European Association of Development Agencies
Association Européenne des Agences de Développement

EURADA-NEWS
Périodique Mensuel
Editeur Responsable : Christian SAUBLENS

EURADA NEWS

E

SMART MAKERS ENTREPRENEURIAL REGIONAL ECO-SYSTEM

This issue of Eurada-News is devoted to a concept note relating to a regional ecosystem intended to promote entrepreneurship and the reindustrialisation of regions based on four pillars: FabLabs, 3D printing hubs, e-commerce platforms and crowdfunding.

We have scheduled a workshop on **21 November 2013** in Brussels bringing together representatives of the four "industries", RDAs and different General Directorates of the European Commission (Regio, Research and Innovation, Enterprise and Industry).

Should you be interested in taking part and/or extending the invitation to an industry representative of your region, feel free to contact us.

Smart Makers Entrepreneurial Regional Eco-System

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The emergence of new prototyping technologies and the acceleration of e-sourcing and e-commerce are offering new types of entrepreneurs (makers and e-solo-entrepreneurs) opportunities that up to now could hardly be leveraged. Deployed on a large scale, the very same technologies may provide the foundation for both the reindustrialisation of certain regions and emerging industries. Finally, if combined smartly, these technologies may become outstanding accelerators in terms of leveraging the outcomes of R&D projects developed by individuals and SMEs.

This document examines the potential of an entrepreneurial discovery ecosystem resting on five pillars including:

- fablabs
- 3D printing
- short production run crowdsourcing
- crowdfunding
- e-commerce for small-series and handmade products.

It also discusses the mainstreaming of some of the business models associated with those five pillars with a view to delivering a reindustrialisation component for certain regions.

INTRODUCTION

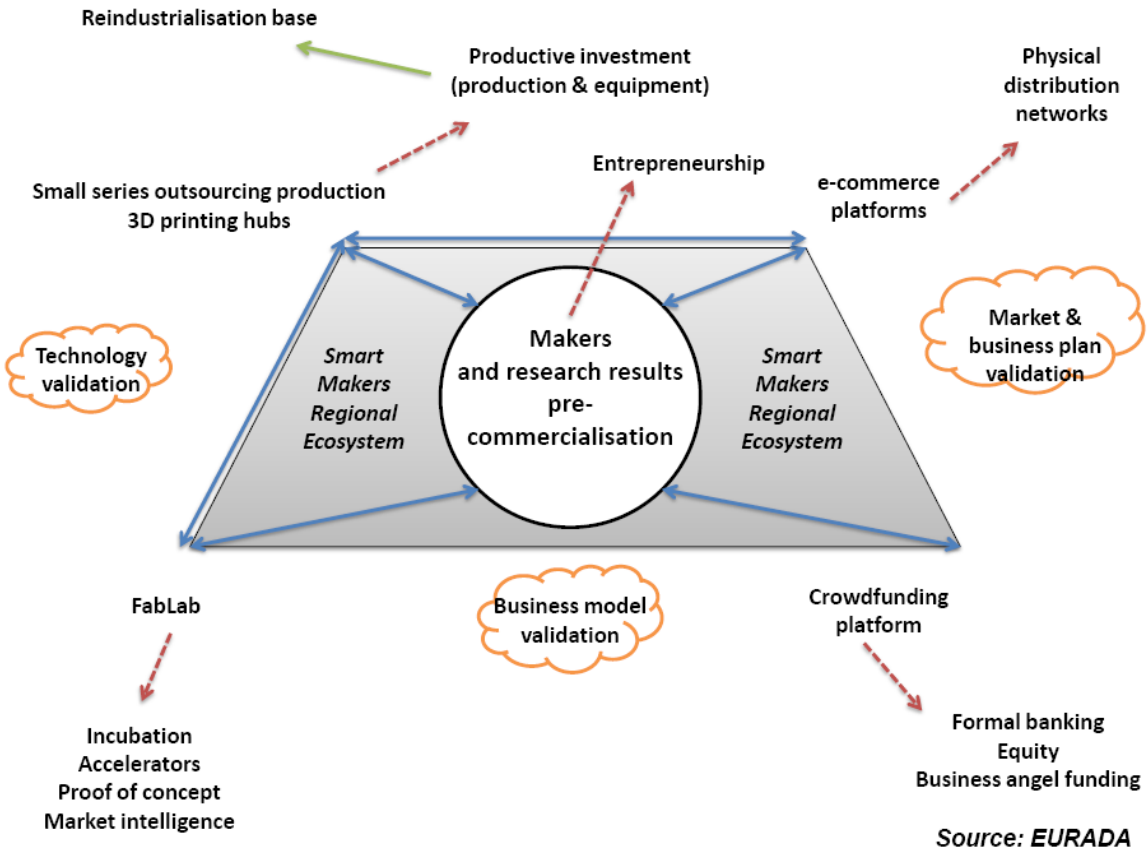
Applied to crowdsourcing in combination with 3D technology, information technology is offering entrepreneurs new market opportunities. Regions should leverage these new opportunities to build adapted ecosystems and lay the ground work for reindustrialisation. Indeed, both these technologies provide a wide range of citizens – hereinafter called “makers” (handymen, DIY enthusiasts, amateur innovators, creative craftsmen, etc.) – with unprecedented business opportunities to the extent that access barriers and entry costs become extremely low, heralding fast growth in the number of e-solo-entrepreneurs. In addition, 3D-printing technology will lead to a complete overhaul of some industrial value chains.

