

# Digital Talent Overview 2019

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# **Barcelona Digital Talent**

**Barcelona Digital Talent** is an alliance formed by the main players of the digital ecosystem in Barcelona to place the city as a pole for digital talent. The initiative seeks to attract and retain local and international digital professionals to respond to the lack of digital talent in the city and the increase in technology-based businesses that require profiles with digital skills.

The founding partners of Barcelona Digital Talent are Mobile World Capital Barcelona, Cercle Tecnològic de Catalunya, Barcelona Tech City, 22@Network, Foment del Treball Nacional, Generalitat de Catalunya and Barcelona City Hall.



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# **Global trends of digital talent**





# Digital talent: the gap between supply and demand is growing

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The digital transformation of the economy increases demand for digital talent to cover current jobs and those created as new, and especially related to the technologies of the 4th industrial revolution, such as Artificial Intelligence, additive manufacturing, Big Data and The Internet of Things, among others.

This demand for digital talent is not being met. Despite the fact that the number of European digital professionals grew by 4% in 2018, there is a shortage of digital talent worldwide and it is estimated that the gap between supply and demand will increase over the coming years.

**900.000**  
vacancies for  
digital jobs in  
Europe by **2020**

**65%** of all European  
children will have jobs  
that do not exist today



**80%**  
of all Spaniards between the  
ages of 20 and 30 who find  
work in the near future will be  
in emerging jobs or jobs that do  
not exist at present. Most will  
be related to digital talent.

# Supply of digital talent in Europe

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**The European ecosystem of digital talent is more interconnected than ever, with 5.7 million professional developers in 2018, 200,000 more than the previous year. However, this supply will not meet the demand for digital talent and the gap is forecast to increase over coming years.**




Germany and the United Kingdom are the countries with most professional developers. Spain, with 308,500, is in sixth place behind Russia and Italy.







## Countries with the highest population of professional developers (2018)


 Total number of professionals



 Percentage representing the  
European total

<+>

**1** **Germany**  
 **15%**  **851.000**

**6** **Spain**  
 **5%**  **305.500**

**2** **United Kingdom**  
 **14%**  **830.500**

**7** **The Netherlands**  
 **5%**  **298.200**

**3** **France**  
 **9%**  **491.800**

**8** **Poland**  
 **5%**  **279.800**

**4** **Russia**  
 **7%**  **407.100**

**9** **Ukraine**  
 **5%**  **184.700**

**5** **Italy**  
 **5%**  **308.900**

**10** **Sweden**  
 **5%**  **166.800**

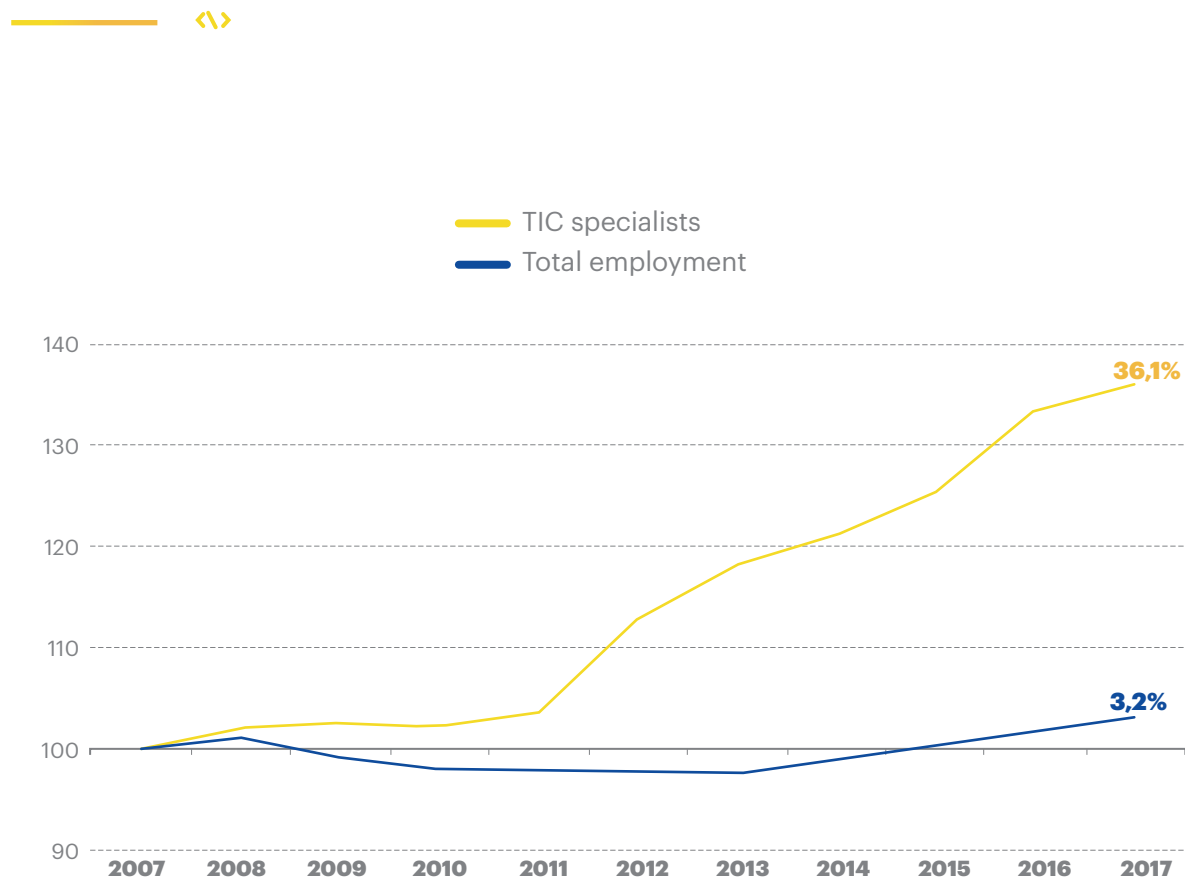
# **Demand for digital talent in Europe**

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An increasing amount of digital talent is required: all European Union countries have increased employment related to digital skills over recent years.

**The demand for professionals with digital skills in Europe has grown by 36.1% compared with 3.2% regarding the remaining demand for professionals.**

## Number of people employed in TIC specialist positions and other occupations, UE-18, 2007 - 2017 (2007 = 100)



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Source:  
Eurostat  
(Online data codes: isoc\_sks\_itspt and lfsa\_egan)

# High mobility of digital talent in Europe

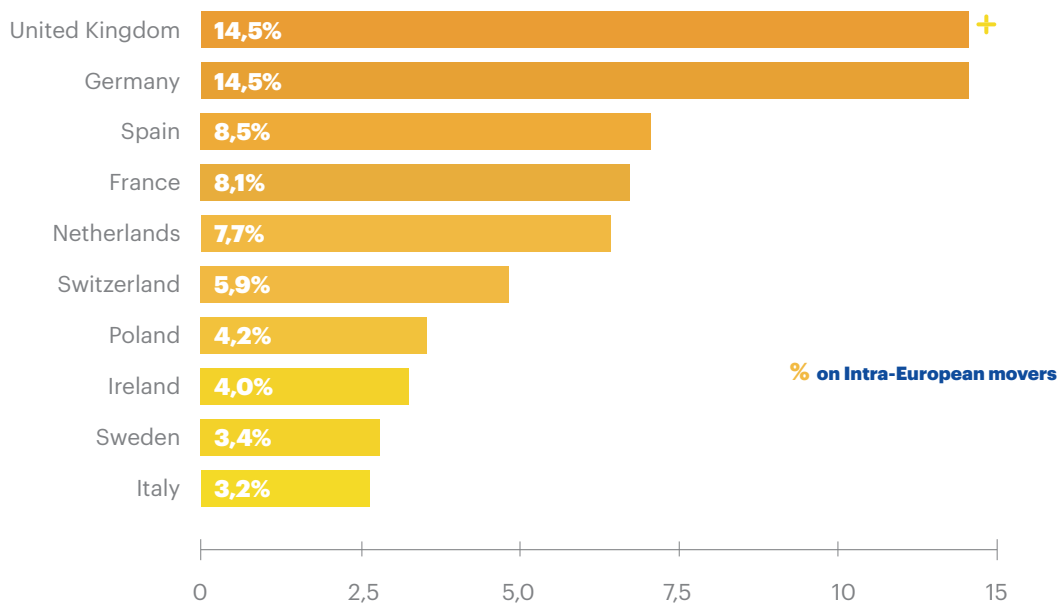
Graduates in studies associated to the digital sector grow steadily in Europe and the United States since 2000.

