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*Taking Stock from Learning  
Activities*

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Alexander Kleibrink, Jens Sörvik and Katerina  
Stancova

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Joint Research Centre  
Institute for Prospective Technological Studies

**Contact information**

Institute for Prospective Technological Studies  
Address: Edificio Expo, C/ Inca Garcilaso, s/n 41092 Seville, Spain  
E-mail: [jrc-ipts-secretariat@ec.europa.eu](mailto:jrc-ipts-secretariat@ec.europa.eu)  
Tel.: +34 9544 88318  
Fax: +34 9544 88300

<http://ipts.jrc.ec.europa.eu/>  
<http://www.jrc.ec.europa.eu/>

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# **Digital Growth Strategies in EU Regions: Taking Stock from Learning Activities**

**Alexander Kleibrink, Jens Sörvik and Katerina Stancova**  
**European Commission, JRC-IPTS, Seville (Spain)**

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## **Abstract**

The development and implementation of regional development policies comprising information and communication technologies (ICT) is a complex process. ICTs play a crucial role in regional development as a horizontally enabling tool, such as high-speed internet infrastructures. At the same time, some regions have an interest in supporting the vertical development of ICT industries and emerging regional specialisations like eTourism. Due to the technical nature and the socio-culturally embeddedness of ICT, policy processes have to include technical, socio-economic and policy capabilities in order to work with ICT. Using participatory methods, policy makers can encourage transfer of knowledge amongst regions to address this complex reality. This policy brief presents the findings from three learning workshops where Andalusia (ES), Lodz (PL), Lombardy (IT), Malopolska (PL), Noordvleugel (NL) and Scotland (UK) have presented their work on ICT strategies and digital growth. The regions' individual experience is distilled into four general observations: i) the importance of an adequate infrastructure as a crucial pre-condition for the development of the digital economy; ii) the significance of involving stakeholder groups in ICT policy development and in governance structures and processes, since every actor is a potential agent of change; iii) the need for inter-regional collaboration both for learning and co-development of policies; and iv) the need for a broad array of policies tailored to the specific needs of each region.

**Keywords:** Information and communication technologies (ICTs), policy learning, peer review, strategy development, innovation strategies for smart specialisation (RIS3), digital growth

# 1 Introduction

Learning how to design effective innovation strategies and policies has become imperative. This constitutes a challenge to regional and national authorities in Europe. Over the past two decades, the European Commission has steadily increased its efforts to support research and innovation activities in EU member states. Information and communication technologies (ICTs)<sup>1</sup> are an important element of contemporary innovation policies as they are powerful drivers of economic growth, innovation and increased productivity.

The European Commission has founded the Smart Specialisation Platform (S3P) to support EU regions and member states in developing innovation strategies for smart specialisation (RIS3) aiming at more effective spending of European Structural and Investment Funds (ESIF).<sup>2</sup> One of the main support activities has been peer reviews that allow policy makers to learn both from each other and from experts.<sup>3</sup> At peer reviews, policy makers and regional stakeholders involved in the development of innovation strategies share their experience and provide feedback to each other. Peer learning helps "to monitor regional economic development in other countries and regions, to facilitate the exchange and collection of knowledge and information about the best regional practices and policies, and to promote the reputation and attractiveness of regional economies" (Midtkandal and Rakhmatullin, 2014: 18).

Peer reviews build on the idea of policy learning. Policy learning is a broad concept that entails different elements in terms of who learns what and to what effect. An underlying factor is the assumption that government officials can learn together with broader policy networks and communities about process-related issues, instruments and ideas (Bennett and Howlett, 1992). Through such learning exercises, both commonalities and particularities across otherwise different local, regional, and national contexts can be identified and adjusted. In the ICT domain, policy learning is complicated by the gulf between broader policy discourses and the highly technical nature of ICT. Policy practitioners and ICT specialists often struggle to find a common language when discussing policy agendas and development strategies. In a domain like ICT, policy learning exercises can help to bridge the very technical side, socio-economic realities and the policy considerations of digital growth strategies.

