

# GEN-Y CITY

Developing, attracting & retaining Gen-Y 'creative-tech' talent in European cities



4<sup>th</sup> Network Meeting, Coimbra (PT), 30<sup>th</sup> – 31<sup>st</sup> March 2017

Thematic Report:

**Smart Specialisation, Tech Hubs and Civic-Tech Innovation to create 'sticky' creative-tech cities**

## Tech will save us ...

***"Without science and innovation, there's no growth. Without science and innovation, there are no jobs."*** - Commissioner Carlos Moedas, July 2017

Europe's economic future depends on the performance of its high-tech and creative industries. Businesses in these sectors are innovative, fast growing, and offer jobs that are less likely to be automated, providing sustainable future employment.

However, the ability for different countries across Europe to support and foster the growth of the tech sector is heavily dependent on the strength, or thickness, of their local tech-ecosystem.

Indeed, research by Balderton Capital<sup>1</sup>, one of Europe's leading VC firms, has found that;

- 43% of employees in European tech are not citizens of the country where the company is headquartered;
- The number of STEM graduates' correlates closely with the strength of a country's ecosystem;
- Many people's tech Job searches are focused primarily on the UK, Germany and France;
- London currently remains the city attracting the most job searches;
- London, Paris and Berlin have almost half the engineering talent in Europe and are home to as many developers as Silicon Valley;
- IBM, Nokia, Microsoft, Accenture and Google are the top 5 companies from which start-up employees are drawn;
- There is huge variation in pay in start-ups across Europe;
- Switzerland is the best paid location to work for a start-up with an average salary of \$90,524;
- Portugal pays the worst, with average salary of \$24,772;
- Women remain in the minority in four out of five European start-ups; and
- Employees in European start-ups are overwhelmingly European and studied at European universities

Balderton Capital also identify that hiring skilled staff is one of the biggest challenges tech companies face across Europe, pointing to the fact that just three countries in Europe – the UK, France and Germany – employ two-thirds of all the people that work for tech start-ups.

James Wise, Partner at Balderton Capital, identifies that the industry's other big issue is that tech start-ups remain dominated by men. In 85% of start-ups, female workers are in a minority. Women are particularly poorly represented at the highest levels. In 73% of start-ups, fewer than a quarter of senior employees are women. Given the looming recruitment crisis in many tech communities, companies must urgently address how they develop female talent within their organisations."

**Given this situation, there is a compelling argument to suggest that those places that can solve the creative-tech talent development, retention and attraction process and crack the diversity issue will help to strengthen their economic position.** But where to start?

## Build from your own foundations ....

In exploring how best to build and enhance tech economies in particular localities, its universally recognised that you simply cannot take components of a tech eco-system 'top-down', from other cities and localities. In reality, you need to build from the bottom up, in such a way which adds value to the strategic assets of your City. This is the genesis of the concept of Smart Specialisation, a 'bottom-up' process and approach for building the innovative capacity of regions which was originally launched by a 'Knowledge for Growth' expert group (DG Research) as part of the ERA<sup>2</sup>.

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<sup>1</sup> [The European Talent Landscape](#), Balderton Capital, December 2016

<sup>2</sup> See [http://ec.europa.eu/research/era/publication\\_en.cfm](http://ec.europa.eu/research/era/publication_en.cfm)

Smart Specialisation stresses a role for all regions in the knowledge economy, to identify specific sources of competitive advantage in specific R&I domains/clusters, that fit with the specificity of their place (not just 'winning' sectors). Smart Specialisation is a process that has been designed to overcome fragmentation and duplication of public R&D investments, and ensure the investments are made are 'grounded' in the local economic landscape and possess a strong potential to be sustained.

One of the challenges of smart specialisation is that it has to embrace the concept of open innovation, not only investment in (basic) research. Also, that Research and Innovation Strategies for Smart Specialisation (often referred to RIS3) need to be integrated, place-based and transformative (in terms of the economy).

