THE DIGITAL COMPETENCE CENTRES OF THE FUTURE

somos digital

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1. INTRODUCTION

1.1. BACKGROUND

Digital Competence Centres (DCCs), telecentres or digital literacy centres – to mention but a few of their names, began to be deployed in Spain, and in the rest of Europe, in the 90's.

Telecentres emerged in a particular social and economic setting, with the **rise of technologies which changed society completely**, such as personal computers, the internet and mobile communications. Most of these centres were established in rural areas, with the purpose of fostering and speeding up **broad band internet connectivity** in such areas, as well as of reducing the **digital gap** of the local population, especially that of groups having major difficulties in accessing new technologies.

We may define telecentres as **public centres** providing **access, awareness and training in the use of the internet and technologies**. They have technologically equipped classrooms, their differentiating aspect being the fact that they are **driven by professionals** who are in charge of providing technological advice and delivering training actions enabling different beneficiaries to access the services of the Information Society.

Over these years, telecentres have evolved from being initially centres granting free internet access and basic training in technological tools to centres of expertise for boosting digital competences and the digital transformation of citizens, becoming **key instruments for the development of Information Society policies and the Digital Agenda** within regional and local governments.

These centres generate a significant volume of **citizen innovation linked to the use of technology**: they help accessing and assimilating technological changes, they are connectors for local resources, and their driving agents are specialised in managing change in local settings as they encourage a smarter use of technologies by citizens, entrepreneurs and SMEs, thus increasing social value and economic impact at the local level.

Following a period marked by a strong economic crisis, Digital Competence Centres are gaining strength again, being now more necessary than ever. **Digital Competence Centres have matured and have brought different networks to fruition** at local, regional, national and European level that are acquiring greater value as they get connected and coordinate with one another. Currently in Spain there are Networks of Digital Competence Centres in almost all Autonomous Communities, and it is estimated that there are some 2 500 centres around the national territory. Most of these networks gather around the **Asociación Somos Digital** – at national level, and around the **ALL DIGITAL Association** – at European level.

Today, some twenty years after, the process of digital transformation continues to spread **more intensely and faster** than ever, as new sociodemographic factors appear, such as urbanisation, rural depopulation, migration and longevity.

Many studies and research anticipate the changes resulting from technologies such as **5G connectivity**, **Artificial Intelligence**, the **robotisation of processes**, **cybersecurity** or **Blockchain**, among others, that will affect all types of occupations within the labour market, causing existing jobs to disappear or to change and sparking the creation of new professional profiles.

In turn, Europe is increasingly putting the focus on the need to foster the digital competences of its citizens, as evidenced by the creation of the **European Digital Competence Framework for Citizens** by the European Commission, or **DigComp**[1], the launching of a new aid scheme for the development of initiatives promoting digital competences, known as "**Digital Europe**", as well as the commitment to foster these initiatives through the **ALL DIGITAL's Manifesto for enhancing digital competences across Europe**[2] which more and more European entities are adhering to.

The digital transformation which society is immersed in **requires a change in approach and in the evolution of the services offered by Digital Competence Centres**. This new context and the immediate future require better digitally trained citizens, capable of participating in different ways in a world where these technologies are not only ubiquitous – but are deeply transforming social relations and the world of work.

Digital Competence Centres must be able to anticipate and react to identify what the new needs are and what new services they can offer to citizens, both from a social and employment perspective. In short, they will have to **adapt and offer new services** to respond to the new socioeconomic challenges that are expected as a consequence of the digital transformation.

1.2. PURPOSE OF THE STUDY

The purpose of this study is to contribute to the **design of a new services portfolio for existing and future Digital Competence Centres**, with a **time horizon of 2030.**

Twenty networks of Digital Competence Centres, both at the Spanish national and international level, as well as experts in different fields (research, employability, education, citizenship and Internet users) have participated in the study.

This document aims to define a broad set of **services which current Digital Competence Centres** will ultimately adopt, with the purpose of providing a strategic vision of the solutions they could offer within such centres. It is important to clarify that the purpose is **not about establishing a single services model that works for all centres**, or to have each and every centre to deploy all the services set out in this document. Each Centre has its own particular scenario, with different features that depend on its sociodemographic, economic, geographic and technological context, and the promoters of each initiative shall ultimately analyse which services in the portfolio proposed here are the most suitable for each type of centre.

To conduct this vision exercise it is necessary to **look at the past and to imagine the future**. Although it is not easy to imagine what it will be like to live and work in the era of technological supremacy, it can be sensed that social life, leisure, relationships, work, transportation or public services, to name but a few examples, will be deeply affected.

[1] DigComp: Digital Competence Framework for Citizens,

[2] Digital Competences Manifesto

The exercise we want to do is to **situate ourselves in some intermediate point in time between the present and the most distant future**: far enough to be able to overstate a characterisation of the social and labour context, but close enough to limit uncertainty. Ten years from now, in 2030, the needs will generally be different from today's. It is necessary to anticipate these needs and to analyse how Digital Competence Centres can contribute to satisfying them in a context of interoperation and interrelation with other related instruments and programmes.

With this vision of Digital Competence Centres set out for 2030, we will try to **answer the following questions**:

- **What will be the role of Digital Competence Centres in the future?**
- **What will be the value they propose?**
- **What will be the services they offer and whom will they be addressed to?**
- **Whom should they collaborate with?**
- **What will be the sustainability model?**

1.3. RECIPIENTS

This study is mainly aimed at **officers and managers of Digital Competence Centres**, at **promoters of** impulse **initiatives** of the Information Society and the digital transformation of citizens, consequently, to any person relating to the area of **training and the promotion of digital competences** in their different contexts (formal and non-formal education, employment, social services, etc.).

This forward-looking exercise of Digital Competence Centres will serve as a **tool to help** them **define their own strategy adapted to their regional context** and anticipate a roadmap for its implementation.

2. SITUATION & TRENDS

This chapter describes first the **current characteristics** of Digital Competence Centres in Spain (although there are many commonalities with other DCCs in the rest of Europe) and then analyses the **technological and social trends** that will determine the services of the DCC of the future.

2.1. CURRENT SITUATION

As a first step in this study, different Digital Competence Centres networks have been analysed, especially entities or networks existing at the national level. As a whole, current Digital Competence Centres are greatly coherent and share a similar approach, with some variations associated with the context in which they operate.

The following table summarises the most general characteristics shared by the different networks of Digital Competence Centres:

Magnitude	Key characteristics analysed	Situation
Scope and impact	▪ Number of centres ▪ Geographical areas ▪ Populational scope	There are an estimated **2 500 Digital Competence Centres at the national level**, with a footprint in almost all of Spain's Autonomous Communities, organised in more than ten local and regional networks. Most part of these centres are in **rural areas**, with an estimated 80% of them located in localities with fewer than 10 000 inhabitants.

Magnitude	Key characteristics analysed	Situation
Governance and functioning	▪ Leadership ▪ Management ▪ Functioning	Most telecentre networks are initiatives of **Regional Public Administrations** (Autonomous Communities) in collaboration with **local authorities** (local and provincial councils), although some initiatives are promoted directly by local bodies and even non-profit associations. In general, **leadership and management** roles are assumed by different bodies, the regional government taking the leadership role and delegating the management role to public foundations or to associations answering to the latter. The operation of the telecentres, with some exceptions, is **conducted over the network**. Precisely this is considered one of the successes of their functioning: the existence of different isolated networks that define their own territorial priorities, but which in turn connect and associate with one other making up different territorial hierarchical levels through the concept of "network of networks " In each of the networks, coordination and management of technological, logistical and content aspects are centralised, thus offering common guidelines and services to a number of geographically dispersed yet networking centres.
Purpose	▪ Value proposition ▪ Key indicators	The **value proposition** concerns the digital inclusion of citizens, the improvement of people's employability and quality of life through technologies, as well as the catalytic effect of Social Innovation, thanks to their contact and the proximity of these centres with the needs of the territory. To measure the evolution and impact of their work, they mainly use **key indicators** relating to the number of users or beneficiaries of the services of these centres by sector of interest (adults, women, people at risk of exclusion, etc.).

Magnitude	Key characteristics analysed	Situation
Services typology	▪ Segmentation of beneficiaries ▪ Services typology	**The main recipients** of the services are elderly people, adults looking for a job or seeking to improve their employment situation, people at risk of exclusion, and recently also young people and children. To a lesser extent, services are offered to entrepreneurs and companies. The **services** currently offered include: Internet access, individual technological advice, face-to-face and online training. In some cases, STEAM-related services, technological vocations and development of social innovation projects that provide solutions to problems identified in the territory. Occasionally, centres issue **digital competence certificates**, but only in those Autonomous Communities whose Regional Government has launched their own digital competence. The services offered by these centres are addressed to the local population in their vicinity, and there are different levels of implementation of the services depending on the local context. It has been noticed how, over the years, some centres in remote areas have closed, while **new ones have opened in urban areas**, and even "lighthouse" centres offering specialised services to the entire Network have been created. It has also been noticed that **online services** have taken a more relevant role over time, adding up to the on-site services offered at the centres and serving as a resource for them.
Communication	▪ Communication and positioning ▪ Brand ▪ Means	Telecentres have become instruments for the **Information Society and Digital Agenda policies** of regional and local governments. The initiative has a different brand in each region, each with their own means of communication and positioning (web, social media, facility signs, etc.).

Magnitude	Key characteristics analysed	Situation
Available infrastructures	▪ Facilities ▪ Equipment ▪ Infrastructures	In many cases, the centres are located in **municipality owned premises**, with training classrooms equipped with computers and broadband Internet access, and occasionally, maker / STEAM equipment (educational robotics kits, 3D printers, etc.). A **trend** has been noticed where users increasingly visit centres carrying their own devices (laptops, smartphones, tablets,).
Driving team	▪ Profiles ▪ Roles ▪ Management	The centres have an in-house **team of professional driving and training agents**. Most telecentres are led by a trainer or a driving agent, who provides advice and training to citizens, helping them take full advantage of technologies. They are the friendly face of technology, acting as connectors between technology and the people and the territory, as they adapt solutions to the local setting, etc. In short, they function as true promoters of the Information Society and add value at the local level. Experience has shown that telecentres without driving agents do not provide the same value and yield a lower impact on local development. In general, driving agents have a **"socio-digital" profile**, combining technical skills with pedagogical, organisational and social skills. Sometimes, training services are provided through **collaborators**, allies, volunteers or training companies in the field of technology are hired for this purpose.
Alliances	▪ Internal alliances ▪ Networks ▪ Members	Some **alliances are internal and some are entered into with other territorial actors** (especially in the field of employment, education, local development agents, etc.). Telecentre networks connect and associate with each other, setting up different territorial hierarchical levels so as to enable them to exchange knowledge and to develop joint actions in the field of digital transformation of society. Thus, many local and regional telecentre networks belong to the **Spanish association Somos Digital** and the **European association All Digital**.

Magnitude	Key characteristics analysed	Situation
Sustainability formula	▪ Major financing ▪ Secondary financing	The telecentres are supported mainly through **public financing associated with regional or local authorities**, linked to the Digital Agenda programmes, with the support of European structural funds (mainly the European Social Fund and the European Regional Development Fund). In general, the services are **open and free** to citizens, with the exception of certain more specialised services that involve the payment of a small fee by the beneficiaries.

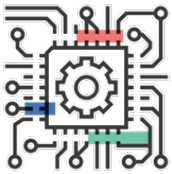
2.2. Ten trends with potential impact for Digital Competence Centres

Along with the analysis of the current situation, ten trends have been analysed that can help characterize the 2030 scenario in relation to issues of interest to Digital Competence Centres. These trends help understand the profile and needs of the future target groups of services, and they help direct the approaches that centres can adopt to respond to new needs. The analysis contemplates different social, technological, competitive and institutions perspectives. These are as follows

+Urbanisation

+Longevity

+Migration

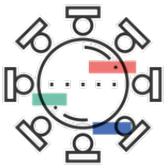


+Technology

+Industry 4.0

+Talent

+e-Administration



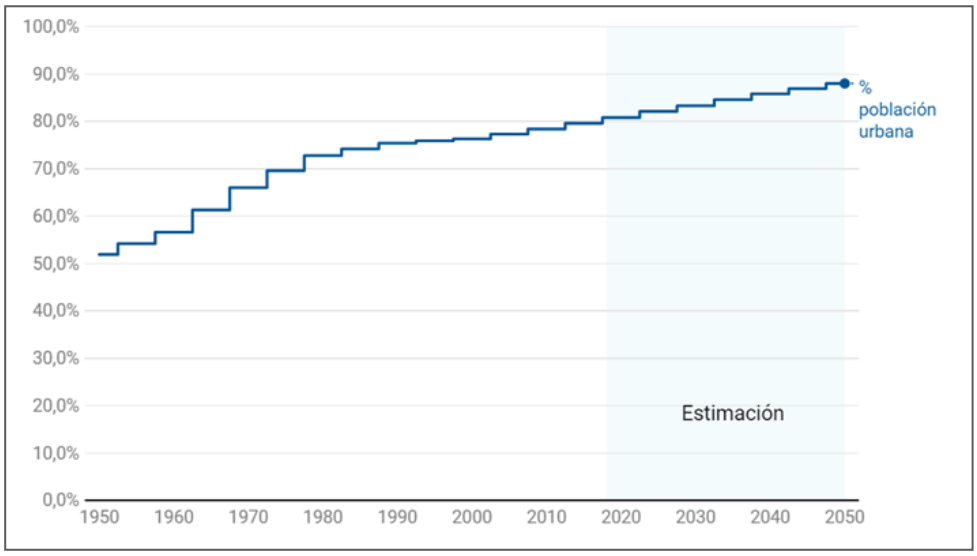
+Community

+Customisation

+Consensus

2.2.1. Urbanisation

Spanish cities and municipalities with more than 10 000 inhabitants have continuously increased their population since the beginning of the 1960s. Of the 8 116 municipalities in Spain, around 750, less than 10%, contain 80% of the population. The rural environment, representing 90% of the territory, contains the remaining 20%. Between 2000 and 2017, the population residing in rural municipalities has decreased by 9%, and this rate has doubled in the second part of the period, between 2008 and 2017, according to data from the Ministry of Agriculture, Fisheries and Food.



