



Architectures for High-Volume, Heterogeneous Category Information Processing in the Company

Language: English
Course Modality: Online

Duration: 6 months

Certificate: TECH Technological University

Official N° of Hours: 450 h.

Target Group: Professionals wishing to update knowledge

of advanced and cutting-edge IT with the aim of broadening their skills.

Website: www.techtitute.com/school-of-business/postgraduate-diploma/postgraduate-diploma-architectures-high-volume-heterogeneous-category-information-processing-company

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# 01 **Welcome**

The role of system administrator has now changed from being an operator who modifies the configuration of a system to implement a series of policies to being more of a software architect who designs and implements specific algorithms whose execution will alter the configuration of a series of resources to meet specific requirements demanded at a given time by a specific situation.

During the last decade, in software engineering, especially on the *Backend Side*, the set of concepts, tools and technologies around distributed systems and data management and processing has grown considerably. In today's rapidly changing landscape, it is critical that the student understands the underlying technology of many of today's systems that are highly demanding in terms of scalability, performance and reliability. The ultimate goal of this is to be in the best position to make good decisions in the design of distributed systems, among other issues of interest.









# tech 08 | Why Study at TECH?

#### At TECH Technological University



#### **Innovation**

The university offers an online learning model that combines the latest educational technology with the most rigorous teaching methods. A unique method with the highest international recognition that will provide students with the keys to develop in a rapidly-evolving world, where innovation must be every entrepreneur's focus.

"Microsoft Europe Success Story", for integrating the innovative, interactive multi-video system.



#### The Highest Standards

Admissions criteria at TECH are not economic. Students don't need to make a large investment to study at this university. However, in order to obtain a qualification from TECH, the student's intelligence and ability will be tested to their limits. The institution's academic standards are exceptionally high...

95%

of TECH students successfully complete their studies



#### Networking

Professionals from countries all over the world attend TECH, allowing students to establish a large network of contacts that may prove useful to them in the future.

100,000+

200+

executives trained each year

different nationalities



#### **Empowerment**

Students will grow hand in hand with the best companies and highly regarded and influential professionals. TECH has developed strategic partnerships and a valuable network of contacts with major economic players in 7 continents.

500+

collaborative agreements with leading companies



#### **Talent**

This program is a unique initiative to allow students to showcase their talent in the business world. An opportunity that will allow them to voice their concerns and share their business vision.

After completing this program, TECH helps students show the world their talent.



#### **Multicultural Context**

While studying at TECH, students will enjoy a unique experience. Study in a multicultural context. In a program with a global vision, through which students can learn about the operating methods in different parts of the world, and gather the latest information that best adapts to their business idea.

TECH students represent more than 200 different nationalities.



# 8

#### Learn with the best

In the classroom, TECH's teaching staff discuss how they have achieved success in their companies, working in a real, lively, and dynamic context. Teachers who are fully committed to offering a quality specialization that will allow students to advance in their career and stand out in the business world.

Teachers representing 20 different nationalities.



At TECH you will have access to Harvard Business School case studies"

# Why Study at TECH? | 09 tech

TECH strives for excellence and, to this end, boasts a series of characteristics that make this university unique:



#### **Analysis**

TECH explores the student's critical side, their ability to question things, their problem-solving skills, as well as their interpersonal skills.



#### **Academic Excellence**

TECH offers students the best online learning methodology. The university combines the Relearning methodology (the most internationally recognized postgraduate learning methodology) with Harvard Business School case studies. A complex balance of traditional and state-of-the-art methods, within the most demanding academic framework.



#### **Economy of Scale**

TECH is the world's largest online university. It currently boasts a portfolio of more than 10,000 university postgraduate programs. And in today's new economy, **volume + technology = a ground-breaking price**. This way, TECH ensures that studying is not as expensive for students as it would be at another university.





# tech 12 | Why Our Program?

This program will provide students with a multitude of professional and personal advantages, particularly the following:



#### A significant career boost

By studying at TECH, students will be able to take control of their future and develop their full potential. By completing this program, students will acquire the skills required to make a positive change in their career in a short period of time.

70% of participants achieve positive career development in less than 2 years.



# Develop a strategic and global vision of companies

TECH offers an in-depth overview of general management to understand how each decision affects each of the company's different functional areas.

Our global vision of companies will improve your strategic vision.