**Spain is the third most popular destination for European tech talent, after the United Kingdom, which stands first, and Germany.**



## Main European destinations welcoming European tech talent, 2018

— %



Source:  
Atomico. The State of European Tech 2018

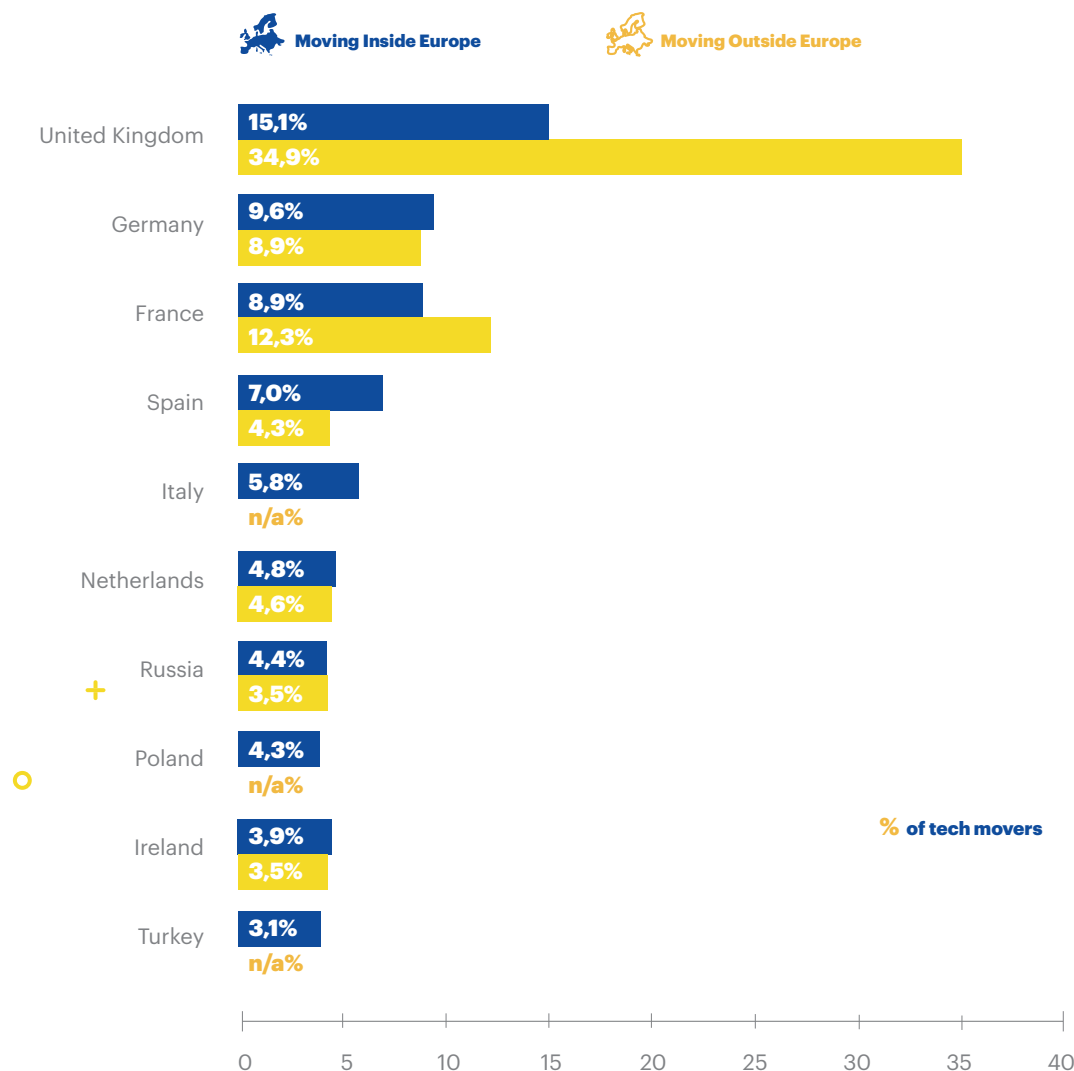
## Spain is an important source of talent for other digital innovation hubs in Europe: it is the fourth exporter of talent.

The United Kingdom is the main exporter of digital talent, both inside and outside the European Union.



### Main European countries exporting digital talent

— %

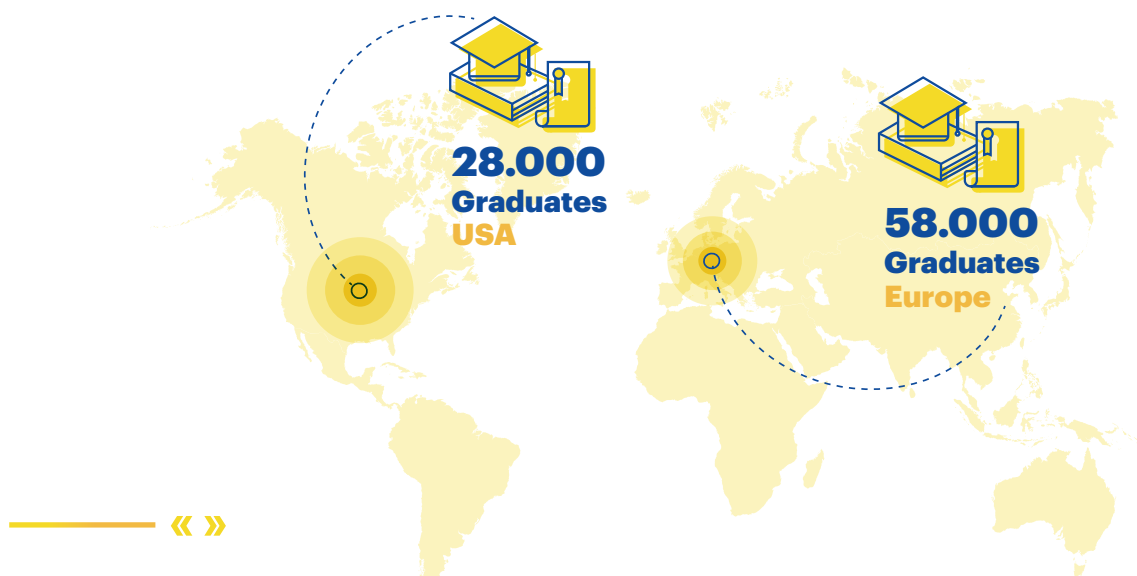


Source: Atomico. The State of European Tech. 2018

# Digital training

The number of graduates in studies linked to the digital sector has been constantly growing in Europe and the United States since the year 2000.

**Over 58,000 graduates in ICT studies were recorded in Europe in 2014, and more than 28,000 in the United States.**



« Over recent years, Barcelona has seen how the Digital Talent Gap has increased significantly. This difference is primarily due to two reasons. The first is the increase in demand for digital talent, and the second the scarce supply of profiles prepared to take on these jobs. **The technology industry has imposed a rhythm of change and innovation that the traditional education system is not yet capable of assuming. This is one of the reasons why “Code Academies” have grown exponentially over recent years.** At Ironhack we have focused on preparing new talent with the skills required by companies (both hard and soft skills). Part of the success also lies in the fact that this process is completed in just 9 weeks. A new system with a high level of effectiveness. 85% of our students find work within the first 3 months of looking. This has enabled us to double the number of students entering industry year after year, placing us as a main player to overcome the difference between the supply of and demand for digital talent in Barcelona.»