1. Evolution of the share of urban population in Spain, and forecasts, UN, 2017.

This phenomenon of rural decline has its own particular conditions, being different from those affecting large municipalities, cities and metropolitan areas. The implementation of new technologies is lower[3], there still being a 5-point difference as regards the use of mobile phones in rural areas as compared to urban areas – although this difference is narrowing, and the deployment of broadband connectivity is outstandingly delayed. Population ageing, i.e. the number of elderly people as compared to the total population, is higher in rural areas than in urban areas, some 10 points above the average value of 18-19% of people above the age of 65 in urban areas. This current depopulation trend of rural areas is expected to accelerate during the coming decades with the disappearance of older generations. Although rural population represents around 20% of the total, according to the 2018 AROPE report, more than 30% of this rural population is at risk of poverty or social exclusion.

[3] INE, Survey on ICT equipment of households.

IMPLICATIONS FOR FUTURE DCCs

Different needs of urban and rural settings.

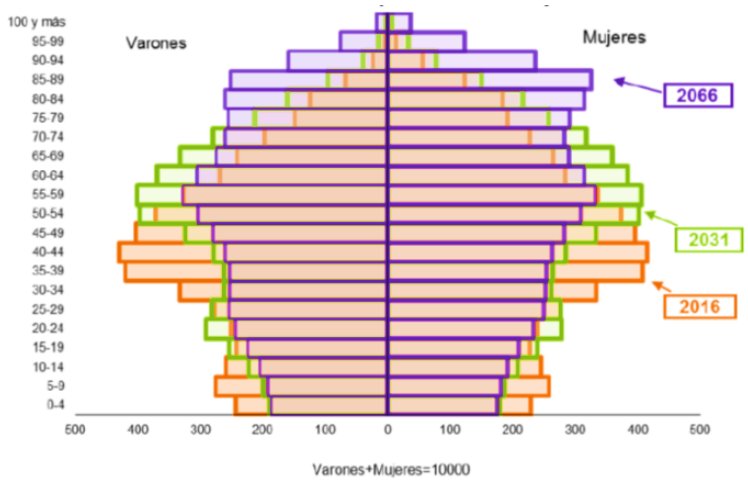
Possibility of specialisation in the urban environment, taking advantage of the density, better transport conditions and the presence of more service provider agents. Greater versatility in the rural environment.

Possibility in the rural environment of becoming an adjunct to public services and as an extension of the administration (electronic administration, participation, social services, health, work, etc.).

Higher percentage of online and virtual systems for training, allowing to reuse contents and services, especially in rural areas.

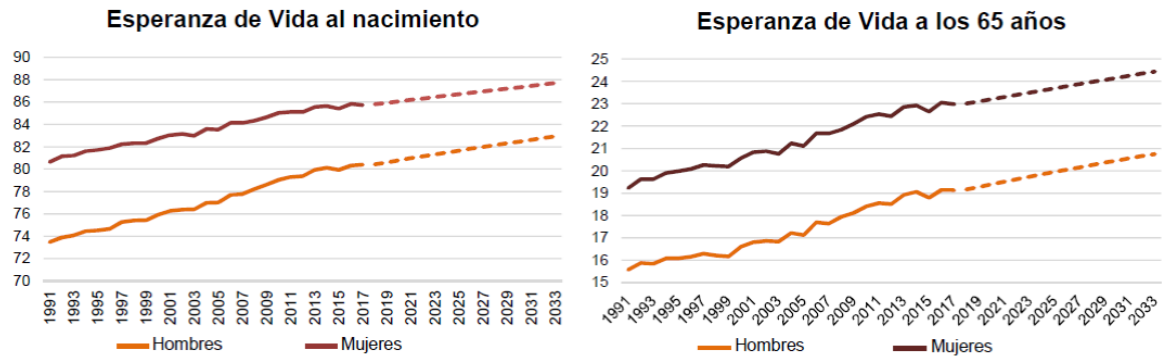
2.2.2. Longevity and ageing

According to the population projections of the Spanish Office for National Statistics (INE, data from 2016), the percentage of the population aged 65 and over, which currently stands at 18.7%, would reach 25.6% in 2031, with a significantly higher percentage of women. According to this projection, the population over the age of 64 in 2031 in Spain would amount to 11.7 million people, three million more than today (34.8%). By five-year age groups, the largest at present is 40 - 44 years old. But this will change in 2031, when the largest group would be 55 - 59 years old.



2. Demographic pyramids in Spain (Men/Women), INE, 2016

In addition, life expectancy at birth, being one of the highest in the European Union, follows a favourable trend, both for men and women. This is also the case with healthy life expectancy at 65 years, which in the last ten years has increased a bit more than 3.5 years for both genders, being therefore higher than the almost 2-year increase in life expectancy at birth.



3. Life expectancy at birth and at age 65 (Men/Women), INE, 2018

That is, the projections for 2030 show a significantly older population, with people over 65 years representing 25% of the population – figures for women being higher than those for men, with healthy and autonomous living conditions and whose life expectancy would exceed 81 years for both sexes.

Elderly people in these projections will be more active, independent and healthy than current elderly people; they will have better technological skills, better social participation from multiple perspectives and will be more empowered as regards health, prevention and self-care.

However, ageing also implies that, considering current models of work and retirement, progressively fewer people will be of working age to keep the economy running – if no alternative models emerge.

IMPLICATIONS FOR FUTURE DCCs

A higher percentage of people over 65 years as compared to the total.

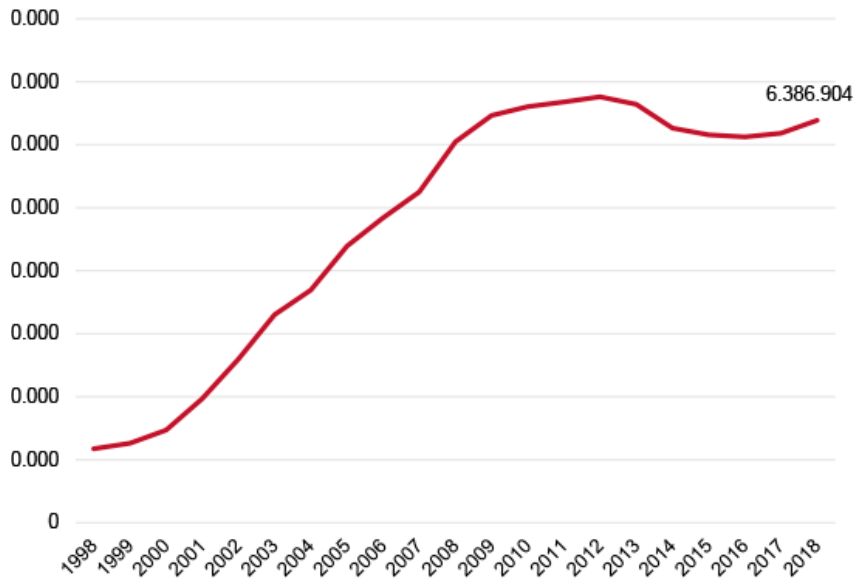
Increased needs regarding health, prevention and self-care at home.

Increase in qualification and requalification needs in the workplace.

Possibility of making the most of the experience and knowledge accrued by this generation with a focus on self-employment, volunteering and community support.

2.2.3. Migration

Following several years with a decreasing trend, the recovery of the employment market and family reunification has led to an increase in immigration: immigrants already represent 14% of the Spanish population and a fifth (21%) of the population between 25 and 49 years – the central stock of population of working age.



4. Evolution of number of immigrants, INE, 2018

Recent immigration in Spain has been mostly of extra-Community origin, of economic nature, being first generation young adult job-seeking immigrants. During the last two decades, a second generation of children of immigrants has already been born. The trend is likely to increase, especially considering that an undetermined percentage consists of irregular migrants, a circumstance that will put pressure on the cohesion of society. A key to social cohesion and integration will be the employability and professional success of these new generations. Unemployment among immigrants continues to be higher than among Spaniards, standing at 21% compared to 14%. Training and qualification will no doubt be useful tools to achieve this, yet this poses an additional challenge, since, although there are no in-depth studies, some authors indicate that there is evidence of a higher dropout rate and a lower educational aspiration in the immigrant population[4].

IMPLICATIONS FOR FUTURE DCCs

Greater focus of digital skills towards employability.

Contribution to the regularisation of employment, via certification mechanisms or similar.

Possibility of including other associated services, not directly linked to digital knowledge and skills, such as training in other disciplines or language.

[4] González, Carmen, "*Inmigración en España: una nueva fase de llegadas*", Real Instituto Elcano, 2019.

2.2.4. Pervasiveness of technology and the challenge of privacy and security

Digital technology has progressively expanded from traditional office automation software in personal computers and the Internet to a new model in which a multitude of smart devices operate and interact around the people in a pervasive way. This is what is known as the Internet of Things (or IoT). Its deployment will contribute to a progressive transformation of our many daily actions, such as how to access our home or how we pay for goods and services.

The deployment of the IoT involves a series of key elements for the design of services for the Digital Competence Centres and that are new in comparison with more typical office and Internet services.

One of the most obvious repercussions is that the IoT entails a transformation of how people behave when using services. For the most typical Internet services, such as downloading contents, transferring money, watching a movie, making a call or sending a message, the activity requires explicit, conscious actions, and is usually timed. With the IoT, interaction is often done with low human intervention, imperceptibly. People are not really aware that an activity is taking place, and the time frame when it happens is usually not relevant. This way of working will multiply as "environmental intelligence" expands and people equip ourselves with more and more smart devices. Being aware and understanding the repercussion of the use of this type of devices and services are extremely complex aspects.

Also, in this scenario, personal, social and labour spheres overlap: these devices establish links and connections with other devices in personal, public or professional environments, generating a complex network of relationships between the devices, between devices and people, and between people, thus mixing up all the spheres. All the information that is generated or consumed in an IoT device in our environment – whether our property or not, all the information about the interaction we have with them – whether we are aware or unaware, and all the information about the relationships and connections of our devices – whether we want to or not, will be stored somewhere in the cloud, along with those pertaining to many other people and devices. This scenario imposes new challenges on people's privacy expectations.

The expansion of the IoT will permeate all facets of our daily life and of the systems that operate the world until it becomes an essential part for the functioning of society. If our vehicles, traffic systems, locks, ATMs, etc. are connected, then ensuring protection against cyber-attacks is critical. Most importantly, malicious intervention can cause invaluable damages, such as an attack on a railway signalling system or a power plant control system. And all this complex network of interactions between devices will increase the points of vulnerability. Therefore, it is necessary to increase robustness and measures preventing the theft and misappropriation of sensitive information, such as passwords, keys, contacts, private or confidential data, as many times this may lead to other acts of assault. Since utter and absolute protection is most likely impossible, the responsibility to mitigate the risk, within a complex legal framework, is being shifted towards many actors, including device manufacturers, infrastructure operators, service providers and regulators.

Part of this responsibility is also being transferred implicitly, sometimes even explicitly, to the users themselves. But due to the density of interrelationships and operations that exist in the network and how difficult it is both to know them and to perceive the implications they have, it is practically impossible for people to understand the risk and act consequently to mitigate their vulnerability.

IMPLICATIONS FOR FUTURE DCCs

A new conception of the type of equipment and type of associated services: not only office automation, but also home automation systems, teleservices, portable systems, gadgets, etc.

Increase in services related to privacy and security management.

Inclusion of legal aspects.

Greater difficulty for driving teams to possess the skills required to provide the associated services directly.

2.2.5. Industry 4.0 and Digital Transformation

Of course, in addition to personal and social levels, technological development and its application are going to have a far-reaching impact on the economic and industrial environment. Concepts such as Industry 4.0 or Digital Transformation are synonyms of innovation or competitiveness, especially for smaller companies. Companies will continue to equip themselves with technology to maintain relative competitive capacity and to enter global value chains. ITs, the Internet and mobile communications are followed by cloud computing, the Internet of Things, precise sensorics, cybersecurity, mixed reality, big data, robotics or Artificial Intelligence. And soon they will be followed by other new ones such as quantum computing, that will involve new paradigms. These are increasingly complex and more interdependent technologies that evolve in an accelerated way, feeding one another. They have such a significant capacity for transformation that they are being considered, as a whole, as the lever of a new "industrial revolution". They will be decisive in determining how and where a good is produced (e.g. 3D printing) and how to respond to society's demands regarding food, health, education, energy, transport, leisure or entertainment.

As in previous industrial revolutions, many functions in the world of work (and not only therein, but also in many other areas such as childcare, housework services or transport) will disappear, others will be transformed and new functions will also emerge, creating a significant impact on employment, on all types of employment. On the other hand, economic growth forecasts for the next decade – between 1.2% and 1.5% per annum on average, are not strong enough to generate employment that may dramatically reduce the current unemployment rate, which might rise up to 30% in some Autonomous Communities.

At the same time, considering employment trends where the retirement age has remained constant, the longevity factor will have a substantial impact, by progressively reducing the number of active workers and increasing the pressure on public funds.

Although employability and entrepreneurship – including self-employment, have never been considered a minor issue for policy makers, they are now becoming especially relevant in the face of the new industrial revolution enabled by technology.

However, technology will also empower the people as regards their working life. It will facilitate and increase their physical and cognitive abilities with greater flexibility in relation to age and their abilities to perform the functions that will be required in the economic domain. At the same time, the exploitation of technology will generate a new economy with new employment opportunities. It is vital to train people, not only at the beginning of their lives, but throughout their lives, to make use of new means and to make the most of the new opportunities that changes will bring.

IMPLICATIONS FOR FUTURE DCCs

Greater importance of digital skills for employability, with a readaptation of contents and services, plus a bigger focus on the skills to be acquired by people.

New potential interest groups, such as highly qualified employees requiring new skills to manage technological systems (e.g., with Artificial Intelligence) in the workplace in areas such as management, medicine, law, etc.

Need for a new positioning for DCCs in this new scenario.

2.2.6. e-Administration

As in the case of companies, the administration will continue to adapt itself to the digital transformation process, both internally and in relation to the functions and services it provides to citizens. The interactions and transactions of citizens with the administrations will become progressively more digital. The enactment in 2015 of Law 39/2015 (on Common Administrative Procedure) and Law 40/2015 (on the Legal Regime governing the Public Sector) laid the grounds for this digital transformation. Both laws should have come into force in 2018, but a moratorium was declared until 2020. According to Ernst & Young's report entitled "La Administración Electrónica en España" ("e-Administration in Spain"), which analyses some aspects of e-administration – from electronic registries to the existence of web portals for local and regional administrations, the degree of deployment and maturity of different services ranges between 0% (representation and electronic registries in municipalities) and 94% (web portals in Autonomous Communities), and this deployment is still not very uniform among the different Autonomous Communities.

