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**Designing a selection process for a Learning
Organization**

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Abstract

The aim of this project is to create a selection process for lotsens, the division of a company from Castellon, which operates in the emerging industry of *Internet of things*. This process is not looking for applicants according to the typical job description, but it is focused on selecting people whose skills contribute to creating a learning organization. Based on the available literature about learning organizations, the main characteristics that define these organizations are analyzed and, consequently the individual competencies that employees must have and which help create a learning organization are established. Those competencies are determined along with an analysis of the values and requirements of lotsens. The selection process involves intelligence tests, an assessment center and a semi-structured interview. This projects is mainly focused on the assessment center, and explains briefly the other tools used during the selection process.

Resumen

El objetivo de este proyecto es crear un proceso de selección para lotsens, la división de una empresa de Castellón que opera en la emergente industria de *Internet de las cosas*. Este proceso no busca candidatos siguiendo la tradicional descripción del puesto de trabajo, sino que se centra en seleccionar personas que posean las competencias que contribuyan a crear una learning organization. A partir de la literatura disponible sobre *learning organizations*, se extraen las características que definen a estas organizaciones y se determinan las competencias individuales necesarias en los empleados para contribuir a crear este tipo de organización. Las competencias se definen junto a un análisis de los valores y necesidades de lotsens. El proceso de selección consiste en: unos tests de inteligencia, assessment center, y una entrevista semiestructurada. Este proyecto desarrolla principalmente el assessment center, y explica brevemente el resto de herramientas empleadas durante el proceso de selección.

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1.Introduction

It is clear that a learning organization not only depends on the characteristics of its members, but also the existing mechanisms and the organizational structure. It would be quite ambitious and mostly unreal to prepare the whole process to transform a regular company in a learning organization. Unfortunately, despite my interest in the topic there is no time and resources to achieve that goal. That is the reason why along this lines the focus will be only on the people that make up the organization, more precisely in the way they are selected.

This project tries to create a selecting process adapted to a specific type of company: a learning organization, and aims to recruit the most appropriate staff to develop the characteristics of this kind of organizations through several tools which assess and select the right candidates.

The choice of this type of organization is not a mere whim. The world has always been changing, but it is generally accepted that the internet and mobile technologies have triggered a turning point in our society. Nowadays, we are living the fastest-changing time in history where globalization is a reality and the threats and opportunities it implies cannot be ignored. The new market is the whole world, hence competitors are not only companies located in a nearby area but they can be from thousands of miles away.

Technology is already in every industry, computer science and the management of data are essential in every company, so knowledge and the ability to learn, share and use it is mandatory.

According to these facts, it is undeniable that not only companies have to adapt to changes, but anticipating to them. If companies want to get or keep a competitive advantage they cannot be standing and hoping that improvements will happen overnight. When an organization wants to change, it needs to learn something new and “*continuous improvement requires a commitment to learning*” (Garvin, 1993, p.1).

1.1 Company description and main topic

The company selected for this project is lotsens, the Internet of things division of a Valencian company called ADC Infraestructuras y Sistemas, providing solutions to transfer

data from sensors to apps. Internet of things concept refers to “the pervasive presence around us of a variety of things or objects which, through unique addressing schemes, are able to interact with each other and cooperate with their neighbors to reach common goals” (Atzori, Iera & Morabito, 2010, p.1).

lotsens division was created in 2013 with the objective of providing its services to the companies that form the holding it belongs to. This group of companies focus their activity in water cycle management, waste management and cleaning for cities. Due to its origin, lotsens has specialized in developing products for three main sectors:

- Smart city. Gathering and displaying real-time information in real time about all kind of city's data.
- Smart water. Solutions for remote water meter reading, being able to operate with several brands.
- 4.0 Industry. Managing data collection, integration, storage and analysis in factories and plants, helping to the digitalization process.

More recently, lotsens has started to provide customized products and services for a wide range of companies. All its activity can be summarized in two main products: sensors, capable of receiving and transmitting data; and the platform, the software which receives, processes, and displays the information.

lotsens division doubled its number of employees since its creation, reaching 25 people working nowadays, and it is expected to continue growing in the recent future. As an example, business development department doubled its size in 2018. The importance of lotsens inside ADC is remarkable, only a few years after its start this division represents the 25% of ADC's turnover, which means 2 million euros approximately.

A high technology company like this one requires a culture of learning and innovation so, as lotsens claims in its website, the following values define the organization: innovative technology, R&D culture, anticipation to the market and sustainable development.

Thus, lotsens can be considered a company which pursues becoming a learning organization. In order to achieve this goal it is important to have employees to rely on, those who can contribute to create this kind of organization, which values fit in this culture and skills are the appropriate ones.

This project may help to create a selection process focused on the soft skills that potential employees should have to be a key part of a learning organization, with the aim of enhancing the capabilities of this company.

1.2 Literature review

1.2.1 Organizational Learning

Before starting to define the concept of learning organization it is essential to explain the idea of organizational learning. The process of learning starts at individual level and a learning organizations is based on the learning process of its members (Wang & Ahmed, 2003) but the existence of individual learning does not implies organizational learning (Ikehara, 1999). It is the duty of the organization to arrange and integrate individual learning in order to become organizational learning.

Many are the authors and researchers who have proposed a definition for organizational learning. Argyris (1977) defined organizational learning as “a process of detecting and correcting error” (p. 2). Fiol & Lyles (1985) defined it as a process that uses the knowledge and understanding to improve actions. Huber (1991) stated that an organization learns when its potential behaviors are changed thanks to the processing of information. And

It is possible to extract some ideas from these definitions: organizational learning implies the use of knowledge and information collectively, it should produce changes in the organization, and it is an improvement process.

1.2.2 Learning Organizations

The concept of learning organization has been around since early 90s and several authors made their contribution with different definitions. Following the previous section, a learning organization should conglomerate some of the ideas already exposed. Along this section this concept and how employees contribute to create it will be analyzed.

The term “Learning Organization” was coined by MIT’s professor Peter Senge in 1990, when he published his world-famous book *The Fifth Discipline*. In this book, Senge defines learning organizations as places “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured,

where collective aspiration is set free, and where people are continually learning how to learn together.” (p.1).

Another author defined a learning organization as “an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights” (Garvin, 1993, p.3).

Pedler, Burgonye & Boydell (1991) claimed that a learning organization should facilitate individual learning with the objective of transforming the organization continuously.

A more recent definition stated “a learning organization should dedicate to improving the learning context and strategically strengthen organization competency to facilitate knowledge creation and innovation, and deliver marketplace-based competency” (Wang & Ahmed, 2010, p. 14).

As it can be seen, researchers offer different definitions which can complement each other. Some are focused on the process and others pay more attention to the result, but at the end, all of them agree on the idea of using knowledge in order to change something in the organization that may lead to future improvements.