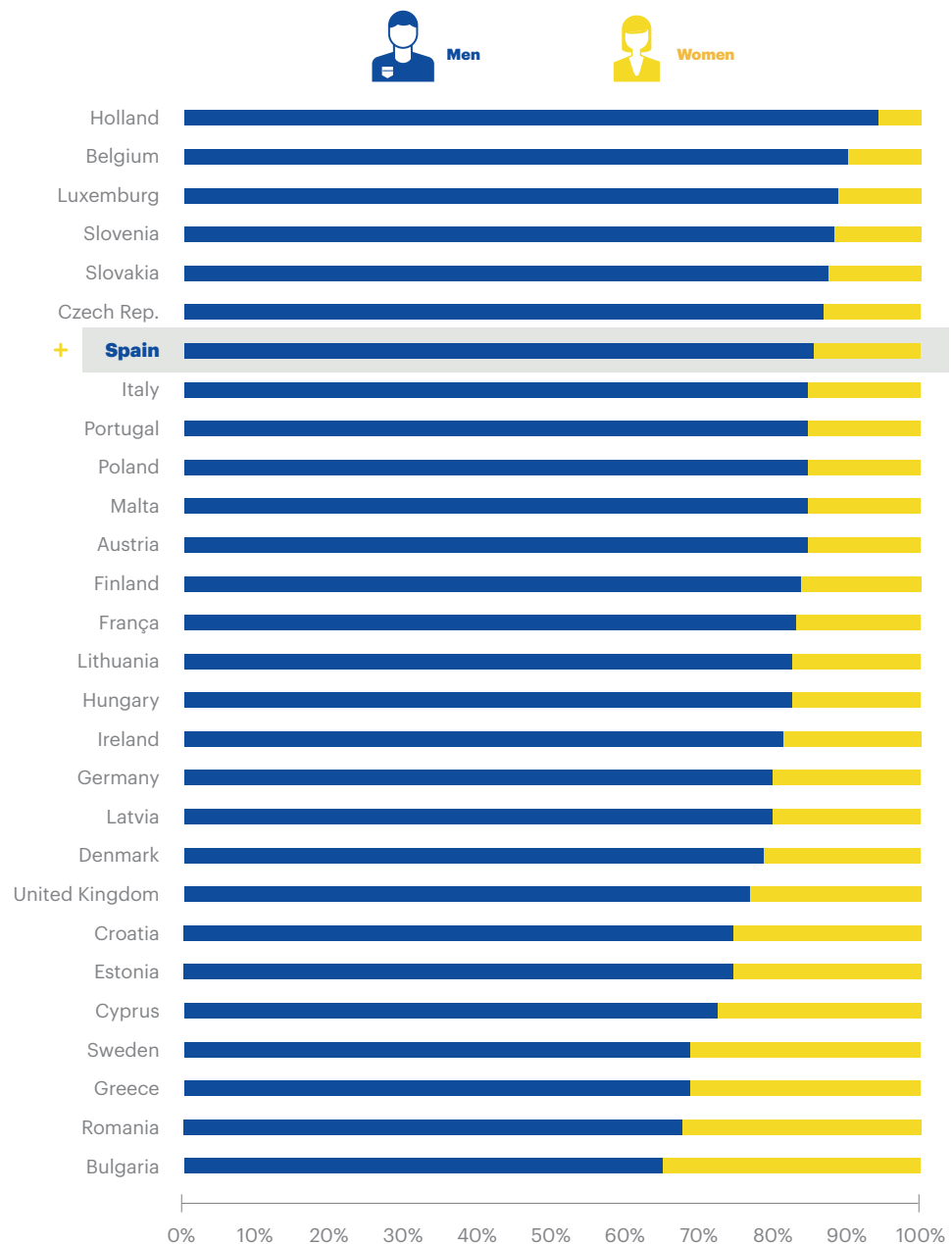
**Adrià Baqués**

General Manager at Ironhack

**Training of women in higher education ICT courses in Europe** accounts for 17% of the total (2016). The situation is trickier in Spain, as women with higher education ICT studies account for 12.7%.

## Distribution of ICT students by sex in the European Union (2016)

%



The growth of Bootcamps, centres that offer digital training in line with market requirements in a flexible and constantly transforming manner, must be noted. This training is not usually counted but does have an impact on ICT training.

Source:  
 State of European Tech 2017  
 Eurostat, 2018b  
 Mujeres en la economía digital en España 2018. DigitalES.

# Remuneration for digital talent is extremely varied in Europe



San Francisco and New York are the cities offering the highest salaries to their digital professionals, followed at a distance by London and cities in Germany and Ireland, who offer the highest salaries in Europe.



**Salaries in Spain are highly competitive in relation to other countries and hubs of reference.**

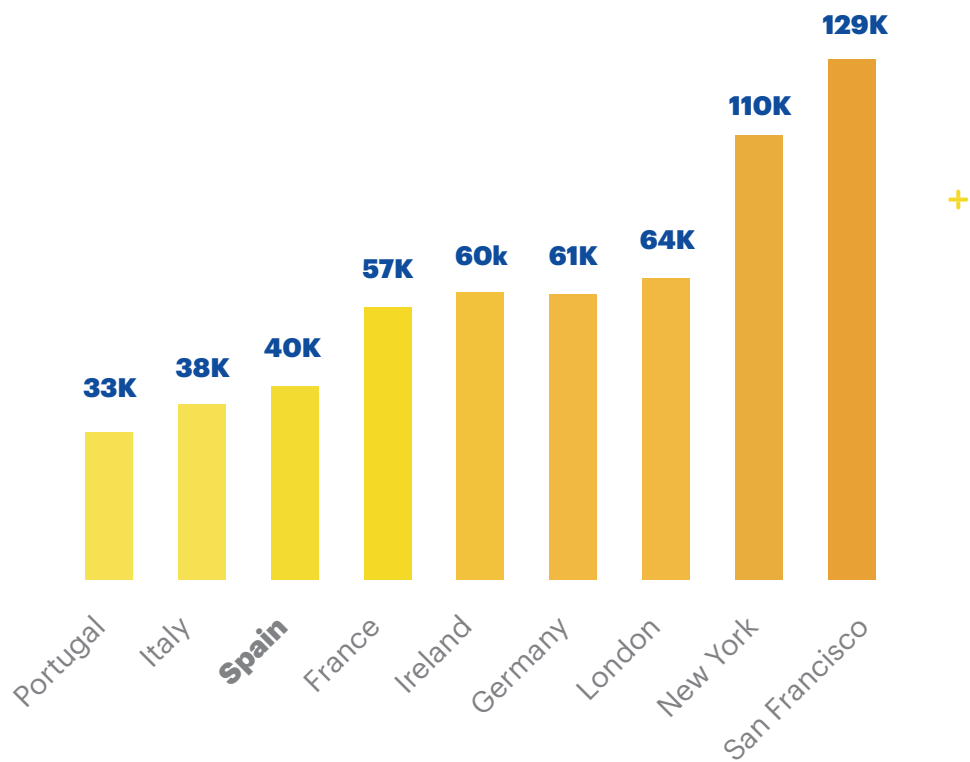






## Salary of a senior software engineer

— € /year



Source:  
Atomico, Glassdoor, Startup Genome

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**The digital  
professional  
of the future**

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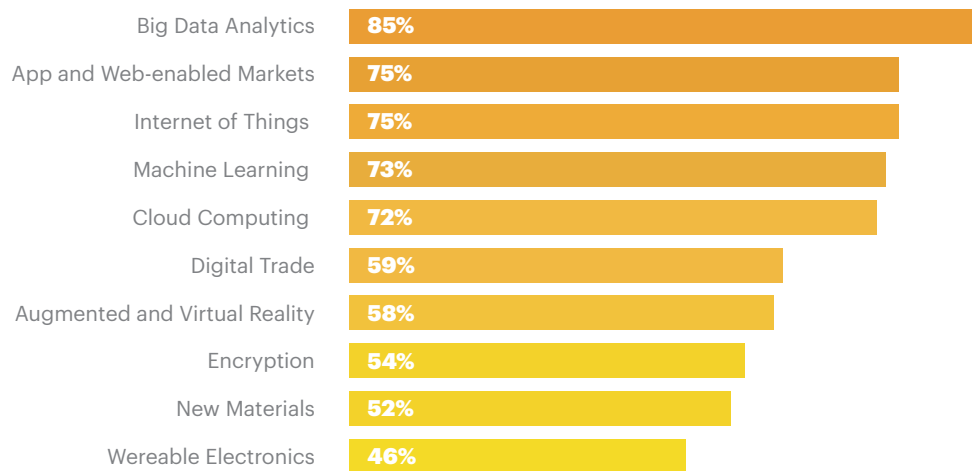
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# The 10 most popular technologies for companies by 2022



**Technologies according to the proportion of companies that will probably adopt them by 2022 (forecast)**



« It is difficult to determine the technologies that will have most impact on the employment market in the short term (5 years). When speaking of technological change, acceleration and disruption develop in very fast, unexpected intervals, often after long periods of maturity. In the short term, it is clear that advanced robotics will be able to take on an increasing number of mechanical and repetitive tasks. However, in the medium term **artificial intelligence will be the true transformative force capable of replacing cognitive tasks and leading to new business models that we might not imagine at present, even being able to create new industries and new value chains.** The Internet of Things or Big Data will create the platforms for the rise of artificial intelligence. Driverless cars will be a subsegment of artificial intelligence and, on the other hand, the advent of genomics cannot be forgotten, also promoted by data and artificial intelligence, with the incredible possibilities offered by personalised medicine, consumer genetics or even artificial life »

**Xavier Ferràs**

Executive Director, Custom Programs, ESADE Business & Law School

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**They will be most heavily implemented in tourism, aviation, travel, and the information and communication technologies sector.**

**The application of currently emerging technologies, such as digital trade, augmented and virtual reality, encryption, blockchain and 3D printing will become more established by 2022.**



**Aviation, Travel  
and Tourism**



**Information and  
Communications Technologies**

+

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**2022**



**1 out of every  
10 people will  
wear internet-  
connected  
clothing**



**1 trillion  
internet-  
connected  
sensors**



**Production  
of the first  
3D-printed  
car**

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Sources:  
Future of Jobs Survey 2018, World Economic Forum  
Deep Shift Technology Tipping Points and Societal Impact. World Economic Forum

# Professions most in demand in 4 years

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The boom in new technologies will increase the demand for professionals such as data and scientific analysis specialists, software and app programmers and specialists in e-commerce and social networks. Specialists in artificial intelligence, Big Data, machine learning, information security analysts, and robotics and blockchain engineers will be most in demand.

The roles requiring 'soft' skills are forecast to increase and be related to customer service, marketing and sales.

## The most redundant jobs between 2018 and 2022 will be those affected by technological progress and process automation.

Jobs that might become obsolete in four years from now are those affected by process automation and related to data inputting, accountancy and payrolls, secretarial duties, auditing and checkouts, among others.