Thus, regional public authorities should enable maximum leveraging of the advantages represented by advances in areas including:
➔ fablabs equipped with ever more sophisticated and affordable machine tools for laser cutting and 3D-printing, robots coupled with 3D-design software enabling makers to develop prototypes or manufacture very short production runs at competitive costs;
➔ 3D-printing hubs and outsourcing e-platforms, i.e. businesses that enable makers to manufacture small series of their products;
➔ crowdfunding, enabling presales and seed funding (equity and peer-to-peer lending);
➔ commerce e-platforms specialising in the commercialisation of small series or single products.

Such an ecosystem may also support the third stage of the future SME support arm of HORIZON 2020 as well as the new "Fast Track to Innovation" initiative, to the extent that it expedites proof-of-concept both from a technical point of view through prototyping and from a commercial perspective via strands including presales crowdfunding and even equity and commerce e-platforms.

Finally, progress in 3D printing will enable a number of subcontractors to leverage new types of competitive advantages with businesses that rely on short production runs, notably in the form of greater reactivity, customization and proximity than competitors who in the past took advantage of trends toward offshoring manufacturing of certain components.

This new ecosystem is presented schematically below.



This ecosystem tackles three major issues faced by public authorities when supporting entrepreneurship and entrepreneurs starting a new business: (i) early-stage production and client search; (ii) local gateway for service sourcing; (iii) early-stage finance and consumer feedback.

1. DESCRIPTION OF THE FIVE ECOSYSTEM PILLARS

1.1 Fablabs: born in MIT (the Massachusetts Institute of Technology), fablabs are prototyping spaces accessible to private individuals (makers) who thus gain access to a variety of specialist digital machines to manufacture their own prototypes or products. Fablab tools are more or less standard and include laser cutters, 3D and circuit board printers and 3D design and other software. Also of note is the emergence of *techshops* (larger fablabs) and *hackerspaces* (fablabs specialising in free software and open hardware).

1.2 E-sourcing platforms: these are electronic platforms matching makers with service providers
1.3 3D printing hubs: specialising in very short production runs of objects using traditional processes or 3D printers. They already enable production of items made of plastic, resin, wood, ceramics, silver and foodstuffs. In the future, there will likely be printers for biomaterials (e.g. human bone and other tissue).

1.4 Crowdfunding platforms: they enable entrepreneurs to secure funding in three ways: (1) presales; (2) peer-to-peer lending and (3) equity.

