AI ECOSYSTEMS

AI startup ecosystem in Spain

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Introduction

Like electricity or the telephone in the past, AI is transforming the world but at a much higher pace, resulting in continously changing and self-reinforcing business models: AI applications in different business produces more users' interactions, reflected in more data about users' behaviours which transitively improves predictive models. E.g. Spotify initially tracked users' music preferences to boost their recommendation algorithm, and once critical mass was reached, they released the playlist feature (allowing users to mix different songs into one playlist) which directly lead to the Discover Weekly algorithm (by analyzing the hidden patterns of different song combinations from millions of users' sessions).

This is just an example that helps us illustrate how AI is at our fingertips, and most of the companies we use online have an AI-engine that powers their business models.

We cannot imagine our inbox email without spam filters anymore, and we are starting to see better smart-reply engines and nudging reminders. At home, smart thermostats result as an optimized solution for energy saving while maintaining comfort (optimization algorithms and smart sensing), smart alarms are reducing the number of false positives alarms (video analytics) and digital assistants are supporting us with easy commands like grocery shopping lists, alarms, and music playing (voice and intent recognition).

By making sense of vast amounts of data to offer efficient solutions, AI improves products, processes and business models in all economic sectors.

Along this article we will discuss the specific EU and Spain strategies on AI and how they affect the development of AI startups. Following we will review a sample of the most representative Spanish startups using AI as a core element on their business model.

EU strategy on IA

The business development of AI-based companies is very unbalanced geographically around the globe, and unfortunately Europe is not ahead. According to the global consulting company McKinsey [1], the potential to deliver on AI and catch up against the most AI-ready countries such as the United States and emerging leaders like China is large.

By analyzing global trends, the US is the global market leader for Artificial Intelligence with 40% of all AI companies erence number=’2′] ; it is home of the most advanced AI service-oriented companies, such as Google, Facebook, Amazon or Apple, as well as the main cloud-based AI infrastructure providers like Amazon Web Services, Microsoft Azure, or Google Cloud. Both the service-oriented companies and the cloud services are massively used in Europe, continuously providing not only revenues, but more data and use-cases that power their AI proposition, reinforcing their advantage situation with respect to Europe.

America’s leadership is the result of a mature, well-financed, and thriving digital ecosystem in Silicon Valley and the New York/Boston metropolitan area. Over 16 governmental agencies support AI companies financially and politically (including DARPA, CIA and NSA). The US also has leading universities (like Stanford and MIT), as well very strong corporate research facilities (like Google DeepMind).

> “The US is a role model in terms of how a technological industry can grow strongly when governmental stimulation, applied research by universities and corporations, entrepreneurship, private funding, and a thriving M&A market play well together.” [2]

However, China has taken advantage of their unified market and exclusivity of their services in their region, resulting in the second country in the world with more AI companies (11% of the world AI companies are based in China). Artificial Intelligence is part of the country’s ambitious 5-year development plan, as China publicly announced its intention to be world leader for AI by 2030.

The government pumps billions into research centers in Beijing and Tianjin. The market for startups is very well-financed, and valuations are even higher than in Silicon Valley. China has the strongest growth by published academic papers and a surprisingly high number of AI startups. “China shows that with political willpower, adequate funding, and a clear strategy, a country can become an influential Artificial Intelligence player within years”. The access to user data combined with a permissive legal framework results in clear

advantages that accelerate the development and deployment of AI solutions that are then expanded globally, and in both cases (US and China) have been focused in customer-service oriented services such as social media, entertainment or online retailers.

Differently than China or the US, the EU Commission is proposing an approach that places people at the centre of the development of AI (human-centric AI) and encourages the use of this powerful technology to help solve the world's biggest challenges such as climate change, safe transportation and cybersecurity. At the same time, the development of this type of AI builds on Europe's scientific and industrial strengths.

At a political level, the European Union continues to build a single domestic digital market, including clear regulation on data sharing and privacy. The European Commission, as well as governments in the UK, France, Germany, and the Nordics, are developing AI strategies to foster the growth of this promising industry. Europe posses the adequate elements to consolidate as a relevant global player in the growing AI industry, by having the combination of research (universities and research centers), entrepreneurship (startups), funding and M&A to build a sustainable and competitive AI ecosystem.