The S3P carries out dedicated activities geared towards ICT, where one of the challenges has been to elaborate how policy learning in such a complex context can be conceptualised. What can regions, member states and the European Commission learn from peer-review discussions? Since 2013, the S3P has arranged three learning workshops for regional ICT strategies and policies. The first one was a pilot workshop on priority setting in ICT (April 2013) followed by a peer review workshop on digital growth in Seville (December 2013) and a digital growth outreach event in Lodz (September 2014).

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<sup>1</sup> According to the Eurostat definition, ICT "cover all technical means used to handle information and aid communication. This includes computer and network hardware, as well as their software". See [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Glossary:Information\\_and\\_communication\\_technology\\_%28ICT%29](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Information_and_communication_technology_%28ICT%29).

<sup>2</sup> For the 2014-2020 programming period of the ESIF, EU member states and regions that want to use European Regional Development Funds for research and innovation activities are obliged to develop RIS3 describing their priority areas of investment, policy instruments as well as monitoring and evaluation mechanisms. Regarding investments in digital growth (enhancing access to and use and quality of ICT), member states and regions are obliged to develop a strategic policy framework for digital growth. Those wishing to use ERDF to extend broadband deployment should also develop a Next Generation Network (NGN) Plan. Thus, authorities investing in ICT can do this both within a vertical thematic priority as in the case of the Noordvleugel region in the Netherlands that invests in big data facilities, or in horizontal measures like Andalusia's broadband infrastructure.

<sup>3</sup> Since 2012, the European Commission's Smart Specialisation Platform has organised 17 peer review workshops based on participatory leadership methods.

At these workshops, six EU regions presented different aspects of their digital growth strategies and ICT innovation priorities. Based on a recent mapping of ICT capabilities at local level (NUTS 3),<sup>4</sup> we can divide these regions into three groups according to the position of the regional metropolis in this ranking: 2<sup>nd</sup> tier (Great Amsterdam in the Dutch Northern Wing/Noordvleugel), 3<sup>rd</sup> tier (Milano in Lombardy & Edinburgh in Scotland) and 4<sup>th</sup> tier (Krakow in Malopolska, Lodz in Lodzkie and Seville in Andalusia). This means that the cases of the regions presented in this policy brief represent varying degrees of ICT capabilities.

Based on workshop presentations and discussions, this policy brief outlines the main lessons learnt in terms of policy processes, practices, and instruments. It concludes by providing a summary of general observations and outlining recommendations for enhancing policy learning in ICT.

## **2 Context-specific findings from the regions**

Six regions presented their digital growth strategies and ICT innovation priorities and opened them for reflections to policy peers, experts, and representatives from European Commission services. The community of peers included regional representatives from other regions (critical friends), representatives of national institutions, and national/regional stakeholders. The workshops were a two-way street, i.e. policy makers both presented their own work and provided feedback on others' regional strategies.

### **2.1 Noordvleugel region covering Utrecht, Almere & Amsterdam (NL)**

The Noordvleugel province is an emerging region in the Netherlands. By 2016, three provinces will merge: Utrecht, Flevoland and Noord-Holland will create one new province - Noordvleugel. The three provinces form an urban functional system with strong relations with the bordering Amsterdam area. The area contains strong innovation capabilities in the area of ICT, both in terms of industry production and R&D. The area is constituted by a number of self-administered regions, that collaborate with various actors located elsewhere including the Amsterdam area or regions in other EU countries. Indeed, the definition of a regional unit is difficult given the variety of administrative and cultural borders.

At the workshop the region presented three main ICT activities that are priorities in the regional ICT agenda:

- Develop next generation broadband information networks and infrastructures to enable multi-sided trans-sectoral data markets.
- Create new eco-systems for cross-over service innovation.
- Capitalise on open, big and linked data to create conditions for economic growth and turn societal challenges into entrepreneurial opportunities.

