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BUENAS PRÁCTICAS

Actuaciones Cofinanciadas

Extremadura Prototyping and Digital Manufacturing Network to help SMEs in Extremadura to develop their ideas

Red.es

**Programa Operativo
Plurirregional de España**

Año 2022

Fondo Europeo de Desarrollo Regional

Evolution of the Extremadura Prototyping and Digital Manufacturing Network to help SMEs in Extremadura to develop their ideas.

This is an initiative that has been launched jointly by Red.es and the Extremadura Regional Government, with more than 500,000 euros provided entirely by Red.es and co-financed by European Funds.

The project aims to set up the Extremadura Network of Prototyping and Digital Manufacturing, as well as its enhancement through the provision of cutting-edge technological equipment, the training of technical staff and users, and the dissemination of the network to society and Extremadura's ICT fabric.

The Network is made up of four FabLabs (Fabrication Laboratory) located in different areas of Extremadura: the Polytechnic School of Cáceres, the School of Industrial Engineers of Badajoz, the University Centre of Mérida and the Jesús Usón Minimally Invasive Surgery Centre in Cáceres, which will host the Digital Prototyping Workshop in Biomedical Technologies.

The presence of the latter centre, specifically geared towards the healthcare sector, responds to the great interest in the printing of medical material, as the region is at the forefront in this area and wishes to transfer to the ICT sector the capacity to offer new products and services in the healthcare sector.

A FabLab (Fabrication Laboratory) is a space that provides its users with a series of resources, tools and knowledge to be able to materialise their proposals and projects. The origin of this concept was born at MIT (Massachusetts Institute of Technology), conceived as a space for "learning by doing". On the other hand, one of the fundamental principles of these spaces is to share knowledge globally, thus contributing to development and research to solve real problems.



Next, we will justify the project as a whole, mentioning in each criterion one of the four laboratories in order to demonstrate that it is a Best Practice.

1.- The action has been adequately disseminated among beneficiaries, potential beneficiaries and the general public.

The initiative was published in official media indicating that the actions were financed with European funds:



FabLab Extremadura: Bioimpresión 3D | Red.es

174 visualizaciones · hace 1 año

redes Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

<https://www.youtube.com/watch?v=IXNSNFv6ZD4>



FabLab Extremadura: Torno de Control Numérico | Red.es

123 visualizaciones · hace 1 año

redes Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de dis...

Restless inquiring minds have contributed | previously generated by a... 4 momentos

<https://www.youtube.com/watch?v=oBsfv4Y8RAU>



FabLab Extremadura: Impresora 3D Filamento | Red.es

127 visualizaciones · hace 1 año

redes Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

https://www.youtube.com/watch?v=v_3aivofWoo



FabLab Extremadura: Cortadora Láser | Red.es

134 visualizaciones · hace 1 año

redes Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

<https://www.youtube.com/watch?v=XKmj8Uho2zk>



FabLab Extremadura: Estudio de Grabación Sol | Red.es

111 visualizaciones • hace 1 año

red.es Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

<https://www.youtube.com/watch?v=aFkzafAtHUG>



FabLab Extremadura: Cultivo de Células para Bioimpresión 3D | Red.es

165 visualizaciones • hace 1 año

red.es Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

https://www.youtube.com/watch?v=hOaFh_IePbc



FabLab Extremadura: Cortadura de Vinilo | Badajoz | Red.es

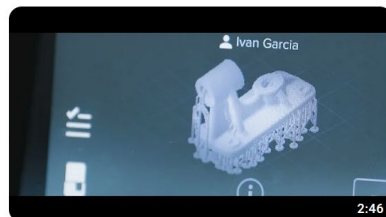
103 visualizaciones • hace 1 año

red.es Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de dis...