At the same time, the progressive "smartisation" of cities and territories will spread technological developments beyond ordinary functions and transactions. New digital technologies, data and innovative approaches will modernize future public services. Services such as mobility, security, environmental management, waste collection, social assistance, etc., will be increasingly supported by technology and interactions will rely on specific devices (such as citizen cards) and generic devices (such as wristbands, watches or mobile phones). Therefore, it is necessary to anticipate how society as a whole adapts to this new operation.

IMPLICATIONS FOR FUTURE DCCs

Potential role of spaces associated with DCCs as an extension of the administration.

In addition to e-administration, further services relating to health, environment, mobility, leisure, security, etc. must be incorporated into the services portfolio.

Qualification of the people supporting e-administration services in DCCs (for managing keys, identities, etc.)

2.2.7. Digital talent

The progressive digital transformation of society, the economy and the administrations is triggering the demand for profiles specialising in areas such as programming or content creation on new media. According to the ***Digital Talent Overview 2019*** report [5], while the need for digitally-qualified personnel has increased by 36.1%, that of regular employees has only increased by 3.2%.

A survey carried out by the Spanish Association for Digitisation, DigitalES, indicates that in 2017 there were at least 10 000 job vacancies in the technology sector in Spain due to the lack of qualification and it is estimated that between 2017 and 2022 digitisation will be responsible for creating 1 250 000 jobs in Spain.[6].

Demand will continue to grow, widening the gap between demand and supply of digital talent. Filling this gap requires various complementary measures. On the one hand, it is essential to promote the reskilling and upskilling of professionals to access this expanding market. At the same time, enrolment in technical and technological colleges should be encouraged, since, according to data from the Spanish Ministry of Education, enrolment rates in Spain dropped between 2010 and 2017 by 28% (engineering and architecture) and 3% (science)[7]. This requires measures to be taken at earlier ages to embark on careers in STEAM (***Science, Technology, Engineering, Arts and Mathematics***).

The gender gap adds up to the digital talent gap. According to DigitalES, the decrease in enrolment in technical colleges is more marked in the case of women. Women only account for 14.6% of graduates in technological studies, and despite the fact that salaries are on average 22% higher than in other sectors, women earn 8.9% less than their male peers.

Finally, it is necessary to highlight the importance of **retaining talent** in the areas where it has been generated, to avoid depopulation (especially in rural areas) and the outflow of talents to cities with greater employment opportunities.

[5] Barcelona Digital Talent

[6] Digitales

[7] "El Desafío de las vocaciones STEM", Asociación Española para la Digitalización, DigitalES

IMPLICATIONS FOR FUTURE DCCs

Incorporation of services linked not only with "knowledge", but also with "know-how": programming, design, electronics, drones, robotics, etc.

Need to incorporate a more sophisticated offer of content and services, probably through new providers.

Adaptation of services to new groups, such as young people, children, or to employees willing to upskill their competences.

Programmes aimed at gender integration in technical and scientific competences and careers.

2.2.8. Communication and community building

People are social beings. We build communities, from family to global structures. Communities are made up of individuals who reinforce the connection and the feeling of belonging, recognize a space as theirs (physical, cultural or ideological) and give meaning and expectations to their members around common values and objectives. In all its configurations, the role of communities has been crucial for the progress and social well-being of both the individual and the group. But at the same time, progress, especially technological progress, is resulting in the reduction of physical communities and their replacement, at least partially, by online or virtual communities.

The maker of the largest online community Mark Zuckerberg published in early 2017 a manifesto on the need to ***build a global community***[8]. In his manifesto he upheld the idea that building online communities would help reinforce the building of physical communities: "***online communities are a bright spot, and we can strengthen existing physical communities by helping people come together online as well as offline. In the same way connecting with friends online strengthens real relationships, developing this infrastructure will strengthen these communities, as well as enable completely new ones to form***". Yuval Noah Harari referred to this idea in his book "21 Lessons for the 21st Century", highlights that, in many cases "***[online] connection occurs at the expense of [physical] disconnection***". He claims that all the energy and dedication we put in to spend more time online entails the opposite to be offline, in the physical world. He further claims that the depth of the individual's knowledge in physical communities cannot be equalled, for the time being, by that of virtual communities, often based on instant interaction, content sharing and the expression of opinions.

In any case, and apparently, the development of online communities and social media is likely to continue expanding at an increasing rate compared to physical communities in the next decade. New digital devices and technologies are increasingly providing a richer and fuller sensory interaction, for example, with augmented and mixed virtual reality systems operating on very high-performance communication networks.

[8] Mark Zuckerberg - manifesto

IMPLICATIONS FOR FUTURE DCCs

Incorporation of new services and configurations into DCCs to reinforce communities: citizenship laboratories, participation environments, etc.

Programmes oriented to the use of new technologies for the creation and development of virtual communities.

Integration of media literacy-related topics and promotion of critical thinking.

2.2.9. Customisation

Customisation means offering products and services exactly adapted to the needs and characteristics of each person. Although the idea arose in the business world as an additional attribute in goods and services for which the client would be willing to pay more, the truth is that little by little it has become a standard value in the market. Technology itself is facilitating the availability of a more accurate and precise knowledge of each client or user, of their habits and preferences. For Digital Competence Centres, the interesting thing is how this customisation trend is transferred to the learning space: how services can be adapted to the characteristics, levels of capacity and paces of each person to maximize their impact and performance. This involves adapting learning resources and methodologies, and adapting them to fit the best channels for each case. However, it also implies a change in the participation of the beneficiaries of the centres themselves in the learning process.

IMPLICATIONS FOR FUTURE DCCs

Introduction of technological tools and technical developments for the provision of services in DCCs (that is, the digital transformation of DCCs) allowing to obtain knowledge about each beneficiary and to generate individual pathways.

Increased flexibility in terms of schedules, contents, materials and channels.

Incorporation of the "virtual" paradigm for DCCs.

2.2.10. SDGs, a consensual model

In 2015 the UN adopted the Agenda 2030 for Sustainable Development, a plan of action for people, planet and prosperity, which also seeks to strengthen universal peace and to provide access to justice[9]. The Agenda proposes 17 Goals with 169 associated targets which are integrated and indivisible and balance the three dimensions of sustainable development: the

[9] Agenda 2030 - Sustainable Development

economic, social and environmental (Sustainable Development Goals, SDGs). It provides a long-term vision whilst allowing to implement short-term actions aligned with the targets.

5. The 17 Sustainable Development Goals

SDGs provide the global framework for international cooperation on sustainable development, with its economic, social, environmental and governance dimensions. The European Union and its member states signed and fully committed to apply this framework; since then, the European Commission has been working to integrate it into its policies. In this process, the EC notes that, as regards education, science, technology, research, innovation and digitisation, they "*are a prerequisite for achieving a sustainable EU economy meeting the SDGs. 56 We need to continue to raise awareness, broaden our knowledge, and hone our skills. We should invest more in these areas, gearing them towards the SDGs* [10]". The EU further notes that "*Enhancing ICT skills and core digital competences, in line with the EU Digital Education Action Plan, 57 and focussing on artificial intelligence 58 should be among the priorities when moving forward. Harnessing the power of the digital transformation to meet the SDGs is a clear priority. The EU is fully committed to develop capacity and expertise in key digital technologies such as connectivity, the 'internet of things', cybersecurity, blockchain or high-performance computing, while simultaneously paying attention to the potential negative externalities of digital infrastructures.*"

[10] "Reflection Paper. Towards a Sustainable Europe by 2030", European Commission, Brussels, 30.1.2019. COM(2019) 22 final.

In other words, the SDGs and their translation into European policies are a reference framework for Digital Competence Centres, who need a new type of guidance and indicators.

IMPLICATIONS FOR FUTURE DCCs

SDGs serve as a framework for establishing impact indicators.

DCCs should analyse their contribution not only from digital skills viewpoint, but also from other key viewpoints outlined in the SDGs on equality, health, the environment, etc.

The European digital skills policy is also a reference framework for different DCC programmes.

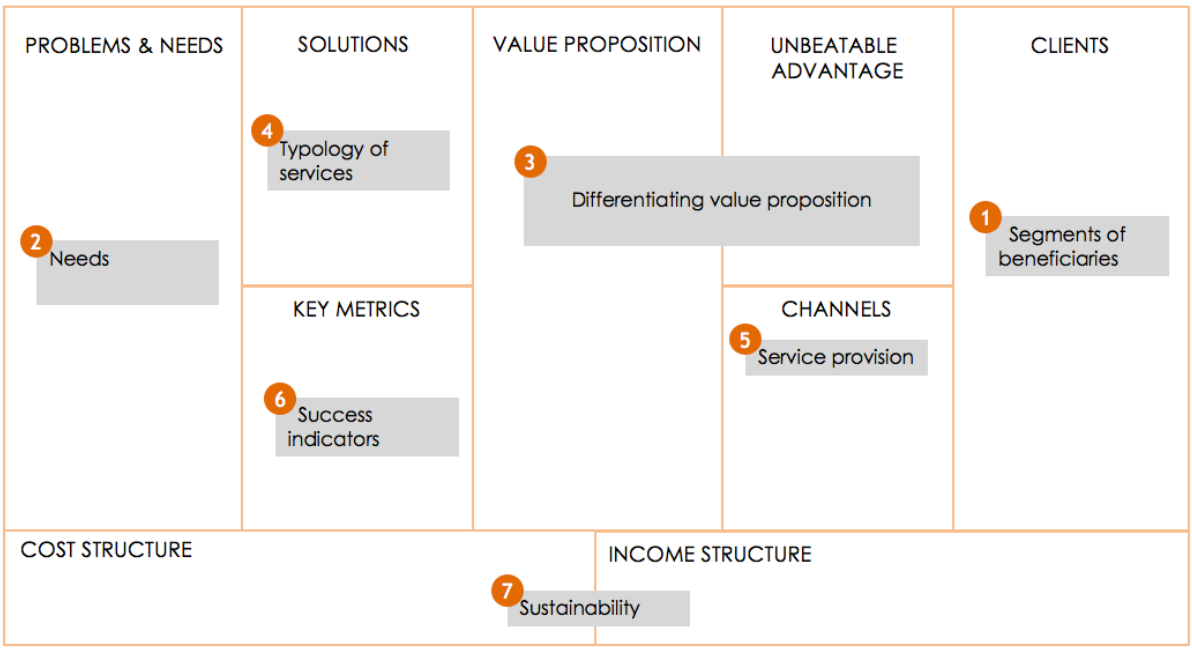
Further resources could be used to supplement existing ones in DCCs through European frameworks, such as the Digital Europe Program, to increase their capacity to act.

3. Model For The Digital Competence Centres Of The Future

This chapter defines what the service model for the Digital Competence Centres of the future will be like.

To approach the model, a lean canvas has been used as a framework. It allows to easily visualize the key components of the model. This is a "lightweight" business model canvas, useful for uncertain environments[11].

The following figure represents how it is adapted to the context of Digital Competence Centres:



6. Adaptation of Lean Canvas to Digital Competence Centres.

The main **components** defining the model are the following:

1. Priority **beneficiary** segments for DCCs.
2. **Needs** for each segment.
3. **Differentiating value proposition** for DCCs.
4. Types of **services** for each segment of beneficiaries.
5. **Service provision** formulas.
6. **Key metrics**: indicators to measure the success of the services.
7. **Sustainability** of the model as a public service.

[11] Maurya, Ash, "Running Lean, Iterate from Plan A to a Plan That Works"

Each of these components are developed in the following sections.

3.1. GROUPS OF BENEFICIARIES

As regards groups of beneficiaries for DCCs in 2030, the following segments of **key beneficiaries** requiring assistance have been identified:

- **Children (<15)**.
- **Young people (15 - 24)**.
- **Young people (15 – 24) not in education, nor employment**.
- **Adults in general (25 – 65).**
- **People seeking employment**.
- **Entrepreneurs, self-employed people and SME employees**.
- **Elderly people (>65)**.
- People at **risk of digital exclusion.**

The segments of beneficiaries are not mutually exclusive: a person can belong to several segments depending on the roles they take considering personal, social and labour circumstances. Their needs may vary according to such roles and different services are necessary to meet each type of need.

Here are the **key differences** between this vision and the current situation:

In the future, there will be a broader and less segmented view of the groups of beneficiaries, which comprises both offline and online society. DCCs will likely have to cater for the specific population of the community where they stand. All citizens will have needs regarding digital skills. In other words, citizens must be served, without significantly prioritising certain groups – as compared with the current vision, which focuses on certain groups at risk of digital exclusion. The CCD will be a meeting place where a cross-sectional sample of society meets.
Those skilled in technology will also be users of these centres. Technological developments bring new challenges even for stakeholders having digital competences in current technologies. Artificial Intelligence, the challenges of privacy and security, robotics and the permanent digital adaptation of people to the jobs of the future, they all are relevant for qualified professionals and not only for those people with lower qualifications or skills in digital technologies.
Children as beneficiaries will have a relevant position in this new vision.
Digital natives and qualified professionals are considered as beneficiaries of the DCCs of the future, since they will face new requirements arising from increasingly complex technologies.

Some aspects that were key in the early stages of DCCs, such as the age gap or the gender gap, will be less relevant in this 2030 vision. Acquiring digital skills for employability will become increasingly important instead.