RIS3 Strategies<sup>3</sup> are multi-annual strategies defining a policy-mix and budgetary frameworks focusing on a limited number of priorities to stimulate 'smart growth'.

### **Smart Specialisation as a framework for identifying sources of local competitive advantage**

The Smart Specialisation/RIS3 process is based on four underlying principles;

- **Competitive advantage:** at the heart of the process is creating matches in the Research and Innovation capabilities of region (or beyond) with business and developing a variety of links; the adoption of (generic/new) technologies for diversification/modernisation of sectors and the exploration of emerging areas;
- **Critical mass of resources & talent:** cooperation between regions by avoiding duplication and fragmentation
- **Policy Choices:** the selection of a limited number of priorities based on the idea of specialisation and their integration into international value chains; and
- **Collaborative Leadership:** involve stakeholders from academia, businesses, public administrations and civil society (i.e. quadruple helix) and develop synergies between funding instruments (EU, national, regional)

### **A step-by-step approach to RIS3 design**

Generally speaking, cities looking to develop a RIS3 strategy should adopt a 6-stage process;

- Step 1 – Analysis of regional context/potential;
- Step 2 – Governance;
- Step 3 – Vision for the future;
- Step 4 – Selection of priorities;
- Step 5 – Policy mix; and
- Step 6 – Monitoring and evaluation.

Looking at these steps in more detail;

#### **Step 1: Undertake an analysis of national/regional context and potential for innovation**

Ideally the person responsible for undertaking the analysis of national/regional context and potential for innovation should adopt a broader definition of innovation, not just be Research and Technology Development (RTD) oriented. They should assess existing national/regional/local innovation assets and identify national/regional sources of competitive advantage. They should try and identify emerging niches for smart specialisation through a combination of methods (e.g. national/regional profiling, SWOT analyses, surveys etc.).

#### **Step 2: Governance**

As far as Governance of the RIS3 process is concerned, in common with the Urbact process, the team responsible for leading the process need to ensure community participation in the process and ensure ownership is strong. Its particularly important to include the demand-side perspective/end users; try and involve the quadruple-helix

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<sup>3</sup> See <http://s3platform.jrc.ec.europa.eu>



partners (university, business, public and community) and create a culture of collaborative leadership. Normally, a dedicated steering group is given the responsibility for managing the process and drawing in wider stakeholders:

### **Step 3: Developing an overall vision of the region's future**

In this phase of the RIS3 process, the team responsible should formulate different scenarios based on analyses and debate of where the region wants to go; articulate the region's potential and main direction for its international positioning; and produce a positive vision of the region's future, whilst maintaining engagement of stakeholders.

### **Step 4: Identification of priorities**

In this phase, the team should develop propositions for a limited number of areas with potential for smart specialisation, as identified in the prior discovery process. This should explain areas where the region hopes to

Excel. In this prioritisation process, it's important to pay attention to horizontal priorities (Key Enabling Technologies, social innovation, etc.). It is also important to avoid being captured by interest groups.

### **Step 5 – Definition of a coherent policy mix, roadmaps and action plan**

This roadmap will include: Action plan target groups, objectives, timeframes, indicators, sources of funding and budget allocations. Pilot projects may be proposed to experiment with unprecedented policy mixes and obtain inputs for updating the RIS3 strategy. This process is all about organising and detailing rules and tools.

### **Step 6 – Integration of monitoring and evaluation mechanisms**

Developing a coherent monitoring framework is needed to verify the correct and efficient implementation of activities. Evaluation is important to verify whether and how strategic goals are met. As developing a RIS3 Strategy is a Structural Funding ex-ante requirement, it's important to set measurable targets and output/outcome indicators. Evaluation and monitoring mechanisms need to be integrated in the strategy:

## **Civic-Tech as a tool to encourage young people to solve challenges in the city**

One tool for developing and building industrial specialisations in a city – whilst also potentially regenerating and improving the urban environment and involving residents in shaping the city - is to strengthen the civic-tech activities in the city.