It has been a challenge to coordinate these ICT activities among the administrative units in the Noordvleugel area. Due to the tensions between administrative, socio-economic, and technological spaces, it has been challenging to locate smart specialisation and digital growth within specific administrative borders.

The region has also faced challenges to delimit how to work with ICT to leverage other sectors and what kind of mechanism can be used to transfer ICT to other sectors. This is related to the definition of ICT, as it can be broad, all-encompassing, or very narrow and limited to only technologies (products and services) and technological infrastructure.

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<sup>4</sup> The European ICT Poles of Excellence project (EIPE) has created a composite indicator based on 42 individual indicators that cover three areas of activity: research & development, innovation and business. Only three cities are in the 1<sup>st</sup> tier of the index: Munich, London and Paris. For more information, see Nepelski and De Prato (2014) and <http://is.jrc.ec.europa.eu/pages/ISG/EIPE.html>.

To address these challenges Noordvleugel has started their work with the demand side, analysing needs and market opportunities. Strong ICT activity was found in several industries. Most industries had an underlying information infrastructure that showed great crossover potential for different sectors. On the other hand, a multi-sited inter-sectoral market makes it difficult to identify the right business opportunities.

The government has taken on an important role in mobilising stakeholders and society, and in involving them in the RIS3 processes. The stakeholder involvement process built on the economic analysis of the various sectors and clusters and continued with round tables of stakeholders, including SMEs and civil society, discussing needs and potential capabilities in the region. The outcomes of the analysis and discussions were consequently summarised and presented in a matrix that outlines areas of main themes and sectors.

The main focus lies with the service industry and its big-data-related innovation potential. Science and technology parks have been identified as attractive for companies because of the connectivity they provide.<sup>5</sup> The RIS3 of Noordvleugel also includes support for developing Almere as a data capital that will serve big data applications. The Almere data campus will connect SMEs and higher education institutes in the region and outside to create critical mass and build on complementarities. Almere has been identified as an optimal location because it is in close proximity to Amsterdam and has good fibre broadband connections. The project received strong political commitment and it aims at developing a 'smart society' that can address issues of common societal interest such as pollution. It plans to scale up the project from regional to EU level and see how societal needs can be jointly met.

## **2.2 Lombardy (IT)**

At the priority setting workshop, Lombardy presented three main ICT policy activity areas. For the RIS3 and the use of ESIF, ICTs are mainly being utilised as enabling technologies that create new products and enhance processes across nine clusters. There is one priority area that is particularly focused on ICT which is the Smart Communities cluster. Lombardy is also investing funds into a new generation of public services based on ICT. Finally, the region is also working on ICT within the implementation of the Lombardia Digital Agenda.

The socio-economic dimension of Lombardy is one of a state-like region. It is a complex and diversified territory. In order to reach consensus on the *RIS3 priorities*, Lombardy has employed a combination of top-down and bottom-up approaches engaging and bridging different stakeholders. Lombardy has identified 16 industrial districts and has been trying to strengthen the links between them. They aggregate them into five meta-districts that integrate different value chains. A survey of more than 3,000 people has been conducted and resulted in cluster proposals with 37 ICT-related components. The process has been oriented towards the main societal challenges. The outcome of this process has been the decision to work in 9 regional clusters which are the basis for the next strategic agenda.

The regional approach is to combine framework policies and tools (financial engineering, human resources, demand-driven initiatives, training, strategic intelligence) with more specific cluster policies to support the development of emerging industries. Some examples of the tools and instruments to support the processes are:

- Public pre-commercial procurement: a call for e-health has been launched;
- Human capital and infrastructure: public/private programme for researcher mobility (inward and outward) is open and includes ICT topics;

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<sup>5</sup> See Nauwelaers, Kleibrink and Stancova (2014) on the connectivity function of science and technology parks.