3.2. NEEDS OF BENEFICIARIES

This section analyses the **"digital" needs** of each of the **groups of beneficiaries identified** in the previous section:

- **Children (<15)**. Estimated needs:
  - Guidance needs towards scientific, technical and technological vocations, with a focus on gender mainstreaming.
  - Needs related to responsible use of technology, security and privacy, critical thinking.
  - Making the most of new digital media, such as videogames, eSports, social media, etc. with a useful purpose.
- **Young people (15 - 24)**. Estimated needs:
  - Needs associated with "know how" pertaining to new technologies so as to participate in their community and in the new digital society (programming, operating devices such as drones, generating digital contents, designing, etc.).
  - Needs arising from a responsible use of technology, security and privacy, critical thinking.
  - Needs for guidance, training and specialisation oriented to their preparation for the world of work. Need to work and reinforce soft skills (communication, leadership, creativity, teamwork, etc.), being transversal skills increasingly more appreciated in the work place.
- **Young people (15 – 24) not in education, nor employment**. Estimated needs:
  - Needs associated with motivation and know-how with a purpose through the use of new technologies, both digital and connected with STEAM concepts and maker spaces, for social or economic entrepreneurship.
- **Adults in general (25 – 65)**, with no particular segmentation. Estimated needs:
  - Needs associated with "know how" pertaining to technology, participating in communities and networks, generating contents, using them in complex environments.
  - Needs related to digital e-administration, especially as new services will arise, related to community and democratic participation and, in general, related to the use of digital services of all kinds deployed in sectors such as finances, insurance, energy, mobility, etc.

  - Needs associated with the co-existence at home, at work and in the environment of new digital concepts, such as Artificial Intelligence, robotics, *chatbots*, shared registry systems, etc. Skilfully solving technology-related problems in these environments.
  - Needs related to understanding legislation, regulations or issues relating to privacy and security.
  - Needs related to el continuous learning, especially focusing on reskilling on digital competences for the workplace.
  - Accredited qualification in digital competences for the workplace.

- **People seeking employment**, both young and adults. Estimated needs:
  - Training and retraining for employability, including both technical competences (more general or more specific, such as programming), and horizontal skills related to creativity, design, teamwork, etc.
  - Accredited qualification in digital competences.

- **Entrepreneurs, self-employed people and SME employees**. Estimated needs:
  - Needs associated with know-how with a purpose through new digital connected technologies: using tools and applying them to processes, products and services; links with clients and partners, eCommerce, personal development, etc.
  - Needs related to digital e-administration from a business perspective.
  - Skilfully solving technology-related problems in the work environment.
  - Needs related to legislation, regulations and issues related to privacy and security from a business perspective.
  - Needs related to continuous virtual learning of all kinds of competences and skills.
  - Training and retraining in the work for a skilful use of technologies as they are deployed in new services and with new functionalities.

- **Elderly people (>65)**. Estimated needs:
  - General digital needs associated with the acquisition of confidence and skilful use and access to media (technology, connectivity), including new media (e.g., Virtual, Augmented or Mixed Reality, technical enhancers, robots, *chatbots*), for applications regarding autonomy, connectivity and relations in a wide sense, including leisure and entertainment.
  - Specific needs related to autonomy at home, telecare, prevention, care and attention.

- People at **risk of digital exclusion** (rural population, women, immigrants, people with disabilities, etc.). Estimated needs:
  - Digital literacy as a tool for an improved quality of life.
  - Developing digital skills for social, labour and personal inclusion de, catering for the specific needs of each specific group: ICT accessibility for people with disabilities, language support for immigrants, etc.

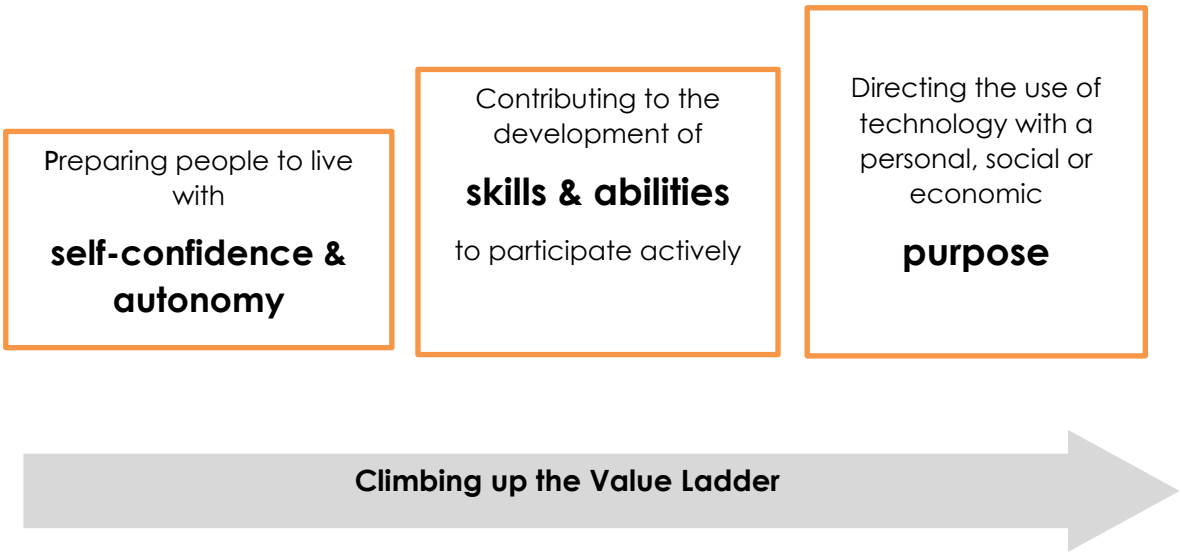
3.3. Differentiating Value Proposition

Based on the fieldwork completed to date, the common vision 2030 for DCCs would cater for the following **general objectives**:

- Bridging the **digital gap** through digital literacy. However, the purpose now is not just to have the competences, but to have the know-how and use them in a smart and skilful way in daily life to develop projects, create things, etc.
- Improving **employability**. Putting the focus on lifelong learning, including transversal aspects supplementing regulated training (creativity, problem solving, learning to learn, etc.) and offering customised guidance and retraining services on digital competences, encouraging technological and entrepreneurial vocations.
- Promoting **civic participation**, community building and citizen empowerment to address local problems related with the use of technology.
- Supporting **active ageing and improving quality of life**, addressing autonomy and active participation, highlighting the expertise and knowledge that the elderly can contribute to the Community.
- Reducing **rural depopulation**: promoting tourism and local heritage, generating local value through the use of technologies, facilitating telework, bringing public services (e-Administration, online training, health-oriented services, telecare, etc.) closer to rural areas.
- Stimulating the **local economy** by supporting self-employed people and small enterprises and fostering their competitiveness through technology.
- Bridging the **gender gap**, especially in the digital domain, providing young and adult women with the competences and skills required for their personal and professional development and growth.

To achieve these objectives, the Networks of Digital Competence Centres rely on a **comparative competitive advantage**, i.e. their proximity to the territory, their capillarity, their having a network that is fully deployed and fitted with equipments, facilities and stable timetables both on the physical domain and, increasingly, on the virtual domain and, of course, the trust generated by the driving agents that support these centres and offer customised support.

In the light of the above, the **Value Proposition for the future model of Digital Competence Centres** could be formulated according to the following Value Ladder:



This formulation follows a "know – know-how – use with a purpose" scheme, as compared with the more typical knowledge-based vision of DCCs in their early stages that has evolved towards a know-how-based approach: carrying out administrative formalities, publishing content or communicating with relatives.

Each step of the Value Ladder represents a higher level in the Value Proposition for the Digital Competence Centres of the future:

- **Preparing people to live with self-confidence and autonomy in the digital society**

  On this step, the value proposition is to bridge the digital gap. The objective is to secure digital literacy and enabling the use of new tools in everyday life, such as communicating and relating with others, obtaining information, interacting with service providers, etc.

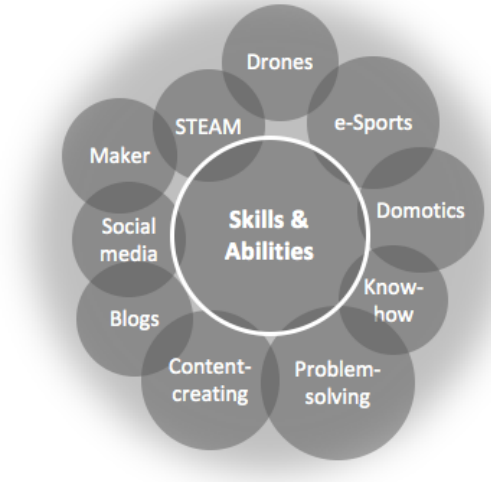
  This value proposition is applicable to all groups of beneficiaries to a greater or lesser extent, including regular users in the digital society, as new elements appear related to new technologies or to increasingly complex aspects concerning privacy and security.

  The aim is for older people to feel autonomous in the use of devices and services, including those related to health, but also for adults to use digital services, for example, e-administration, or for "native" young people to use these means responsibly, know the implications and their consequences.

7. Self-confidence and Autonomy

- **Contributing to the development of skills and abilities to participate actively**

  On this step of the Value Ladder, the focus moves from having the knowledge about what these tools are about and how they are used in usual transactions towards developing the skills and abilities enabling a more active participation, including easier issues such as generating content and using social media and more complex ones such as creating, programming, managing networking communities, etc. Citizens will be empowered to shift from "using" to "doing".



8. Skills and Abilities

- **Directing the use of technology with a personal, social or economic purpose**

  On this step, the skills and abilities concerning the use of tools are applied to generate value for society, contributing to community building, to an improved employability and to social and economic progress.

  For example, for older people, this means empowering them for an active, healthy, safe and independent ageing, but also for greater social and political participation, self-training, work and volunteering. For professionals, it means taking advantage of these tools to create better products, services and relationship infrastructures. For the youngest, it means promoting STEAM competences, innovation and vocations towards new technology-based professions.

9. Value Proposition

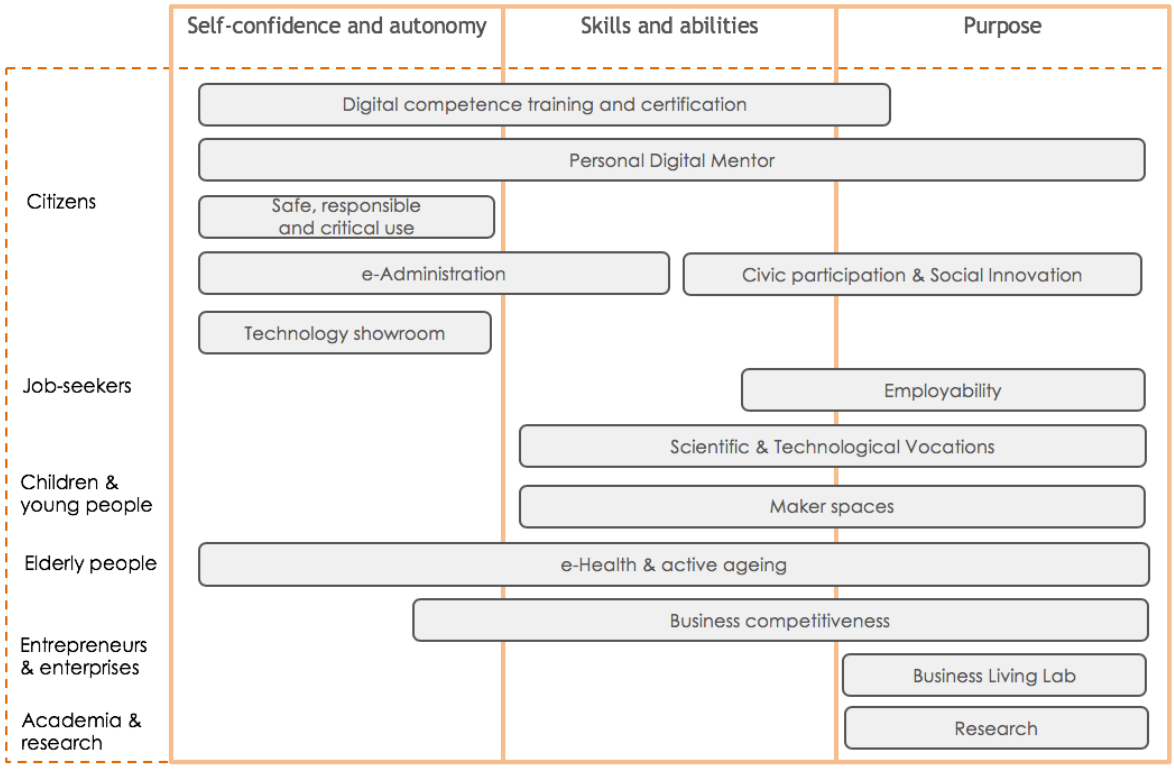
Of course, this Value Proposition is a general proposal. Each DCC could develop different specific proposals adapted to different priorities. In this sense, a characteristic of these networks and tools is that their general mission is usually outlined by the priorities of their governance. If the managing of the DCC or the DCC network is organisationally subject to a public structure holding powers regarding economy and economic development, the network will develop a certain orientation, within its mission, towards this dimension, which will surely be somewhat different from what it would develop if it was subject to another structure holding powers regarding employment, social action, civic participation or education.

In addition to the "main" Value Proposition, that is, the one that is aimed at the main interest groups (in this case, the beneficiaries of the services), it is important to consider that there are also other secondary Interest Groups. DCCs can build value proposition for these interest groups. Their territorial presence, both urban and rural, or the ability to connect a large sample of users with technological solutions are valuable assets for other agents, such as researchers or technology companies that want to channel, contrast or validate new approaches. There are also interest groups within the administration itself: DCCs can complement the work of Citizen Advice Bureaux, health and welfare services, certain education services, statistical services and monitoring centres, etc.

3.4. Types of Services

Below is a description of the different **types of services that could characterise the offer of services made available by DCCs** so as to implement the above Value Propositions and respond to the needs identified for each group of beneficiaries.

The following figure is a general representation of the value proposition associated with the type of preferential beneficiary, although people may take different roles and become potential beneficiaries of different services.



10. Map of services

These services will be deployed as programmes and activities that each Centre will develop depending on its resources, considering whether it is an urban or a rural centre, the priorities established by the public administration which the centres report to, the human resources (driving agents and coordination structure), the public-private partnerships they assemble, the experience of the centre, the available budget and, of course, the creativity of driving agents and managers when planning their activities.

The following tables describe the **types of services proposed**, with a general description of their main recipients, the needs they cover and, where appropriate, the eventual implications for DCCs themselves.