#### Consolidate the student's senior management skills

Studying at TECH means opening the doors to a wide range of professional opportunities for students to position themselves as senior executives, with a broad vision of the international environment.

You will work on more than 100 real senior management cases.



#### Take on new responsibilities

The program will cover the latest trends, advances and strategies, so that students can carry out their professional work in a changing environment.

45% of graduates are promoted internally.



#### Access to a powerful network of contacts

TECH connects its students to maximize opportunities. Students with the same concerns and desire to grow. Therefore, partnerships, customers or suppliers can be shared.

You will find a network of contacts that will be instrumental for professional development.



### Thoroughly develop business projects

Students will acquire a deep strategic vision that will help them develop their own project, taking into account the different areas in companies.

20% of our students develop their own business idea.



#### Improve soft skills and management skills

TECH helps students apply and develop the knowledge they have acquired, while improving their interpersonal skills in order to become leaders who make a difference.

Improve your communication and leadership skills and enhance your career.



#### Be part of an exclusive community

Students will be part of a community of elite executives, large companies, renowned institutions, and qualified professors from the most prestigious universities in the world: the TECH Technological University community.

We give you the opportunity to train with a team of world renowned teachers.





# tech 16 | Objectives

Your goals are our goals.

We work together to help you achieve them.

The Postgraduate Diploma in Architectures for High-Volume, Heterogeneous Category Information Processing in the Company enables students to:



Generate specialized knowledge to perform data analysis



Establish best practices for data management according to their typology and uses



Unify diverse data, achieving consistency of information



Produce relevant, effective information for decision-making

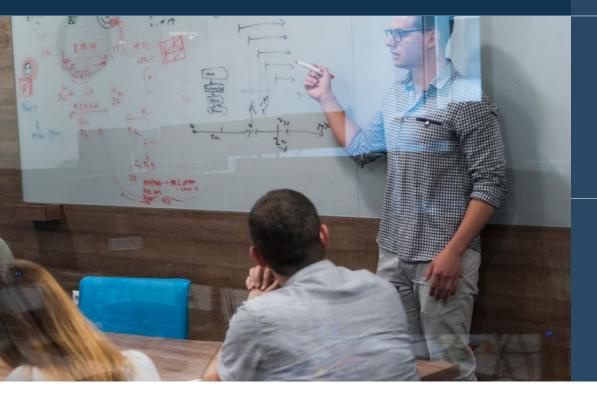




Develop data access and reuse policies



Ensure the security and availability, integrity and confidentiality of information





Use of data management tools (with R)



Establish the concepts of reliability, scalability and maintainability









# tech 22 | Structure and Content

#### **Syllabus**

The Postgraduate Diploma in Architectures for High-Volume, Heterogeneous Category Information Processing in the Company is an intensive program that prepares students to face challenges and business decisions in the field of Data Processing and Security in the Company.

The content of the Postgraduate Diploma in Architectures for High-Volume, Heterogeneous Category Information Processing in the Company is designed to promote the development of skills that enable more rigorous decision making in uncertain environments.

Throughout 450 hours of study, the student will analyze a multitude of practical cases through individual and teamwork. It is, therefore, an authentic immersion in real business situations.

This Postgraduate Diploma deals in depth with the world of computer science in the business world, and is designed to train professionals who understand Advanced Computing Techniques and Technologies in a Company from a strategic, international and innovative perspective.

A plan designed for students, focused on their professional improvement and that prepares them to achieve excellence in the field of business management and administration. A program that understands both yours and your company's needs, through innovative content based on the latest trends, and supported by the best educational methodology and an exceptional faculty, which will provide you with the skills to solve critical situations, creatively and efficiently.

This Postgraduate Diploma takes place over 6 months and is divided into 3 modules:

Module 1 Data Types and Data Life Cycle

Module 2 Scalable and Reliable Massive Data Usage Systems

Module 3 System Administration for Distributed Deployments



#### Where, When and How is it Taught?

TECH offers the possibility of taking this program completely online. Throughout the 6 months of training, the studuent will be able to access all the contents of this program at any time, allowing them to self-manage their study time.

A unique, key, and decisive educational experience to boost your professional development and make the definitive leap.