« **Artificial Intelligence is leading the next technological revolution, with the cloud as a game changer. In this context, the construction of an ecosystem of diverse and inclusive digital talent, key for economic growth and for the development of our society, will require intense public-private collaboration. We are living an exciting time in which digital talent, cultural transformation in organizations, new work environments and the use of Artificial Intelligence will be more essential than ever for our competitiveness.»**

**Montse Pardo**

Director of Institutional Relations at Microsoft Ibérica



## Professions in most demand by 2022



- Data Analysts and Scientists**
- AI and Machine Learning Specialists**
- General and Operations Managers**
- Big Data Specialists**
- Digital Transformation Specialists**
- Sales and Marketing Professionals**
- New Technology Specialists**
- Organizational Development Specialists**
- Software and Applications Developers and Analysts**
- Information Technology Services**
- Process Automation Specialists**
- Innovation Professionals**
- Information Security Analysts**
- Ecommerce and Social Media Specialists**
- User Experience and Human-Machine Interaction Designers**
- Training and Development Specialists**
- Robotics Specialists and Engineers**
- People and Culture Specialists**
- Client Information and Customer Service Workers**
- Service and Solution Designers**
- Digital Marketing and Strategy Specialists**



Source:  
Future of Jobs Survey 2018, World Economic Forum

# Key skills by 2022 <sup>+</sup>

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The new technologies and the incorporation of machines into the working environment will change the skills most highly valued among professionals.

**Apart from the 'hard' skills -knowledge, digital- new 'soft' skills will be required that differentiate us from machines.**



**Creativity, critical thought, troubleshooting abilities and emotional intelligence: the 'soft skills' of the future.**

Machines will streamline the automation of processes and, therefore, humans will become less significant in reasoning and decision-making tasks, administrative duties, research, and the transfer of information. The demand for manual and physical abilities, financial resource abilities and installation and maintenance techniques will also decrease.

**Forecasts indicate that the increase in automation will boost labour productivity by 30% (2022 compared with 2015).**





## The 'soft' skills most highly valued by 2022



- Analytical thinking and innovation**
- Active learning and learning strategies**
- Creativity**
- Technology design and programming**
- Critical thinking and analysis**
- Complex problem solving**
- Leadership and social influence**
- Emotional intelligence**
- Reasoning**
- Systems analysis and evaluation**



Source:  
Future of Jobs Survey 2018, World Economic Forum

# Digital talent integration mechanisms

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Companies must assume leadership in the creation of training programmes for their employees in order to support the transition to future professions.

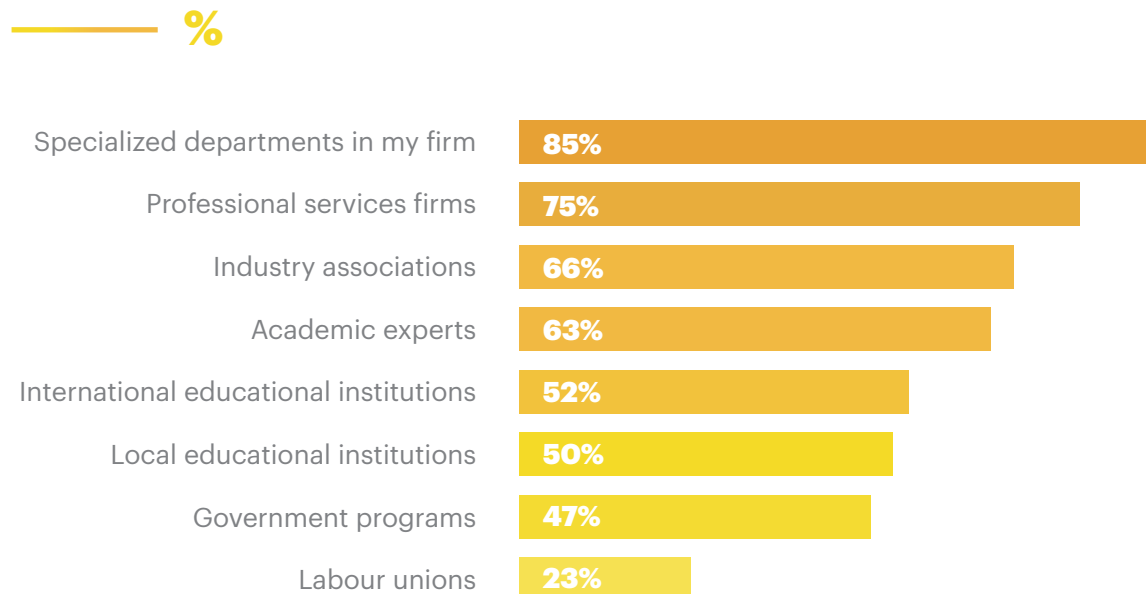


**More than half of the companies indicate that their employees will be trained through in-house departments, one quarter through private training providers and around one fifth through public education institutions.**

- Governments will be the key partners in the creation of learning incentives
- The opportunities for collaboration include associations with teachers to reform the curricula in schools and universities, intra and inter-industrial collaboration in the creation of talent channels and alliances with trade unions to improve the mobility of talent between industries



## Key collaborators in integrating digital training into companies



« **The automotive sector is currently at a time of unprecedented, deep transformation that is affecting both the product and the organisations. To face these challenges, we need new profiles with new skills, basically STEM and Digital Business profiles, to help us design the future of mobility. Meanwhile, we cannot forget our in-house talent: current employees must be trained in the professions of the future.** »

**To adapt to this situation, SEAT HR has deployed a comprehensive offensive that includes these main initiatives: a new Talent Acquisition and Employer Branding strategy with different on-line and off-line activations to connect with the new profiles, and a new concept in Training (Always Learning) that goes beyond its commitment towards the professional development and growth of our employees. The driving force at SEAT are the people, including both current employees and future candidates, and our strategy is based on the care and development of both.**

### Oliwia Puppel

Head of Talent Acquisition, SEAT

Source:  
Future of Jobs 2018 World Economic Forum

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# Digital talent in Barcelona





# The digital talent gap is growing year after year in Barcelona



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**In Barcelona, the demand for digital profiles has increased by almost 40% in one year, whereas the profiles available has grown by just 7.6%. There is a digital talent gap that must be reduced.**



**« Barcelona has many conditions to consolidate as one of the great hubs for the development of the digital economy; the vibrant ecosystem of startups, the celebration of large world technology conferences such as MWCongress and the establishment in the city of digital innovation centers of large multinationals are some examples. Zurich has established its technological Hub in Barcelona since 2006, offering services to the entire Group. The biggest challenge to maintain competitiveness will be to sustain a growth in the attraction and generation of digital talent according to the needs of the market»**

**Xavier Tuduri**

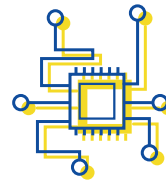
CEO at ServiZurich





**67.720**  
digital  
professionals

In 2018, Barcelona recorded 1,282,583 professionals. 5.3% perform digital tasks -involving IT, internet or telecommunications-.



**11,4%**  
digital  
offers

Of the total number of job offers published in the area of Barcelona, 3,964 are specifically for digital professionals.\*



**3.964**  
half the  
candidates

There are 37 professionals for every job offer published in Barcelona. When this involves offers for digital professionals, this figure drops to 17 available candidates..\*



**22%**  
women

In Barcelona, only two out of every 10 digital employees were women in 2018. In Catalonia, female occupation in the sector dropped by 10% from 2016 to 2017.

\* This data refers to the September-November 2018 period.



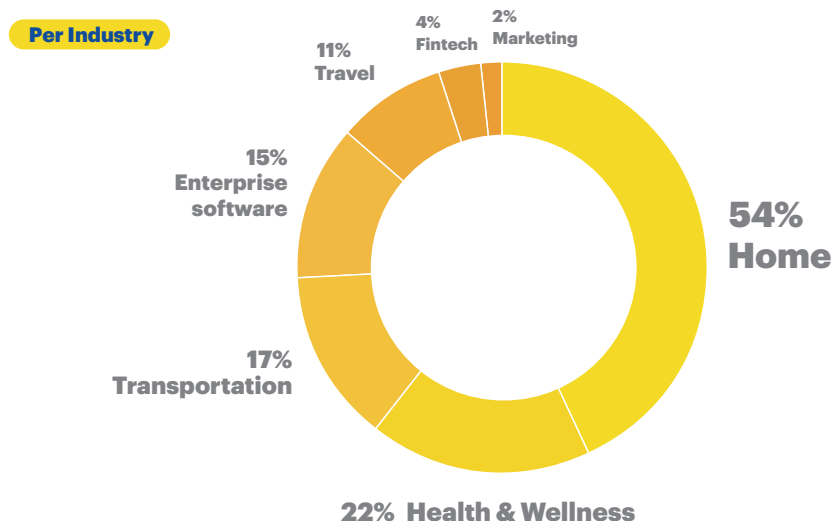
Sources:  
TalentUp.io  
Barcelona Activa (2018)  
ACCIÓ. El Sector TIC a Catalunya. Píndola sectorial

# Barcelona has generated a mature business network with great demand for digital professionals...



## Top invested sectors in Barcelona

%



« Digital talent has provided one of the most important hubs of technological companies, the industrial context and the city perspective. The attracting and retaining of new talent must enable us to take a leap forwards in placing Barcelona as a city where they want to work. In order to position Barcelona in the first option chosen by digital professionals, the alliance of all the relevant actors in the value chain of talent generation is necessary: training, attraction and quality of professional development.»