Civic tech is technology that solves civic problems; enables greater residents to participate more strongly in civic/government issues; or assists government to deliver citizen services and strengthening ties with the public. Some municipalities use 'civic-tech' as a catch-all term to explain all technologies related to the public sector and civic life, but 'government-tech' is probably a more suitable term for this broader category of technology.

Civic-tech is where the public lends its talents, usually voluntarily, to help government do a better job.

'Hackathons' – workshops which bring together software developers, entrepreneurs and government officials to look for innovative solutions to civic problems or challenges, over the course of a day or two - are perhaps the most common example of civic-tech, but the definition can be stretched to include any intersection of government cooperation with the public where the goal is to expand the role of the citizen in government activities.

Civic-tech is relatively young discipline, so impact is difficult to quantify except to say it's growing faster all the time, with new companies popping up each month.

Because much of the civic-tech movement started in the US, much of the analysis of the opportunities come from US reports. In 2013, The Knight Foundation produced a report entitled The Emergence of Civic Tech: Investments in a Growing Field, which identified two major themes and 11 clusters of civic-tech activity;

## Open Government

1. Data Access & Transparency
2. Data Utility
3. Public Decision Making
4. Resident Feedback
5. Visualization & Mapping
6. Voting

## Community Action

7. Civic Crowdfunding
8. Community Organizing
9. Information Crowdsourcing
10. Neighbourhood Forums
11. Peer-to-Peer Sharing

Sometimes civic tech comes from the people, and sometimes it starts with efforts by groups of residents trying to solve a particular issue. In the USA, Civic tech is now also attracting Venture Capitalists.

In Europe, [Code for Europe](#) is a grouping of cities and regions that are using technology to help government connect to citizens and deliver better services. Inspired by Code for America, the civic coder movement is spreading across the globe; Mexico City, the Caribbean and Japan are just three of the 'Code for' movements that are beginning to come together under the banner of Code for All.

In the Netherlands, Openstate.eu aims to utilise Open Data to deliver digital democracy programmes. One of their projects is [Open Health Costs](#) is a combination of open data and crowdsourcing which could result in savings of millions of Euros in the Netherlands. Because medical insurers and providers won't openly publish what they charge consumers, the Dutch Consumers Association, working with OpenState, is asking patients to upload their receipts for medical work, building an open database of costs that can then be compared with the national average. Eventually, they hope the availability of this data should force medical costs down.

In the UK, Nesta has been encouraging governments to discover civic tech through a [Civic Exchange](#) platform, where they have developed a catalogue of civic apps and case studies. They recognise that reaching a non-technical audience within local government is not easy. They suggest that 'public service managers, policy officers and elected representatives are primarily interested in solutions to their problems. Functionality comes second, perhaps even third behind cost'.

In the US, Erin Simpson, Micah Sifry and Matt Stempeck have developed the Civic Tech Field Guide an excellent resource that maps the key tools, trends, processes and more of the civic-tech world in a bid to help improve understanding, collaboration and research. The best introduction to their work is probably on the Microsoft Blog, ['Towards a taxonomy of civic technology'](#).