Inicio | Proceso de creación | Proceso de corte | Fin 4 capítulos

https://www.youtube.com/watch?v=fK_rj-W57-A



FabLab Extremadura: Scanner 3D+Impresora 3D de Resina | Badajoz | Red.es

125 visualizaciones • hace 1 año

red.es Redpuntos

... en marcha de la Red Extremeña de Prototipado y Fabricación Digital para llevar a cabo procesos de diseño y prototipado en la ...

https://www.youtube.com/watch?v=fK_rj-W57-A



One example of innovation is precisely the bioprinting machines that have been acquired, which have the ability to create a three-dimensional structure using living cells that can replace the function of damaged tissue or even an organ

Nace el laboratorio que quiere imprimir órganos en Extremadura

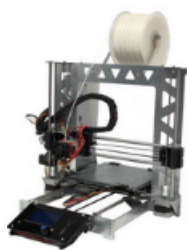
Acaba de ponerse en marcha en el Centro de Cirugía de Mínima Invasión Jesús Usón de Cáceres y cuenta con tres bioimpresoras 3D
proyecto ha sido posible gracias a Red.es, una entidad que depende de la Secretaría de Estado para el Avance Digital, la Junta de Extremadura y la cofinanciación de 528.380 euros procedentes del Fondo Europeo de Desarrollo Regional para la adquisición de los equipos.

On the other hand, from an organisational point of view, FabLabs are particularly innovative, as they are structured in working groups around specific projects. In this way, leadership is fostered, because as soon as a participant has developed a knowledge or competence, he or she proceeds to share it with other interested people through the development of training processes.

The working groups are structured through collaborative projects, which enables each participant to contribute their knowledge and experience, so that there is a continuous learning process throughout the whole process.

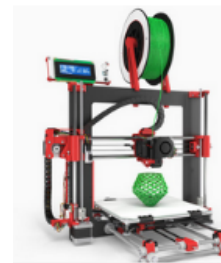
3.- Adequacy of the results obtained to the established objectives.

One of the objectives of this project was the evolution of the Extremadura Prototyping and Digital Manufacturing Network by means of equipment, installation and start-up in the four laboratories that form part of the network. Thus, as a starting point, all the centres, thanks to this project financed with European Funds, have state-of-the-art technological equipment, with laser cutters, augmented reality equipment, milling machines, equipment for the manufacture of drones and control systems, etc; as well as cutting-edge equipment, such as bio-printing equipment in the Digital Prototyping Workshop in Biomedical Technologies.



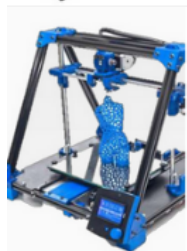
Impresora 3D Prusa i3 Steel

La impresora 3D Prusa i3 Steel es un proyecto libre que...



Impresora 3D Prusa i3 Hephestos

La impresora 3D Prusa i3 Hephestos es un proyecto libre...



Impresora 3D RepRap BCN3D+

La impresora BCN3D+ es un diseño propio de Bcn3dtechnolog...



Fresadora CNC

Fresadora CNC de alta potencia y gran formato. Mesa de...

Thus, for example, in the FabLab of Cáceres (called Smart Open Lab) they have been able to develop projects or laboratories such as the 3D Lab, Air Lab, Pant Lab or Garage Lab, among others; all of them with a high number of participants. Or the projects developed by the Digital Prototyping Workshop in Biomedical Technologies are also very promising as they have obtained

applications of great health interest such as surgical simulators and trainers, surgical meshes or drug-releasing contact lenses, etc.

Simuladores y entrenadores quirúrgicos

- Desarrollo de simuladores para enteroscopia por doble balón.
- Línea en actual desarrollo.
- Estudios de diferentes materiales basados en TPU para diferentes flexibilidad.
- Trabajos realizados presentados en XXXVIII CASEIB

Prototipos de instrumental quirúrgico

- Mejora de la ergonomía del cirujano
- Impresión FDM en PLA
- Publicación científica

Desarrollo de Bioimpresora

- Trabajo en desarrollo
- Modificación del extrusor
- Diseño de cabina de pre-incubación
- Publicación científica

Estudio de Biomateriales

- Pruebas reológicas
- Pruebas mecánicas
- Síntesis de Biomateriales
- Simulación computacional
- Publicaciones científicas