Apart from the definitions, authors have also presented the characteristics and processes shared by learning organizations. Peter Senge (1990) introduced five necessary disciplines in a learning organization: mental models, personal mastery, shared vision, team learning, and systems thinking. Later, Galvin (1993) proposed that learning organizations master five main activities: systematic problem solving, experimentation, learning from the experience and history, learning from the success and mistakes of other organizations, and the transference of knowledge.

Systematic problem solving refers to the use of scientific method, gathering the available data, and using statistics software to make a decision and solve a problem. It is an approach to solve problems based on objective information guided by a standardized process.

Experimentation means that the organization tries to find new approaches to do what it is already doing, and test new ideas, processes, products, etc. which may imply a competitive advantage. This is possible when the organization encourage its members to try out without fear.

Learning from past experience consists in understanding previous success and failures as lessons for future decisions and behaviors. The importance of this activity lies in analyzing thoroughly every decision or action.

Learning from others implies observing the environment to obtain valuable insights from what is happening outside the organization. The information obtained during this observation may be used and adapted to the context of the organization.

Transferring knowledge is the process of spreading the knowledge obtained throughout the whole organization in order to make the most of it in every area. The process of organizational learning is not complete if what is learnt is not shared. In this activity, the organization must create mechanisms to achieve it, and employees have to be willing to participate in this process.

Moreover, organizational culture is a key factor to create a learning organization. Baars established five dimensions in 2003 to enable learning processes. A company is creating a culture for learning when it focuses on: personal development, learning on-the-job and through experience, shared responsibility and problem-solving skills (Salanova y Llorens, 2007).

1.2.3 Competencies

Reviewing the literature related to human resources, there are many definitions of the term competencies. In the early 70s, Mcllelland (1973) defined competencies as the group of characteristics owned by a person, which are observable through behaviors and are related to success at work. Spencer and Spencer (1993) defined the term as individual's traits positively related to a high performance at work. For their part, Pereda and Berrocal (2001) defined competencies as the combination of perceptible behaviors related to an excellent performance at work.

Another more recent definition claims that competencies are the personal attributes essential to perform the activities and tasks in a company (Chiavenato, 2007). All definitions share that competencies are traits from people that are observable and may influence positively in work performance.

1.2.4 Types of competences

Pereda and Berrocal (2001) distinguish between strategic and specific competencies. All the members in the organization should share strategic competencies. These competencies are necessary to achieve the overall goals and are related to the culture, values and strategy of the organization. On the other hand, specific competences depend on the job

position, its tasks and responsibilities. Moreover, inside specific competences, Pereda and Berrocal (2001) differentiate between vertical competences, which are common to all members of a department; and horizontal, which are common to every position in the same hierarchical level.

Another classification of competences by Chiavenato (2011) is based on the organizational level where its members are located. So, we can find three levels with different competences: institutional level, intermediate level, and operational level. The first one refers to the highest level in the organization, formed by people like shareholders, general managers and high executives. The second level, intermediate or tactical, is composed by mid-level managers and team leaders in charge of connecting institutional and operational levels. The last level, operational or technical, is referred to the employees in charge of the operational tasks. Depending on the level, members of the organization should have the appropriate competences for their tasks and responsibilities.

1.2.5 Selection Process

The selection process is the function in an organization that includes gathering the information of candidates for a job position, and to choose the person to be hired (Valle Cabrera, Jackson, Schuler, & Dolan, 2003). Traditionally, the classic model proposed by Thorndike defined this process in the following phases: analysis of the job vacancy, electing the criteria to be predicted, electing the predictors, designing the tests and tools for the assessment, and validating the process (Osca Segovia, 2006).

According to this model, the first step consists in the analysis and description of the position. The description contains the tasks and responsibilities of the job whereas the analysis refers to the knowledge, skills and attitudes required from the candidate (Pereda Marín, Berrocal Berrocal, & Alonso García, 2011). Thus, the second one means the competencies needed to succeed in the job. These competences can be specific for a job position or could be general and shared by all the members in an organization. For example, some authors have defined the competencies or performances that employees should carry on in companies operating in the knowledge economy (a term strongly related to learning organization), not in a specific position but the whole company. Pulakos et al. (2001) identified eight dimensions for adaptive performance in employees: handling emergencies or crises; handling work stress; solving problems creatively; dealing with unpredictable work situations;

learning work tasks, technologies and procedures; demonstrating interpersonal adaptability; demonstrating cultural adaptability; and demonstrating physically oriented adaptability.

The second step would mean to anticipate to the future performance of the candidate in the job once he or she would be hired. Campbell in 1990 and Viswesvaran in 1993 proposed different dimensions regarding the tasks to be performed.

The third step implies the selection of the right tests and tools, those more valid and reliable. So, it is key to find the tools able to predict future performance of the candidates. As an example, a meta-analysis conducted by Hunter and Hunter in 1984 found that overall intelligence is the best predictor for future performance (Osca Segovia, 2006).

The most common tools used to assess candidates are the following: biographic information, personality tests, intelligence tests, structured interviews, group discussions, presentations, case or problems resolution, and In-basket technique.

Finally, the last step consists in the continuous verifications of the tools used by comparing and contrasting with big samples from research studies, which is quite complicated due to the lack of some researches adapted to the selection process of the organization (Osca Segovia, 2006).

2. Objectives

The main objective of this project is to create a selection process to hire the right candidates for a learning organization based on their strategic competencies.

In order to do that, there are some steps that must be taken before proposing the selecting tools. Hence, here we can find the specific goals that must be achieved during this process:

1. To identify the main characteristics of a learning organization and match it with individual competences that allow creating this organization.
2. To detect the individual most valued competences according to lotsens values and objectives.
3. To choose the right tools to identify and assess those competences in the candidates.
4. To establish a coherent selection process based on the lotsens values and objectives.

3. Methodology

This selection process will be focused on detecting transversal competencies in the candidates interested in working in this company. As it has already been said, lotsens is expanding its business and it is going to require more staff in the coming years. The mentioned company is not requiring any experience in its candidates, and different study fields are valid for the company. The minimum requirements for participating in this process is set in possessing a Bachelor's degree or to be studying the last year of these degrees. Moreover, lotsens will train its new employees on the knowledge and technical skills required to conduct their tasks. As every lotsens position is a high qualified job, it makes sense to set a minimum standard to apply for any position.

General Management of the company, along with the values claimed by itself are focused on becoming a learning organization. This objective is a long term priority that must be set in motion as soon as possible. For this reason, the future need for personnel is the first step in the process of becoming a learning organization. Thus, it has been agreed that the selection process will be focused on the competencies that match with a learning organization characteristics and the values of lotsens.

3.1 Method

In this section, the steps followed to create the selection process will be developed. The model proposed by Garvin in 1993 with the main activities that an organization should master to become a learning organization will be used to extract the individual competences that candidates should possess. This model has been selected because of its practicality and easily understandable applicability. Moreover, according to the information obtained with interviews with the company, the most valued competencies will be essential to design the desired criteria from candidates.