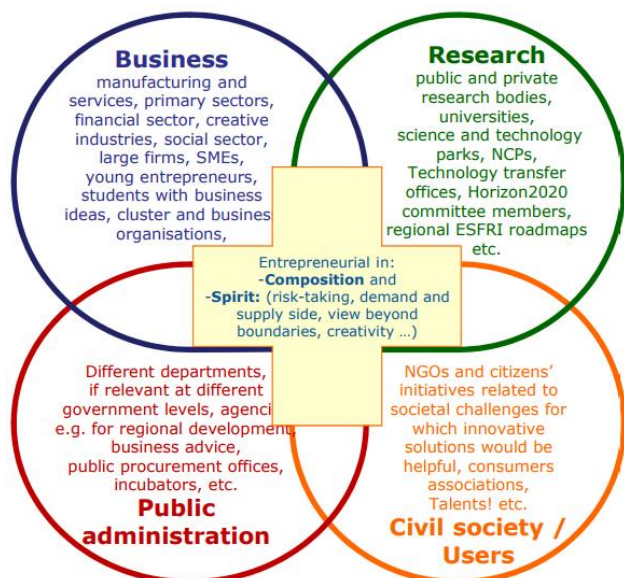


Fig. 1 The Quadruple Helix Model sits at the heart of the Civic Tech Process

## Civic-Tech Case Study: Projecto Há Baixa, Coimbra



Whilst many people might only think Digital when thinking Civic-Tech, Coimbra has developed a very successful and inspirational project, Há Baixa, a project which is built on University, Municipality, Citizen and Business Participation in the field of Social Architecture.

The reason the project is inspirational is because;

- It solves physical problems in the city and promotes renewal and the importance of caring for public realm;
- It enables young people (in this case architects) to work in 'live' urban renewal and regeneration projects, as social activists, gaining experience whilst studying;
- It demonstrates how technical disciplines can be fulfilling careers and how technical skills can improve people's lives;
- It re-engenders a sense of community spirit, to solve societal problems and achieves outcomes that are consistent with the goals of the residents, the university, the municipality and the business community.

The project has been created by a group of students from the University of Coimbra whose motto is 'helpful practice' and it encourages young architecture students to set their talents to work on working with local communities and residents to solve local 'built environment' challenges in Baixa, Coimbra.

This project is based on volunteer students who want to build, help and learn, establishing a very direct relationship with the practice of architecture, with the subject, technicians and former masters, and above all with the community.

Each project is developed, from the beginning, by the students and all phases of the work are carefully studied so that the construction work is carried out according to various workshops on all types of material to be handled, guided by professionals specialized in each area concerned.

As far as Civil Society and Smart Specialisation is concerned, a number of points are particularly worthy of note;

- Engaging a wide range of actors has long been fundamental to Cohesion Policy since these different actors have skills and knowledge that is potentially able to support both planning and implementation;
- The RIS3 Guide recognises the significance of and the need for the Quadruple Helix approach by proposing to add a fourth group (civil society as innovation users) to the classical Triple Helix model;
- This Quadruple Helix model puts innovation users at its heart and encourages the development of innovations that are pertinent for users (civil society). Users or citizens here own and drive the innovation processes. In line with this perspective, new innovative products, services and solutions are developed with the involvement of users in their role as lead users, co-developers and co-creators;
- Citizens would be involved in the development work, and would also have the power to propose new types of innovations, which then connect users with their stakeholders across industry, academia or government;
- In turn, the role of organisations in the other three helices is on supporting citizens in such innovation activities (providing tools, information, development forums and skills needed by users in their innovation activities);
- This user-centred approach requires a further development of collective management and implementation of the RIS3 process;
- RIS3 strategies should not only target science and technology (S&T) innovation but should also foster innovation in non-S&T fields (i.e. social, public sector and service innovation). It should also ensure a more effective and complementary use of EU investments in the regions and help channel private capital into regional smart specialisation niches.

## Tech Hubs, Tech Towns & Tech Cities

Civic-Tech activities are just part of a much wider range of activities that cities can implement to encourage young people into prosperous, higher value Creative-Tech Careers.

In discussion with another Urbact III Project, Tech-Town, we have explored the possibilities of developing Cities as Tech Hubs, Tech Towns and Tech Cities. Tech Town was established to better understand how cities can exploit and promote technology to transform the economy, in terms of productivity and connectivity, especially for SMEs

App & software development	Data management & analytics	Digital advertising & marketing
Digital entertainment	Enterprise software & cloud computing	Internet of things / connected devices
Cyber security	E-commerce & marketplace	Edtech
FinTech	Games	Hardware & devices / open source software
Healthtech	Online gambling	Social networks
	Telecommunications & networking	

Fig.2: The Scope of Tech Town's definition of the Tech and how it impacts on the economy.