Title	**DIGITAL COMPETENCE TRAINING AND CERTIFICATION**
Description	This service makes it possible for users to: ▪ Obtain a **diagnosis of their digital skills**. This diagnosis will shift from simple models to other more complex processes that could incorporate Artificial Intelligence or other technologies, both to diagnose and to propose training pathways and recommendations. ▪ Having the chance to access different **training pathways** depending on their needs. The training methodologies will be adapted to the needs of the recipient, prioritising online training with increasingly individualised learning processes based on gamification and simulations. Trainees will have access to their PLE (Personal Learning Environment). The contents may be multiple, ranging from office automation and personal productivity, with the use of mobile applications, social media, to more specialised topics, such as Artificial Intelligence, robotics, cybersecurity, etc. ▪ **Certification of digital skills.** The certificate will gradually gain recognition and value for access to employment purposes in the public and private sectors. When developing this type of actions, the tendency is to align with one of the available digital competence frameworks. In relation to this, the European Commission published in 2013 the first version of the European Framework of Digital Competences for Citizens (DIGCOMP), a common framework at European level that has become the benchmark for the development and implementation of training, evaluation and certification initiatives in digital competences for citizens.
Target audience	▪ General public. ▪ Unemployed people. ▪ People in employment. ▪ Groups at risk of social exclusion. ▪ Entrepreneurs.
Trends	▪ Digital Talent. ▪ Customisation. ▪ European Framework of Digital Competences (DIGCOMP)
Covered needs	▪ Training for a better employability. ▪ Accreditation of knowledge to apply for a job (public and private). ▪ Training for regularly using the tools.
Value proposition	▪ Self-confidence and autonomy. ▪ Skills and abilities. ▪ Purpose.

Challenges facing DCCs	▪ Establishing a methodology for diagnosing and certifying digital skills. ▪ Recognition in the public/private sector. ▪ Development of training pathways.
Inspiring ideas - Where to start	▪ Design training itineraries by type of recipient and professional profile. First, identify which profiles you are going to address and what digital skills those profiles need to meet their needs or perform their role. ▪ Design an on-demand training offer, which includes a self-training micro-content portfolio always available and adapted to mobile devices. ▪ Provide DCCs with a self-diagnosis tool to assess the digital competence level of users and guide and offer training pathways based on their goals and concerns. There are some tools available so you do not need to start from scratch, e.g., online self-diagnosis tools developed by the Government of the Basque Country (IKANOS) or the Junta de Andalucía. ▪ Apply the concept of *learning by doing* to training activities, preparing project-based assignments, or applying the flipped classroom model, where certain learning processes are taken out of the classroom and where class time, together with the teacher's experience, is used to facilitate and enhance other knowledge acquisition processes within the classroom. ▪ Organise workshops for users to learn about the resources available on the Internet and learn to design and manage their own personal learning environment (PLE). ▪ Organise videoconference talks with ICT experts that can be streamed from other DCCs. ▪ Apply gaming techniques to training, for example, by organising an Escape Room, a contest or a hackathon. These types of actions work especially well when working with children and young people. ▪ Use accreditation systems and face-to-face exams to certify courses previously completed online. ▪ Use DCCs as digital skill examining boards. There are digital skill certification initiatives that can inspire you: Poland (ECCC), France (PIX), Basque Country (BAIT), Catalonia (ACTIC), Castilla y León (tuCertiCyL), etc. The following document is an interesting reference to become familiar with success stories in the implementation of the DIGCOMP framework in the field of digital skill training and certification: **DigComp into Action: Get inspired, make it happen**

Title	**PERSONAL DIGITAL MENTOR**
Description	A common element in the comparative analysis has been that one of the singularities of DCCs is the proximity to the territory, the proximity and the trust that is generated to solve doubts and personally accompany users on various issues related to digital issues. The way in which this accompaniment, mentoring or advice will be carried out will evolve and each network will have a greater or lesser degree of virtualisation. Potential work scenarios: ▪ Smart systems identify people's needs and offer them advice and training pathways, with a high virtual component. The digital accompaniment will deal with both work and personal issues. ▪ Virtual counselling scheduled by appointment and under closer communication channels such as videoconferencing, with the possibility of remotely accessing the devices of the people who make the consultation. ▪ Like any "coaching" process, rather than isolated consultations from beginning to end, the service will identify strengths, weaknesses, areas for improvement and establish a roadmap for the person to progress in their digital skills and abilities. The service will be comprehensive: from issues related to digital certification pathways to media literacy, cybersecurity, digital employability, device configuration, etc. The service is likely to become twofold: Personal Digital Mentor service and a similar but more SME- and self-employed-oriented service.
Target audience	▪ General public.
Trends	▪ Customisation. ▪ Pervasiveness of technology and the challenge of privacy and security.
Covered needs	▪ Customisation of services. ▪ Defining ways to intervene with citizens through a combination of customisation and efficiency.

Value proposition	Depending on the type of service one of the following value propositions will prevail: ▪ Self-confidence and autonomy. ▪ Skills and abilities. ▪ Purpose.
Challenges facing DCCs	▪ *Call Centre* centralising the demand for the service. ▪ Highly specialised driving agents.
Inspiring ideas - Where to start	▪ Make tools available to the driving agents to help them in their digital mentoring work (automated diagnosis, action plans, protocols, resources portfolio, dashboard tool and reports, etc.) ▪ Prepare a portfolio of ICT support services that can be offered at the centre or through online advice to support citizens in the use of technologies and teach them how to solve typical problems that arise (cybersecurity, online fraud, digital identity and professional brand, etc.). ▪ Establish alliances with the public employment service so that employment counsellors and DCC promoters work in a coordinated way and complement the services they offer to people actively seeking employment. ▪ Offer a user service and mentoring system at different levels, so that the most basic levels can be present in all DCCs, and those being more specialised and serving very specific purposes can be offered from certain "lighthouse" centres or remotely to all centres in a centralised way.

Title	**SAFE, RESPONSIBLE AND CRITICAL USE OF TECHNOLOGY**
Description	Service teaching how to use the Internet and technologies in a safe, responsible and healthy way, with the aim of guaranteeing their privacy, online reputation and avoiding risks associated with the use of technologies. Terms such as netiquette or media literacy should also be included in this service addressing the ethics put into practice and the good manners that every citizen should observe in their online activity. Likewise, in recent years new illnesses associated with the use of mobile devices, the Internet and social media have emerged, affecting the entire society, but paying special attention to young people and teenagers: addictions, cyberbullying, isolation, sedentary lifestyle, etc. DCCs have room for the development of activities based on awareness, training, assistance and generation of security and trust aimed at citizens in general, and especially at young people, parents and educators concerning the prevention of risks associated with the use of technologies and how to act before them.
Target audience	▪ Preferably children, young people, parents and educators. ▪ General public.
Trends	▪ Pervasiveness of technology, the challenge of cybersecurity and privacy. ▪ Emergence of new illnesses associated to the use of technologies.
Covered needs	▪ Promoting a responsible and critical use of technology. ▪ Preventing health-related risks associated with misuse of technology.
Value proposition	▪ Self-confidence and autonomy.
Challenges facing DCCs	▪ Specialisation of driving teams so they obtain the skills required to provide the associated services directly. ▪ Alliances with educational centres and health services. ▪ Coordination and collaboration with leading entities in the field of cybersecurity and cybercrime: Spanish Cybersecurity Institute (INCIBE), Spanish Data Protection Agency (AEPD) or the National Police and security forces with specialised units.

Inspiring ideas - Where to start

- Mainstream the issue of security and the ethical use of technology in all the training activities that are already carried out in DCCs. It is not only about teaching how to use technology for a purpose, but also how to use it efficiently and safely. For example, in an email training action you could cover issues such as secure use of passwords, spam or phishing, or in a social media training action, you could talk about privacy settings, reputation, netiquette and disinformation.
- Create a portfolio of cybersecurity-related services so that DCCs can offer advice and refer citizens to entities that provide specialised services (for example: data protection authorities for data protection and the right to be forgotten; anti-cybercrime authorities for cybersecurity issues when surfing the net or using devices, or issues regarding minors; Police and security forces for cybercrime, etc.)
- Collaborate with anti-cybercrime or police authorities to have them give a talk to families, children and young people about the safe use of technology and crimes on the Internet.
- Hold small workshops to update parents in the technological language used by their children, offering guidelines for mediating with and accompanying minors. There is a great challenge concerning the raising of awareness among fathers, mothers and educators on the importance of guardianship and accompaniment of minors in their digital activity.
- Offer services for the secure configuration of services and technological devices: social media, smartphones, PCs, but also advanced home systems and gadgets (smart TV, smartwatch, personal assistants, etc.).
- Organise awareness-raising activities on media literacy to promote critical thinking of citizens and fight problems such as disinformation.
- Provide orientations on digital detoxification services ("digital detox") in collaboration with health professionals for people suffering from addictions, pathologies and other problems associated with the use of technologies and affecting their health.

Title	**e-ADMINISTRATION. ACCESS POINT.**
Description	The public administration is increasing the number of services made available to citizens through digital channels. This trend implies that citizens, self-employed people and SMEs have the right to interact with the administration digitally. DCCs (especially in rural environments) can provide strategic support to public administrations, by accompanying citizens in their online formalities through training activities, advice or support in administrative processes. This scenario turns DCCs into excellent allies of the local, regional and national public sector to promote the use of their official websites. Thus: ▪ Some driving agents may be commissioned to intervene in electronic administration processes. ▪ DCCs could qualify as registration authorities. ▪ Public administrations will innovate using different technologies to simplify the process or to generate trust through virtual or video assistance systems to remotely enable formalities to be conducted at DCCs. ▪ DCCs could become accreditation offices for issuing digital certificates.
Target audience	▪ General public. ▪ Special service for: ○ Elderly people. ○ Immigrants. ○ People with disabilities.
Trends	▪ e-Administration. ▪ Longevity. ▪ Immigration
Covered needs	▪ Bringing e-administration services closer to citizens and accompanying them to conduct formalities. ▪ Reduce travel.
Value proposition	▪ Self-confidence and autonomy.
Challenges facing DCCs	▪ Collaboration with the modernisation and e-administration departments of the different public administrations. ▪ Specialised and well-trained driving agents. ▪ Purpose-specific equipment.

Inspiring ideas - Where to start	▪ Turn DCCs into help points so that elderly people or digital illiterates can conduct electronic formalities with the administration with the help of the centre's driving agents. ▪ Enter into agreements with public administrations (local, regional, national) so as to remotely assist citizens in their e-administration formalities.

Title	**CIVIC PARTICIPATION AND SOCIAL INNOVATION**
Description	Especially in rural environments, DCCs are a recognised and accepted meeting point for citizens, characterised by their digital component in terms of resources, connectivity and accompaniment. Based on this potential to attract citizens, DCCs will increase services related to: ▪ Community-building spaces (for both digital and non-digital issues). ▪ Proposals for action to generate changes in their immediate environment, promoting civic participation in decision-making and municipal, regional or national initiatives. ▪ The empowerment of citizens through literacy and the use of civic participation platforms and/or participatory budgeting. ▪ The transformation and enhancement of rural environments. The characteristics of DCCs make them the ideal environment for the development of social innovation projects. According to ESADE, 5 variables that and shape social innovation projects: ▪ Solving a social problem. "Social" is construed here in a very broad way (and in this sense, SDGs are an unmatched frame of reference). Therefore, it is important to cause impact and social transformations. ▪ Economic sustainability and viability. The design of solutions to social problems must include self-sufficiency and be result-oriented (social or economic). Indicators must therefore be incorporated into the design. ▪ Intersectoral collaboration. Identifying different public and private agents capable of collaborating and contributing from their own perspectives. ▪ Open innovation, as the sources, the inspiration and the adaptation of proposals are in many cases of external origin. ▪ Scalability and replicability. In line with the previous factor, many problems are common to different dispersed territories - different scenarios but shared problems. Hence the importance of taking them to other spaces or managing to scale the business model of social innovation.

	Therefore, a relevant factor is to get driving agents to agree on and share methodologies and tools. In other words, the network intervening in the territory with its people based on Digital Social Innovation a perspective should share a common frame of reference, so that all driving agents and management teams "speak the same language". In this light, there are many projects that could find their place in this service, as there are many social problems and there are also different ways of dealing with them through digital social innovation.
Target audience	▪ People interested in carrying out projects that have an impact on the territory. ▪ Seniors committed to the territory and who have a know-how that results in the common good for the general public. ▪ Associations. ▪ Entrepreneurs.
Trends	▪ Longevity. ▪ Rurality. ▪ SDGs. ▪ Communication and Community-building.
Covered needs	▪ Increasing civic participation processes generated by public administrations, such as participatory budgeting. ▪ Citizenship as a driving force for change: empowered citizens supported by services to generate proposals. ▪ Generating spaces for interaction and socialisation for citizens and thus reducing the isolation and loneliness of elderly people. ▪ Activating the economy of rural territories: creating wealth at the local level, based on local actors and resources. ▪ Showcasing the product, the service, the heritage, the gastronomy, the people in a different way from today's.
Value proposition	▪ Purpose.
Challenges facing DCCs	▪ Identifying needs and elements of improvement and change linked to the territory to generate local transformation. ▪ Identifying collaboration best practices between policy makers, public and social agents, plus DCCs. ▪ Training driving agents in social innovation. ▪ Having a frame of reference with common methodology and tools a making it available to Social Innovation promoters. ▪ Piloting actions that can be scaled within the entire Network.

Inspiring ideas - Where to start	▪ Use the Design Thinking methodology, based on empathetic listening and observation of the needs of the recipients, to design social innovation projects adapted to the territory. ▪ Use the centre to convene local residents to create proposals for improvement and connect them with the organisations having the capacity to solve them (city council, associations, etc.). ▪ Ask young people, through idea competitions or similar, to talk about the aspects they like best - and least of where they live, as an opportunity to identify innovative projects they could feel involved in. ▪ Convene NGOs and associations to collect demands and proposals for different projects that they would like to develop. The focus should be put on the "on demand" perspective, to get them to lead/coordinate the projects, while DCCs provide advice and support. ▪ Create online communities in social media for local projects or topics where people can share their knowledge. ▪ Create technology-based solution prototypes with users of the centre in their areas of interest (active ageing, circular economy, climate change, water, etc.) that highlight rural areas as an attractive place to live. ▪ Organise a "Design Thinking Week"-type event where a topic of local interest is proposed (mobility, environmental sustainability, etc.) which citizens can provide solutions to. ▪ Organise idea competitions for mobile app development hackathons to create new local services based on the open data generated by public administrations. ▪ Launch a "Big Brother"-type technological volunteer service, so that DCC users themselves take an active role and participate in training and accompanying other users sharing similar characteristics or needs but lacking the knowledge. ▪ Create a digital time bank: space for the exchange of digital knowledge among citizens and professionals without financial consideration.