Then, several tools especially designed with questions and tasks that assess those competencies will be implemented. In agreement with the company, the selection process will include: psychological tests, an assessment center and a semi-structured interview. The assessment center is the main tool selected for this process. This tool includes a situational test, a presentation and a group discussion; which will take place during a day and will be observed and supervised by trained staff. Despite the importance of every step in the

selection process, in this project only the assessment center process will be explained in detail due to the lack of space. The rest of tools used in this process will be named and explained briefly.

3.2 Procedure

The selection process is composed of the following phases:

1. Identifying main characteristics of a learning organization and matching individual competencies.
2. Setting minimum requirements of candidates and identifying most important competencies for lotsens.
3. Matching between lotsens and learning organization competences.
4. Assessment tools: abstract, numerical and verbal reasoning test. Those who pass will participate in the Assessment Center.

3.2.1 Identifying main characteristics of a learning organization and matching individual competencies

The first step to develop this selection process is to identify what individual competencies from potential employees contribute to the creation of a learning organization. We started analyzing thoroughly the activities that must be done in this kind of organization:

- Systematic problem solving.
- Experimentation.
- Learning from the experience and history.
- Learning from the success and mistakes of other organizations.
- Transference of knowledge.

The meaning of each activity has already been explained previously in the literature review section. As a continuation of this process, we established a series of individual competences that must be present in the role of every employee, which are strongly related to the activities mentioned above, based on the KASAs selected by the 'Employability Skills Tool Kit' from *The Conference Board of Canada* (Salanova & Llorens, 2007):

Systematic problem solving	<ul style="list-style-type: none"> - Assess situations and identify problems - Seek different points of view and evaluate them based on facts - Recognize the human, interpersonal, technical, scientific and mathematical dimensions of a problem - Readily use science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions - Evaluate solutions to make recommendations or decisions
Experimentation	<ul style="list-style-type: none"> - Be creative and innovative in exploring possible solutions - Personal initiative - Proactive personality - Continuous learning and pursue of personal development
Learning from the experience and history and from the success and mistakes of other organizations	<ul style="list-style-type: none"> - Adaptation capability - To identify and access to resources and learning opportunities. - To monitor continuously the success of a project or task, identifying improvement opportunities. - Identify the root cause of a problem
Transference of knowledge	<ul style="list-style-type: none"> - To be flexible, open-minded and to support other's contributions and ideas. - To provide feedback constructively. - Contributing to the team integrating knowledge and experience. - To write and speak eloquently, awaking attention from others. - To listen and asking, valuing other's contribution. - To integrate information using ITCs.

3.2.2 Setting requirements and key competencies for lotsens

The basic requirements defined by lotsens for any of its positions are the following:

- Good and clean appearance
- Bachelor's degree or studying the last course
- Available to travel

These are the basic conditions for applicants who want to participate in the selection process. Moreover, it is important to avoid incoherence between the competencies highlighted by lotsens and competencies identified for a leaning organization, so it will be

filled a questionnaire to gather the most valuable competencies for lotsens (*Annex I*). This questionnaire includes 15 general competencies and descriptions, some of them are present in the previous section of learning organization competencies, was delivered to the General Manager. The general competences were:

1. Learning. Ability to learning and applying fast the new knowledge, systems and work methodologies.
2. Flexibility. Ability to modify behaviors and attitudes in a changing environment, adapting effectively to new tasks and responsibilities.
3. Decision. Fast decision making even in adverse conditions.
4. Communication. Ability to transmit and to receive information clearly, finding the right information from others oral and written.
5. Excellence. Performing and carrying out tasks with the highest standards of quality.
6. Handle pressure. Rational and emotional balance when facing stressful situations, keeping efficiency and efficacy in the tasks.
7. Negotiation. Ability to empathize with an opposite position and making profitable agreements.
8. Personal development. To foster a positive work atmosphere, encouraging continuous training and development.
9. Technical knowledge. Ability to use knowledge and tools common and essential for the day-by-day tasks.
10. Leadership. Managing, guiding and leading groups efficiently to succeed in a task or project.
11. Planning. Ability to establish the actions to make and the resources that will be needed in order to achieve a goal.
12. Collaboration. Ability to work efficiently with other people from different levels or departments.
13. Problems solving. to analyze problems, identifying the key aspects to find the most efficient solutions.
14. Teamwork. To work nicely and cooperatively in a group facilitating the work to others.
15. Continuous improvement. To be focused on improving every action, analyzing the tasks, being trained and looking for feedback.

Among these competencies, the General Manager had to check all the competencies useful for the company and, from those selected, he had to choose a maximum of eight in order from most relevant to least relevant. In this case, the competences selected were the following: **learning, flexibility, decision, communication, problems solving, teamwork, excellence and continuous improvement.**

Once the most important competences had been selected, the next step in this part was to indicate in each one of the main competences, which behaviors are more important to be performed. In this section it can be selected five items from each competence in the second questionnaire (*Annex II*).

Here can be seen the behaviors selected for each competency:

Competency	Behaviors
Learning	<ul style="list-style-type: none"> a. To acquire rapidly new knowledge and skills from indications, study or experience. b. To transfer rapidly the knowledge and skills learnt to the tasks. c. To work efficiently with tools, products or software which are continually updated or modified. d. To test new approaches and methods to carry out the main tasks. e. To prepare guides, manuals, handbooks, procedures or protocols explaining how to solve new problems.
Flexibility	<ul style="list-style-type: none"> a. To adapt easily to changing tasks and responsibilities. b. To be effective when activities or responsibilities change suddenly. c. To manage efficiently new situations at short notice. d. To perform a wide range of tasks efficiently and effectively.
Decision	<ul style="list-style-type: none"> a. Making decisions when a rapid action is needed. b. To defend, arguing critically, the own decisions made c. To show confidence in the actions or interventions proposed.
Communication	<ul style="list-style-type: none"> a. To speak usually with colleagues to give or receive information. b. To check if the conversational partner understood the message. c. To gather data from different sources to get and contrast the right information. d. To create networks with colleagues to spread the information throughout the organization. e. To explain in detail information about changes in an adapted style understandable by everybody.
Problems solving	<ul style="list-style-type: none"> a. To identify the objective causes of a problem. b. To establish how a fact may cause a plausible consequence. c. To connect different information to understand it easily. d. To provide with multiple solutions for a problem. e. To analyze the advantages and disadvantages of any solution.
Teamwork	<ul style="list-style-type: none"> a. To keep partners updated with own ideas and perceptions. b. To contribute to create a pleasant atmosphere at workplace. c. To keep a team-minded attitude to solve problems.

	d. To ask for other's opinions and thoughts.
Excellence	<ul style="list-style-type: none"> a. To look for new ways of improving the work. b. To show interest in progressing continuously in the tasks. c. To highlight the importance of excellence during planning stages. d. To encourage others to achieve better levels of excellence.
Continuous improvement	<ul style="list-style-type: none"> a. To establish systems able to improve management and performance. b. To stress the importance of efficiency during planning stages. c. To motivate others to set their own mechanisms to keep improving. d. To identify factors that need to be trained and improved.

