. Without us specifically asking about front end skills more than one third of the interviewed company’s pointed us to the fact that PHP/Symphony was a basic skill that they expected their tech employees to have.

When asking what skills are particularly difficult to find for these companies they mentioned front end developers, full stack engineers, back end Java, any kind of data scientist, and machine learning skills. However over 70 percent of interviewees indicated that finding any new employees with any of the skills depicted in figure 1 is a serious challenge.

Importance of skills when recruiting talent, n=25





## 1.2 Expertise wanted



When asked if recruiters are looking for junior, medior, or senior talent we received a mix of answers. First, the smaller tech startups often cannot afford senior talent making this issue less relevant for them. Many tech scale ups agreed on that senior expertise was an absolute necessity. Due to the fact that these businesses were growing on a daily basis they had little time to educate junior talent. New developers were needed continuously to make sure these companies could meet their ambitions and scale fast. Hence the majority of scale ups were mostly looking for medior and senior tech talent, although they are harder to find.

However, about one third of the scale ups interviewed disagreed and indicated a balance of 20-30% senior with 70-80% junior was good enough to keep their tech teams meeting demands while improving at the same time.

The larger, more established tech corporates were overall very open to junior talent, one of the reasons being that these talents can still be "formed to the company".

It is surprising to see such a varying mix of results, showing that every tech company has its own unique approach in terms of recruiting these talents.

Concluding, with data scientists being a major runner up, front and back end developers are still the largest priority and biggest issue for tech firms. Qualified developers are extremely hard to find and competition - both local and international - for these talents is unlike any other field. This especially holds for medior and senior talents, with the latter being hard for any Dutch startup to acquire due to recruitment and salary costs.

## 2. Back to school

The current role of education in the tech ecosystem and future opportunities

*"six out of ten young people entering the world of work by 2025 will go into professions that do not exist today."*  
- Wolf, 2013

### 2.1 Only the brightest?

In the Amsterdam tech-sector HBO and WO backgrounds are the dominant forces. Together they make up for at least 80% of the employees among the tech companies interviewed. However, it must be noted that a unusually large number of developers did not even finish their secondary education. These dropouts numbers are higher than we see in any other industry. One explanation we got was that young talented students find out they can earn 3-5 times their lecturers wage and see no point in continuing studies over accepting a job offer. Many of the startup recruiters do not recruit based upon educational background, but instead mainly focus on the programming skills of the potential recruits. This is a typical finding among tech companies, showing that current education does not adequately meet the tech markets demand.

On the other hand, many of the bigger companies have a quite fixed HBO+ mindset. They won't consider people without a HBO or higher diploma. An interesting quote of one of the companies illustrates the division of educational background inside the tech companies: "WO are the architects, HBO are the senior consultants and MBO keeps the light burning". The architects are the ones that create new systems, algorithm or techniques. They create something from scratch. The ones with a HBO background understand the systems and can work with them, besides they should also have the contact with the clients and act as account managers. Conclusively the MBO educated people take care of the internal system, they fix the systems and they also fill in the technical support roles. They are the internal architects.

Currently there are few MBO educated employees working in the tech-sector in Amsterdam. However, we still identify a shift towards more and more MBO backgrounds in the tech-sector. The main reason is that the industry is rapidly professionalizing. Therefore more pragmatic tasks are arising. These tasks are operational in nature and demand less creation of new systems. Because HBO and WO employees cost more, it is not beneficial to have them work on such operational tasks. This is the reason that increasingly more MBO employees are being employed in the tech-sector in Amsterdam.

The companies state it is difficult for them to find the right tech skills locally. The educational institutions that are being targeted and mentioned as a good source for tech talent are: Technical University Delft, Technical University Eindhoven and the Hogeschool of Rotterdam. In the AMA tech companies can find 'business support' talent, such as accounting, finance, marketing and human resources.

## 2.2 Missing the chance

A general issue in the Netherlands and especially in its creative, cultural capital is that programming is still not seen as "cool" and few students seem aware of the diverse and excellent job opportunities.

In general the advice of the companies to the Municipality and the Amsterdam Economic Board is to create a better link between educational institutions and tech companies. The local tech-sector has thousands of vacancies, but the match with local talent is lacking.

Besides, it was often mentioned that since the tech sector is so dynamic and the necessary skills change rapidly, it is essential to keep a closer connection with the market.