## Scale of growth

The European Commission estimates 8% of the GDP of the G20 major economies (€3.2 trillion) is attributable to the Tech Economy; the sector has the potential to create a 1.5m additional jobs in the EU digital economy; for every job destroyed through digital transition, 2.6 jobs are created; for every job created in high tech industries, 5 jobs are created in other industries; and 75% of the value created by the internet is found in traditional industries<sup>4</sup>.

## Challenges and barriers to growth

Tech Town has identified that the major challenges and barriers to growth are;

- Skills mismatch
- Lack of entrepreneurial culture
- Poor digital infrastructure
- Unequal access to digital technologies - and digital skills
- Cost and speed of protecting intellectual property does not match the speed of technological change
- Funding mechanisms lack agility
- Cultural barriers – the different nature of tech and creative people (geeks and luvvies!)

## The role of cities in developing Tech Hubs, Towns and Cities

Tech Town has identified that the role of cities in developing Tech Hubs, Towns and Cities could include;

- Facilitating unrestricted access to data for developers
- Enhancing connectivity and making wi-fi more widely available
- Leading by example
- Ensuring a flexible and supportive business environment for start-ups and entrepreneurs
- Creating living labs for start-ups and scale ups with a lighter regulation load
- Facilitating labour market flexibility and promoting STEM skills development
- Encouraging a risk taking, entrepreneurial culture
- Brokering relationships and networking opportunities – e.g. between large & small companies, between 'creative's & techies', along supply chain, between digital companies & others needing digital transformation, between research institutes / education providers & SMEs

## Components of a Tech Town

It is widely recognised that Tech Towns generally need to develop a successful 'eco-system' for encouraging and promoting tech, and the components of a success 'eco-system' should include;

- Workspace;
- Talent
- Finance;
- Data; and
- Connectivity;

As far as **Workspace** is concerned .... these comprise networks of 'digital natives' and physical attributes, infrastructure and spaces for the digital community. This could include incubators, accelerators, co-working spaces, maker-spaces etc. One should not underestimate the importance of the community and 'the network' which often needs to be in place before the spaces are viable.

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<sup>4</sup> Quote from Tech Town presentation to the GEN-Y CITY Network



## Case Study: Coimbra City Council supports a Pedro Nunes Institute project based on future internet technologies



Coimbra City Council (CMC) has signed a protocol with the Pedro Nunes Institute (IPN) - Incubadora, to provide financial support of 22,000 Euros to the activity of the Internet Innovation Hub (IHUB) of Coimbra, which is installed in IPN and aims to promote entrepreneurship and innovation based on Future Internet technologies. The project already has the support of the European Commission (FIWARE technologies) for a total of 110,000 Euros.

*"The Internet Innovation Hub is a European project for which they have been selected prominently and is therefore a matter of general interest recognized by the European Commission. And the selection of the IPN is for the technological quality, but also for the human quality, for the human resources that are concentrated here",* said the president of the CMC, Manuel Machado, before signing the protocol.

Manuel Machado also recalled the importance of strengthening ties of cooperation with the IPN and thanked the help that the institute gave, and continues to give, for the creation of a space of "co-working space" in the Courtyard of the Inquisition, in the heart of the city, an Area that is intended with "social, economic, business and creative life."

*"We are the only Portuguese incubator to be part of the Internet Innovation Hub,"* said Teresa Mendes, president of the IPN, also recalling "the case of ESA-BIC".