At this point, the most valuable competences and the behaviors expected from candidates have been defined. In the next section, there is a match between the selected competences by lotsens and those obtained from the characteristics of a learning organization.

3.2.3 Matching lotsens and learning organization competences

Once lotsens has defined the most valuable competencies, they will be combined with the competences that enable a learning organization. Thus, it is possible to prepare a list of competences to be evaluated according to the organization objectives.

Therefore, according to the classification followed by lotsens desired competences at *Figure 3*, the learning organization competences have been inserted, adapted and combined to this list in order to create coherence with lotsens goals of becoming a learning organization, and simplifying the assessment process

Combined tables of competences:

Learning
1. To acquire rapidly new knowledge and skills from indications, study or past experience.
2. To transfer rapidly the knowledge and skills learnt to the tasks.
3. To work efficiently with tools, products or software which are continually updated or modified.
4. To test new approaches and methods to carry out the main tasks.
5. To prepare guides, manuals, handbooks, procedures or protocols explaining how to solve new problems.
6. To identify and access to resources and learning opportunities.

Flexibility
1. To adapt easily to changing tasks and responsibilities.

2. To be effective when activities or responsibilities change suddenly.
3. To manage efficiently new situations at short notice.
4. To perform a wide range of tasks efficiently and effectively.
5. Adaptation capability.

Decision

1. Making decisions when a rapid action is needed.
2. To defend, arguing critically, the own decisions made.
3. To show confidence in the actions or interventions proposed.
4. Personal initiative.
5. Proactive personality.

Communication

1. To speak usually with colleagues to give or receive information.
2. To check if the conversational partner understood the message.
3. To gather data from different sources to get and contrast the right information.
4. To create networks with colleagues to spread the information throughout the organization.
5. To explain in detail information about changes in an adapted style understandable by everybody.
6. To listen and asking, valuing other's contribution.
7. To write and speak eloquently, awaking attention from others.

Problems solving

1. To identify the objective causes of a problem.
2. To establish how a fact may cause a plausible consequence.
3. To connect different information to understand it easily.
4. To provide with multiple solutions for a problem.
5. To analyze the advantages and disadvantages of any solution.
6. Readily use science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions.
7. To seek different points of view and evaluate them based on facts.
8. To be creative and innovative in exploring possible solutions.

Teamwork

1. To keep partners updated with own ideas and perceptions.
2. To contribute to create a pleasant atmosphere at workplace.
3. To keep a team-minded attitude to solve problems.
4. To ask for other's opinions and thoughts.
5. To be flexible, open-minded and to support other's contributions and ideas.
6. Contributing to the team integrating knowledge and experience.
7. To provide feedback constructively.

Excellence

1. To look for new ways of improving the work.
2. To show interest in progressing continuously in the tasks.
3. To highlight the importance of excellence during planning stages.
4. To encourage others to achieve better levels of excellence.
5. To monitor continuously the success of a project or task, identifying improvement opportunities.

Continuous improvement

1. To establish systems able to improve management and performance.
2. To stress the importance of efficiency during planning stages.
3. To motivate others to set their own mechanisms to keep improving.
4. To identify factors that need to be trained and improved.
5. To be motivated for continuous learning and pursue of personal development.

After defining the competences and behaviors to be assessed, in the next section the right tools to evaluate them will be exposed and explained.

3.2.4 Assessment tools

The selection process for candidates will be divided in three stages:

1. Intelligence tests: numerical, verbal and abstract reasoning.
2. Assessment center: situational test, group exercise and presentation.
3. Structured interview.

3.2.4.1 Intelligence tests

Private companies and public institutions have commonly used intelligence test in many selection processes around the world. Despite some negative reviews, many authors and their researches demonstrated the validity of this technique. As lotsens operates on an advanced technology industry, high-qualified staff is required. In order to provide the company with these personnel, a first screening like this is useful to focus on a little number of candidates. In case of a high number of candidates apply for the position; there is the possibility to attend these tests online. lotsens website has a candidate's area to register and start with the test. There are three tests in this stage: verbal, numerical and abstract reasoning. Prometrics, the most trusted company for developing psychological tests, has developed and validated all the tests. Several recognized institutions work with this company

to design their selection processes. At Annex III, a Summary of Statistical Specifications can be consulted.

VERBAL TEST

This test assesses applicants' skills to think logically, focus capability, and to understand verbal information. It will be composed by 10 questions to be answered in 18 minutes. Each question consists of a text fragment no longer than 130 words and 4 possible statements. It must be chosen the statement that can be absolutely verified in the text. So, it means a statement is not true if the information given cannot be confirmed in the text fragment.

In order to pass this test 6 out of 10 questions have to be correct. An example of question can be find in *Annex III*.

NUMERICAL TEST

This test assesses candidates' skills in thinking logically and understanding numerical information such as: tables, charts, percentages, etc. It will be composed by 10 questions to be answered in 20 minutes. Each question consists mainly of a table or chart with figures or percentages that gives information about a specific issue. There are 4 answers and only one is correct. In order to pass this test 6 out of 10 questions have to be correct. An example of question can be find in *Annex IV*.

ABSTRACT TEST

This test assesses candidates' skills in thinking logically and understanding the relations between different concepts involving spatial, numerical or no linguistic elements. It will be composed by 10 questions to be answered in 20 minutes. Each question consists mainly of 5 pictures made up of several shapes like geometric forms, lines, arrows, etc; all these pictures follow a common pattern. As possible answers, there are 5 more pictures, and among them, there is one that follows the same pattern and is the correct one. There is only one right answer. In order to pass this test 6 out of 10 questions have to be correct. An example of question can be find in *Annex V*.

In order to move on to the next stage, it is necessary more than a 60% overall mark. Moreover, only the top 20% marks will be selected for the next level, and a maximum of 10 candidates per vacancy.

3.2.4.2 Assessment Center

Intelligence tests work as initial screening to reduce the number of applicants who move to the assessment center. This stage is crucial to evaluate the essential competencies identified in previous sections. The assessment center intends to determine the extent to which candidates will succeed in their future job position. This tool has been selected because several competences, eight in this process, can be evaluated in a short period of time; and until 10 candidates will be in the process simultaneously. Moreover, many studies support its validity and fidelity.

At this stage, several tests are carried out: a situational test, a group exercise and a presentation. All these tests will take place during a day and four observers will be in charge of assessing applicants' competences. The group of observers comprises of experienced experts specialized in the industry, in human resources, and the cluster lotsens belongs to. In this case this people will be: the general manager of lotsens, the human resources manager of the cluster, a HHRR external consultant and the CEO of ADC.

SITUATIONAL TEST

The first test that takes place in the assessment center is the situational test. To prepare it, the design process followed has been this one:

1. To determine the competences to be assessed.

From the eight competences to be assessed during the whole process, in the situational test will be evaluated the following: learning, flexibility, problem solving and excellence.