Alex Fabra

Partner, Everis



# ... and a leading innovation and entrepreneurship ecosystem.

**6<sup>th</sup>** European Startup Hub

Only behind London, Paris, Berlin, Amsterdam and Madrid. It is home to 1197 startups and the second Spanish city to welcome most.

**3<sup>th</sup>** Most attractive City

After Berlin and London, Barcelona is the city preferred by European founders to create new companies.

**5<sup>th</sup>** Investment Hub

5th investment hub in Europe to receive most investment, after London, Berlin, Paris and Stockholm.

Barcelona attracts 60% of all Spanish capital invested in startups.

**IA** Benchmark technology in 4 years

Almost 85% of all capital invested in Barcelona focuses on the mobile and e-commerce sectors.

## Investment in the mobile and e-commerce sectors

Barcelona will be an international hub for artificial intelligence. Genomics, VR, AR and Blockchain will also mark the city's innovation ecosystem.

# Consolidated technologies in the city

**Web development** is currently the technology most in demand by companies in Barcelona according to demand for talent.

Popularity of the 10 most consolidated technologies in Barcelona

1

Web Development

6

Cloud

2

App Development

7

Cybersecurity

3

UX/UI

8

Business Intelligence

4

CRM + ERP Consultant

9

Big Data

5

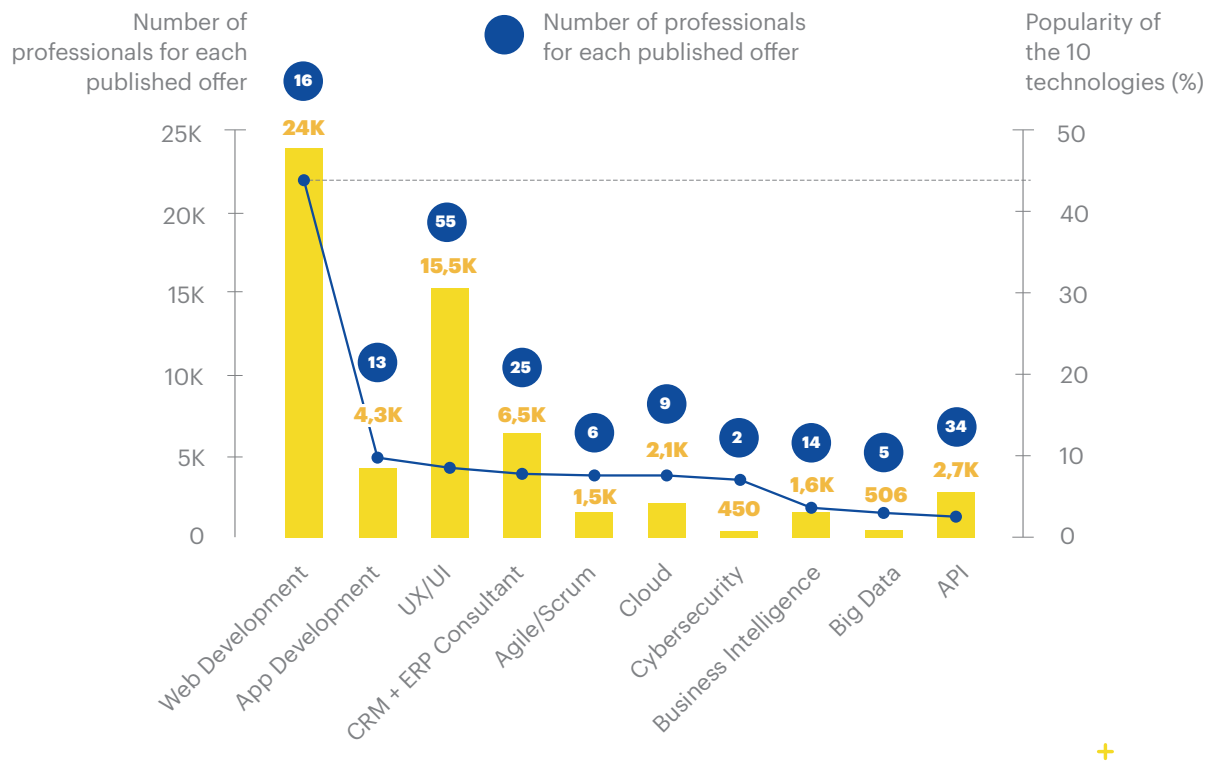
Agile / Scrum

10

API



## Professionals by consolidated technology

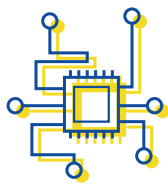


Sources:  
TalentUp.io

# Most popular jobs for consolidated technologies

Companies demand an increasing number of professionals with a command of **Agile** and **Scrum** as flexible development and management methods for digital projects.

Most popular jobs for consolidated technologies



1

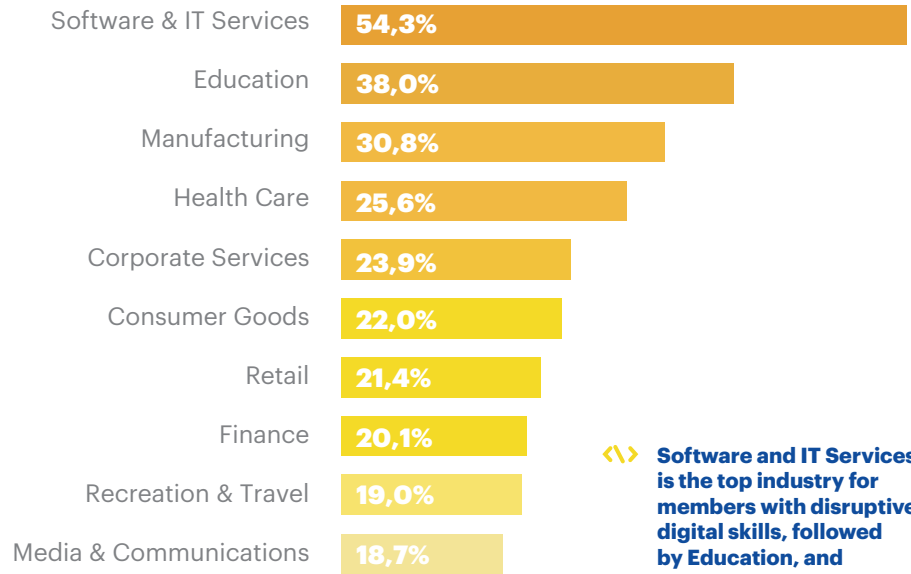
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<b>Web Development</b>	Frontend developer	Backend developer	Java developer
<b>App Development</b>	iOS developer	Android developer	Mobile developer
<b>UX/UI</b>	UI/UX designer	Product designer	Graphic designer
<b>CRM + ERP Consultant</b>	SAP developer	Dynamics developer	Salesforce developer
<b>Agile / Scrum</b>	Product Owner	Scrum master	Devops engineer
<b>Cloud</b>	Cloud developer	Cloud architect	Cloud engineer
<b>Cybersecurity</b>	Security engineer	IT Security Engineer	Security analyst
<b>Business Intelligence</b>	BI consultor	BI developer	BI analyst
<b>Big Data</b>	Data scientist	Data engineer	Data analyst
<b>API</b>	API's developer	Microservices architect	Mean web developer

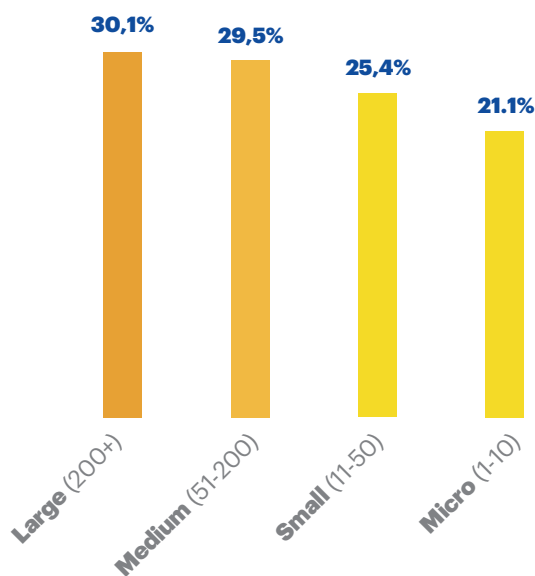
Sources:  
According to volume of published job offers in TalentUp.io.