However, all these elements to become a global AI player are scattered throughout Europe, and we must acknowledge that international competition is fierce. Therefore, in order to guarantee Europe's leading position in AI, it is essential to join forces at the European level to capitalise on our strengths.

The global consulting company McKinsey affirms there are 3 main gaps that EU need to overcome to successfully compete in the global AI race[1]:

- Europe needs to continue developing a vibrant ecosystem of deep tech and AI startup firms that will use AI to create new business models
- Europe's incumbent firms need to accelerate their digital transformations and embrace innovating with AI
- Progress on the digital single market is continuing but still incomplete

In a desperate attempt to tackle these points, on April 2018, the European Union presented a Coordinated Plan on AI [3] where one of the main points is the €20 billion of public and private investments in research and innovation in AI until the end of 2020, fostering collaboration between academia and industry in Europe, and supporting startups and innovators in AI and blockchain in their early stages as well as for companies in their scale-up phase.

In the following section we will analyse how Spain especifically is tackling their AI strategy and their relationship with the start-up ecosystem.

Spanish Strategy on IA

AI entrepreneurship is becoming mainstream globally. In an impressive report produced by MMC Venture in collaboration with Barclays Bank [4] , they state that in 2013, one in 50 new startups embraced AI; today, one in 12 put it at the heart of their value proposition. In order to better understand how Spain ranks, it is important to briefly review the European picture.

The UK is the powerhouse of European AI with nearly 500 AI startups, and Spain ranks fourth with 166 AI-based startups. Despite this impressive number of startups, when observing the AI Preparation Index [5] , Spain ranks eleventh in the EU. This Index measures the position of countries in a range of AI enablers, including the number of AI start-ups per capita, automation, potential of work activities, digital maturity, availability of scientists and engineers, creation of ICT business models, R&D expenditure and ICT connectivity.

Unfortunately, Spain is below the European average in this index as well as in the number of AI startups per capita, the creation of ICT business models, RDI spending and ICT connectivity. Spain is in the last quartile in terms of AI skills, and therefore in a serious situation in terms of the potential of work activities and the availability of scientists and engineers in this area.

These poor indicators are transitively impacted in the observed investments, as private equity investment in start-ups focused on AI in Spain between 2011 and mid 2018 is 3% of the total amount invested in start-ups based in the EU (well behind France – 13%, Germany – 14% or the United Kingdom – 55%) [6].

Despite these past bad indicators, it seems that things are changing, and according to Startup Ecosystem Overview 2019 [7] , the startup ecosystem continues to grow at a rapid pace, with a 55% increase in the number of startups since 2016. Factors such as talent, investment, and capital are drawing more and more entrepreneurs to start their new business ventures.

This report also affirms that Spain is attracting more qualified tech talent than ever, and European founders have voted Barcelona as the third best place to start a company in Europe, which illustrates the city’s appeal. Spain’s connection to the rest of the European and international tech industry makes the country an exciting place for those who want to take a risk and get their ideas of the ground.

In spite of being one of the most appealing places for startups to call home, Spain could do more to accommodate the startup industry. It may be the startups and the ecosystem that are bringing in both talent and economic growth to Spain, “but it’s up to policymakers and community leaders to step up and allow the ecosystem to have a stronger voice in regard to politics, industry, and society. The government must work with startups and not prohibit the potential growth they present for the country’s economy.” [7].

Although the entrepeneurial environment might not be the most adequate, Spain has produced some of the most important AI-based startups in the world, and in the following section we will present a few of them.

Spanish representative AI startups

Health

Mediktor: This startup has developed an accurate expert system for pre-diagnoses, triage and decision-making support allowing patients to make better decisions from the first symptoms. Their core product is scientifically validated symptom checker and triage tool based on artificial intelligence; “Mediktor Hospital” was succesfully trialed in Hospital Clínic in Barcelona, Spain in December of 2017, and based on the interactions with 1,015 patients, it achieved a success rate of 91.3%, compared to the “gold standard” of diagnosis by a human doctor.

Their solution have been awarded the NODE.Health award, the 2018 Best in Class Clinical Studies Competition, focused on discovery, standardization, improvement and sharing best practices in digital evidence.

Mediktor bases its functioning in 2 main areas of AI: *firslty Natural Language Processing,* allowing for a chat-based interface that allows patients to have a similar experience as thhey would have with a physician, and secondly, Machine Learning that allows to make a diagnosis once all the symptons are gathered, based on all past interactions.

Medicsen: Medicsen is a non-invasive artificial pancreas for diabetes based on a learning algorithm, a chatbot app and a needle-free insulin smartpatch. This start-up was born at the Endocrinology Department in La Paz Hospital in Madrid, with the vision of creating a service that allows for the Diabetes treatment personalization, and his founder Eduardo Jorgensen was named Spain’s innovator of the year in 2017 by MIT Technology Review.

Te usage of AI is allowing Medicsen to have 3 important features that compose their value proposition: (1) a machine learning algorithm predicts future glucose values up to 1 hour in advance with less than 10 glucose units as error; (2) by continous data tracking they can adapt the therapy for each patient and each moment recommending meals, insulin doses and exercise; and (3) a NLP powered chat-bot interface allowing questions and answers and easing treatment adherence.

Woom: Is a data model driven startup to empower women to maximize chances of pregnancy either natural or through medical treatment. Their fertility-tracking app recently featured in Forbes’s list of 60 female-led startups, representing one of the most powerful femtech companies in Spain. Their founders launched the app after facing fertility issues themselves and raised €2M through crowdfunding. Every month 80.000 women are interacting with WOOM and they have a community of 40.000 users sharing their doubts,

experiences and support each others around fertility, pregnancy.

Through an algorithm, WOOM identify fertile window and calculates daily percentage of pregnancy based on 32 data points such: period regularity, age, IMC (weight/height), smoking & lifestyle habits and it also delivers personalized content. Also, users receive support through an engaged community and a platform of fertility services.

Mobility Services

Cabify: One of the biggest Spanish startups unicorns, an international transportation network company that provides vehicles for hire via its smartphone mobile app. Vehicles are driven by their owners, who must pass a rigorous selection process. Cabify's platform connects people with private cars and drivers to make getting around cities easier, safer and more enjoyable.

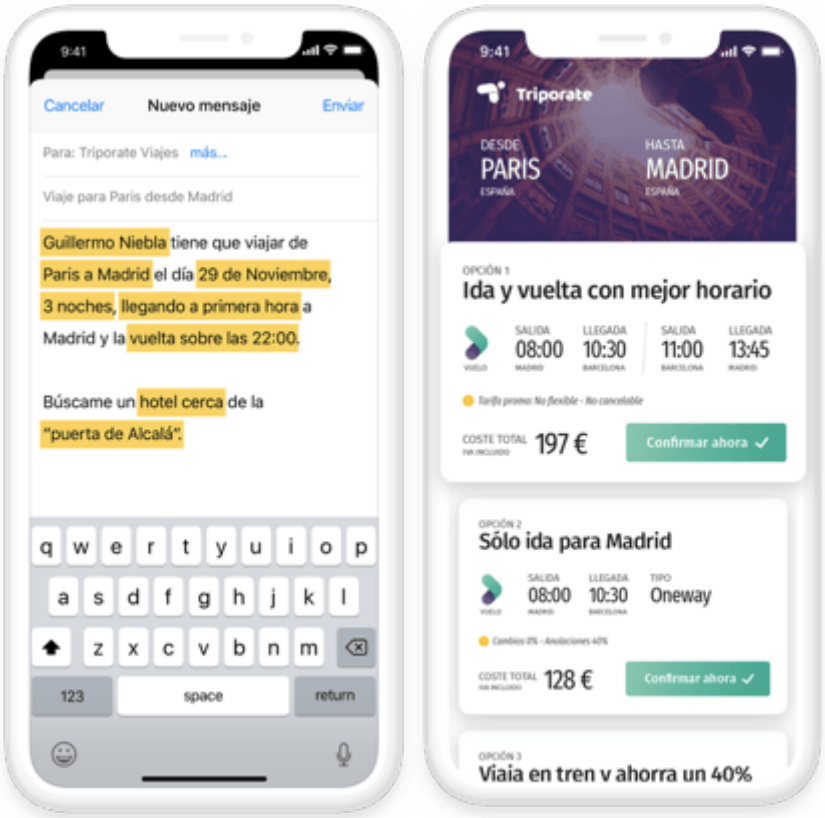
Innovation initiatives at Cabify also focus on areas such as improving the algorithm that matches users to drivers, which Pilo says has reduced customer waiting times by 5 percent. Big Data and machine learning are being used to detect common occurrences such as rides that end within very short distances or outstanding payments, therefore reducing the need for staff involvement.

"We use technology and automation to analyze passenger and driver behavior indicators in a scalable manner. This enables problem-solving before users even realize, therefore improving their experience while increasing operational efficiency," stated by Pilo, Cabify's Brasil Country Manager.

Triporate: Powered by AI, Triporate's platform extrapolates transport and accommodation preferences from email to deliver a personalized travel itinerary for business travellers.

Launched in 2017, Triporate manages each part of the travel itinerary within company travel policy parameters. This includes booking anything from flights, trains or taxis, hotels, serviced apartments or AirBnB accommodation, as well as managing billing and expenses and compounding them into a single monthly invoice. In the five months January through May 2018, the company multiplied by six the volume of trips handled and generated €60,000 turnover. In the first quarter alone, Triporate claimed it achieved growth of 88% MoM.

Triporate's strength lies in its development of natural language processing (NLP) technology to interpret email text, and in AI algorithms which research and compare results on multiple travel solutions.



Triporate snapshots: from user's request to trip proposal.

OnTruck: Founded in 2016, the Madrid and Barcelona-based startup is building the leading tech platform and carrier network for B2B, on-demand trucking. OnTruck makes trucking simple and transparent, giving shippers and carriers back control.

It enables companies who have road freight shipping needs in Spain and more recently the U.K. to connect with the startup's network of drivers operating in both countries. For the truck drivers themselves, many of whom are owner-operator businesses, OnTruck offers a steady stream of readily priced work.

OnTruck's platform automates the process of connecting a shipment to carriers' trucks with users selecting price specs and pick-up arrangements. It earns revenue through commission fees, generated by algorithm, on the charges from carriers and shippers.

Specifically, OnTruck describes its technology as automating the matching of loads to trucks, and providing real-time GPS tracking of all shipments. The company's algorithms also attempt to dispatch work in a way that significantly cuts down on empty journeys, which is a particularly common problem for the regional and short-haul market OnTruck is targeting.

Housing and Talent

Badi: This Barcelona-based urban room rental startup improves urban living by connecting people with shared spaces with a seamless and powerful product experience. The company built its platform with the aim of disrupting the older classifieds approach to room rentals,

where people list rooms to rent and then have to do lots of manual legwork fielding all the calls and emails their advert receives.

The matchmaking algorithm used by Badi is based on machine learning technology. The platform cross references the data of all the users and brings together those who have the most in common. Moreover, the more active the person is on the application, the more information will be generated by the algorithm, so that the recommendation for flatmates becomes more accurate.

Jobandtalent: A free job search app that instantly matches employers with job seekers, simplifying the hiring process. Jobandtalent is the first business to provide the entire process of selecting, hiring and managing employees within a mobile app. It uses unique technology, developed by data scientists and engineers, which combines big data analysis and machine learning to match the right job opportunities with the right candidates in the most accurate and efficient way possible, claiming 80% matching accuracy. This algorithm learns from the users and their interaction with the platform, and they measure the effectiveness of our technology with a self-created industry performance metric: ATR (Application Through Rate), that measures the rate of applications that the algorithm generates per job view.

This algorithm acts like a virtual recruitment consultant that analyses hundreds of thousands of jobs and suggests suitable vacancies taking into consideration our candidates' preferences and professional profiles. Jobandtalent is, in essence, like a virtual headhunter, without the cost.

Fraud & Cibersecurity

Buguroo: Founded out of Madrid in 2010, this cybersecurity company that develops software based on deep learning (AI) and analysis of biometric behavior for online fraud detection. Buguroo's product BugFraud detects cyberthreat thanks to the development of next generation technologies based on deep learning (artificial intelligence), neuronal networks and behavioral analysis biometric.

Their main product, bugFraud uses Deep Learning algorithms to identify fraudsters or bots trying to impersonate legitimate users. It detects suspicious users and prevents attacks from happening. bugFraud can detect unknown malware campaigns aiming at manipulating the content that the user is watching on their web browser or mobile apps (web injections, MiTB, RAT, RitB), regardless of whether or not the interaction matches a known malware signature. Their approach goes beyond known signatures or blacklists, analyzing whether web page navigation has been subverted by fraudsters. bugFraud classifies grey anomalies to prevent false positives and false negatives.

"By collecting thousands of parameters relating to the customer's behavioral biometrics and environment, including smartphone and mouse movements, keystrokes, device profiling, geolocation and malware records, Buguroo is able to create a unique 'cyber profile' for each user – a digital DNA – that stops fraudsters from impersonating financial

services customers online and manipulating accounts" the company said in a statement.

Red Points: A Barcelona-based technology company that provides a solution for brands and content owners to counterfeiting online and digital piracy. Red Points is the preferred brand protection partner in the sporting, entertainment, fashion, editorial, design and luxury industries, providing unique products across the entire digital spectrum. They are able to do this through our proprietary technology which employs machine learning algorithms to scan the internet and identify all violations and infringements. Unfortunately, not much information is revealed about the AI behind these algorithms.

Chatbots & RPA

Taiger: Taiger provides robotic process automation solutions. Primarily serving the banking, insurance, and government sectors, the company specializes in advanced AI-engineered information access and extraction solutions. It provides solutions for automated onboarding, processing of SSIs, ISDA documentation review, claims processing, customer biodata reconciliation, processing of NRICs & CPF statements, automatic metadata generation, semantic search, and more. Notable clients include Santander, Manulife, and Vodafone. The company was recognized as a Gartner Cool Vendor in 2017.

Inbenta: Inbenta is a cloud-based platform which offers online self-service and conversational solution using artificial intelligence and natural language processing engine. It uses semantic search technology which enables search and virtual assistant technologies to perform complex natural language operations. With interaction management, knowledge management, and content delivery it helps to improve customer experience. It claims to match unstructured, intention narrowed user search queries with specific, structured answers using semantic search NLP. Clientele includes Groupon, Ticketmaster, Schlage, Blurb, among others.

Cognicor: CogniCor Technologies is an AI-enabled provider of automated customer service software platform for enterprise. CogniCor's cognitive AI powered chatbot platform enables enterprises to build high end chatbots without the need of scripting all the flows. It offers innovative features such as document ingestion, built in customer journeys, and transactional support.

Sherpa.AI: ased in Bilbao and Silicon Valley, this company is responsible for creating Digital Assistant technology based on strong Artificial Intelligence algorithms with conversational and predictive abilities that allow the assistant to learn about the users and anticipate their needs before they ask. Sherpa's technology is designed for manufacturers of consumer products like cars, intelligent headphones, home speakers, appliances, and electronic accessories that are looking to add intelligence to their products and explore new business models based on offering digital services.

Their success is proven as it has been preinstalled on Samsung smartphones since 2016 and has a product for cars, thanks to an agreement with Porsche.

Other Relevant Companies

Source{d}: This is an engineering observability platform that develops neural networks for the executives to analyze and understand actionable insights about codebases, software development processes, and teams. The company is characterized by matching the code of developers to bring them closer to an appropriate project based on the objective measure of their work.

Geoblink: A SaaS-based location intelligence solution that helps companies make informed business decisions that helps professionals from the retail, real estate, and FMCG industries make informed decisions about their business strategies. Geoblink combines traditional and non-traditional advanced analytics techniques over big and small data, together with a rich map-based UI to display multiple types of statistics in a way that is simple to use and easy to understand.

Graphext: Graphext provides an end-to-end workflow solution that empowers data analysts to enrich and transform data, perform data exploration and analysis, and share insightful reports. Graphext aims to disrupt the traditional data analytics industry by focusing on making data exploration and analysis faster and easier to do for everyone.

Conclusions

In this article we have reviewed the current status of AI startups in Spain, where we have a number of important companies disrupting their business verticals, such as Woom (in femtech), OnTruck and Cabify (in mobility), or Buguroo (in fraud).

However, the previous discussion about the status of AI in Europe and Spain have shown us that Spain has eneough elements to become a relevant player in the European landscape, but more cooperation between from the Government is needed to foster this entrepeneurial environment.

The successful startup soil and the traditional solid academic European entities will place Europe as a strong competitor against current AI players (USA and China) once the combination of government support for startups is properly combined with a pan-unified European AI and data strategy.

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