2. To establish behaviors to evaluate during the test and prioritizing them.
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Learning	<ol style="list-style-type: none"> 1. To acquire rapidly new knowledge and skills from indications, study or past experience. 2. To transfer rapidly the knowledge and skills learnt to the tasks. 3. To identify and access to resources and learning opportunities.
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Flexibility	<ol style="list-style-type: none"> 1. To be effective when activities or responsibilities change suddenly. 2. To manage efficiently new situations at short notice.
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Problem solving	<ol style="list-style-type: none"> 1. To identify the objective causes of a problem. 2. To establish how a fact may cause a plausible consequence.
-----------------	--

	3. To connect different information to understand it easily. 4. To be creative and innovative in exploring possible solutions.
Excellence	1. To look for new ways of improving the work. 2. To show interest in progressing continuously in the tasks

3. Selecting the right type of situational test.

The situational test selected has been a case study because it fits to the competencies that want to be assessed.

4. To prepare observation scales.

This will be a form that will be used by evaluators to grade the candidates' behaviors. There is a scale from 1 to 5 to assess the competencies and its behaviors. In this scale each number means:

- 1 → Non Adequate
- 2 → Limited
- 3 → Acceptable
- 4 → Relevant
- 5 → Excellent

5. To establish a minimum level required

The minimum level will be a 3 in each one of the competences.

6. To elaborate the test

A case study related to the Internet of things (IoT) industry have been selected. Applicants will be sit individually in a desk in front of a computer. They will find the text to read in a PDF file that can be found in the desktop. Applicants are allowed to use any software in the computer to solve this case. Moreover, there are some physical specialized journals in the desk. Candidates have initially 150 minutes to finish this exercise.

This case is based on the situation of a real technological company which is trying to increase its revenue through entering in new markets, specifically the industry of internet of things. In this case it is provided the information of how this company expanded to new sectors in the past, detailing the procedure it followed, the pros and cons of the decisions they made and the final results. Then, there is detailed information about the new sector to come in. Despite the given information, more data may be required to give a proper answer to some questions. Here are the questions to be answered by candidates:

Question	Behavior to be assessed
1. What had you changed in the past strategy this company adopted? Which results would you expect from those changes?	1. To look for new ways of improving the work. 2. To show interest in progressing continuously in the tasks 3. To establish how a fact may cause a plausible consequence. 4. To connect different information to understand it easily.

	5. To acquire rapidly new knowledge and skills from indications, study or past experience.
2. Which are the positive and negative aspects of entering into the IoT industry? What are the main strengths of this company to succeed in the new industry?	1. To identify the objective causes of a problem. 2. To transfer rapidly the knowledge and skills learnt to the tasks. 3. To identify and access to resources and learning opportunities. 4. To be creative and innovative in exploring possible solutions.
It is given an extra question in the minute 120 to be answered within the initial time: 3. Prepare a project briefing to entry in an alternative third market with the overall steps to be followed.	1. To be effective when activities or responsibilities change suddenly. 2. To manage efficiently new situations at short notice.

7. To try out the case study.

Before using this test, it must be tried out in order to find mistakes and to check if it is understandable and well arranged. The evaluators will be in charge of trying the test.

8. To train the observers

This training includes how to present the exercise to the applicants, how to behave during the execution, observation guidelines and the explanation to provide with once the test is over.

- Evaluators will give the indications about where is the case available.
- Evaluators have to solve doubts regarding the procedure.
- Not extra information from evaluators is allowed.
- Evaluators will pay attention to applicants constantly.
- Evaluators will use the observation guide form to assess candidates' performance.
- Evaluators will inform candidates about the extra activity they have to do in the minute 120.
- Evaluators will give indications for the next test once the first exercise has finished.

PRESENTATION

The ability to speak in public is essential in most of the jobs. In this exercise, after finishing the case study, applicants will have to present their answers to questions 2 and 3 to the rest of candidates and evaluators. They have 30 minutes to prepare the presentation. Computers are allowed to be used to prepare slides but it is not mandatory. Then, they'll have a maximum of 10 minutes to expose their presentations in public. In this exercise, the following competences will be assessed:

Communication
<ol style="list-style-type: none"> 1. To check if the conversational partner understood the message. 2. To explain in detail information about changes in an adapted style understandable by everybody. 3. To write and speak eloquently, awaking attention from others.

Flexibility
<ol style="list-style-type: none"> 1. To adapt easily to changing tasks and responsibilities. 2. To manage efficiently new situations at short notice. 3. Adaptation capability.

Decision
<ol style="list-style-type: none"> 1. To defend, arguing critically, the own decisions made. 2. To show confidence in the actions or interventions proposed.

Evaluators will use the observation guide form to assess candidates' performance. Once all applicants have exposed their presentation they will have a break.

GROUP DISCUSSION

Group discussion is the final test in the assessment center. The challenge for this exercise is to discuss the ideas exposed in the previous presentations and trying to reach an agreement to solve the problems asked in exercises 2 and 3. Candidates will sit together to defend their points of view, to share ideas and to provide evaluators with the best possible solution. This meeting will last 45 minutes and the final conclusion will be delivered when the time finishes by a spokesman elected by applicants. In this exercise the following competences will be assessed:

Decision
<ol style="list-style-type: none"> 1. Making decisions when a rapid action is needed. 2. Personal initiative. 3. Proactive personality.

Communication
<ol style="list-style-type: none"> 1. To speak usually with colleagues to give or receive information. 2. To check if the conversational partner understood the message. 3. To create networks with colleagues to spread the information throughout the organization. 4. To listen and asking, valuing other's contribution.

Teamwork

1. To keep partners updated with own ideas and perceptions.
2. To contribute to create a pleasant atmosphere at workplace.
3. To keep a team-minded attitude to solve problems.
4. To ask for other's opinions and thoughts.
5. To be flexible, open-minded and to support other's contributions and ideas.
6. Contributing to the team integrating knowledge and experience.
7. To provide feedback constructively.

Excellence

1. To look for new ways of improving the work.
2. To highlight the importance of excellence during planning stages.
3. To encourage others to achieve better levels of excellence.

Continuous improvement

1. To stress the importance of efficiency during planning stages.
2. To motivate others to set their own mechanisms to keep improving.
3. To identify factors that need to be trained and improved.
4. To be motivated for continuous learning and pursue of personal development.

Those candidates who achieve a minimum average score of 3 will be conducted to the next step: a semi-structured interview.