## Prevalence of profile with disruptive digital skills by industry



Software and IT Services is the top industry for members with disruptive digital skills, followed by Education, and Manufacturing

## Prevalence of profile with disruptive digital skills by company size



Members who list disruptive digital skills are more likely to be found in Medium or Large enterprises

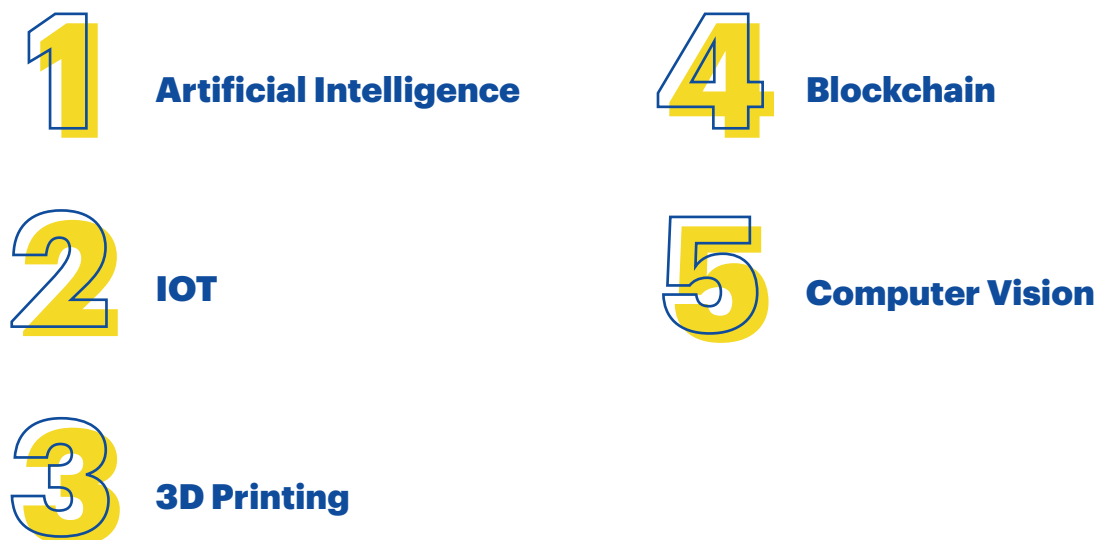
Fonts:  
LinkedIn Economic Graph, 2019

# Emerging technologies according to the demand for talent

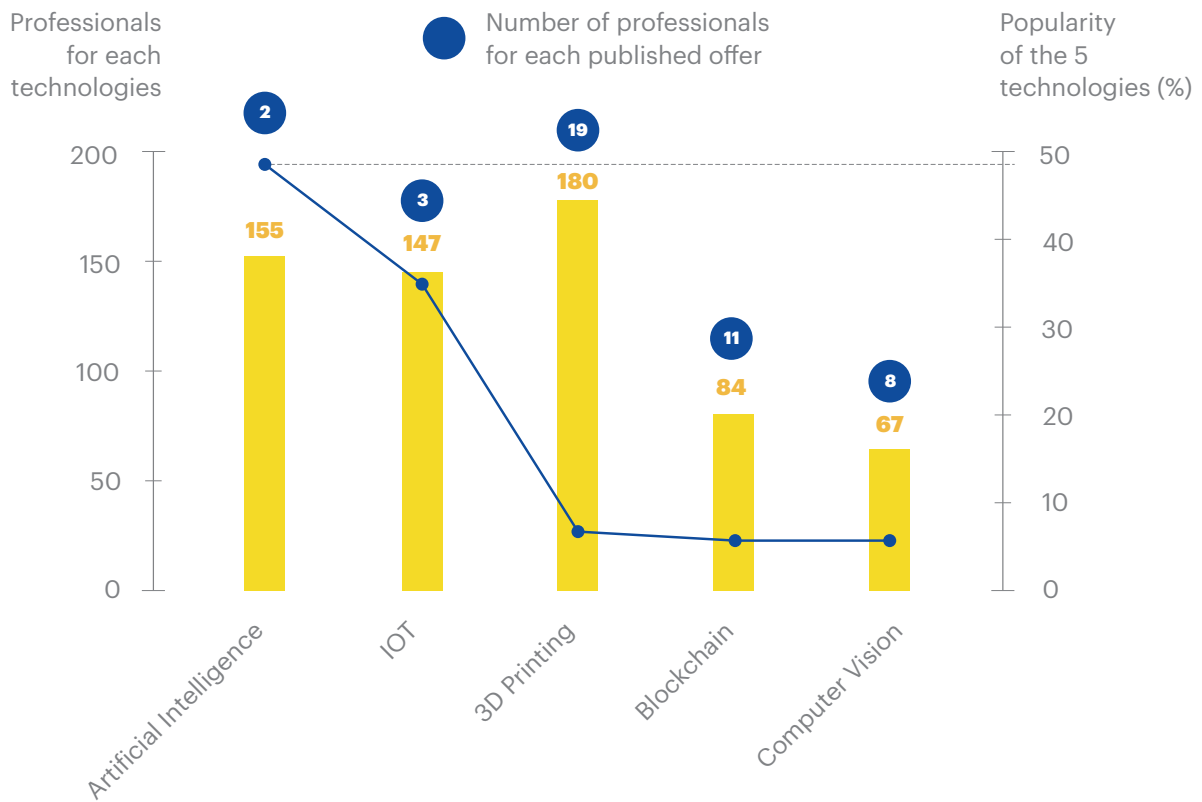
**Artificial Intelligence** is the emerging technology most in demand in Barcelona, followed closely by **The Internet of Things**.

3D printing, Blockchain and computer vision are taking a firm hold on the market and the first products developed in Barcelona using these technologies are appearing.

## Popularity of emerging technologies in Barcelona



## Professionals by emerging technology



Sources:  
TalentUp.io

# Most popular jobs for emerging technologies

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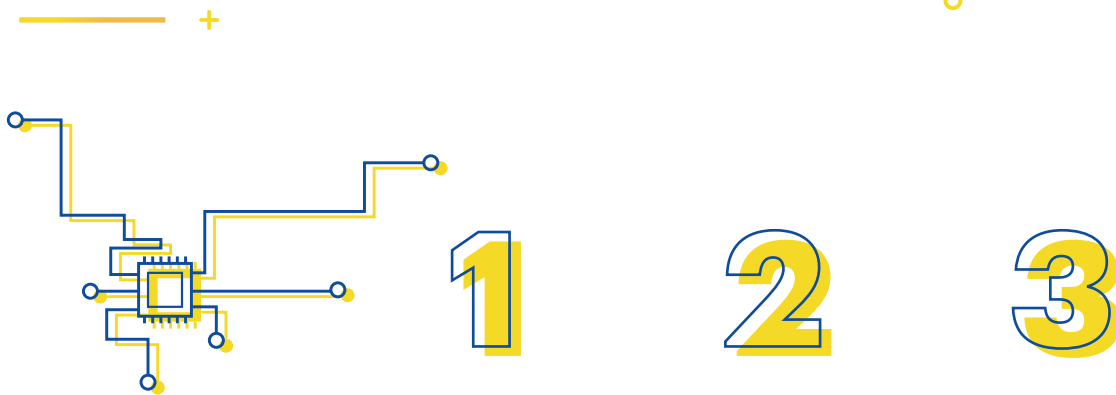
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## Most popular jobs for emerging technologies



<b>Artificial Intelligence</b>	AI engineer	AI researcher	AI programmer
<b>IOT</b>	Software developer	IOT developer	Full stack developer
<b>3D printing</b>	3D designer	Software engineer	Manufacturing engineer
<b>Blockchain</b>	Blockchain developer	Full stack Blockchain developer	Hyperledger Blockchain developer
<b>Computer vision</b>	Computer vision engineer	Machine learning engineer	Data Scientist



# Barcelona: pole of attraction for digital talent



**30% of all ICT professionals in Barcelona are from other cities. Madrid and London are, respectively, the cities in Spain and Europe to export most talent to Barcelona.**

Big Data is the technology to import proportionally most talent over half of all employees come from outside Barcelona



« **Letgo attracts some of the best talent around the world** by offering a rare opportunity to build something ambitious, on a mass scale, in a culture that empowers them to do innovative, impactful work. »