Mallas quirúrgicas

- Trabajos previos patentados
- Bioimpresión de mallas con propiedades controladas
- Estudio de propiedades mecánicas
- Funcionalización química
- Liberación de fármacos

Lentillas liberadoras de fármacos

- Trabajo en desarrollo
- Estudios de imprimibilidad
- Estudios de biomateriales
- FDM
- SLA

4. Contribution to the resolution of a problem or weakness detected in the territorial scope of implementation.

The Extremadura FabLabs Network will serve as a driving force for a sector such as 3D manufacturing with little presence until now in Extremadura, but which is configured as a strategically important activity for the digital transformation promoted in the region's business fabric.

In particular, in the educational field there were no such spaces or equipment in the Technical Schools of Badajoz and now, thanks to this project, the Fablab Badajoz can provide students with great teaching resources of great interest for motivation and student learning such as experimental demonstrations and projects, case studies, various activities, techniques and practices.

In the case of the Digital Prototyping Workshop in Biomedical Technologies, it should be stressed that, although the region is already a leader in this field, the need to transfer to the ICT sector the capacity to offer new products and services in the health sector has been seen. This project has attempted to respond to this need by providing cutting-edge resources capable of developing projects of high scientific and medical interest by proposing non-intrusive healthcare techniques that enable greater patient wellbeing, as well as a series of flexible and personalised surgical practices that adapt to the practical needs of surgeons.

5. High degree of coverage of the target population.

The FabLabs that make up the Network are therefore open to anyone who wants to create or produce, transcending the university, technological or strictly business sphere. Almost any idea that can be materialised in a product or creation is likely to take shape through the resources provided by the FabLabs. These are growing beyond the university environment and although they have yet to make themselves known in their respective territories, they have an increasing number of users and a greater heterogeneity of users.

Special mention should be made of the Centro Universitario de Mérida, which has managed to attract young people after class; and the Smart Open Lab, the FabLab in Cáceres, which has created a very diverse and constantly growing ecosystem (engraving and metal craftsmen, 3D modelling companies, patisserie, technology consultancy companies, furniture companies, doors, etc.) that provide services to entrepreneurs and companies.



6- Consideration of the horizontal criteria of equal opportunities and non-discrimination, as well as social responsibility and environmental sustainability.

As we have seen in the previous criterion, anyone can use the Fab Lab, with collaboration between all users being a fundamental factor in carrying out the projects. Most active communication channels are used, such as social networks, youtube channels, project stories (success stories), etc., so that friendly and open forums can be created where there can be a relaxed atmosphere.

Despite this, there is still a long way to go as there is a gender gap in the maker culture not only at a national level but also in the entire international network due to the lack of participation of women and girls. The whole community is aware of this and is working on actions to attract more women to these spaces. In any case, small achievements are being made, since, although gender parity has not been achieved among FabLabs participants, it can be observed that the presence of women is greater in these spaces (around 16%) than that observed in technical and engineering careers (around 12%).

7. Synergies with other policies or instruments of public intervention

This action is fully aligned with both the Digital Spain Strategy 2026 and the Digital Strategy for Extremadura, where the priority objective is to strengthen the business fabric, favouring the creation of new business models associated with ICTs, as well as research and innovation in the sector.

Likewise, this action fits perfectly into the Regional Strategy for Research and Innovation for Smart Specialisation (RIS3), an integrated strategy for the economic transformation of the region through the promotion of scientific and technological leadership in those sectors in which there is a high growth potential, directing its activities towards priority or specialisation areas such as agri-food, clean energy, tourism, health and ICT.

In the specific field of FabLabs, there is a great deal of collaboration between the entire network of laboratories in other cities in Extremadura. Right now, the Junta is funding the public FabLabs and they are trying to collaborate and help through a common platform with the private FabLabs to share both human resources and machinery.

On the other hand, they offered Grants aimed at the implementation of teleworking solutions and digital entrepreneurship in companies, the first point of these emerging technologies being the FabLab culture.