*"We have an incubation Centre of the Portuguese Space Agency in Coimbra, which we are coordinating at the national level and we were also selected for this",* reinforced the official, highlighting these two important international projects. Teresa Mendes also recalled that *"in both the incubator and the accelerator, 100% of the space is occupied"*, adding that the IPN estimate is that the 23 companies that are on the accelerator generate a turnover of 50 million Euros (Value for 2016).

*"The celebration of this protocol is therefore very important because it helps us to leverage this work,"* concluded the IPN president.

Some of the companies installed in the IPN incubator and accelerator include Active Aerogels, Space Layer Technologies, DOOC, Medicineone and Stratio Automotive - successful companies that already operate in the European market and even beyond this and that now need to grow even more.

CMC works with two of them: Space Layer, which controls pollutants with solutions for real-time alerts, satellite images and sensors installed in fixed structures and moving vehicles, and Stratio Automotive, which manages and Real-time monitoring of repair needs of 50 vehicles of the Municipal Urban Transport Services of Coimbra (SMTUC).

*"The IPN is not only one of the best incubators in the world, but the product that is produced by the companies that operate here is of high quality and improves the competitive capacity of our country, and of Coimbra, of course,"* Manuel Machado concluded.

Often, workspaces sometimes have specialist equipment, services and attractions co-located in their premises, to further enhance the attractiveness of the spaces (and potentially the premium price that is chargeable, over a home base).

## Diverse types of Makerspaces

One of the types of Workspaces that has become particularly popular of late is Makerspaces. Makerspaces are collaborative workspaces for making, learning, exploring and sharing that contain a variety of maker equipment, including 3D printers, laser cutters, CNC machines, soldering irons etc.

There are diverse types of makerspaces and each have their own set of unique characteristics;

- **FabLabs:** A FabLab is a type of makerspace that was originally conceived by Prof. Dr. Neil Gershenfeld at the Centre for Bits and Atoms headed at MIT. A FabLab provides access to modern means for invention such as electronics equipment, laser cutters, routers and milling machines in order to enable makers to create nearly anything. There are currently over 300 or so FabLabs around the world.
- **Hackerspaces:** Also called a Hacklab or Hackspace, these are places where computer programmers, makers and artists converge to collaborate. Hackerspaces have been around since the mid 90's with the founding of c-base in Berlin which was one of the first independent (i.e. not affiliated with another institution), stand-alone hackerspaces in the world. Hackerspaces were originally started by computer hackers however they have since expanded to encompass many other activities such as creating physical objects, conducting instructional workshops, etc. There are currently estimated to be circa 2000 hackerspaces around the world.
- **TechShops:** TechShops are a chain of – membership based - for-profit spaces which offer access to industrial tools and equipment, including welding equipment, woodworking machinery and 3D printers to build projects. They currently have 8 shops in the US with their flagship shop in San Francisco and plans for expansion in Europe.
- **Makerspaces:** Makerspaces are creative, spaces where people can gather to create, invent, learn and undertake DIY projects. They usually have access to 3D printers as well as electronic, metalworking, woodworking, and traditional craft equipment. They are used by schools and libraries to provide valuable skills in math and engineering to children of all ages.

Many of these spaces work best if they bring together a good balance of anthropologists, designers, strategists and developers amongst the participants. That way, the outcome of any collaborative activity will be improved, each participant will get better at innovating when they return back to their own business (because of the skill-share).

As far as **Talent** is concerned Tech-Town has concluded that digital careers can be a popular lifestyle choice for many young people, with good career progression opportunities. Networks & meet ups are useful tools for encouraging talent development, as are spaces and places for creating connections. They are exploring the potential of positive Role models (including an alumni programme); programmes which 'hack' into the educational curriculum to offer wider tech-skills training (e.g. coding clubs, TeenTech – type events); 'soft' activities (fruit, table tennis, tea & coffee etc.).

From a **Finance** perspective, good Tech Cities offer different forms of finance that start-ups and scale ups need (Angel finance, seed funding, venture capital, grants, debt finance etc.). They also offer support to access public sector funding, contracts and infrastructure.