3.2.4.3 Semi-structured interview

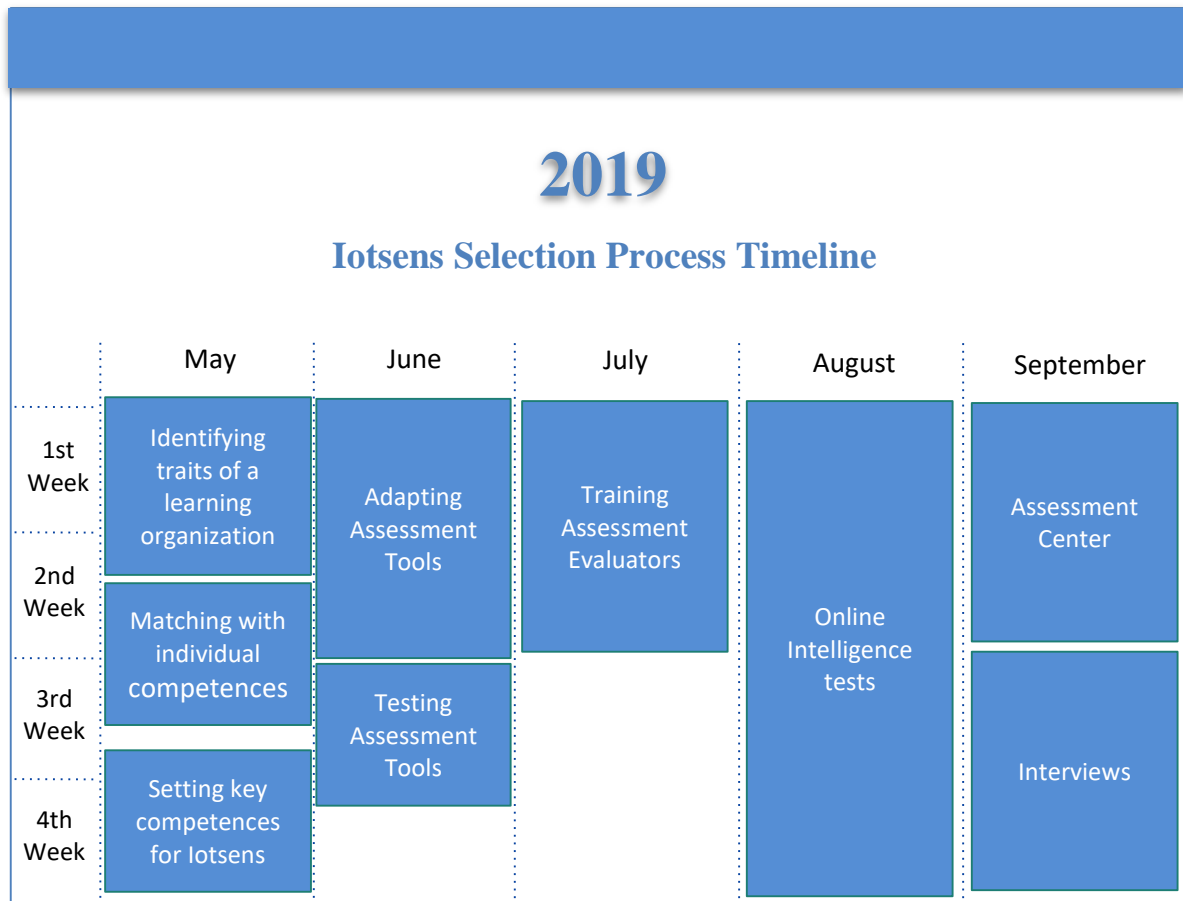
The last step in the selection process is a semi-structured interview. It will be an individual interview conducted by two people: the general manager and the human resources manager. It will not last more than 30 minutes and will pursue the following objectives:

- To assess competencies that cannot be evaluated in previous stages.
- To offer a good institutional image of the company.
- To find out relevant personal traits not identified previously.

In order to assess applicants' competencies this interview will be focused on obtaining past behaviors at work or studying that may help to predict future performance. Hence, STAR technique will be used to gather this information.

3.3 Timing

The whole process has been scheduled to be completed in less than 4 months. Here is exposed the general timeline.



4. Expected results

Along this process this project has been focused on delivering a selection process capable to help to Iotsens to create a learning organization. It would be enviable to claim that a selection process can transform an entire company and become a learning organization. Unfortunately Iotsens still have a lengthy path to go to achieve its final goal. Nevertheless, this project lays the foundations for this objective. It is expected that this selection process will change the selecting methodology and the focused will be on those applicants who possess competencies that contribute to create a learning organization.

Matching learning organization's competences with Iotsens values will guarantee integration and coherence between the reality in the company and the main goals. The assessment tools have been studiously selected to succeed in its function. Intelligence tests will guarantee a first screening that will reduce the number of applicants to a few, reducing subsequent stage costs. The case study will identify those competences mainly related to learning and problem solving. The presentation will assess communication, flexibility and decision skills. And the group discussion will help to discern teamwork, communication,

excellence and personal development behaviors. Finally, the interview will put the final touches to the selection process ensuring coherence between candidates and lotsens.

5. Budget

In order to establish a budget several factors must be taken into account: hours dedicated to prepare the selection process, the complexity of the project, the expected salary of the selected staff, and many other factors. In this case, it has also been considered the official recommended fees by the Valencian Psychologists Association. Here are the details regarding this project:

Total hours dedicated	Complexity of the process	Average expected salary	Maximum number of candidates assessed
200h	High	28.000€/year	10

The complexity of this process has been declared high due to the specifications of the industry, the assessment methodology required and the specifications of a learning organization. Hereafter, an itemization of the hours dedicated to the project is displayed:

Task	Hours
Identifying learning organization competencies	25
Identifying lotsens desired competencies	25
Matching of competencies	10
Selecting and developing assessment tools	100
Assessment center	12
Semi-structured interview	8
Gathering and analyzing information	20
Total	200

Finally, the fees have been established as an average amount defined by the factors previously exposed.

Total hours	Price(€)/hour	Total Amount
200	20	4000€

6. Conclusions

6.1 Competences acquired during the Master's Degree

In this section I will introduce and assess the competences acquired and developed during the Master's degree which can be found at Annex VI, according to the following evaluation scale:

1	2	3	4
Knowledge and basic skills exist but competencies are not properly developed	There is a competency to carry out tasks but must be guided and supervised	There is a competency to carry out simple tasks without guide nor supervision	There is a competency to carry out complex tasks without guide nor supervision

Before starting the Master's degree I had a basic background regarding psychology applied to organizations. I studied business administration, which only contains a subject related to human resources and it is seen from managerial perspective. Thus, I had a poor level in the competencies assessed during this Master.

CE1	
Pre-Master Level	Post-Master Level
1	3
Expectations	Examples
I do not have any contact with occupational psychology. I have never read an article about this topic so my initial knowledge is absent. I hope to acquired the basic theories and concepts and I think I will be able to learn rapidly.	I have learnt the basic concepts of preventing laboral risks. I have understood the actual definitions of burnout, technostress, mobbing, workaholism...

CE2	
Pre-Master Level	Post-Master Level
1	4
Expectations	Examples
I have never conducted a research regarding occupational psychology so I expect to learn the right methodology to succeed in this task.	I have learnt to define the main constructs, to identify them in real situations, and to choose the most appropriate tools to assess their importance.