Last, we discussed recent the development of tech reschooling initiatives. Over the past year, Amsterdam has seen a steady growth of 6-36 months programmes that train people in tech skills such as programming, growth hacking, UI/UX design, and prep them for a professional career in these fields. The general opinion about these initiatives is positive; most tech-companies find this non-traditional education important to help to overcome the gap on the labor market. An important side note is that only a few of the tech companies we spoke to had active ties with the initiatives and recruited from these initiatives. We found these opportunity for collaboration currently underutilized.

Concluding, we found fast growing startups are primarily looking for the brightest minds that can work independently, have excellent analytic skills and pick up new information quickly. The larger organizations however, provide more room for lower educated tech personnel, for more operational tasks such as IT networks.

The local tech scene indicated most talent was scouted either abroad or outside of Amsterdam although the recent increase in reschooling initiatives provides some compensation for the lack of IT students.

## 3. Attracting talent

A deep dive into the barriers and success factors regarding Amsterdam's attractiveness.



### 3.1 Barriers

Education plays an important role in the supply of talent. However there will always be the need to attract talent from outside of the AMA as well. This paragraph looks into general barriers; what works, what could be improved and what role is there for the AMA to attract tech talent?

To get an unbiased general impression we started by asking the interviewees what their main barriers were when attracting international tech talent. This resulted in a wide range of answers. The most important barriers turned out to be housing and local competition. Affordable, easy to find housing can act as a magnet for young talent that is looking for a tech job in Europe. Although housing is more affordable than for example London, Stockholm, or Paris, wages in the AMA are generally also somewhat lower. For the AMA to maintain its advantage, it must keep on prioritizing housing availability. The city center of Amsterdam is facing a difficult housing market, which is bothering tech companies. Newcomers often report difficulties finding long-term accommodation. As a result new initiatives are popping up and short stays are becoming increasingly popular. More on this in the initiatives section.

Second barrier is the local competition. Over the past ten years, the AMA has become a hotbed for tech companies, with both startup and large overseas companies placing their (North-Western) European headquarters in Amsterdam. Currently, over 400 tech companies reside in the AMA. As a result, local competition over tech talent is fierce. Especially the smaller tech startups, with limited marketing budgets and HR resources, report having trouble competing with the increasing amount of competition.

#### Barriers for attracting



- Housing
- Cultural fit
- Onboarding
- University connections
- Capacity at international schools
- Image of city
- Visa for developers
- Local competition

### 3.2 The AMS-Factor

What attracts talent to Amsterdam, and what can the city do to improve its attractiveness Overall, Amsterdam proves to be an excellent place to live. Time and time again, the city of canals and bikes shows up in the top spots of rankings of liveability and European tech hubs. In Savills February 2017 Tech Cities4 ranking, Amsterdam is the 5th tech city globally and 2nd in Europe just behind London.

How can it be that a city with just under 900.000 inhabitants is competing with San Francisco, New York and London? And what initiatives would the local tech companies like to see from its city?

To start with, we asked our respondents what attracts their tech talents to Amsterdam.

Overall they indicated Amsterdam is a most attractive city to move to. Most importantly for its high quality of life, its relatively low cost of living, airport and connectedness, 30% tax rule, international orientation, size, and its political and economic stability.

Amsterdam is a livable city where non-Dutch speaking newcomers are easily accepted and getting around in this “not too big” city is an enjoyable experience rather than a hassle as in some other large European metropolitans areas.

The startup scene is very internationally-oriented and since developers generally come for all around the world, the English proficiency is pervasive.

Then there’s the Dutch 30% tax ruling. Since expats are more likely to have larger expenses (housing, travelling, etc.) The Netherlands has created a ruling stating that expats – that meet a set of standard criteria – earn 30% of their gross salary tax free. Since most Western European countries have relatively high taxes compared to other parts of the world, this 30% makes quite a substantial difference. Also, Amsterdam’s size is often mentioned. It’s trams, metro, financial heart, large airport, and international orientation give this city the advantages of a large global city, but it’s canals, and relatively small size – biking in the city center will take you usually no longer than 15-20 minutes - give it the feel of a place where you will not get lost and work and friends are usually no longer than a bike ride away.

These factors play an important role considering the fact that London for example offers its tech employees a higher salary and finding affordable housing in sexy Berlin is considered easier.

### 3.3 Points for city improvement

Next to asking what works for these companies, it is even more important for the city to know what to improve: what do these companies feel the city has to change in order to keep it attractive for talent.

#### *Housing*

A clear winner on this end was “housing”. Affordable and easy to find housing is of utmost importance when attracting talent. This is where the city’s small size is a minor disadvantage which is however compensated by its excellent public transport facilities.