Inspiring ideas - Where to start	• Encourage the digital competences of citizens by generating digital contents that highlight their material and intangible cultural heritage. • Design travel routes "from urban to rural" with social media influencers, with the aim of spreading values from rural areas and get entrepreneurs from urban environments to see the value and opportunities of settling in a rural environment. • In collaboration with public institutions, special employment centres, vocational training centres, recycling entities, or the like, setting up electronic waste recycling points in DCCs and conduct environmental awareness-raising raising activities through technologies. The electronic waste deposited in the centre can be used by special employment or VET centres to repair devices and get them back into use.

Title	**SHOWROOM – EMERGING TECHNOLOGIES LAB**
Description	There is a set of Emerging Technologies that will be present in personal, social and work environments that, so to speak, involve a new process of literacy, demonstration or display regarding their existence, operation, consequences and areas of application. The adoption, use or understanding of these emerging technologies (Internet of Things, Big Data, Robotics, Cybersecurity or Artificial Intelligence) may imply the generation of a new digital gap, thus giving DCCs the opportunity to bring these technologies closer to their users – including citizens, the self-employed and SMEs in their area of influence. The service will have a demonstrative, practical, showroom-like character (specialised; permanent or itinerant), with a dissemination, trust-building and learn-by-doing, hands-on approach to technology. The goal of DCCs will be to act as display and demonstration venue, and get citizens to enhance their critical thinking on these technologies and eventually allow labour or business opportunities to be identified in their context.
Target audience	▪ General public, regardless of their working status. ▪ Specific programmes/contents on the impact on: ○ The labour market. ○ The self-employed, SMEs and/or certain sectors (e.g. agro-industrial and trade sectors).
Trends	▪ Industry 4.0 and Digital Transformation. ▪ Digital Talent.
Covered needs	▪ Training and retraining for employability. ▪ Entrepreneurs requiring digital knowledge and abilities for their project.
Value proposition	▪ Self-confidence and autonomy.
Challenges facing DCCs	▪ Acquiring specific technological infrastructures and equipment. ▪ Driving agents specialised in these areas of knowledge. ▪ Collaboration with companies that collaborate with the territory (e.g., undertakings developing Smart Rural, Smart Cities projects).

Inspiring ideas - Where to start	▪ Build an open space with resources such as VR glasses, personal assistants, home automation systems, IoT, smart car simulators, drone IR cameras, 3D printers, etc. to display technology and learn how to use it. ▪ Identify the most active economic sectors and organise technological demonstrators for them. ▪ In rural areas, build a "techno-farm", a technology showcase for the farming sector, e.g.: smart machinery, biochips, animal health and care tools and applications, smart irrigation, etc. ▪ In areas of special tourist interest, build a digital heritage room: set up a demonstrator of new technologies to discover and preserve our heritage with digital animation, virtual reality, etc.

Title	**EMPLOYABILITY**
Description	The labour market is being transformed due to the impact of emerging technologies. Many studies indicate that certain occupations and sectors are disappearing or being transformed, and this will have a bigger impact. In this sense, DCCs will have room to operate in different contexts: ▪ Designing support services and training pathways for people who, at a mature age and with working experience, remain unemployed. This scenario may involve a redeployment process. ▪ Training pathways anticipating potential transformations of occupations. ▪ Converting areas of the Centre into co-working spaces so that people can work remotely (with support on digital issues), undertake and create collaborative work spaces. ▪ Meeting point between supply and demand in the local environment (especially in rural areas). ▪ Accompanying people considering self-employment or entrepreneurship in their first steps by providing digital counselling.
Target audience	▪ Unemployed people. ▪ People in employment interested in technological retraining processes. ▪ Entrepreneurs.
Trends	▪ Immigration. ▪ Industry 4.0 and Digital Transformation. ▪ Digital Talent.
Covered needs	▪ Training and retraining for employability. ▪ Entrepreneurs requiring digital knowledge and abilities for their project.
Value proposition	▪ Purpose.
Challenges facing DCCs	▪ Driving agents specialising in these areas. ▪ Collaborations with specialised companies, business centres or technology centres. ▪ Development of training content.

Inspiring ideas - Where to start	▪ Launch an orientation, coaching and accompaniment service for people in active job search, in collaboration with the public employment service, for the retraining in digital skills of the different professional profiles. ▪ Identify most demanded jobs in your geographical area and analyse the digital skills associated with these positions to organize job search workshops adapted to professional profiles. Interesting resources include labour market reports (Public Employment Service - SEPE, Infojobs, etc.) and studies that analyse digital competences associated with most demanded professions (e.g., the study Digital impact jobs occupied by vulnerable groups-Accenture, el Fundación Telefónica's employment map, or IKANOS's professional digital profile patterns) ▪ Connect the supply of digital professionals with the demand for technological profiles. A company that needs a professional profile with certain digital skills could attract talent among users of DCCs where they have been previously trained. ▪ Organise "soft skills" development workshops (creativity, communication, leadership, problem solving, etc.) that add value to the person over the machine in the occupations of the future. ▪ Organise training in digital occupations of the future: big data, Artificial Intelligence, robotics, video games, 3D printing, IoT, cybersecurity, etc. ▪ Create small groups to search for professional opportunities and create technological entrepreneurship initiatives in rural settings. ▪ Collaborate with associations of immigrants, one of the groups with higher unemployment rates, for their digital skilling and qualification, including other related services for their labour integration, such as language.

Title	**SCIENTIFIC AND TECHNOLOGICAL VOCATIONS**
Description	This service will allow to promote and encourage vocations and interest in occupations, university and vocational training studies related to STEAM's five areas of knowledge (Science, Technology, Engineering, Arts and Mathematics). Some DCC networks are already working in this context, especially from areas related to programming and robotics. However, the approach needs to be increasingly innovative as regards young people, going beyond the scope of extracurricular activities. As certain participants in STEAM activities are of ages at which decisions must be made on academic issues, the service should include contents and activities related to the current digital labour market (as is now and as is estimated by studies on the transformation and impact of technology on the labour market). There are 3 drivers of the service: ▪ The need to attract talent to occupations and university or VET studies involving STEAM knowledge. ▪ Emerging technologies (Big Data, Artificial Intelligence, Internet of Things, robotics, drones, etc.) provide new areas of knowledge to increase the offer for the youngest. ▪ Designing activities especially intended to attract girls' interest in technological and engineering occupations.
Target audience	Main recipients: ▪ Children. ▪ Young people. Further recipients include parents (with the aim of getting them to understand the opportunities related to the digital labour market) and counsellors from high schools and schools, VET teachers.
Trends	▪ Digital Talent. ▪ Industry 4.0 and Digital Transformation.
Covered needs	▪ Generation and identification of ICT talent. ▪ Access to training in digital job-related activities and contents. ▪ Response to digital social innovation projects and processes that require prototyping of proposals.
Value proposition	▪ Skills and abilities. ▪ Purpose.

Challenges facing DCCs	▪ Infrastructures and equipment. ▪ Identification of specialised collaborators. ▪ Development of alliances with STEAM-promoting national and international programmes ▪ Collaboration with the educational system.
Inspiring ideas - Where to start	▪ Organise programming, educational robotics, 3D design, VR, etc. workshops, in collaboration with the educational system to awaken technological vocations at early ages. ▪ Organise design, programming, robotics or gaming hackathons to detect young talent in cybersecurity, industry 4.0 and video games. ▪ Organise career guidance support workshops oriented to scientific vocations at the DCC, aimed at high school students and taught by ICT companies. ▪ Organise initiatives to detect ICT talent among VET /university students in collaboration with local ICT companies. ▪ Organise inspiring talks for girls/young females, given by women of reference in the ICT field. Launch a bootcamp or code academy, a multi-week crash training programme in these disciplines. The initiative could relate to the concept of "Employability", i.e. retraining for initially non-ICT-related job seekers and long-term unemployed people.

Title	**“MAKER” SPACES**
Description	This service will enable DCCs to offer "Maker"- and "FabLab"-related services and activities linked to creativity, collaborative problem solving, digital competence, entrepreneurship and soft skills, all of them being key competences to the jobs of the future. This service will be developed especially in those areas with no offer of "Maker" culture. In addition to the services related to infrastructures (e.g. for 3D printers, prototyping or training in the use of 3D printers), this service will also promote the development of a “Maker Culture” related to peer learning, the development of collaborative projects, and will introduce and integrate the concept of "prototyping" into activities relating to entrepreneurship and social innovation.
Target audience	▪ Young people, university or VET students. ▪ Young people, not in education nor employment. ▪ People seeking employment. ▪ Entrepreneurs. ▪ Groups at risk of social exclusion.
Trends	▪ Digital Talent. ▪ Community. ▪ Customisation. ▪ Industry 4.0 and Digital Transformation.
Covered needs	▪ Discovering future options and trends related to technological knowledge. ▪ Approaching highly-demanded areas of knowledge and occupations (especially intended for young people in rural environments). ▪ Updating knowledge on the labour market.
Value proposition	▪ Skills and abilities. ▪ Purpose.
Challenges facing DCCs	▪ Infrastructures and equipment. ▪ Retraining of driving agents in the *maker* culture.

Inspiring ideas - Where to start	▪ Build an open space for innovation in which different groups with a common goal can work as a team with 3D printing technologies, programming, robotics, manufacturing, etc. ▪ Visit different Maker Spaces and FabLabs to get inspired and learn the necessary methodology and resources. Further resources include the following publication, which explores the potential of these centres and future trends, analysing different long-term scenarios (2034): "Makerspaces for education and training (JRC-European Commission)" ▪ Use the Maker space as a resource to put the knowledge acquired in the classroom into practice and apply it to real projects. ▪ Collaborate with other formal education entities (schools, high schools, VET centres, Universities) so that they can use the Maker space to carry out projects and thus evaluate the abilities of the students. ▪ Organise activities to recycle, repair and use obsolete technological devices for other creative purposes. ▪ Launch a "Maker" equipment rental service (robotics kits, 3D printing, manual manufacturing ...) aimed at potential agents or other stakeholders.

Title	**e-HEALTH/TELECARE SUPPORT SERVICES**
Description	Health and healthcare services (both in the public and private sectors) will play a key role in the society of the future. This type of services will be provided through tools, devices and digital channels that will imply that users (especially the elderly and their carers) have the necessary knowledge to get used to interacting in this digital environment. In addition to apps, videos or audios, health services, remote diagnosis and assistance will increase interaction with their clients or patients through devices that control their vital signs, chatbot-based communication systems, virtual assistants (Google Home or Amazon's Alexa) or "humanised" robots that will interact and socially accompany elderly people who live isolated or alone. DCCs provide the venue for the development of activities based on training, accompaniment, assistance and building of safety and trust, especially aimed at adults and the elderly (healthcare, autonomy and active ageing). It will be necessary to forge alliances with health centres, health insurers (e.g. Sanitas, Adeslas, Asisa, etc.) and NGOs such as the Red Cross.
Target audience	▪ Adults, elderly people. Further target groups: relatives, carers.
Trends	▪ Longevity and Ageing. ▪ Pervasiveness of technology and the challenge of privacy and security.
Covered needs	▪ Building trust in the health and care services offered through emerging digital services. ▪ Contributing to a better quality of life and active ageing.
Value proposition	▪ Self-confidence and autonomy. ▪ Purpose: active ageing.
Challenges facing DCCs	▪ Collaboration with the public health system. ▪ Collaboration with NGOs. ▪ Alliances with private health companies. ▪ Collaboration with social personnel in the area of influence, social workers. ▪ Collaboration with service networks for the elderly: day residences, nursing homes, etc.

Inspiring ideas - Where to start	▪ Carry out activities in DCCs to make the public aware of the online health services they can benefit from (request for appointment, accessing your medical history, use of the electronic prescription system, etc.). ▪ In collaboration with health centres, turn digital competence centres, especially those located in rural areas, into tele-healthcare centres using technology (provision of telecare services, medical sensors, remote diagnosis, robots, communication with family members, online entertainment and socialisation, technological volunteering of elderly people, etc.). ▪ Organise health and ICT workshops for public in general with the aim of contributing to disease prevention and improving the health of citizens through the use of tools and related mobile apps (physical activity, healthy eating, mental exercises and relaxation, etc.). ▪ Hold small workshops with elderly people to improve memory, using simple games and challenges with the help of technology, or to improve their self-esteem/loneliness through digital content creation workshops where they share their knowledge and experience (local memory, cooking blog, traditions, etc.). ▪ Teach citizens how to use different devices that will facilitate their autonomy and active ageing: personal assistants, smart watches, mobiles, tablets, VR glasses, etc. ▪ Organise self-care forums for dependent people and their families, presenting apps designed from managing daily activities, self-diagnoses, etc. ▪ Promote activities that connect generations: activities between young and old people, where the elderly rely on the young to learn to handle the technology or social media of the day. ▪ Organise a e-Health Week, in collaboration with agents and health professionals of the territory for the development of digital skill workshops applied to the field of health.

Title	**BUSINESS COMPETITIVENESS – SMART COMPANY**
Description	This service is about accompanying SMEs, self-employed people and entrepreneurs undergoing digital maturity and transformation processes, offering activities on technological dissemination, training, advice and contact with local suppliers to encourage technology solution implementation processes. The day-to-day life of SMEs and the self-employed makes them stay far away from the trends and opportunities that ICT, and especially Emerging Technologies, can offer in terms of competitiveness. Hence the importance of guiding services that favour the permanence of local companies in the market. Depending on the characteristics of the business and economic fabric of the territory, the Digital Competence Centre will have the opportunity to design, be it with business associations and agrarian cooperatives or with the tourism or trade sector, actions that strengthen business capacities and the competitiveness of local businesses. Furthermore, the promotion of services related to improving business competitiveness through information technologies involves collaborations and accelerating the local ICT sector.
Target audience	▪ Local SMEs and self-employed people. ▪ Agro-food industry, tourism and trade sector. ▪ Entrepreneurs.
Trends	▪ Industry 4.0 and Digital Transformation. ▪ Digital Talent. ▪ Globalisation of e-commerce. ▪ Improving the user experience through big data, artificial intelligence, machine learning and virtual assistants.
Covered needs	▪ Permanence in the market. ▪ Improving competitiveness. ▪ Improving customer relationship. ▪ Identification of providers. ▪ e-Commerce.
Value proposition	▪ Self-confidence and autonomy. ▪ Purpose: improving business competitiveness.