- Support to industrial research: projects supported through synergies of regional, national and European funds;
- Inter-regional cooperation: joint research call with Sardinia region for research projects on biotech and ICT.
- Transnational cooperation for R&D. It also has bilateral agreements in place and participates actively in European projects. One of the aims is to position the region among the Horizon 2020 leaders.

*Cluster for Smart Communities:* 76 companies and 20 research institutions constitute this cluster with various thematic working groups. These will enable synergies and cross-innovations with other sectors. In a number of meetings, the cluster management together with stakeholders discussed their goals and the role of enabling technologies. Various technologies are covered within this cluster, like microelectronic, big data centres, etc. Particularly security and monitoring of surroundings are areas of strength.

*Digitalisation of public administration and the Digital Agenda for Lombardy (DA-L):* In 2011, Lombardy launched an open data portal with 381 datasets in 6 different formats to allow interoperability. The DA-L encompasses a number of sub-sections, e.g. increasing competitiveness, the development of broadband, the modernisation the public administration, interoperability and standards, tourism and digital vouchers. In terms of collaboration, cross-border public services and cloud computing feature prominently.

While the attention paid to interoperability is a strong point in Lombardy, three challenges remain. First, it is not easy to carve out what the appropriate and unique ICT niches are for the region. The problem is related to the all-encompassing and very broad digital agenda definition promoted at the EU level. Given this tension, specialisation becomes more difficult when choosing from a broad range of options. Secondly, Lombardy faced challenges in terms of governance and the involvement of stakeholders to identify different priorities and ICT streams by combining bottom-up and top-down approaches. Lombardy disaggregated the answers to the call for contributions and re-elaborated the priorities by asking stakeholders to take part in round tables. Keeping them committed and involved in the implementation of the strategies will be very important. Finally, the process has to continue in order to ensure re-elaboration and an on-going update of the strategy. Managing clusters is a learning process that entails a change in the way policies are made.

### **2.3 Scotland (UK)**

Scotland's digital growth policies were presented in the context of their smart specialisation strategy, which is embedded in Scotland's broader approach to economic growth.<sup>6</sup> This process started in Scotland even before the launch of the RIS3 processes at EU level. The Scottish government's economic strategy addresses the need for innovation and identifies priority economic sectors, such as creative industries (including digital media) and enabling technologies like ICT.

Scotland's Digital Future initiative has identified the following four key areas for supporting the transition to a world-leading digital economy: i) digital connectivity extended to rural areas; ii) stimulate up-take and up-skilling of individuals and businesses; iii) public service delivery; and iv) digital economy.<sup>7</sup> It is important to note that all areas are strongly interlinked.

As far as the governance of Scotland's Digital Future strategy is concerned, a Cabinet sub-committee oversees the overall direction and delivery. Each strand of the strategy has its own formal governance depending on the nature of objectives and deliverables. For public services, the strategy is developed with and for the public sector as a whole. In particular, the Strategy

<sup>6</sup> Scotland's approach to Digital Growth, see <http://www.scotland.gov.uk/Topics/Economy/digital>.

<sup>7</sup> Digital Economy Scotland, see <http://www.scotland.gov.uk/Publications/2013/05/2347>.

Assurance Board oversees the strategy's cross-sectoral implementation (e.g. health) and industry membership, ensuring the alignment of national level actions and actions at sector level. Furthermore, an Industry Board comprising representatives from both large and small and medium enterprises provides advice from the perspective of the ICT sector.

In the context of the digital economy, Scotland's strengths regarding ICT as a sector are particularly pronounced in the field of big data analytics and sensor systems. The corresponding opportunities are being exploited through new publicly funded innovation centres (e.g. the Data Lab),<sup>8</sup> bringing together industry and researchers and led by industry. With regard to the role of ICT as an enabler for other fields, Scotland is specialising in digital healthcare and smart mobility.