1.5 E-commerce platforms: they specialise in online sales by micro-producers, including of handmade products (cf. ETSY and DAWANDA).

2. THE ADVANTAGES OF THE ECOSYSTEM FOR ENTREPRENEURSHIP

The ingredients of the ecosystem facilitate the first stages in the business lifecycle through dematerialisation and by sharing risks with a community of users. Indeed, makers do not need to invest at the early stages of business development into either production tools or distribution networks or even market surveys. Thus, the ecosystem largely reduces costs and hence the risks associated with the start-up stage of business development. Furthermore, use of crowdfunding facilitates both access to seed capital – if not credit – and of course the search for first clients.

Organisations supporting entrepreneurship need first to mainstream this new business model into the range of advisory and other services they provide to potential entrepreneurs and second to help makers with high entrepreneurial growth potential to leverage the lessons learned from using this ecosystem in terms of market knowledge and financial capacity with financial organisations and business development consultancies. These lessons can be used in a business plan aiming to gain access to traditional external funding sources (banks, business angels, venture capitalists, etc.).

3. THE ROLE OF PUBLIC AUTHORITIES IN DEVELOPING OR PROMOTING A SMART MAKERS ECOSYSTEM

As with all public intervention in support of entrepreneurship, public authorities have three choices: provision, outsourcing or “laisser-faire”. When it comes to this project, public intervention can address eight areas including:

a) provision of funding to help
   - fablabs buy equipment and possibly cover their operational expenses,
   - crowdfunding platforms support their development,
   - co-investment funds connected to crowdfunding platforms.

b) advice for would-be makers or e-solo-entrepreneurs through detailed knowledge of the advantages and limitations of the five ecosystem pillars. A signposting system needs to be deployed, as well as bridges to the traditional ecosystem that will support business growth.

c) networking among regional Smart Makers ecosystem stakeholders and with other business support intermediary bodies. Support may include coordination of makers clubs and user communities.

d) raising would-be maker awareness of new business opportunities provided by the this ecosystem.

e) framework conditions that facilitate the growth of these new activities, notably in the field of crowdfunding.

f) training in generic technologies that support the ecosystem and entrepreneurship with new target groups of would-be entrepreneurs. This may require support to set up demonstration centres.

g) analysing the industrial value chain of the region with regard to the use of 3D technologies, specialized software and e-commerce.

h) a reflection on education in entrepreneurship. The ecosystem requires both intellectual and technical skills and know-how. This eliminates the differences between "blue collars" and "white collars" and can foster entrepreneurship.

The table below presents the benefits of this new ecosystem for entrepreneurs and citizens as well as the types of public intervention that support it.

Ecosystem ingredients	Benefits for entrepreneurs	Benefits for citizens	Public authority interventions
Fablabs	Prototype production facility Prototyping expert support Low production costs	Delivering creativity Interest in entrepreneurship Object customisation	Support to buy equipment Support for mentoring/ coaching provision Participation in PPPs to develop fablab-type infrastructure
3D printing hubs E-sourcing platforms	Flexible access to small-series production tools		Support for businesses providing 3D printing services
Crowdfunding platforms	Access to different (pre)seed finance formats, peer-to-peer lending and presales Crowdfunding provides entrepreneurs with information about the market and also often about their first clients	Support for emotion-based projects Pre-purchasing Financing of business projects Communication with entrepreneurs	Investment in co-financing funds
E-commerce platforms	Access to local and global clients without the need to invest in a distribution system	Buying products through dematerialised commercial channels	Verifying the usefulness of a space to promote regional products, including from within a generic platform Advising entrepreneurs on how to leverage e-commerce

4. ECOSYSTEM PILLARS IN EUROPE

To the best of our knowledge, no attempt has been made to structure a Smart Makers-type ecosystem at regional level within the EU. Each pillar is more or less developed in different EU Member States. There is no study on how best to build synergies among the different direct and indirect ecosystem stakeholders.

Below is an attempt to present the different stakeholders of the ecosystem.