Challenges facing DCCs	▪ Driving agents oriented to the business world and a "business logic". ▪ Identifying allies: ○ Local ICT companies. ○ Business associations. ○ Adhering to programmes that disseminate and promote technological empowerment of SMEs. ○ Specialists in vertical issues; e.g., agriculture and drones.
Inspiring ideas - Where to start	▪ Hold very practical short workshops to help self-employed people and small businesses introduce technology into their business. ▪ Offer a customised technological advice and support service to entrepreneurs and small companies, offering a portfolio of basic services: Internet and social media presence, identity management, online procedures, cloud tools, cybersecurity. ▪ Connect companies that need to digitise their processes or services with local ICT companies. ▪ Organise a hackathon for local companies and give them a check for investing in digital marketing, with the aim of achieving the greatest possible impact on their sales. ▪ Help detect and use data (whether open or not) to improve a business project.

Title	***LIVING LABS***
Description	DCCs are a powerful asset for companies developing digital solutions and services, since they encompass a wide spectrum of typologies of potential users. Developer companies can use this capacity to perfect their products and services and make them more competitive, with innovations focused on people's actual needs. This approach enables these developers to minimise the risk associated with novel solutions, checking their acceptance, analysing the feedback and identifying possible reluctances to use these solutions so as to validate them in real conditions. It also helps to identify new demands. At the same time, these users can experience these innovations and test new prototypes, thus jointly contributing to the socialisation of technology. DCCs can in this way promote strategic initiatives and services for their groups of beneficiaries, guiding innovations towards areas of potential interest to the community they serve.
Target audience	▪ Entrepreneurs. ▪ Technology businesses. ▪ Public in general. In general, any agent interested in the open development of digital solutions, including universities.
Trends	▪ Industry 4.0 and Digital Transformation. ▪ Technology. ▪ Digital Talent.
Covered needs	▪ Participating in the co-creation of services. ▪ Testing innovative services and solutions. ▪ Improving the competitiveness of technology businesses.
Value proposition	▪ Purpose: more competitive products and business services connected to people.
Challenges facing DCCs	▪ Developing a network of relationships with developer companies and agents of digital products and services. ▪ Deploying spaces for open experimentation and innovation. ▪ Developing meeting and co-creation methodologies between developers and users.

Inspiring ideas - Where to start	▪ Organise social lab events, in which companies that have an innovative idea or business project can test it with real users of the centres, so as to validate the business proposal, a mobile app, a web service, a video game, etc. Users will be thus co-creators of the business idea. ▪ Collaborate with other entities and programmes relating to entrepreneurship at the local level (accelerators, chambers of commerce, support for entrepreneurs) to incorporate the technology project testing service through Living labs with DCC users and thus offer comprehensive support.

Title	**RESEARCH IN THE FIELD OF DIGITAL COMPETENCES**
Description	The service aims to identify programmes and partnerships that can be designed jointly with the academia. Potential areas of action: ▪ Designing research work focusing on the social, economic and technological impact of DCCs on their environment. ▪ Identifying mechanisms that allow applying or implementing final academic projects and dissertations from concept to realisation. ▪ Since DCC facilitators know precisely the social characteristics of their users, proposals can be made that favour experimental studies, pilot tests or prototyping in a wide variety of areas. ▪ DCCs such as relays or connection points with research transfer offices. ▪ Online training services offered by universities.
Target audience	▪ Universities and research centres. ▪ Enterprises.
Trends	▪ SDGs. ▪ User experience.
Covered needs	▪ Providing DCCs with knowledge and research on their impact as a public service. ▪ Connecting the academia and its surrounding community through DCCs.
Value proposition	▪ Purpose: transferring innovation to society and local enterprises.
Challenges facing DCCs	▪ Identifying collaboration best practices between the academia and DCCs. ▪ Piloting actions that can be scaled to the entire Network.
Inspiring ideas - Where to start	▪ Call an idea competition for university students to submit proposals for "digital projects" of a social nature that can be managed and promoted by DCCs. ▪ Promote the completion of technology-related final projects and dissertations from theory to realisation through the DCC. ▪ In collaboration with public administrations, universities and study institutions, sample DCC users for designing research related to the social and economic impact of the use of technologies.

3.5. SERVICES PROVISION

Elaborating the model for the Digital Competence Centres of the future requires not only to examine the segmentation of interest groups and their needs, to define the value proposition and to develop the set of services best adapted to the implementation of the value proposition.

An integral part of the value proposition as a whole is **how these services are provided** throughout their life cycle. And how these services are provided will likely evolve, subject the evolution of society itself.

In spite of their social nature, DCCs will undergo a digital transformation that will affect and condition their "business model" to win and serve beneficiaries. Like any other organisation that is dealing with this transformation process, three internal domains will need to be continually adapted:

- The **human team** and particularly the driving team behind DCC services that will integrate new value-adding functions.

- **Marketing** and communication, positioning and "market" appeal mechanisms will increasingly require customisation, closeness, continuation and evolution.

- The process of **innovation** and improvement concerning operations, services, assistance to beneficiaries and the generation of further "business" models of a social nature.

As in any other organisation, these relational, structural and, especially, human intangible assets are becoming increasingly important and should be a priority and should be offered a permanent focus of attention in the development of DCCs towards the new model.

3.5.1. Human team and driving team

The value-adding functions of the human team managing and running DCCs are critical and key to the success of a new DCC model - as it currently the case.

For all this, the DCCs of the future will have to establish particular profiles for their driving agents. In some cases, the people performing this role will become educators or trainers; in others, they will connect the agents of the territory (generators of communication/social and civic participation) or, in some other cases, they will take a more passive role of surveillance and coordination of the activity. This last role includes generating accesses for the beneficiaries or making sure that the facilities and infrastructures are properly maintained. Therefore, the heterogeneity of the DCC networks in terms of actions and priorities and of how to carry them out is reflected in the heterogeneity of the competence profiles of the driving team.

A necessary reference in relation to driving teams is the **Association of Professional Digital Driving Agents** from Catalonia, which has been working since 2017 to bring together professionals in this field, and whose objectives include training, skill development and professional recognition. This type of communities will acquire greater strength and presence as the number of people taking this occupation is growing, even beyond DCCs. Many associations, educational institutions and NGOs, to name but a few, are focusing on aspects such as employability, social insertion and education, and these components increasingly demand the use of digital tools and strategies requiring knowledge, abilities and skills.

The table below displays a list of trends regarding the evolution of DCCs and their impact on the role of drivers. If DCCs evolve, so will their responsibilities and fields of action.

Target audience	DCCs in the future will have a greater diversity of users. This factor implies that it will be necessary not only to understand the characteristics of each group, but to work from a "customisation" perspective, so that each person attending the DCC feels unique in terms of identification of their needs and provision of services. This will require more sophisticated guidance and accompaniment, and a command of more complex pedagogical and didactic materials, both conventional and virtual.
Connector	The role of driving agent will have a substantial connecting role for other agents and stakeholders in the territory as well as among DCC users. Driving agents will thus contribute to community building.
Facilitator	The team providing training, guidance and support could evolve and take on a more "facilitating" role, which means they could provide certain services and additionally mobilise third-party resources, i.e. partners, providers and even volunteers, to provide the services.
Communication and positioning	The linking role of DCCs with citizens is another element that requires to be reinforced, as regards both physical and virtual interaction. The frontline consists of driving agents, but it may be supported by other technological formulas (apps, web portals, *chatbots*, etc.) Relational and team-management skills will need to be developed to meet these new needs.

Knowledge	In DCC Networks, driving agents with a general knowledge and others with more specialised knowledge will coexist. The latter could carry out their activities in an itinerant way in different areas. Without a doubt, the driving agent must understand that they are performing a job that requires permanent updating. Such updating of knowledge does not always imply specialisation, but it does involve an update of the trends and identifying who has the best knowledge to meet their objectives. Their occupation is a clear example of Lifelong Learning.
Diagnosis	What are the motivations and needs of the people who come to the DCC? The driving agent must have either tools or personal skills, or both, to carry out a "technological triage" to identify the person's needs - both evident needs and other needs that may seem secondary. In other words, a person may attend a DCC for employment reasons, but the centre may also offer services or accompaniment in areas related to digital leisure, family or personal development, and may as well help identify how to contribute to and participate in the community.
Virtualisation of services	In the short term, DCCs will tend to automatise, systematise, and digitise the maximum number of procedures so as to minimise the time spent by driving agents for tasks with little added value. The incorporation of chatbots or AI has to contribute to the solving of queries. The driving agent will respond to queries from users who are not necessarily physically present at the DCC.
Influencer	The driving agent becomes a digital influencer. They are the professional that people go to to consult, learn, seek advice or guidance on issues of a digital nature. In many areas and situations, agents will rely on their own resources and knowledge, but in other cases they will have to refer these queries to other driving agents in the network who can provide further knowledge.
Network support	The network to which the driving agent belongs must provide him/her with resources: continuous training, materials or didactic guides, intervention protocols, generation of good practices, etc. A determining factor will be the need for networks to have adequate human resource management policies. Driving agents are isolated working in the territory, so it is important to provide corporate strategies for members of the network, training in communication skills, group management, internal communication, etc. Another very important issue, where the Network must prove supportive, is the identification of strategies by providing resources and systems that minimise the time spent in completing administrative and control tasks.

Local player	The driving agent will provide services from the DCC to the people, companies or civil society of a given territory in collaboration with other agents. The driving agent must identify how to join the value chain of other agents in the territory: public sector, companies, social partners, etc. In other words, the driving agent is to identify in which situations, contexts and activities the DCC can offer a "plus", and at the same time detect who can contribute a specific added value to the DCC.
Learning by doing	The driving agent must tend to design activities oriented to "learning by doing". Any type of activity, be it STEAM, eGovernment, entrepreneurship, digital skills, social innovation, etc., should be designed from the perspective of practical, hands-on workshops, where participants interact, aimed at acquiring skills and abilities. Although the driving agents will agree on this principle, its implementation is not always so obvious and will require driving agents to receive training or the coordination of the corresponding network to design activities with this approach.
Emerging technologies	Emerging technologies will be a new field of knowledge and of activities to be developed in DCCs. The driving agents may not be experts in these matters, but they should tend to have a generic knowledge allowing them to accompany the users to make their own judgment on these technologies. In the event that specific activities are required, driving agents will identify and rely on collaborators and allies that work in these areas.
Space management	The centre will become another resource that will need to be adapted to the needs of beneficiaries and, therefore, of activities, such as courses, workshops, bootcamps, master classes, meeting points, community building, piloting of products / services of entrepreneurs, etc. The physical space of the DCC will be more frequently used by other organisations requiring it, and this will increase the perception that it is a community resource.

3.5.2. Marketing and communication

As regards **marketing and communication**, the mechanisms envisaged pertain to communication, appeal, bonding and relations with beneficiaries through multiple physical or virtual contact points. In this case several factors need to be considered:

- As society becomes more digital, communication and service provision formulas will shift to **digital means**. DCCs will require a greater command of these means as compared with to the current situation, and will require being present in social and digital media, the use of chatbots and virtual systems, the incorporation of new means of interaction, etc.

- The search for **greater customisation** will require the adoption of precise analysis and treatment mechanisms, using data analytics techniques and Artificial Intelligence. Such mechanisms and techniques will be applicable in all the phases of the service life cycle: from winning beneficiaries to assessing, including the provision of both face-to-face and virtual services.

- The characteristics and infrastructures of physical spaces will have to be adapted to new contexts, possibly becoming more **flexible and diverse**, more versatile (and less dependent on the type of service) and more adapted to a larger number of social profiles.

3.5.3. Innovation and improvement

Another key element is how DCCs deploy, develop, improve and innovate processes and operations. In this case, this concerns aspects such as:

- The pace and dynamism of **renewal of the services** provided by DCCs will gradually increase, as technological development accelerates.

- As the scope of work and the type of technologies expand, it will be necessary to develop **collaboration** formulas with other agents that complement the capacities of DCCs.

- DCCs will have to develop structures and mechanisms for greater **participation** of beneficiary groups in the innovation and improvement of DCCs.

3.6. Metrics: Key Success Indicators

A crucial element for the management of the services implemented in DCCs is to **define how their success will be measured**, and what are the key indicators.

Exercises were done together with experts and other participating bodies while conducting the study, leading to a battery of preliminary indicators, some more quantitative and some more qualitative, some more performance-oriented and some more impact-oriented.

The following are some examples of indicators that should be considered to evaluate and monitor the results and impact of future DCCs:

Project indicators:

- Number of people served with respect to the investment.
- Number of services adopted with respect to the investment.

- Percentage of the territory covered by DCCs.
- Additional funding raised with respect to the baseline investment.

Social impact indicators:

- Impact of DCCs on society.
- Percentage of people at risk of digital exclusion.
- Level of digital competence of citizens.
- Profile of DCC users.
- Degree of autonomy in the use of technology and Internet services (e-commerce, e-Administration, online health, civic participation, etc, etc.)
- Confidence, safe and responsible use in the digital world.
- Indicators aligned to the SDGs.

Economic indicators:

- Impact on economic dynamism (employment, tourism, Internet sales, etc.).
- Employability and qualification of jobs.
- Increase in STEAM vocations.
- Degree of digital transformation of local companies.
- Presence of start-ups, technology-based companies or ICT sector.

In this regard, there is a general consensus on the nature of these indicators:

The focus should be moved from indicators linked to "results", such as the number of courses taught or the number of people served, to indicators linked to "impact", such as employment or social dynamism.
The SDG framework can be used as a reference for metrics and indicators.
The indicators must be aligned with the Digital Agendas or applicable strategies at local, regional, national and European level.

3.7. Alliances for Sustainability

The networks analysed are mainly financed by public administrations, it being understood that the service provided is a public service or that the training, advice or free access actions are carried out at no or little cost for the beneficiaries. In other words, the personnel, rents, premises, overhead expenses, connectivity and equipment is supported with public funds.