# tech 24 | Structure and Content

1.1. 1.1.1. 1.1.2. 1.1.3.	Statistics: Descriptive Statistics, Statistical Inferences Population, Sample, Individual	<b>1.2.</b> 1.2.1.	Types of Data Statistics According to Type 1.2.1.1. Quantitative: Continuous Data and Discrete Data 1.2.1.2. Qualitative: Binomial Data, Nominal Data, and Ordinal Data	1.2.2.	According to their Shape 1.2.2.1. Numeric 1.2.2.2. Text: 1.2.2.3. Logical According to its Source 1.2.3.1. Primary 1.2.3.2. Secondary	1.3.2.	Life Cycle of Data Stages of the Cycle Milestones of the Cycle FAIR Principles
1.4. 1.4.1. 1.4.2. 1.4.3. 1.4.4.		1.5. 1.5.1. 1.5.2. 1.5.3.	Data Collection  Methodology of Data Collection Data Collection Tools Data Collection Channels	1.6. 1.6.1. 1.6.2. 1.6.3.	Data Cleaning Phases of Data Cleansing Data Quality Data Manipulation (with R)	1.7.1. 1.7.2.	Data Analysis, Interpretation and Evaluation of Results Statistical Measures Relationship Indices Data Mining
1.8. 1.8.1. 1.8.2. 1.8.3.	Data Warehouse (Datawarehouse) Elements that Comprise it Design Aspects to Consider		Data Availability Access Uses Security/safety	1.10.1 1.10.2	Regulatory Aspects  . Data Protection Law  . Good Practices  . Other Normative Aspects		
Mod	<b>ule 2.</b> Scalable and Reliable Massive D	)ata Us	age Systems				
2.1.	Scalability, Reliability and Maintainability	<b>2.2.</b> 2.2.1.	Data Models Evolution of Data Models Comparison of Relational Model with	<b>2.3.</b> 2.3.1. 2.3.2.	Data Storage and Retrieval Engines Structured Log Storage Storage in Segment Tables	2.4.	Services, Message Passing and Data Encoding Formats

#### 2.4.1. Data Flow in REST Services 2.1.1. Scales Document-Based NoSQL Model 2.3.3. Trees B 2.1.2. Reliability 2.4.2. Data Flow in Message Passing 2.2.3. Network Model 2.1.3. Maintainability 2.4.3. Message Sending Formats 2.6. Distributed Transactions 2.5. Replication 2.7. Partitions 2.8. Batch Processing 2.5.1. CAP Theorem 2.6.1. Atomic Operations 2.7.1. Types of Partitions 2.8.1. Batch Processing 2.5.2. Consistency Models 2.6.2. Distributed Transactions from Different 2.7.2. Indexes in Partitions 2.8.2. MapReduce 2.5.3. Models of Replication Based on Leader and 2.8.3. Post-MapReduce Approaches Approaches Calvin, Spanner 2.7.3. Partition Rebalancing 2.6.3. Serialisability Follower Concepts 2.10. Case Uses. Twitter, Facebook, Uber 2.9. Data Stream Processing 2.9.1. Messaging Systems 2.10.1. Twitter: The Use of Caches 2.9.2. Persistence of Data Flows 2.10.2. Facebook: Non-Relational Models 2.9.3. Uses and Operations with Data Flows 2.10.3. Uber: Different Models for Different Purposes

Mod	ule 3. System Administration for Distr	ibuted [	Deployments				
3.1.3.	Classic Administration. The Monolithic Model Classical Aplications. The Monolithic Model System Requirements for Monolithic Applications The Administration of Monolithic Systems Automization		Distributed Applications The Microservice Distributed Computing Paradigm Microservices-Based Models System Requirements for Distributed Models Monolithic vs. Distributed Applications	3.3.1. 3.3.2. 3.3.3.	Tools for Resource Exploitation "Iron" Management Virtualisation Emulation Paravirtualization	3.4.1. 3.4.2. 3.4.3.	laaS, PaaS and SaaS Models LaaS Model PaaS Model SaaS Model Design Patterns
3.5.	Containerisation	3.6.	Clustering	3.7.	Cloud Computing	3.8.	Monitoring and Testing
3.5.2. 3.5.3.	Virtualisation with Cogroups Containers From Application to Container Container Orchestration	3.6.2. 3.6.3.	High Performance and High Availability High Availability Models Cluster as SaaS Platform Cluster Securitisation	3.7.3.	Clusters vs Clouds Types of Clouds Cloud Service Models Oversubscription	3.8.2. 3.8.3.	Types of Monitoring Visualisation Infrastructure Tests Chaos Engineering
3.9.	Study Case: Kubernetes	3.10	Study Case: OpenStack				
3.9.3.	Structure Administration	3.10.1 3.10.2 3.10.3	. Structure . Administration . Deployment . Development of Services for OpenStack				



A complete and cutting-edge program that will allow you to progressively and completely advance in the acquisition of the knowledge you need to intervene in this sector"



This training program offers a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.



