**CE STORY** | **FOCUS ON DIGITALISATION AND CIRCULAR ECONOMY**

# Digital technologies: accelerating circular economy

Circular economy is the major economic, social and environmental imperative of our time.

> **Unit of Sustainable Development, Department of Territory and Sustainability, Government of Catalonia** - 11/12/2018

The pressure we exert on raw materials to manufacture products and the amount of waste we produce after consumption is proven to be highly inefficient and completely unsustainable in the mid-term. Thus, as a society, we need to build up a system where value is retained, and products and materials circulate indefinitely over time while waste is minimised. However, change is never easy and the transition from a take-make-dispose model into a circular one still needs a strong implementation drive.



In order to close the gap between theory and practice, **digital technologies play a major role in implementing the circular economy.** While engineering, biochemistry and other natural sciences are able to transform matter (from waste to energy or secondary raw materials, etc.), digital technologies are necessary to trace, control and monitor those material flows and loops, which the circular economy is founded upon. In this sense, blockchain technologies can enhance supply chain transparency and traceability of materials; ERP[1] software can be used to control and predict on-demand production, and limit stock generation; RFID and NFC technologies[2] enable big data applications that monitor availability of materials, resource flows and quantify material loss and waste generation; and last but not least, digital platforms open an immediate and straight channel of communication between brands or public bodies with consumers and citizens. In other words, **communication is the key to unlock the circular economy.**

[1] Enterprise Resource Planning (ERP)
[2] Radio Frequence Identification (RFID); Near Field Communication (NFC)

Transformation is about to happen. **Dynamic business ecosystems**, which promote the generation of **new digital business cases**, are expected to **lead the way of the circular economy** in the immediate future.



**A**s an example, **Catalonia** has a vibrant ecosystem of more than 1.300 start-ups, 80% of which are focused on generating new business models and opportunities by deploying online software, Big Data IoT, Industry 4.0 and mobile technologies in the market [1].

Participant tech companies in the CirCE project in Catalonia have **proved to be necessary tools to catalyse and implement disruptive solutions that can respond to sustainable and circular needs:** Agrifood IT helps to monitor and efficiently use natural resources in crop production; AE Innova offers smart and energy efficient solutions to manufacturers of several industries; Beabloo is disrupting retail by using the potential of digital signage to transfer relevant information from brands to consumers; and companies such as eTailers are engaging and innovating the design of subscription models and ecommerce services for brands of many consumer goods industries.

However, communication is again crucial to accelerate the technological transference into end-market users that want to implement circular solutions. **Tech companies have the know-how, but food, beverage, fashion, building and other industries have the challenges.** As it happens in other regions, Catalonia needs to design effective instruments to bridge the potentialities that digital technologies enable and the different end-markets of the economy so as to become a **major hotspot of Circular Enabling Technologies.** ■

Barcelona is increasing its profile as technological and digital hub, becoming one of the TOP 3 destinations for start-ups, after European capitals such as London and Berlin [2].

[1] http://startupshub.catalonia.com
[2] www.startupheatmap.eu/analytics/city/Barcelona

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