4.1 Fablabs

The MIT identified around 52 fablabs within the EU. They are based mainly in The Netherlands (12), France (9), Germany (6), Spain (6), the UK (5), Belgium (4), Italy (3) and one each in Austria, Portugal, Finland, Luxembourg and Poland. A dozen fablabs are being set up, including one each in Greece and the Czech Republic.

Europe seems to lead the US, where 35 fablabs are operational and 6 are being set up (cf. www.fab.cba.mit.edu).

The International Fablabs Association identified 112 fablabs in the EU, including 42 in France, 22 in The Netherlands and 11 in Germany (cf. www.fablabinternational.org).

Through its subsidiary Cubify, US company 3D System offers makers cloud-based 3D printing services (http://cubify.com).

4.2 3D printing Hubs

A few hubs operate in the EU. They are located in:

- France: Sculpteo (www.sculpteo.com), which opened a subsidiary in San Francisco;
- Belgium: Materialise (www.materialise.com) is the hub of a global network;
- The Netherlands: Shapeways (www.shapeways.com) and TIM – The Innovative Modelmakers (www.timmodelmakers.nl/index.php?lid=2);

Also noteworthy is Ponoko (www.ponoko.com), a group based in New Zealand with subsidiaries in London (UK), Milan (I) and Berlin (D) as well as in California.

The websites of some of these hubs also offer makers space to commercialise their products.

Sophistication of the prototyping facilities they provide is how these hubs differentiate themselves from certain sourcing platforms including CafePress or Zazzle, which simply specialise in customising basic objects and materials such as mugs and T-shirts.

4.3 Sourcing platforms for very short production runs

alibaba.com, a Chinese website, offers to identify on behalf of micro-producers companies that can manufacture small quantities of any product. ARAN (www.aran-rd.com/index.php?page_id=408) is an Israeli company that proposes very short production runs – including for products that require a sterile environment (medical applications) – in addition to prototyping and IP management services.

4.4 Crowdfunding platforms

There are around 200 crowdfunding platforms operating in Europe. Some of the platforms operating on the presales segment include KissKissBankBank (FR), Peoplfund.it (UK), Ulule (FR) and Sonicangel (BE). When it comes to raising venture capital, key players include Symbid (NL), CrowdCube (UK), Seedrs (UK) and Anaxago (FR). As for peer-to-peer lending, household names are Babylon (FR), Funding Circle (UK), Zopa (UK) and Smava (DE).

The search for venture capital mainly concerns business development projects in industries including ICT applications, food and drinks, the environment, energy and consumer goods.

En 2012, crowdfunding generated transactions for €945 million in Europe (±36% of the world market). The respective market shares of the three crowdfunding forms worldwide are as follows: Presales: 52%; Peer-to-peer lending: 44%; Equity: 4%. The growing significance of crowdfunding in raising venture capital is evident in the fact that in France, €40 million were crowdfunded in 2012 against €20 million secured from business angels. US platform Kickstarter enabled several entrepreneurs to raise over US$3 million per project, i.e. more than the total annual seed capital activity of certain Member States.

4.5 E-commerce platforms for very short production runs and handmade products

Three websites seem to dominate the B2C market: ETSY (www.etsy.com), a US website operating from several Member States; DaWanda (http://fr.dawanda.com/), a German website; and Bonanza (www.bonanza.com).

Worth mentioning too is Tindie (www.tindie.com), a website offering makers more than 400 products and also enabling them to commercialise their production (±75 offers in August 2013).

B2B for intermediary products and parts of the production chain remain to be explored as well as marketing through open innovation platforms of large enterprises.

4.6 3D printer manufacturers

The skills of EU companies including Phenix Systems (FR), Envision TEC (DE), Voxeljet (DK) and MCOR (IRL) are recognised in 3D printer manufacturing. The Dutch enterprise OLED Technologies and Solutions is developing a 3D printer to use in OLED technology.