# tech 28 | Methodology

#### At TECH Business School we use the Harvard case method

Our program offers a revolutionary method of skills and knowledge development. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.



At TECH, you will experience a way of learning that is shaking the foundations of traditional universities around the world"



We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition.



Our program prepares you to face new challenges in uncertain environments and achieve success in your career.

#### A learning method that is different and innovative

This intensive program from TECH Technological University School of Business prepares students to face all the challenges in this area, both nationally and internationally. We are committed to promoting personal and professional growth, the best way to strive for success, that is why TECH uses Harvard case studies, with which we have a strategic agreement that allows us to provide our students with material from the best university the world.



You will learn, through collaborative activities and real cases, how to solve complex situations in real business environments"

The case method has been the most widely used learning system among the world's leading business schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They must integrate all their knowledge, research, argue and defend their ideas and decisions.

# tech 30 | Methodology

#### **Relearning Methodology**

Our university is the first in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance Harvard case studies with the best 100% online teaching method: Relearning.

Our online system will allow you to organize your time and learning pace, adapting it to your schedule. You will be able to access the contents from any device with an internet connection.

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our online business school is the only one in the world licensed to incorporate this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



### Methodology | 31 **tech**

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. With this methodology we have trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, markets, and financial instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:



#### **Study Material**

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



#### **Classes**

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



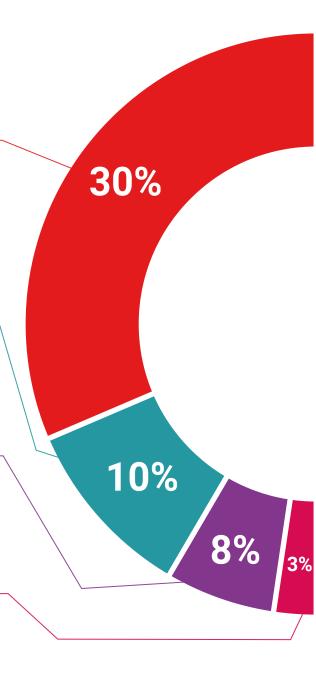
#### **Management Skills Exercises**

They will carry out activities to develop specific executive competencies in each thematic area. Practices and dynamics to acquire and develop the skills and abilities that a high-level manager needs to develop in the context of the globalization we live in.



#### **Additional Reading**

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





They will complete a selection of the best business cases used at Harvard Business School. Cases that are presented, analyzed, and supervised by the best senior management specialists in Latin America.



#### **Interactive Summaries**

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.



This exclusive multimedia content presentation training Exclusive system was awarded by Microsoft as a "European Success Story".

#### **Testing & Retesting**

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises: so that they can see how they are achieving your goals.