There showed to be a *large difference between small startups and the larger tech startups* and scale ups. The larger scale ups already having (some) international recognition and being able to offer a higher salary often attract talent with a higher budget giving new talent more options in the Amsterdam housing market. Medior/senior developers often make for a higher salary than most other Amsterdam occupations, and this opens up a large range of real estate that junior developers at a low salary cannot afford. These juniors are in the same pool as a large part of other workers in the city and with little network in a new city, they face a difficult challenge in finding a place to live.

Affordable housing is thus an absolute priority for the more junior tech talents and it’s partly up to the city to ensure there is enough affordable property on the market. Based on this research an initiative spun off to create housing opportunities for young tech talents. More on that in the final chapter.

For the medior/senior talent the ease of finding housing is an important factor. Even though this group has more options, finding a house still proves a long and difficult process for many.

## What to improve to make the city more attractive?



Housing / more short  
stay and student  
hotels



Education relevance



Diversity



Strengthen  
ecosystem



Attract large  
investors and CEO's

Concluding, Amsterdam is an most attractive place to live due to its connectedness, English proficiency, 30% tax ruling, and high quality of life. Still, companies struggle to attract talent due to a shortage in affordable easy to find housing, local competition and fierce international competition (e.g. London, Berlin). Next steps for the Amsterdam and its tech ecosystem to work on are housing, (tech) education, and attracting successful serial entrepreneurs/CEO's.

### 4. A look into the future, the CTO perspective

In order to obtain insights into the near future regarding tech recruitment, a variety of Chief Technology Officers were interviewed. In general CTO's have the capability to be more future orientated than recruiters, and thus are a good source to get insights in which tech skills are needed in the near future.

If we understand which skills might become most important in the coming years, the city of Amsterdam and other stakeholders could adapt its strategy. However, as one of the first results from the interviews with these CTO's, looking years ahead often proves futile, especially for startups and scale ups. Technological applications, business models, and consumer insights change rapidly making 3-5 year predictions increasingly difficult.

Since all these CTO's have their specific skills necessities for their varying types of businesses, the focus will be on the common denominators; what are similarities in their responses on which skills are needed in the near future?

### *Developers*

The increasing demand for developers will most likely keep rising, regardless of advances in AI related fields. Regarding to specific skill sets; it is hard to say which coding language is most needed since the spectrum of answers is broad. A new prediction however, is an increase in the demanded skill set of developers, especially front end developers. These developers should 1) understand trends of technology (IoT, Cloud and AI) and 2) be able to conduct more operational work. Where in the past developers were required to focus mostly on building the software and a separate team was responsible for keeping the product up and running, this is shifting towards a requirement from back enders to be able to execute some DevOps skills as well.

### *DevOps*

This need for DevOps was a commonly mentioned among most interviewees. This combined skillset is becoming more important for most of the interviewed tech-companies. It stems from a desire to become more agile and responsive to business demands while maintaining the stability of their infrastructure.

### *Data Science*

Mostly the larger tech companies and marketing companies will be looking for an increased number of data scientists. Data will keep piling up and with most of the available data currently not being utilised the demand for qualified data scientists will keep rising for years to come.

### *Machine Learning*

Together with the advances in AI, there will be increased demand in machine learning, although it still takes a minor and experimental role in most tech companies interviewed. There will be growth in smart apps, digital assistants and mainstream use of AI. For example testing will be automated and engineers with the machine learning skillset can create these technologies. We found that the tech startups currently making use of machine learning is still very limited, but most CTO's indicated that in the coming 2-3 years they do need see ML becoming a major skill for their organization.

Concluding, even though technological advances bring a lot of new opportunities for tech companies, it is still developers that are no. 1 on any companies wish list. Upcoming technologies such as AI, VR, and AR are still for the few specific tech firms that focus on these issues. What is changing however is that the task set of developers is changing into a more broad set of skills, a back end developer will more often be required have a broader DevOps like skill set.

### CTO's view on Future Skills

- Development
- Devops
- Data science
- Machine learning (AI)



## 5. Initiatives

As stated in the introduction, the purpose of the white paper is also to propose recommendations on how to deal with the mismatch between demand and supply of tech skills in Amsterdam. A few initiatives have come out of this research. During the interviews with the tech companies a range of new ideas started to come up which could be tested immediately. Below are the most significant ideas that were being co-created in this process.