For the implementation of the digital growth strategy, the strategy leaders set out the direction of the strategy, trying to involve and influence other actors that will implement parts of the strategy with their own budgets. In this context, national public service initiatives have been funded from the Scottish government budget while sectoral initiatives were funded by the respective organisational budgets. Complementary initiatives (e.g. broadband) have dedicated and substantial budgets. The potential role of ESIF to enhance the existing approach is being explored, in order to enable businesses' digital capacity and skills, smart city management using data (e.g. traffic flows, pollution), and connectivity in remote rural areas.

The presentation by Scotland focused on how digital enablement of public services (e.g. eGovernment) can contribute to the Digital Agenda goals.<sup>9</sup> The rationale for focusing on the delivery of public services is that the public sector is part of the innovation ecosystem - with business, universities and citizens - according to the quadruple helix model. The digital enablement of public services creates demand for knowledge, goods, and services from other parts of the innovation ecosystem and not just from ICT multi-nationals but also from the private sector (e.g. SMEs) at large. Digital government creates flows of knowledge between sectors.

Four parts of the strategy were defined as key strands for the delivery of public services at the regional, sectorial and organisational levels:

- User focus (citizen and business), with an emphasis on delivering online services in a uniform way;
- Effective management of data, promoting open data to target services (e.g. smart city management) while respecting privacy;
- Skilled and empowered workforce, thus ensuring specialised digital skills, especially in the public sector;
- Effective collaboration and value for money, in order to save money by re-using existing solutions, while promoting interoperability and the development of common standards.

In general, the region perceived that there is a need to increase support for Scottish companies - of all sizes - in order to use digital technologies in effective and efficient ways. One of the supporting measures is the development and improvement of eSkills. Objectives, approaches, and measures for eSkills development are summarised in the Skills Development Scotland Operating Plan published in June 2013.<sup>10</sup> Within this context, the delivery of digital public services will exploit areas of sectoral strengths (e.g. digital healthcare, smart mobility, etc.) as well as open data to improve public services. This will increase demand for ICT/digital suppliers and potentially reinforce a virtuous circle.

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<sup>8</sup> <http://www.thedatalab.com>.

<sup>9</sup> <http://ec.europa.eu/digital-agenda/about-our-goals>.

<sup>10</sup> [http://www.skillsdevelopmentscotland.co.uk/media/815091/sds\\_operating\\_plan\\_2013-14.pdf](http://www.skillsdevelopmentscotland.co.uk/media/815091/sds_operating_plan_2013-14.pdf).

The recommendations of the peers and experts spelled out at the S3P peer review workshop in Seville in December 2013 centred on ensuring that businesses (including SMEs) are well placed to act as suppliers. Scotland was recommended to include companies in the early planning phase of the digital growth strategy and invite them to work on specific issues (e.g. pre-commercial procurement). Other suggestions included launching initiatives like competition for ideas, for instance in relation to new government services based on open data. With regard to how to make the public sector an 'intelligent customer', peers recommended to build a common framework encompassing:

- A common procurement system for all institutions;
- Interoperability;
- Supporting digital identity/signature;
- Promoting the use of cloud computing to support the deployment of common solutions for the public administration.

To promote data innovation, e.g. businesses using public sector data to develop new products and services, Scotland was recommended to provide common platforms for sharing data from public/private actors while implementing transparent policies regarding the use of data. Furthermore, the region should consider differentiating their policy tools concerning data innovation for large companies versus SMEs.

## **2.4 Andalusia (ES)**

Andalusia is the most populous of the autonomous communities in Spain, encompasses the second largest surface area among the autonomous communities in Spain and has been classified as an EU convergence region. This creates a different reality when working with ICT compared to the Dutch region mentioned before.

Andalusia participated at the S3P peer review workshop in Seville in December 2013. The presentation by the region of Andalusia focused mainly on regional broadband policies. With respect to the DAE targets for broadband coverage, the situation in Andalusia in mid-2013 was as follows: 99% of the households were covered by broadband with at least 1 Mbps, 56% of the households were covered by broadband with at least 30 Mbps, and 36.5% of the households were covered by broadband with at least 100 Mbps.