As far as **Data** is concerned, this requires clear governance arrangements (because of data protection issues); access to reliable, accurate & updated data; a long-term commitment; and a community of data users - enabling

demanders and suppliers to come together and explore problems and solutions: workshops, meetings, hacks, market places, showcases, community-oriented-, and other events.

**Connectivity**, in terms of good broadband infrastructure and connectivity to networks of expertise are also vital.

As far as the development of a Tech City Eco-system is concerned, there is a recognition that this cannot be created 'top down' but requires the creation of the conditions to encourage a vibrant ecosystem to flourish. Tech Town cited a number of Digital Eco-systems, like the one used by Limerick, below.

## Limerick's Digital Ecosystem

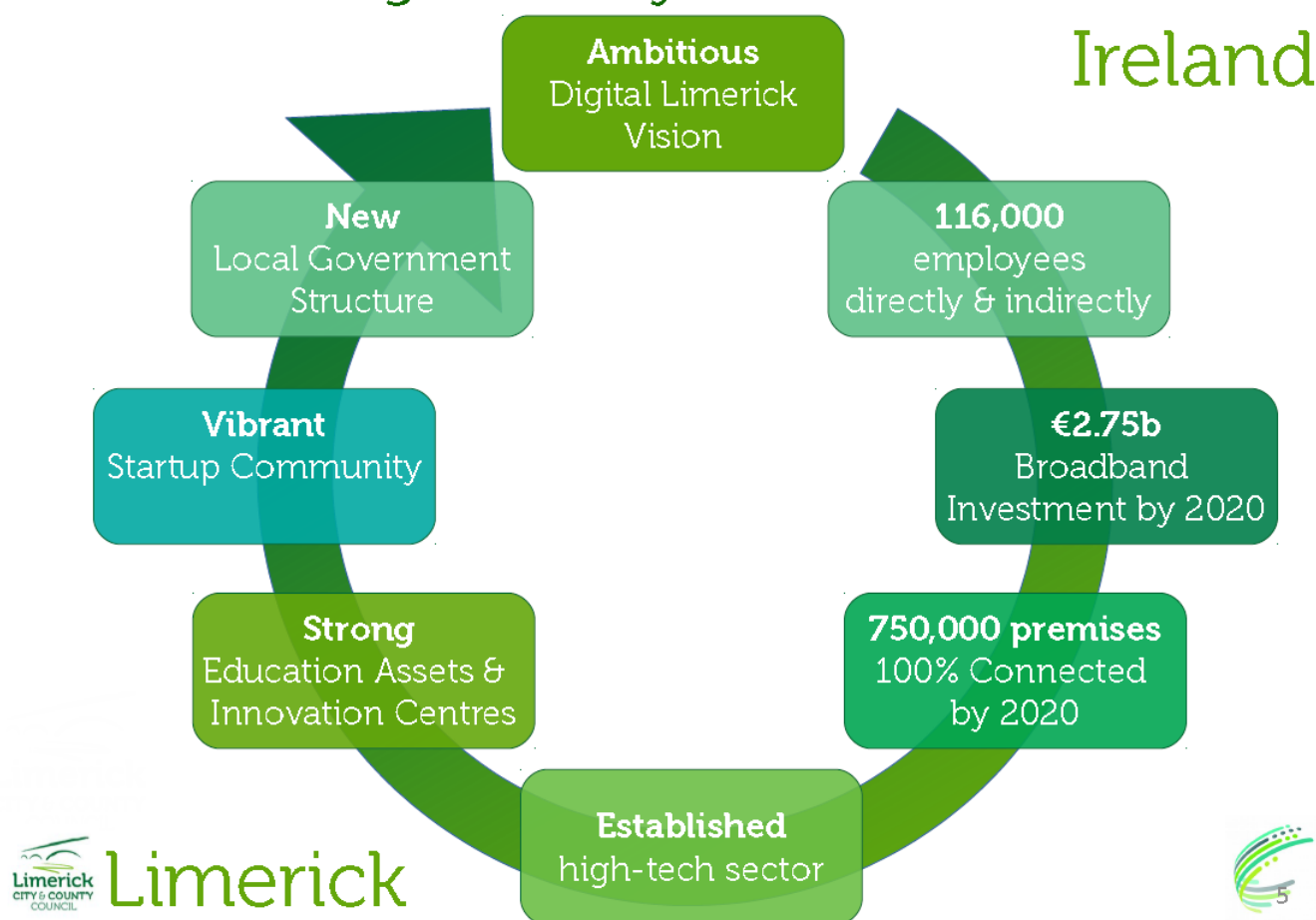


Fig. 3: The Limerick Digital Eco-system

The reason building and growing a widespread creative-tech culture in a city requires 'eco-system' thinking is because the need to drive sufficient change requires the whole-system to influence and encourage citizens to act and think differently.

According to Mark Earls in 'Herd: How to Change Mass Behaviour by Harnessing Our True Nature'<sup>5</sup> behaviour change requires the organisations that are trying to do it to influence the Macro-Social System (cultures, generations, social class, lifestyle); the Micro-Social System (sub-cultures, tribes, interactions and practices); the Individual (subjects, cognition, motives, the unconscious); and the biological (basic needs like food etc.)