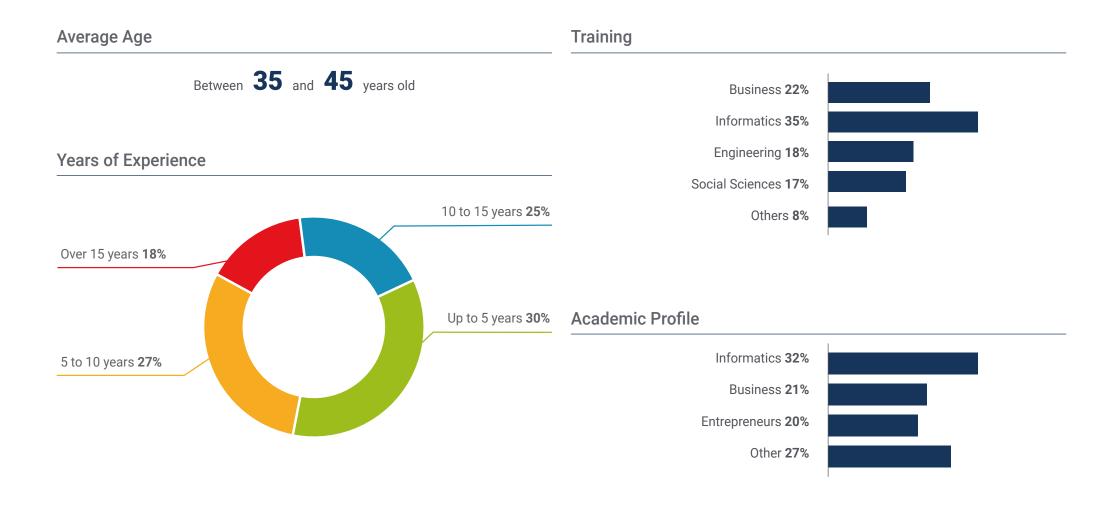


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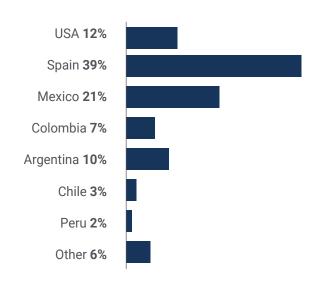




# tech 36 | Our Students' Profiles



### **Geographical Distribution**



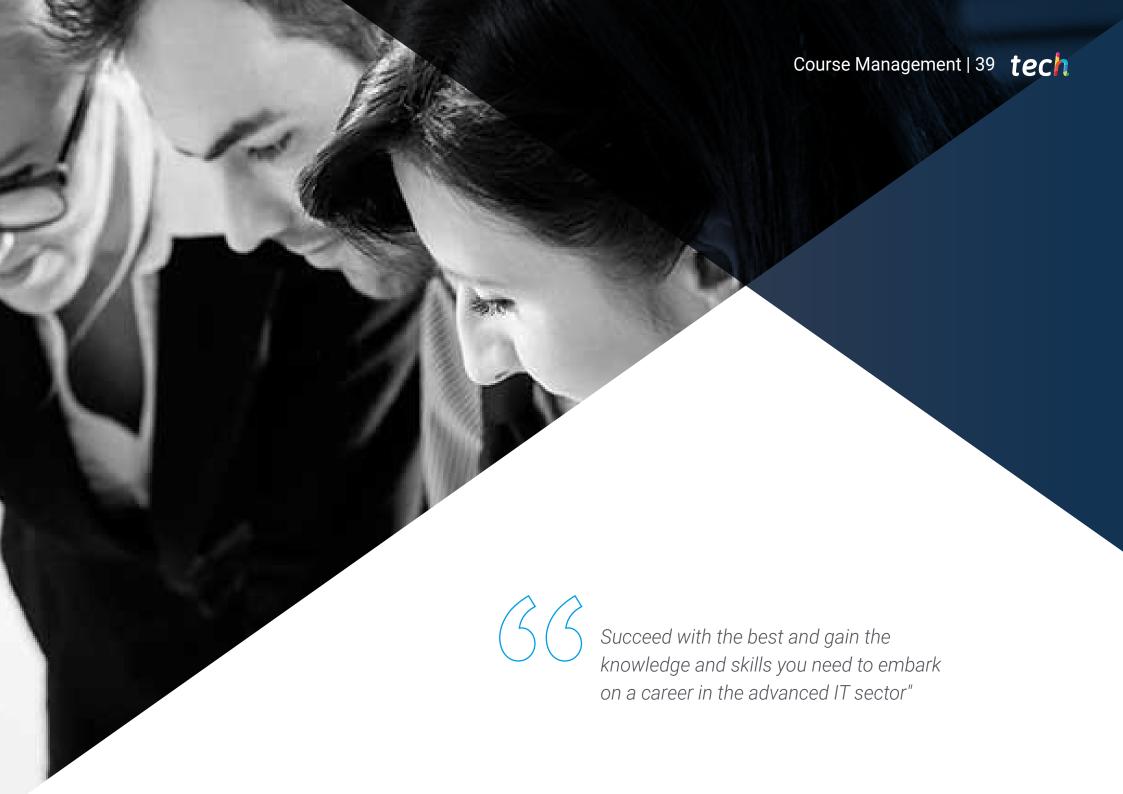


# Lucía Sánchez Morales

#### **Data Entry Technician**

"With TECH I have been able to advance my career and apply the content taught in my daily practice quickly and effectively. The professors of the program have accompanied me throughout the specialization, solving my doubts and guiding me during the whole process. I will certainly continue my training with them"