### 1. Tech house

One of the ideas that came out of our change of minds was the plan to start large tech houses that would provide an easy soft landing place for incoming tech talent. This could solve the problems of finding a house from abroad and connect these tech nomads with like-minded peers. For cities and local corporates and startups these tech houses / communities would be a most interesting talent hub. For the companies involved it is a USP when they can offer a soft landing place for their potential recruits. While for the city such a tech house will enhance the image of being a tech-city. While writing this paper we are currently working on bringing this idea to life and are discussing the possibilities on which company wants to be in the lead of the development of the project.

### 2. Project A

Second, results of this research have been used to create and direct a new campaign to get talent to move to Amsterdam. With insights from the research – what are tech firms looking for, what attracts tech talent to Amsterdam, and what needs to be improved? – such campaigns can be targeted at a more specific audience with a more specific message. One of the results is a campaign where we fly in tech talent to have them meet with tech companies and see Amsterdam. Since this is in the interest of both these companies as well as the AMA there is a strong motivation to join forces in such a campaign. In our example, the city of Amsterdam leads the campaign and the tech firms provide content. Together we show Amsterdam's attractiveness.

### 3. Reschooling

Over the past few years, the city has been involved in a set of tech related reschooling programs. These are programs that reschool young professionals in 6-36 months towards in digital skills - developing, growth hacking, UI/UX design, etc – and often include a traineeship at a startup or corporate. Currently, these programs are a most valuable addition to IT education at universities and the success rates are impressive. For most of these programmers more than 90% of candidates land a tech job straight after completion. Examples of these successful reschooling programs are: BSSA, Growth Tribe and Codaisseur. The companies that have been interviewed are very positive about such programs. Therefore we are looking into possibilities to increase the impact of the programs. One of the initiatives is to also start a pilot program that is focused on MBO-students.

### 4. Stronger link with traditional education

One of the main issues that the companies pointed out is that the link between the labor market and traditional education is not optimal. Since the tech-sector is changing rapidly and new skills are constantly demanded it is hard to keep the curriculum up to date. Furthermore, there are many development languages, and in schools, students often learn to develop in only one language. During the meetings we came up with to ideas that would bring education and the labor market a bit closer to each other.

*CTO's of tech-companies in the advisory board.* The CTO's of the tech-companies have insights in what the tech-skills of the future will be. Therefore they could advise educational institutions on curriculum building and they could discuss new development with the teachers.

*Guest lecture platform.* A significant number of the companies are in favor of more guest lectures. Currently the guest lectures at educational institutions are not being coordinated in a structural and professional way. By creating a digital platform this can be professionalized. The main goal is to teach the students about market trends and which skills are required in the near future. A secondary goal is that the tech-companies can promote themselves to the students.

## **5. Infographic for recruitment**

Since the battle for international tech talent is extremely fierce it is important to highlight the strengths of Amsterdam. Some of the companies told us that there exists some misunderstanding of Amsterdam. To help the recruitment department of the tech-companies a bit, an infographic will be developed. The goal is to highlight the life quality in Amsterdam and the region, and also provide insights in prices and housing. Hopefully this will help a potential recruit form a better and more positive image of Amsterdam and the region.





## Conclusion

In today's war for talent the city of Amsterdam cannot simply rely on its canals, quality of life, and excellent transport system. It needs to focus on the ways that it can make itself even more attractive in order to keep up with the European metropolises, in order to grow its tech scene. This requires strong efforts from local and national government, education, and the tech industry. The demand for Junior IT talents has doubled in the past year, reaching 1 candidate per 26 vacancies, with developers still being the most sought-after candidates and data scientists being extremely hard to find as well. This is not changing in the coming years, hence it is the responsibility of all to work on tackling this issue.

When attracting these talents from other cities and countries, housing and intense competition are the largest barriers for most.

Amsterdam has recently kickstarted a range of initiatives - as can be seen above - to increase the local supply of tech talent and its attractiveness for talent from outside, and new initiatives are being developed as we speak.

An important lesson was that every party interviewed acknowledged the importance of tech talent and the willingness to dedicate attention and efforts to this issue.

Failing to attract tech talent puts a company's future at risk. On a bigger scale, a city's future economy depends on its companies' ability to succeed.

The authors of this white paper call upon local government, education institutes, the tech industry, and politicians to join the mentioned initiatives. Besides there is need for an increase in collaboration with other parties and start initiatives of their own. Joining forces will increase opportunities for tech talent, subsequently this will increase the Dutch and Amsterdam's attractiveness and will bring the local tech scene to the next level.



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