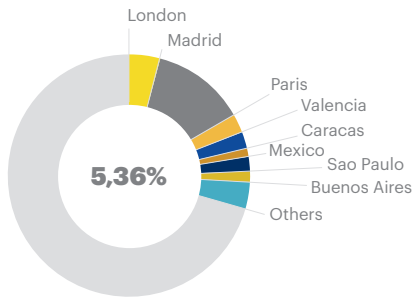
**Alberto Cuevas**

Letgo COO

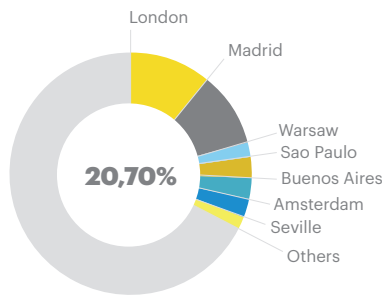


**Percentage of professionals from outside Barcelona**

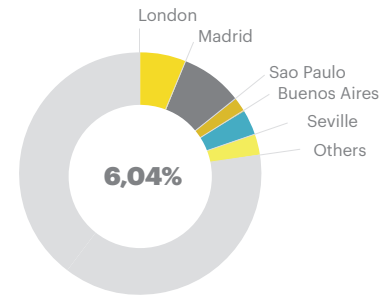




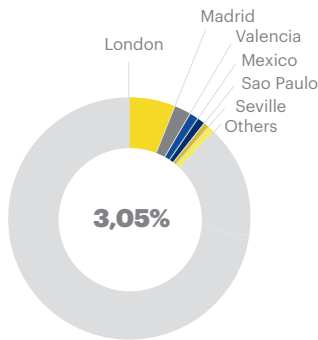
**Desenvolupament web**



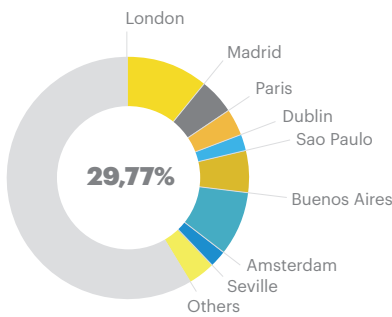
**Desenvolupament App**



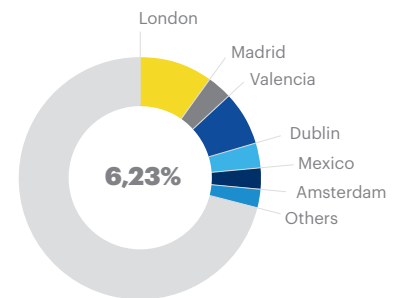
**UX / UI**



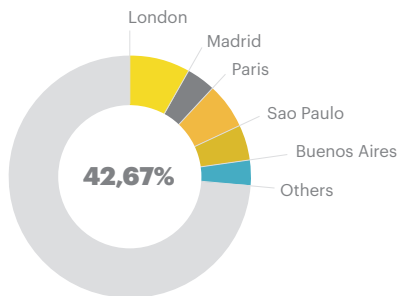
**CRM + ERP Consultant**



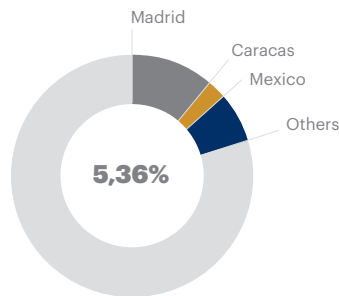
**Agile / Scrum**



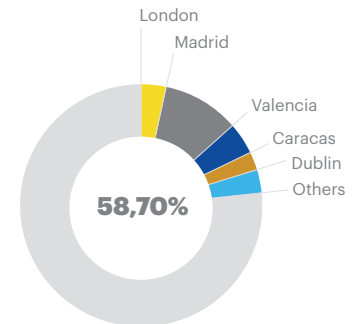
**Cloud (AWS)**



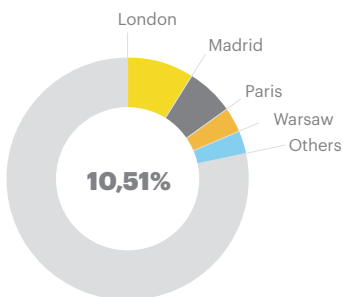
**Cybersecurity**



**Business Intelligence**



**Big Data**



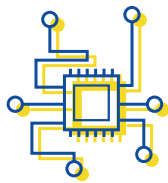
**API**



# Companies appointing most digital profiles



## Consolidated technologies



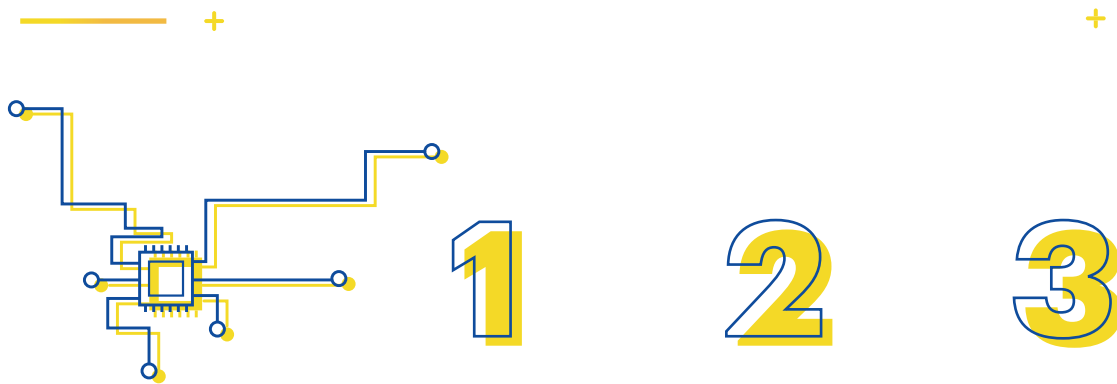
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2

3

<b>Web Developer</b>	Everis	Marfeel	Schibsted
<b>App Developer</b>	Opentrends	Slash Mobility	Wallapop
<b>UX / UI</b>	Everis	Edreams	Altran
<b>CRM + ERP Consult</b>	Sage	Seidor	Everis
<b>Agile / Scrum</b>	Everis	Mango	GFT Group
<b>Cloud</b>	Everis	Itnow	Altran
<b>Cybersecurity</b>	EY	Colt	Deloitte
<b>Business Intelligence</b>	Everis	Accenture	Indra
<b>Big Data</b>	Accenture	Everis	Minsait
<b>API</b>	Everis	Edreams	Altran

## Emerging Technologies



<b>Artificial Intelligence</b>	Everis	Accenture	IBM
<b>IOT</b>	Telefónica	IBM	Accenture
<b>3D printing</b>	HP	Xerox	IBM
<b>Blockchain</b>	Everis	GFT Group	Mastercard
<b>Computer vision</b>	Pangea Reality	Crisalix	Inition

# Training in digital skills

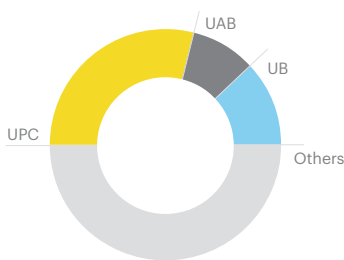
**The Polytechnic University of Catalonia -UPC- is central to the training of digital talent in Catalonia and has an impact on all jobs and technologies.**

The UAB, the UOC, the UB and the UPF also offer training in ICT. The boom of Bootcamps, which have a particular impact on web developer training, is noteworthy.