5. CLUES TO BENCHMARK THE EU WITH THE US

As emphasised in the section above, some pillars of the Smart Makers ecosystem are dominated by US initiatives. Furthermore, the US believes in the future of 3D printing. For instance, as part of the US re-industrialisation initiative, the Obama administration supported a PPP project to set up NAMII, a centre of 3D printing excellence in Youngstown, Ohio. Investment there amounted to US$70 million. The PPP notably involves five federal agencies, 14 universities and 40 businesses. Several states are developing similar initiatives, e.g. the Hudson Valley 3D Printing Initiative in New York and a partnership between the University of Connecticut and Pratt & Whitney.

Companies such as Boeing, Ford and GE rare investing in this technology. And there is movement in the software industry too, at the software interface between designers/makers and 3D printers. Deloitte Consulting LLC and 3D Systems have teamed up to establish solution centres in several US regions to acquaint their clients with this technology and train them to introduce it. Facing the loss of its competitiveness, Europe must position itself on the "high end" which often involves customizing the offer and smaller series. This is what 3D printing allows.

The Chengdu area of China too is investing into the development of a centre of 3D printing excellence in partnership with industrialists, universities and public research centres. The initial investment amounts to US$70 million for the CoE and US$32 million for research projects. Latest international developments in the field of 3D printing can be monitored on www.3ders.org. The government of Singapore recently announced a US$500 million five-year development programme to establish a 3D printing industry.

Worth underscoring finally is that commercial 3D printers are becoming more affordable. The Cube printer now features in Staples' office supplies catalogue, for instance. In the UK, Maplin retailers have been selling 3D printers (from UK£ 700) to private customers since July 2013. In Japan, Yamada Denki – the country's largest household appliance chain store – is selling such printers too.

Some US universities (Arizona, Cornell, Delaware,…) develop their own crowdfunding platforms to finance R&D projects or leverage research project outcomes.

3DSystems (who manufacture Cube) and Startasys appear to lead the 3D printer market. 3DSystems bought EU companies Phenix Systems and TIM – The Innovative Modelmakers while Startasys paid more than US$ 400 million to take over Maker Bot, a manufacturer that achieved fame with its 3D printer model called Replicator 2. GE bought Morris Technologies, who manufacture materials using the 3D printing process, arguing that "*our ability to develop state-of-the-art manufacturing processes for emerging materials and complex design geometry is critical for our future.*"

6. CHALLENGES FOR THE EU

Member States and regions alike need to seriously consider developing strategies to:

- → help leverage the entrepreneurial potential (makers, e-solo-entrepreneurs) represented by an ecosystem resting on the five pillars of the Smart Makers Regional Ecosystem concept;
- → promote a regional re-industrialisation process based on 3D printing technology;
- → encourage leadership in the development of new technology deriving from 3D printing;
- → build a strong human leadership to lead and manage the transition towards this new ecosystem.

7. CHALLENGES FOR THE EU COMMISSION

The EU Commission should ascertain how such ecosystem contributes toward the objectives set in its recent communications in fields including:

- the Entrepreneurship Action Plan;
- Web-based entrepreneurship;
- the Startup Europe Initiative;
- Industrial policy;
- Youth employment.

The EU Commission could support an initiative to exchange experience as it did recently with the Startup Europe's Accelerator Assembly (www.acceleratorassembly.eu/). And why not consider supporting a pilot initiative in favour of a few pioneering regions with an interest in testing and learning the lessons of the implementation of a Smart Makers ecosystem? Even better, this ecosystem should be promoted by DG Regio within the framework of ERDF priorities 1 and 3 of the next generation of regional programmes.

The Commission could deploy a pan-European Smart Makers ecosystem to leverage the outcomes of projects funded so far under the 7th Framework Programme and in future as part of HORIZON 2020.

Finally, it could compile an inventory of the potential represented by the Smart Makers ecosystem as a vehicle for reindustrialisation in some regions, for revitalisation of certain traditional industries and to leverage new market opportunities (software, hardware, machine tools, etc.).