CE3	
Pre-Master Level	Post-Master Level
1	4
Expectations	Examples
I have studied human resources from a	I have discovered the inception of human

managerial perspective so I did not delve into psychology theories. I think I will find a different approach to the way people in organizations are managed.	resources and its evolution from an operational idea to a key strategic approach in every company. Moreover, I have found new trends in human resource management.
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CE4	
Pre-Master Level	Post-Master Level
1	3
Expectations	Examples
I had never heard about Positive Psychology and at the beginning I was a bit sceptical about the term. I hope to find the utility of this idea.	I realised the importance of Positive Psychology, its empirical validity and the real ideas behind the term through applying it in different intervention projects.

CE5	
Pre-Master Level	Post-Master Level
2	4
Expectations	Examples
I have already studied change management theories from authors such as: Lewin or Kotter. I have a little notion of work climate characteristics and its main factors. I hope to deepen in the main concepts.	I have refreshed the main theories about change and learning at organizations. I have deepened in the characteristics of organizational culture.

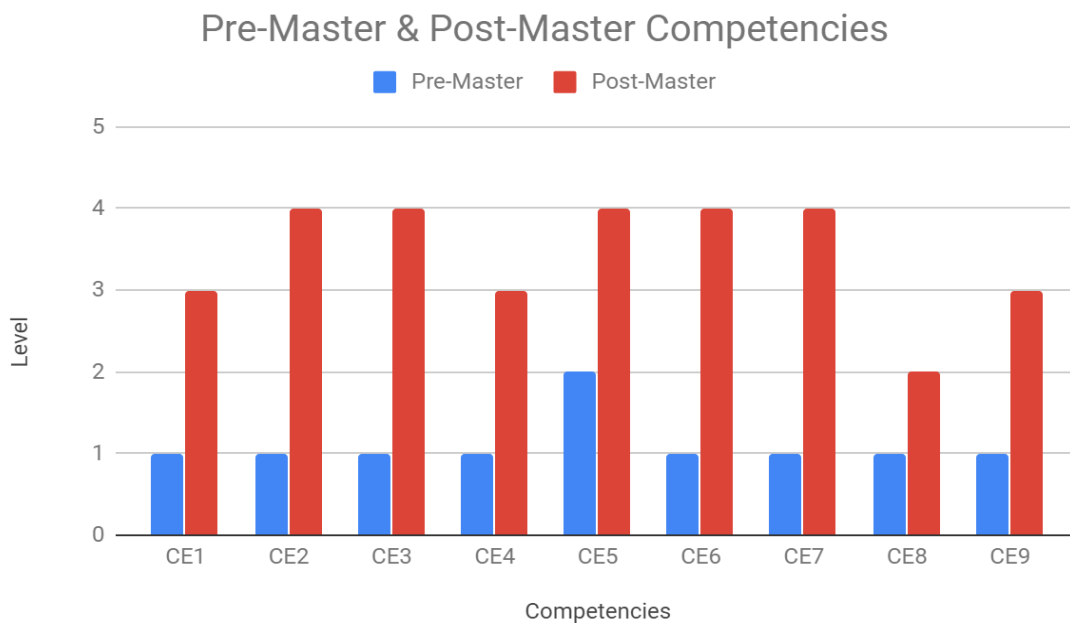
CE6	
Pre-Master Level	Post-Master Level
1	4
Expectations	Examples
I am not familiar with the impact of human resources techniques impact on psychosocial health, individual and group development.	I have learnt the techniques that influence psychosocial health of employees. I have established the use of these techniques for several projects.

CE7	
Pre-Master Level	Post-Master Level
1	4
Expectations	Examples
I have never defined human resource interventions in organizations, and I did not expect the impact these interventions may have in employees.	I have carried out several intervention projects focused on improving psychosocial health, defining the tools to measure their impact on individuals, making use of HR techniques.

CE8	
Pre-Master Level	Post-Master Level
1	2
Expectations	Examples
I do not know how to prepare, design and apply a psychosocial intervention in a company. I do not have the main concepts and characteristics to develop it.	I learnt the most important concepts and constructs and the procedure to design an intervention, but I do not acquired the necessary practice to apply it in a real organization with psychosocial issues.

CE9	
Pre-Master Level	Post-Master Level
1	3
Expectations	Examples
At the beginning I thought this field would not be so complex and interesting. I was not able to judge my own competencies.	After this course, I have evaluated different interventions and I designed tools to measure the scope of measures taken. Now I feel more capable of judging my own level of competencies.

Here is a comparison between the level of competencies prior to Master's degree and after.



Overall, I can state that this course has provided me with a lot of resources to improve employees' lives at organizations. I have learnt to look for the essential resources and the most important authors in Occupational Psychology. Now, I am able to use the knowledge acquired during this course to create a Positive Organizational Psychology intervention in a company and assess the impact of this intervention at individual, team and organizational level.

6.2 Plausible transference of knowledge to professional career

Generally speaking, I think Organizational Psychology is not specially valued at current companies. There are many other functional departments such as: finance, production, sales or marketing; which are taken more into consideration than human resources. Hence, only a very small fraction of annual budget concerns this area. This situation, is even more accentuated at small and medium-sized companies where outsourcing is really common and human resources functions are seen as expenses instead of an investment.

Fortunately, times have been changing in recent years and modern companies and big corporations noticed the importance of managing people and making them happy. Human resources management is finally seen, not only in papers and researches, as a strategic tool able to create a competitive advantage; and employees are considered the key factor to success in the age of knowledge we are living in.

This new scene represents a real opportunity to the students of this Master, which have acquired enough tools to transfer to real companies. I think I am able to design and implement different interventions in regular organizations, since I have already been developed in every subject with the major support of my wonderful C.U.L.O. team.

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8. Annexes

Annex I. Questionnaire most valuable competencies for lotsens.

Key factor?		Order	Competencies
Yes	No		
			Learning. Ability to learning and applying fast the new knowledge, systems and work methodologies.
			Flexibility. Ability to modify behaviors and attitudes in a changing environment, adapting effectively to new tasks and responsibilities.
			Decision. Fast decision making even in adverse conditions.
			Communication. Ability to transmit and to receive information clearly, finding the right information from others oral and written.
			Handle pressure. Rational and emotional balance when facing stressful situations, keeping efficiency and efficacy in the tasks.
			Excellence. Performing and carrying out tasks with the highest standards of quality.
			Negotiation. Ability to empathize with an opposite position and making profitable agreements.
			Personal development. To foster a positive work atmosphere, encouraging continuous training and development.
			Technical knowledge. Ability to use knowledge and tools common and essential for the day by day tasks.
			Leadership. Managing, guiding and leading groups efficiently to succeed in a task or project.
			Planning. Ability to establish the actions to make and the resources that will be needed in order to achieve a goal.
			Collaboration. Ability to work efficiently with other people from different levels or departments.
			Problems solving. to analyze problems, identifying the key aspects to find the most efficient solutions.
			Teamwork. To work nicely and cooperatively in a group facilitating the work to others.

			Continuous improvement. To be focused on improving every action, analyzing the tasks, being trained and looking for feedback.
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Annex II. Most important behaviors 5 items.

Key factor?		Order	Behaviors
Yes	No		
			To acquire rapidly skills and knowledge from indications, studies or experience.
			To apply rapidly new knowledge and skills to habitual tasks.
			To work with tools, products or software that change very often and whose changes must be learnt rapidly.
			To try out new approaches and methods to solve usual problems.
			To detect and check pros and cons of work processes systematically.
			To show initiative to participate in new activities to know deeply different work processes.
			To spread new procedures and work processes through writing up guides and protocols for the organization.
			Other options. Explain.

Annex III. Summary of Statistical Specifications.

Elements of Form Assembly and Statistical Review	Specifications/Standards
1. Range of item difficulties	P-values = .30 - .89 (optimal)*
2. Target value(s) for item discrimination indices	rpBis > .20
3. Target ranges for estimates of internal consistency reliability	Alpha > .80
4. Target ranges for estimates of classification consistency or reliability	Livingston > .80

Source: Prometrics

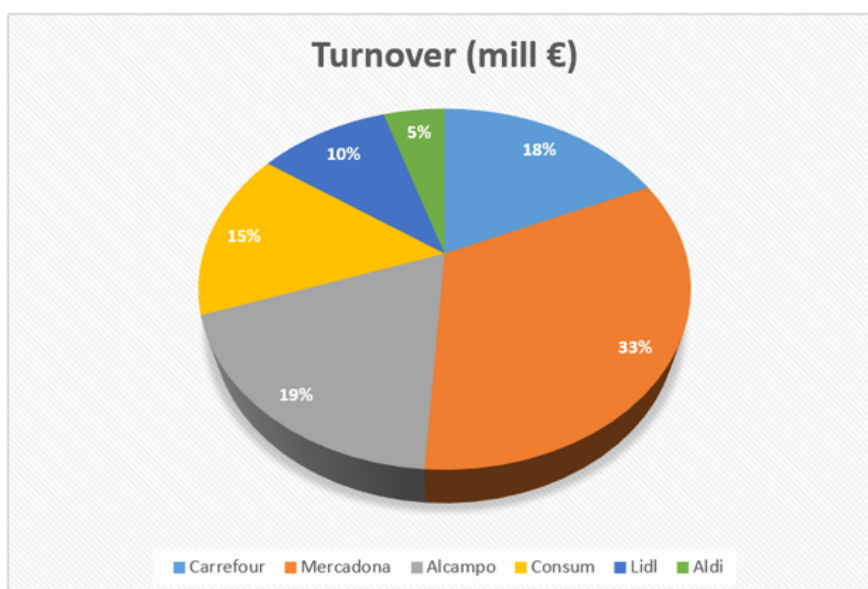
Annex IV. Verbal test sample.

Each of the following questions comprises a short text followed by four statements. You have to indicate which of the four options is the one that best responds to the given text.

1. In general, water pollution can be divided into the one that is dissolved and the one that is suspended, floated or carried away by water. It is also possible to separate the inorganic pollution from the organic one, and the one that is eliminated normally by nature and the one that is not. There are normal parameters for the measurement of pollution in general, which can be estimated with indicators such as BOD5 (biological demand for oxygen after five days) and COD (chemical oxygen demand), which are the quantities of oxygen needed to oxidize the organic matter susceptible to be oxidized either by biological means (bacteria and microorganisms) or by chemical means. There is another parameter, which is the amount of total suspended solids (TSS), which gives an idea of the amount of human matter in the water.

- There are many indicators of measurable and non-measurable pollution, however, the most widely used are BOD5, COD and TSS.
- The pollution of organic nature can be eliminated in a normal way by nature.
- The amounts of oxygen needed to oxidise the organic matter susceptible to oxidation are measured with the BOD5 indicator.
- COD is an indicator used to measure pollution in general.

Annex V. Numerical test sample.

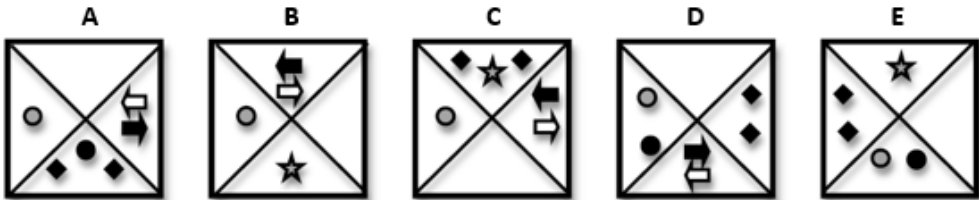


1. "Aldi" decides to withdraw from the market due to its poor results. What will be the estimated increase in the market share of Carrefour?

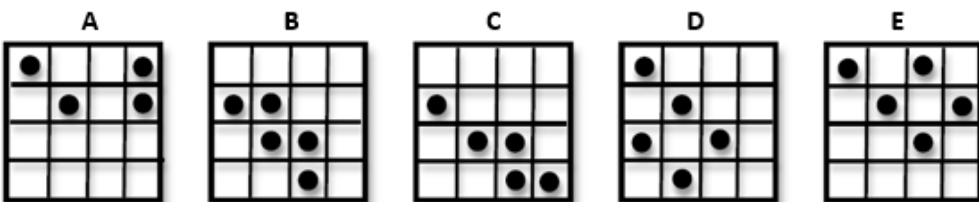
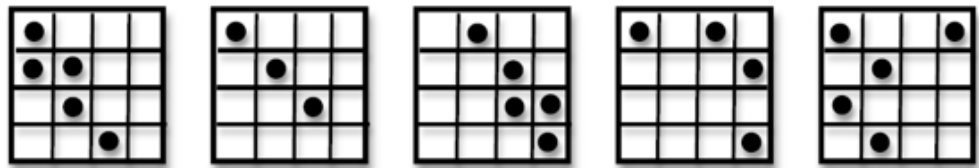
- 3.01%
- 1.9%
- 2.3%
- 3.3%
- 2.02%

Annex VI. Abstract test sample.

1.



2.



Annex VII. Master's competencies.

CE1 - To interpret the different theories and development processes on Occupational Health Psychology and Ergonomics

CE2 - To develop a basic research in Occupational Health Psychology, Organizational Psychology and Human Resources development.

CE3- To Compare the different theories and development processes on Human Resources Psychology

CE4 - To apply the different theories and development processes of the main individual and organizational strengths on Positive Organizational Psychology.

CE5 - To assess the characteristics that determine the organizational climate and culture as well as the processes of change and organizational development over time.

CE6 - To implement Human Resources management techniques and interpret their relationship with psychosocial health and personal and group development in organizations.

CE7 - To intervene in organizational environments through the implementation of organizational practices that contribute to the prevention and promotion of employee health.

CE8 - To apply intervention / optimization techniques of psychosocial health from the occupational health psychology.

CE9 - To judge the competences acquired throughout the master's degree in Work, Organizational Psychology and Human Resources.