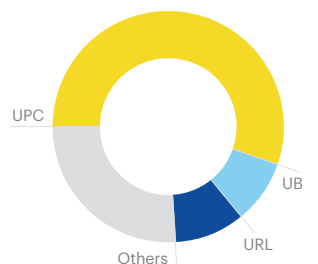


## Sources of talent according to job

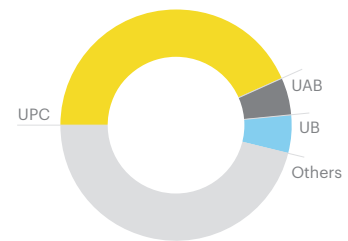
### Emerging Technologies



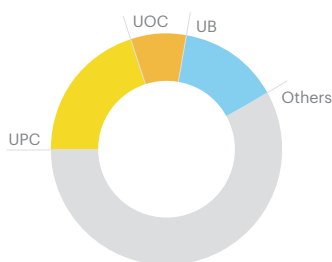
**Artificial Intelligence**



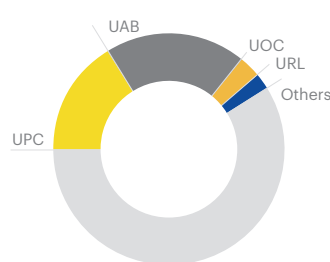
**IOT**



**3D Printing**



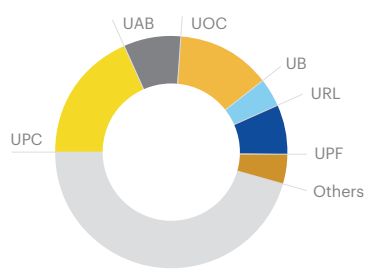
**Blockchain**



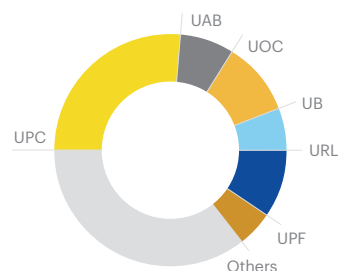
**Computer Vision**

Sources:  
LinkedIn Economic Graph

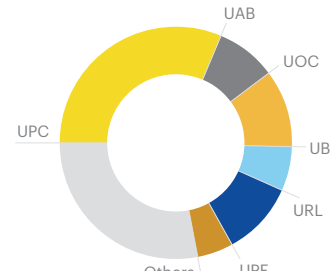
**Consolidated Technologies**



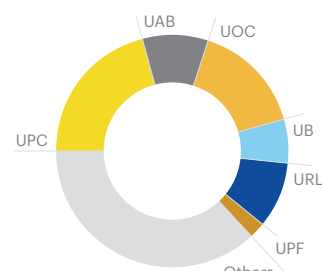
**Web Development**



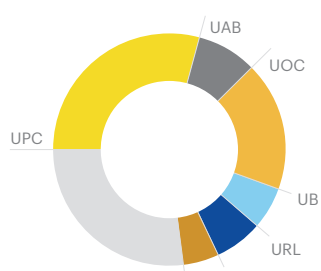
**App Development**



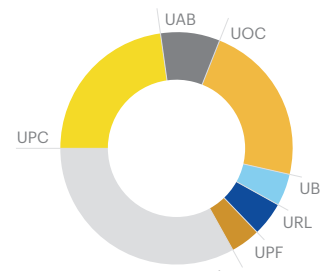
**UX/UI**



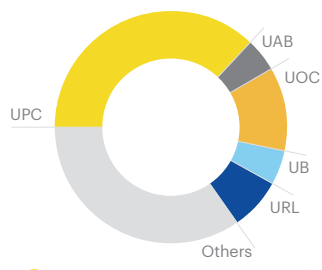
**CRM + ERP Consultant**



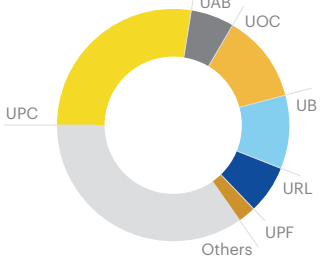
**Agile/Scrum**



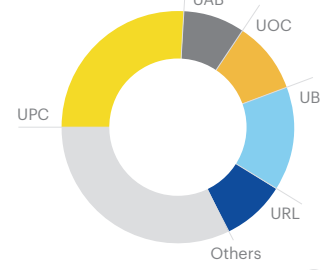
**Cloud**



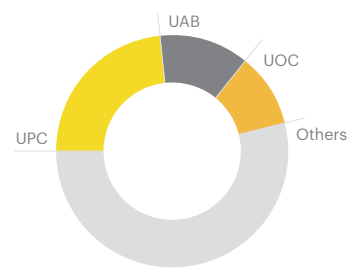
**Cybersecurity**



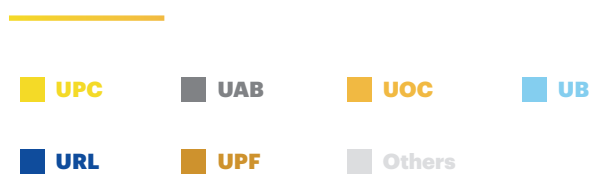
**Business Intelligence**



**Big Data**



**API**



# With more competitive digital salaries than other European cities

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**Barcelona offers higher salaries than Madrid in the digital sector, but notably lower than cities such as London, Paris or Amsterdam.**

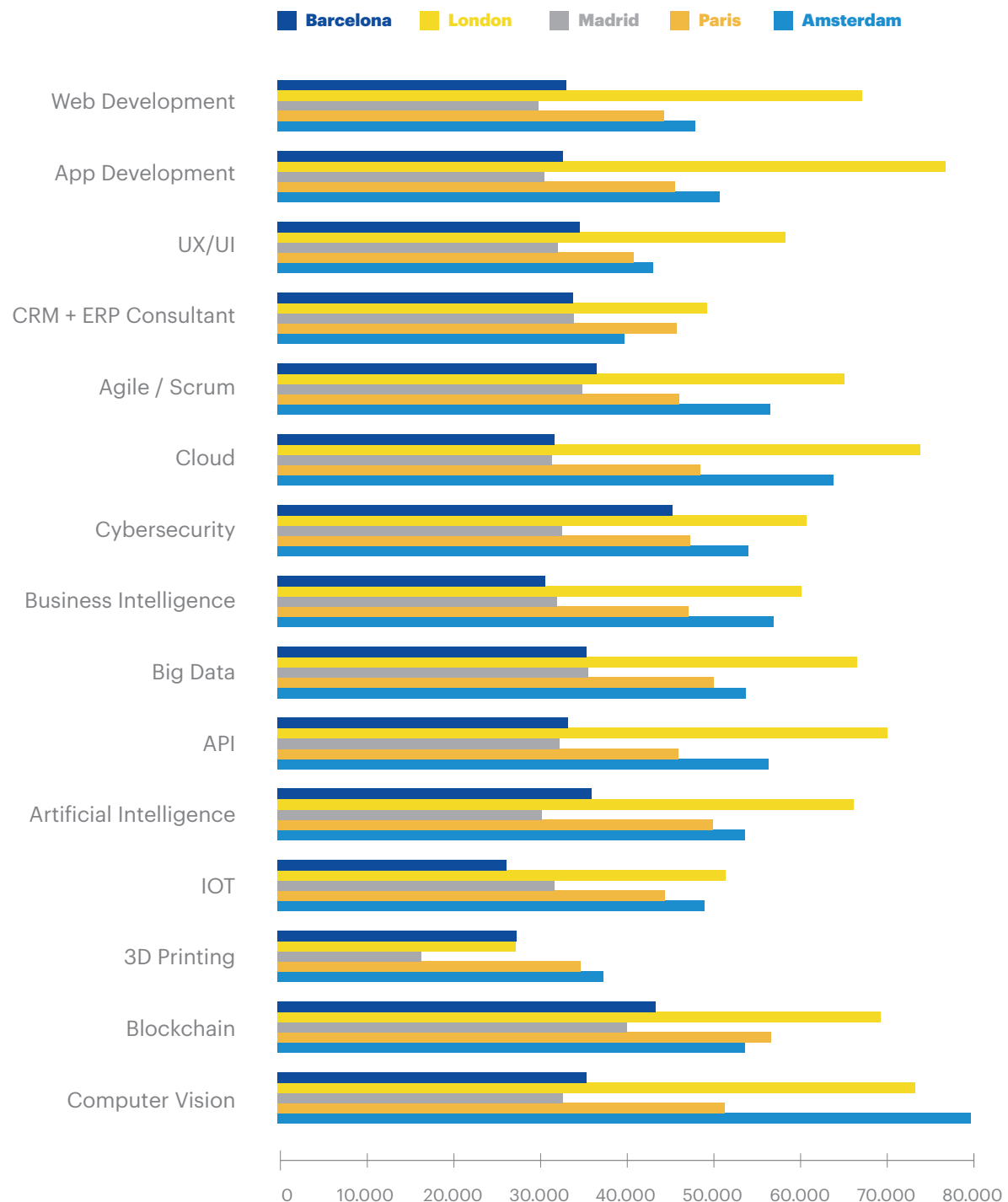
- The salary of a web developer, the profession currently in most demand in Barcelona, is less than half in this city than it is in London.
- In general, salaries increase as of the third year of experience. Salaries for cybersecurity and CRM +ERP consulting jobs increase exponentially.





## Average salary according to job in the main European cities (consolidated and emerging technologies)

— €



Sources:  
TalentUp.io

# 4

## **Fighting the digital talent gap. 2019-2022 Guidelines**

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# How to reverse the current digital gap? 2019-2022 Guidelines



## Promotion of retraining for non-technological talent

Promote campaigns that provide visibility to the opportunities that involve training in digital skills. Accompany professionals throughout the retraining process, from making them aware of the need to acquire digital skills to the training itself.



## Attraction of international talent

Promote proactive activities to attract foreign digital professionals, along the same lines as those used to attract international investment. The Tech Visa must be promoted, and the conditions and red paper involved must be streamlined in order to attract extra-Community talent to the city.



## Training according to market requirements

Adapt training programmes to the evolution and needs of the market. Permanent interaction between the training institutions and the market is key to training future professionals with the skills required by the market.

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### Impulse to schools

Promote the interest for technology and digital skills in schools in order to attract youngsters. The vocation of women for digital jobs and professions must also be promoted in order to increase female training and occupation in the sector.



### Decision-making based on Big Data

The strategies to promote digital talent must be supported by new technologies such as Big Data. Nowadays, these new technologies allow for the real-time analysis of the evolution of the digital talent market and to anticipate trends.



« We are delighted to partner with the Barcelona Digital Talent alliance and provide it with insights about the city's digital talent, skills and potential, drawn from our Economic Graph. This partnership will enable policy makers, businesses and local people to understand and harness labour market changes and identify the 'jobs of the future'. We believe that the talent insights uncovered will also help further strengthen the already vibrant digital ecosystem in Barcelona. »

**Sarah Harmon**

Country Manager Spain and Portugal, LinkedIn







**Barcelona  
Digital Talent**

Promoted by:

