Combination of **processes, technologies and business models** that are **based on data and capturing the value of the data itself**. This can be achieved both through improved efficiency through the **analysis of data** (a more traditional view) or via the **emergence of new business models** involving an engine of growth. The main objective of big data is to provide a **technological infrastructure for companies** and organisations with the aim of **storing, processing and analysing the large amount of data** generated daily in a **cheap, fast and flexible** way. This requires the development and implementation of both hardware and specific software to manage this amount of data and to extract useful information for business objectives.

ORIGIN OF THE INVESTMENT OPPORTUNITY

● ECONOMIC/BUSINESS	● DEMAND	◔ REGULATIONS	● TECHNOLOGY

For some time, **public administrations and businesses have stored information about citizens but did not have the capacity to process such large volumes of it**. Big Data comes about thanks to the fall in storage costs, the increase in processing speed and the appearance earlier this century of the **massively parallel computing and software**.

Companies need to analyse data, since this analysis to find relationships between data that at a glance seem to have nothing in common but that **may be of benefit to businesses, organisations and the general public** because It allows them to detect patterns, trends and correlations to make informed decisions. It is very useful to detect subtle correlations that may be lost when analysing smaller data sets for carrying reliable diagnostic and prognostic tests in many areas.

Businesses demand **applications that enable them to analyse weather, stock values, traffic in real time, predict trends in trade and crime**, even when a **virus outbreak or epidemic** will occur in a population.

LOCATION OF THE INVESTMENT OPPORTUNITY IN THE SECTOR VALUE CHAIN

Telecommunications networks	Production	Commercialisation	Services

The Big Data business opportunity is found in the services link. It encompasses the **development of solutions** and support programmes that allow **analysis and management of data**. That is, it allows users to store, manage and analyse data from many different sources, in addition to given access to data to business analysts, data scientists and IT users.

DIFFERENTIATING FACTORS OF THE INVESTMENT OPPORTUNITY

CONSUMER/USER	COMPANY/INNOVATION	SOCIETY
●●● Innovation	○○○ Operations	●●○ Environment
●○○ Price	○○○ Supplies	●●○ Well-being
●●● Quality	●●○ New business lines	●●○ Safety

- For companies implementing such solutions, Big Data means **understanding the profile, needs of and feelings of its customers** about products and/or services. This is particularly relevant as it allows for **adapting the way the company interacts with its customers** and how it serves them.
- This allows **improving the efficiency and costs** and improving business management.

- Today's businesses are changing and seeking new ways to **get value through the use of information**. This places new demands on the IT infrastructure of their companies. It is when the opportunity arises for technology companies that **develop new products that meet these business needs**.

- In the US it has been used to **predict earthquakes, unemployment rates, lower crime rates** and track **epidemics**. It also has environmental related applications.
- Thanks to this technology along with data capture using sensors scattered around the city, the French city of Lyon has been able to analyse **traffic congestion** in order to predict at any time when it will cause a jam.

INVESTMENT OPPORTUNITY LIFE CYCLE

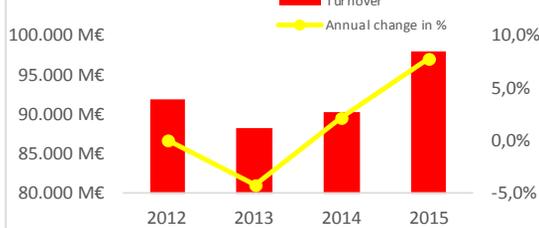| DEVELOPMENT	INTRODUCTION	GROWTH	MATURITY

Information is multiplying exponentially. **Most of data stored** in the world have been **created in the last years**. The **sources** of these data are increasingly **diverse**, ranging from the traditional, such as **bank transactions, SMS or telephone calls**, to the most novel, such as **social networks, smartphones, or the Internet of Things**. There is therefore the need to be able to collect information in an automated manner and which in turn renders it easily accessible. **Big Data is beginning to become more and more important** thanks to the proliferation of web pages, image and video applications, social networks, mobile devices, apps, sensors, the Internet of Things, etc. capable of generating more than 2.5 quintillion bytes per day [1].
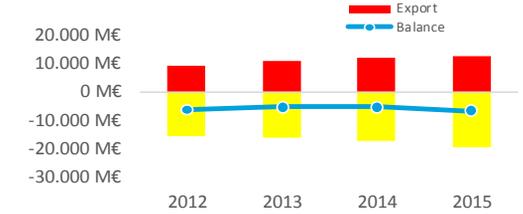
CHARACTERISTICS OF THE ICT SECTOR [2]

Turnover

Legend: Turnover (red bars), Annual change in % (yellow line)

X-axis: 2012, 2013, 2014, 2015
Left Y-axis: 80.000 M€ – 100.000 M€
Right Y-axis: -5,0% – 10,0%

Trade balance

Legend: Import (yellow), Export (red), Balance (blue line)

X-axis: 2012, 2013, 2014, 2015
Y-axis: -30.000 M€ – 20.000 M€

Employment

Legend: No. Companies (red bars), No. employees/company (yellow line)

X-axis: 2012, 2013, 2014, 2015
Left Y-axis: 27.000 – 33.000
Right Y-axis: 12 – 17

Territorial distribution of turnover (2014)

- Andalusia 2%
- Valencian Community 2%
- Other 9%
- Catalonia 15%
- Madrid 72%
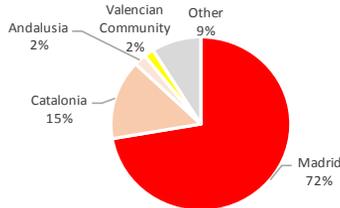
SUPPLY

TOP 5 COMPETITORS

#	Company	Net sales	Last available data
1	Hewlett-Packard Company (HP)	€336.47 M	2013
2	IBM	€2,177 M	2013
3	PowerData	€5.35 M	2012
4	Synergic Partners	€3.02 M	2013
5	Stratio	€0.02 M	2013

DEMAND

GROWTH

- **IT spending on Big Data** worldwide grew from **27 billion dollars** (20.938 billion euros) in 2012 to estimated **55 billion** (42.652 billion euros) in **2016**.
- Demand for **Big Data service expenditure** was estimated to increase to **132.3 billion dollars in 2015**, which equates to **4.4 million jobs** worldwide. The demand will generate 550,000 jobs in outsourcing over the next years. Another 40,000 jobs will be generated in software vendors over the next years.[3]

SUCCESS STORIES

Fujitsu has built an innovation centre for data analytics in Madrid The company has opened an innovation centre in Madrid specializing in data analytics and in which it has initially invested five million euros.

The opening of this centre in Madrid is a demonstration of the **importance of innovation in Spain for Fujitsu**. The centre already has **several innovative projects in Spain with major Spanish institutions and organisations**, including the University of Seville and the Foundation for Biomedical Research San Carlos Clinical Hospital. In the first case, the project is focused on **heritage data integration** , and in the second, a **support system for clinical decisions based on data fusion**.

EY have a Big Data and Analytics laboratory located in Spain for the financial sector. EY Global has chosen Spain to host the **first Global Centre of Excellence in Big Data and Analytics**, specialising in **Financial Services**. Conceived as a `laboratory' for ideas and business strategy design for the sector, the Centre intends to respond to the challenge and strategic importance that the **data revolution implies for the management of customers in banking**, insurance and Wealth Management. The initiative, with which EY aims to become the world leader in the field, is already working on the design of what will be the future financial industry. Among other initiatives, the Centre will provide training, which takes place through what is called: "The Academy", and will launch a specialised one year training programme in Big Data and Analytics.

Iberdrola uses Big Data technology to guide the expansion of smart grids.

Iberdrola and Ibermática have collaborated in developing a software solution based on Big Data, which aims to **efficiently manage its database**, which contains information transmitted every hour **from smart meters** that Iberdrola is incorporating in its electricity distribution network as part of their innovation and infrastructure improvement projects. This analysis allows to **plan, evaluate and monitor electricity consumption** and therefore reduce energy costs and reduce emissions. This advanced technology, which allows the processing of data from 240 million daily records from 11 million meters, has seen Iberdrola take the lead in the expansion of the smart grid.

POSITIVE FACTORS FOR INVESTING IN SPAIN

Favourable factors in Spain for the development of the opportunity

Public Administrations' commitment to Big Data	**Big Data** has various **applications in Smart Cities** for **managing the amounts of data generated** mainly from the interactions of people on social networks, and from sensors and connected devices. In addition to the **large volume of data to be managed** in the cities of today, there are a **variety (**over 80 percent are unstructured) and **decisions must be made quickly**. In Spain, the development of **Smart Cities** is very advanced and therefore there is a **large market for the application of Big Data solutions**.
Interest in Big Data above the European average	Significantly, a high number of **Spanish companies (96%)** have already analysed or are considering how Big Data could benefit their business. This is 15 percent above the **average of other countries analysed (81%)** according to the study "Big Data: Beyond the noise. "
Specific qualifications in Spain	Spanish universities, aware of the importance of Big Data, are developing **specific courses**, namely the University of Valladolid offers the **Degree in Computer Engineering with a specialisation in computation**, in addition to the two 'traditional' Software and Information Technology degrees.
Social factors and habits	Social networks such as Facebook, Twitter and LinkedIn, Foursquare and Google+, are widespread and adoption by users has accelerated producing a large amount of data. Spain has an economically **active population of 28.9 million people**. **73% of this population actively uses social networks monthly**.[4]

Favourable factors for the sector in Spain

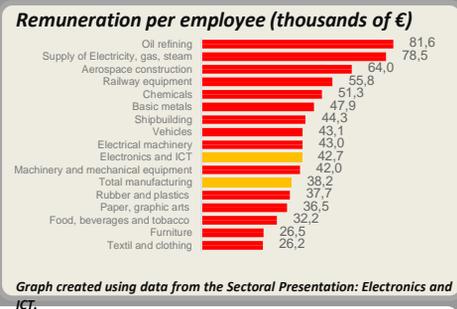|	
Macroeconomic situation	**The Added Value of the information technology and communications sector** in 2015 was 45,296 million euros, representing 4.9% of the added value of the Spanish economy. Sector exports totalled **13,032 million euros.** [2]

Remuneration per employee (thousands of €)

Oil refining	81,6
Supply of Electricity, gas, steam	78,5
Aerospace construction	64,0
Railway equipment	55,8
Chemicals	51,3
Basic metals	47,9
Shipbuilding	44,3
Vehicles	43,1
Electrical machinery	43,0
Electronics and ICT	42,7
Machinery and mechanical equipment	42,0
Total manufacturing	38,2
Rubber and plastics	37,7
Paper, graphic arts	36,5
Food, beverages and tobacco	32,2
Furniture	26,5
Textil and clothing	26,2

Graph created using data from the Sectoral Presentation: Electronics and ICT.

Labour market	The **average productivity per employee** in the ICT sector is **52,100 euros** per year. Their **average individual remuneration** is **42,700 euros per year**. The **Unit Labour Cost** accounts for **81.8%** of the ratio between the remuneration per employee and the individual productivity (productivity defined as value added per employee). [5]
Incentives	The Ministry of Energy, Tourism and Digital Agenda allocated **80 million euros to R&D in the ICT sector in 2016 to promote high value technologies** in industries of the future (Components and Systems, Internet of the future, High Performance Computing (supercomputing), robots and autonomous systems, Internet of Things, cloud computing solutions for mass data processing...), Cybersecurity and digital trust, agrifood and environmental management, energy efficiency, transport and logistics, and digital content.
I+D+i	There are 15,736 **innovative companies** and the **percentage of innovative companies is** roughly **28.5%**, spending a total of **13,6747 million euros** on innovation.[6]
Talent	Installs in Spain Google Campus to the world's largest entrepreneurs, ahead of London, Seoul and Tel Aviv, demonstrating confidence in the creativity and talent in the country by leading companies the sector. These facilities provide work areas and technical advice for the implementation of new projects. TechHub is involved in this project which manages a **global community of digital entrepreneurs**.
Geographic location	Spain is **within reach of three main regions**: the **European** region, the **Mediterranean** region and the **Atlantic** region. Spain is considered to be the gateway between North Africa and Europe, and a key link to Latin America, not only because of its geographical location but also because of its strong historical and cultural ties with the region. In Spain the **Canary Islands** play a key role with regards to **maritime traffic** with **West Africa**.
Technological and research infrastructure	Spain has a very advanced technological infrastructure as shown in areas such as: the presence of **84 technology parks** that house more than 5,000 technology companies and a **broadband coverage of 96.5%**, one of the few OECD countries that has had included in its legislation since 2012 the **universal obligation of 100 Mbps broadband supply**. In the **business** arena, broadband penetration exceeds that achieved in the European Union. In 2016 **99%** of **companies** in **Spain** that access the Internet do so by broadband [7].

Technology centre locations

Graph created using data from Spanish Foundation for Science and Technology.

Transport infrastructure and logistics networks	There are **250 airlines** operating in Spain in its 47 airports; its high-speed rail network is the 2nd best in the world and the best in Europe; it is ranked **1st in the EU for its motorway network**; and it has excellent sea connections to its **46 ports** distributed along the Atlantic and Mediterranean coasts.