### Management



### Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO in Korporate Technologies
- CTO in Al Shephers GmbH
- Doctorate in Psychology from the University of CastillaLa
- PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in her PhD
- Doctorate in Psychology from the Castilla la Mancha University
- Master's Degree in Advanced Information Technologies from the University of Castilla la Mancha
- Master MBA+E (Master's Degree in Business Administration and Organisational Engineering) from the University of Castilla la Mancha
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla la Mancha
- Professor of the Master in Big Data and Data Science at the International University of Valencia
- Lecturer of the Master's Degree in Industry 4.0 and the Master's Degree in Industrial Design and Product Development
- Member of the SMILe Research Group of the University of Castilla la Mancha

#### **Professors**

#### Ms. Fernández Meléndez, Galina

- Data Analyst. Aresi | Gestión de Fincas Madrid-Spain
- Data Analyst. ADN Mobile Solution-Gijón-Spain
- ETL processes, data mining, data analysis and visualisation, establishment of KPI's,
  Dashboard design and implementation, management control ADN Mobile SolutionGijón-Spain R development, SQL management, among others. Pattern determination,
  predictive modelling, machine learning
- Bachelor's degree in Business Administration. Bicentennial University of Aragua-Caracas
- Diploma in Planning and Public Finance. Venezuelan School School of Planning-School of Finance
- Professional Master's Degree in Data Analysis and Business Intelligence. University of Oviedo
- MBA in Business Administration and Management (Escuela De Negocios Europea De Barcelona)
- Master in Big Data and Business Intelligence (Escuela de Negocios Europea de Barcelona)

#### Mr. Díaz Díaz-Chirón, Tobías

- Researcher at the ArCO laboratory of the University of Castilla-La Mancha, a group dedicated to projects related to computer architectures and networks
- Consultant at Blue Telecom, a company dedicated to the telecommunications sector
- Freelance mainly dedicated to the telecommunications sector, specialising in 4G/5G networks
- OpenStack: deploy and administration
- Degree in Computer Engineering from the University of Castilla-La Mancha, specialising in computer architecture and networks
- Associate Professor at the University of Castilla-La Mancha in the subjects of distributed systems, computer networks and concurrent programming
- Speaker at Sepecam course on network administration

#### Mr. Peris Morillo, Luis Javier

- Technical Lead in Capitole Consulting. He leads a team at Inditex in the logistics unit of its open platform
- Senior Technical Lead and Delivery Lead Support en HCL
- Agile Coach and Director of Operations at Mirai Advisory
- Member of the Steering Committee as Chief Operating Officer
- Developer, Team Lead, SCRUM Master, Agile Coach, Product Manager in DocPath
- Higher Engineering in Computer Science by the ESI of Ciudad Real (UCLM)
- Postgraduate in Project Management by CEOE Confederación Española de Organizaciones Empresariales (Spanish Confederation of Business Organisations)
- 50+ MOOCs taken, taught by renowned universities such as Stanford University, Michigan University, Yonsei University, Polytechnic University of Madrid, etc.
- Several certifications, some of the most notable or recent ones are Azure Fundamentals





# tech 44 | Impact on Your Career

Are you ready to take the leap?

Excellent professional development awaits you

With this program, the student able to advance drastically in his or her profession, although there is no doubt that, in order to do so, he or she will have to make an investment in different areas, such as economic, professional and personal.

However, the goal is to improve in your professional life and, to do so, it is necessary to fight.

Thanks to this programme you will receive a large number of job offers with which you will be able to start your professional growth.

The best way
to achieve
professional
change is to
increase your
skills. So don't stop
studying at TECH.

### When the change occurs



### Type of change



# Salary increase

This program represents a salary increase of more than **25%** for our students.

\$32,900

A salary increase of

25.22%

\$41,200





# tech 48 | Benefits for Your Company

Developing and retaining talent in companies is the best long-term investment.



### **Intellectual Capital and Talent Growth**

The professional will introduce the company to new concepts, strategies, and perspectives that can bring about significant changes in the organization.



# Retaining high-potential executives to avoid talent drain

This program strengthens the link between the company and the professional and opens new avenues for professional growth within the company.



## **Building agents of change**

You will be able to make decisions in times of uncertainty and crisis, helping the organization overcome obstacles.



### Increased international expansion possibilities

Thanks to this program, the company will come into contact with the main markets in the world economy.