<sup>5</sup> Herd: How to Change Mass Behaviour by Harnessing Our True Nature, Aug 2009, Mark Earls

Mark Earls ideas are adapted from the work of Desjeux (1998) and the French Sociologist Bernard Cova, much of which looked at consumption patterns within society, something which is extremely relevant to GEN-Y CITY, as illustrated by the diagram opposite.

Greater Birmingham in the UK has produced a [White Paper](#) entitled Building a World Class Tech & Digital Ecosystem in Greater Birmingham) which similarly sets out some of the key factors that makes such ecosystems successful.

This is just one example of a City that has used the Smart Specialisation process to understand what strategic assets it has and to build on these to achieve a further source of competitive advantage.

In an increasingly competitive world, its vital cities try and develop, retain and attract creative-tech talent to maintain their prosperity. Smart Specialisation, Tech Hubs and Civic-Tech Innovation are just some of the tools to create 'sticky' creative-tech cities.

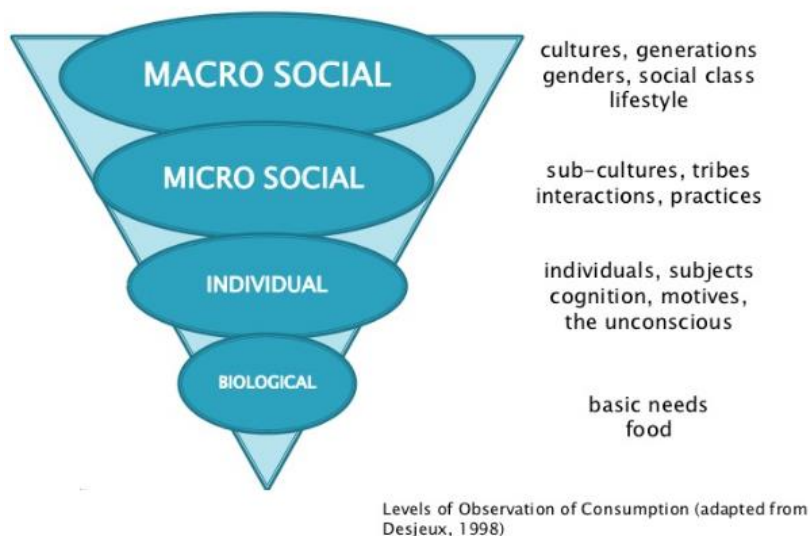


Fig. 4: The Social System in which we consume and how alignment of the key factors in this system can drive behaviour change