However, the range of actions that they incorporate now and will incorporate in the future is increasingly wider, as the typology of **beneficiaries** receiving the service is becoming **more diverse** and the list of **fields of knowledge** is getting **longer and more complex**. This opening of focus and diversity of content will progressively require more updating of the services, infrastructures, training resources or people specialising in providing advice or training or in facilitating workshops.

Alliances with other public or private agents seeking the same objectives is one of the most important tools. Whether together or individually, territorial networks of Digital Competence Centres could rely on this type of entities to increase their scope and depth by multiplying available resources.

Digital Competence Centre networks show a **comparative competitive advantage** to orchestrate these actors:

- Capillarity of the DCC network.
- Closeness to the territory.
- Trust generated by driving agents.
- Customised support.
- Availability of a network that is deployed and fitted with equipments, facilities and stable timetables both on the physical domain and, increasingly, on the virtual domain.
- Flexible and quick capacity to deploy training programmes in their facilities and to adapt to changing needs.

These factors are an excellent complement that can underlined when negotiating and entering into agreements with organisations and companies that are making significant efforts to create contents and to design training programmes but that may find it more difficult to access the final beneficiaries.

DCCs can also generate a new value proposition for other stakeholders by becoming an instrument for evaluating and providing feedback to technology providers on the use of technology by all kinds of users.

In the light of the above, there are **opportunities to forge alliances with third parties to ensure the sustainability** of DCCs. As regards potential allies for DCCs:

- At the **local and regional** level, it is necessary to deploy an all-embracing and wide-ranging network of partners and allies, both public and private, especially in the domains of education, public employment services and social/health services, so that the services provided to citizens have a bigger impact and become more sustainable.

- At the **national** level, Digital Competence Centre networks have the chance to collaborate with Red.es, especially for the deployment of training programmes that may match the priorities of the networks. "Crear Futuro"[12] is a good example.
- At the **European** level, collaboration should be encouraged with European associations pursuing the same objectives as DCCs, such as **ALL DIGITAL**. These associations are a source of resources and opportunities, as well as a meeting point for the exchange of good practices and participation in European projects that have an impact on DCCs.
- As for European funding and the *Digital Europe* programme, which is focused on developing the strategic digital capacities of the EU and facilitating the deployment of large-scale technologies to be used by citizens and companies. With a total budget of 9.2 billion euros for the period 2021 - 2027, Europa Digital will dedicate 700 million to the development of advanced digital capabilities.
- There is a **growing interest in the private sector**, mainly large Internet companies and telecom operators, in developing programmes related to digital issues and with very diverse focuses: digital jobs, STEAM, rural women, entrepreneurship, cybersecurity and families, etc. E.g.: Google, Facebook, Fundación Telefónica, Fundación Vodafone, Fundación Orange.
- There are further **agents not specialising in digital issues** that target the same groups as Digital Competence Centre networks, responding to their priorities on employment, social integration or active ageing. E.g.: Red Cross, Colectivo Gitano, Obra Social Caixa, Abanca.
- Attention is to be paid to new training and "literacy" players in the field of **emerging technologies and their efficient and** geographically **distributed structures**. E.g.: Saturdays.ai, a non-profit organisation whose mission is to empower people by learning **artificial intelligence** on a collaborative and project-based approach.

[12] "Crear Futuro" Initiative by Red.es, http://www.crearfuturo.es

4. CONCLUSIONS

This study puts forward a **model for the Digital Competence Centres of the future** based on the views of experts and desk officers in this field. This model brings together different dimensions, such as the type of recipients, their needs and the services to be offered by the DCC of the future, among others.

Of course, this model is a frame of reference, so each centre or particular network will have to adapt it to its specific conditions and background.

The most relevant features of this model for the DCCs of the future as compared to that of current centres and networks are the following:

The DCCs of the future will serve very diverse groups of users, since practically all sectors of society will need to be digitally skilled. There will be a more standardised view of the groups of beneficiaries to be served, with no groups being significantly prioritised over others. The aim is to have centres serve representative samples of all the population groups in their territory.

The Value Proposition of DCCs will evolve towards a "know – know-how – use with a purpose" scheme, as compared with the more typical "know" vision (that is, competence training) of DCCS in their early stages.

The key indicators for evaluating the impact of DCCs will have to evolve towards the measurement of their socioeconomic impact, focusing on employability and not so much on the strict running of the centres.

To adapt to technological and social changes, the centres must expand the typology of the services they offer. Furthermore, increasingly faster updates will occur due to the exponential deployment of digital products and services in all facets of society and of the economy.

The centres themselves will be dealing with their digital transformation, incorporating tools for a better customisation of services, for a more modern provision and for both their on-site and virtual operation.

The role of the driving agents, key to the success of the centres, will change from being mere service providers to becoming facilitators and connectors between the demand and the specialised agents in the various subjects.

It will be necessary to strengthen alliances and partnerships with other public and private agents that share the same purposes as the centres. The networking of DCCs will be reinforced, not only at local, regional or national level, but also at European and global level.

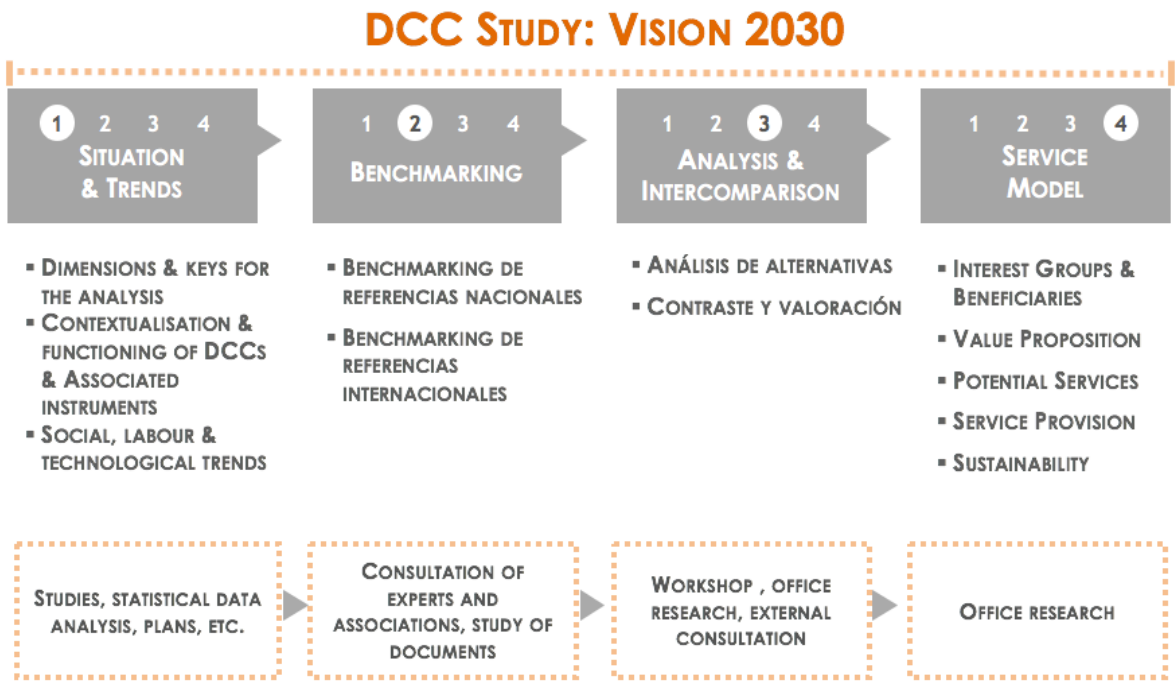
DCCs are going to develop a powerful intangible asset, such as the network of relationships and proximity to citizens, which has enormous value for secondary interest groups other than the main one, i.e. the beneficiaries of the services. They should also develop value propositions and services for these other groups that contribute to maximise their mission.

As the digitisation process of society gets more and more consolidated, other agents providing different services to the same groups of beneficiaries (including employability-oriented and health-related services, for example) will increasingly incorporate the digital approach into their services. Future DCCs will have to continue strengthening their differentiating components to remain the benchmark in the field of digital skills development.

Finally, we must not forget the determining importance of governance in the definition of these DCCs and their orientation towards certain types of services. It will be very important for the governance of these DCCs to work co-ordinately in a cross-cutting manner with other administration policies (economic development, employment, social action, civic participation or education) to ensure that these key instruments for social and economic progress deliver the maximum impact for all society.

5. ANNEX: METHODOLOGY OF THE STUDY

The following 4-step process were applied to carry out this study:



11. Methodological outline of the study

1. PRELIMINARY ASSESSMENT OF THE SITUATION AND TRENDS

The first step involved a preliminary analysis of the current situation. For this, a series of key dimensions were defined to understand the context of the main currently operating networks of Digital Competence Centres, as well as other adjacent programmes and instruments:

- Typology, governance and operation.
- Value proposition and key monitoring indicators.
- Typology of services by type of beneficiary.
- Communication and access to beneficiaries.
- Available infrastructures for the provision of services.
- Characteristics of the driving and service provision team.
- Alliances, networks and partners.
- Sustainability formula.

These dimensions allowed to characterize the operation of this type of instruments, as well as to understand their major differences with respect to other adjacent instruments.

On the other hand, it was necessary to analyse the main trends that will affect the life of society and the world of work, particularly those regarding the impact of technology. New needs will eventually arise from these trends.

2. NATIONAL AND INTERNATIONAL BENCHMARKING

After analysing the current context and future trends that will affect the scope of DCCs, the next step was to collect information about how the foreseeable evolution of these instruments was perceived. A representative sample of public and private entities in charge of managing digital competence centres in the national territory, as well as experts and to civil society entities (user associations, driving agents, etc.) was used for this purpose. The international approach of the study was secured through the Joint Research Centre (European Commission) and the European association All Digital, which brings together more than 60 entities promoting digital skills training for citizens.

Interviews were made to identify key elements and operating prospects of Digital Competence Centres in the future. A script was used the interviews, although, depending on the direction of the conversation, the level of knowledge, the specialisation or priorities of the interviewee, further themes arose or some of the proposed issues were covered to a greater or lesser extent. The table below displays the main themes:

Vision 2030	The interview started with an open-ended question about the vision of the DCC Network managed by the interviewee with a time horizon of 2030. *What is your vision of the DCC Network in 2030? or What is your DCC Network's reason for being and / or existing in 2030?* was the ice-breaking open-ended question posed to obtain an initial approach in respect of the future from the people interviewed. This distant horizon was chosen to bring to the surface nuances and more disruptive observations. The predominant profile of interviewees was that of officers in charge of the management or the operation of the networks.
Drivers and general, social and technological trends	*What social, economic or technological trends will be present both in the way the services are provided and in the content?* This question looked for trends other than technological ones.
Groups and types of beneficiaries, needs	*In 2030, what types of DCC beneficiaries will be more common or frequent? Please indicate the four main types of beneficiaries that will focus 80% of the efforts.*

DCCs' value proposition	*What will be the value proposition of DCCs in 2030? What will make your network and your centres different? Please summarize the contributed value in one sentence or in a few words.*
Benchmark services in 2030	This section was intended to get the interviewee to identify what 4 main services would be more common in 2030, in their opinion. Current services of a certain experimental or prototyping nature were also discussed, with the intention of identifying user learning.
Key indicators	Reflection on current and future indicators, as well as on how to measure the success of the initiative. A comparison was sought between the opinions of the interviewees to assess if currently used indicators are useful to approach the typology of activities, services, programmes and policies to be deployed in 2030.
Role of driving agents	Currently, DCC driving agents are an asset that distinctively characterises the service. But, what will be their role in 2030? How should they structure their work? Can DCCs operate without driving agents?
Partners/Allies	What kind of allies will DCCs need in the future? To date, these types of networks usually work in collaboration with different public administrations, business associations, NGOs, etc. Is it necessary to identify other types of allies in the future? Maybe allies with increasingly specialised knowledge and resources? What would you ask from your future allies? What can they offer from the DCC Network? Or, conversely, do you think that in the future you will continue to work with the same type of allies that you have to date? Obviously, a scenario where there are no allies in your ecosystem also arises.
Physical spaces	Does space gain or lose importance in the future? Is it important to create open, multipurpose, social spaces or, on the contrary, will they be similar to how we view them today? Can DCCs operate without a physical space?

Agents participating in the interviews:

- Joint Research Centre (JRC). European Commission.
- European association ALL DIGITAL.
- Red Guadalinfo. Andalusia.
- Red Conecta Cantabria. Gobierno de Cantabria - Fundación CTL.
- Red de Puntos de Inclusión Digital. Junta de Castilla La Mancha.
- Espacios CyL Digital. Junta de Castilla y León.
- Diputación de Burgos. Castilla y León.
- Fundación Esplai.
- PAT Extremadura. Aupex. Junta de Extremadura.
- Red CEMIT. Xunta de Galicia.
- Fundación Integra. Región de Murcia.
- Fundación Dédalo. Tudela. Navarre.
- RICID. Red Insular de Centros de Inclusión Digital. Cabildo de Tenerife.
- D.G. de Participación Ciudadana y Procesos Electorales. Generalitat de Catalunya.
- Xarxa Punt TIC. Catalonia.
- Red KZgunea. Basque Country.
- Good Things Foundation (United Kingdom).
- LITKA (Latvia).
- SAMBRUK (Sweden).
- Makaia (Colombia).
- Asociación de Usuarios de Internet.
- Associació de Professionals de la Dinamització Social Digital.

In addition to the interviews, further information was collected from an online survey of partners of the Association All Digital whose opinions were aligned with the approaches of this study.

3. COMPARATIVE WORKSHOP

The third step was a comparative workshop, attended by a large representation of managers and coordinators of DCC networks at the national level. The objective of this workshop was to generate shared visions about the model for digital Competence Centres in ten years and their services, as well as to generate new value service ideas for these centres through brainstorming techniques and creativity dynamics.

4. DEFINING THE SERVICES MODEL FOR THE DCCS OF THE FUTURE

Finally, a service proposal for the Digital Competence Centres of the future has been prepared, generating the components of the model in terms of segments of beneficiaries, value proposition, typology of services for each type of beneficiary, service provision mechanisms, metrics and keys to sustainability.