# **Project Development**

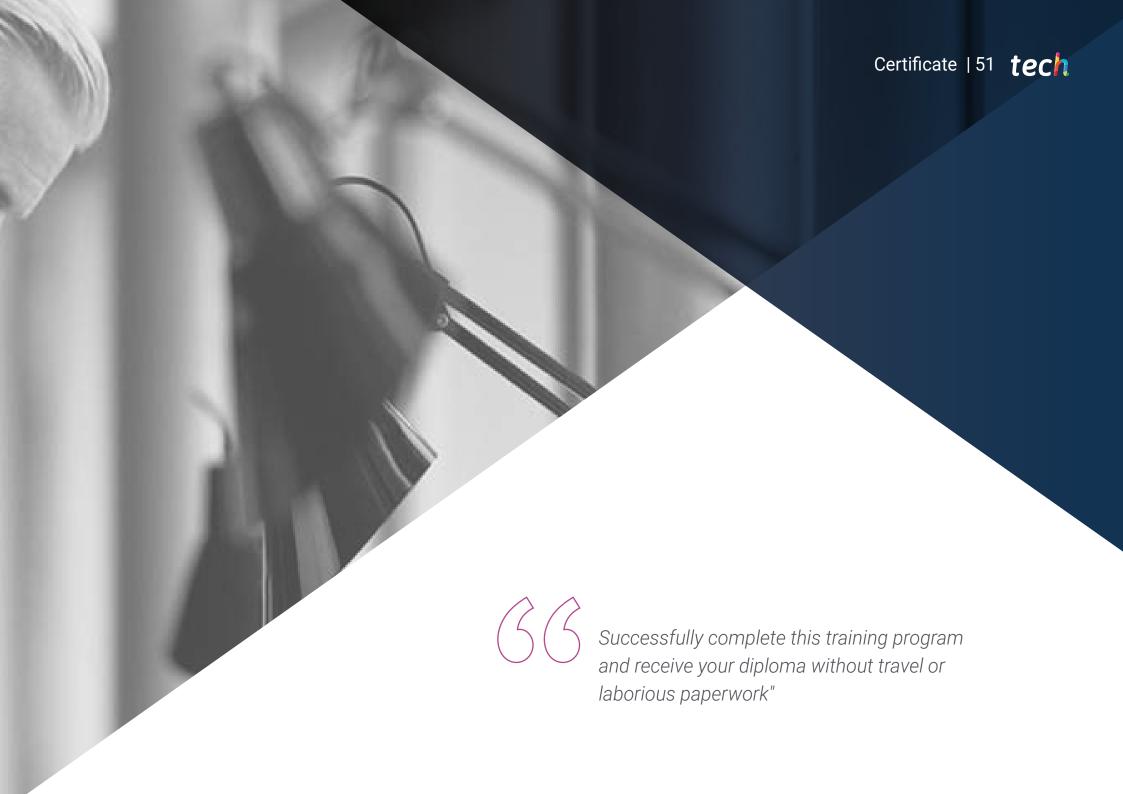
The manager can work on a current project or develop new projects in the field of R&D or Business Development within their company.



### Increased competitiveness

This program will equip students with the skills to take on new challenges and drive the organization forward.





# tech 52 | Certificate

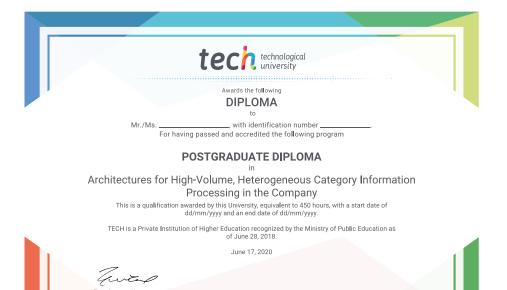
This Postgraduate Diploma in Architectures for High-Volume, Heterogeneous Category Information Processing in the Company contains the most complete and updated program on the market.

After the student has passed the evaluations, they will receive their corresponding **Postgraduate Diploma** issued by TECH Technological University by tracked delivery\*.

The diploma issued by TECH Technological University will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees

Title: Postgraduate Diploma in Architectures for High-Volume, Heterogeneous Category Information Processing in the Company

Official N° of Hours: 450 h.



<sup>\*</sup>Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.



# Postgraduate Diploma

Architectures for High-Volume, Heterogeneous Category Information Processing in the Company

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Official No of Hours: 450 h.