In terms of smart specialisation, the RIS3 process was described as being in progress and ICT was identified as one of the six strategic areas. In support of ICT deployment, the Digital Strategy for Andalusia (*Estrategia Digital en Andalucía*) was developed aiming at ICT-driven growth in Andalusia. In addition, the Broadband Infrastructures Strategy for Andalusia 2020 provides the regional framework to promote the deployment of NGA broadband infrastructures and thus achieve the Europe 2020 broadband goals. The broadband strategy is interlinked with the Digital Strategy for Andalusia and the regional RIS3. In the context of this strategy, a SWOT analysis has been carried out and a number of challenges were identified, including limited funding and delays in the deployment of NGA networks, social rejection of infrastructures deployment, and broadband adoption below national rates.

Correspondingly, a number of strategic areas for intervention have been identified, in particular in terms of promoting the deployment of infrastructures for fast and ultra-fast networks, leveraging EU Structural Funds, and putting in place the appropriate governance and coordination measures at the regional level, while maintaining the alignment with national and European strategies.

Peers and experts at the workshop suggested Andalusia to take a more global perspective and develop a shared vision, with a broader stakeholder representation including more the private sector. Public-private cooperation with the sharing of commitments and risks was considered as a key success factor for regional broadband development.

The regional strategy for ICT development and digital growth should be coherent and aligned with the national one. The region should encourage municipalities to combine efforts in promoting broadband deployment, in accordance with the strategy defined at regional or national level. The broadband strategy should be linked to the financial resources available at regional and national level.

Also, there is a need for stimulation of both broadband supply and demand in terms of investments in infrastructures (e.g. for schools) and in terms of developing and deploying public services in key areas (e.g. eSchool, eHealth). This could also create positive conditions for private investments to promote broadband networks in rural and underserved zones not covered by private operators. A complementary procurement model and public intervention could be considered.

Public funding for broadband might be necessary under certain socio-economic conditions, e.g. when market demand is not sufficient to invest into broadband development. A broadband demand aggregation model could also be a way to achieve cost benefits, for instance by supporting public bodies to collaborate. This may promote interoperability and reduce costs. In order to plan cost-effective interventions in areas where the market has failed, setting up a Broadband Competence Centre at the regional level can be a possible solution. Finally, peers suggested a concession model in which the public sector owns the infrastructures but the private sector takes medium to long term concessions as a wholesaler. This concentrates competition at the level of services.

## **2.5 Malopolska (PL)**

As a part of the peer review workshop in Seville in December 2013, Malopolska presented its digital growth strategy that is integrated for coordination purposes within the Regional Innovation Strategy of the Malopolska region for 2013-2020, i.e. the regional RIS3. The objective of Malopolska's digital growth strategy is to increase the region's competitiveness by creating better conditions for the development of the information society in the region.

Specifically, the digital growth priorities established by Malopolska are to:

- Develop a regional broadband network;
- Develop electronic services and interoperable digital platforms;
- Develop digital content.

Malopolska has identified two ICT specialisations through the RIS3 process: i) touchless computer interfaces and ii) intelligent systems, where ICT is intended mainly as an enabler for a number of applications spanning from mining and quarrying, transport and storage, to health, recreation, and culture. In terms of policy implementation, innovation vouchers will be granted for the provision of services and purchase of intangible assets, e.g. for R&D, licenses, and patents for prioritised smart specialisation areas like ICT.

Malopolska's governance mechanism for RIS3 is based upon a multi-level governance model, where the Marshal Office of the Malopolska region (Department of Economic Development) acts as a coordinator of the strategy design process. Also, the Marshal Office is the entity responsible for the monitoring of the RIS3, in terms of monitoring the progress in achieving the targets set by RIS3, monitoring the implementation of strategic projects - on an annual basis - and reviewing the strategy through a mid-term evaluation.

Peers and experts advised Malopolska to better integrate their digital growth strategy with their broader innovation strategy and to enhance coordination between regional and national level. Moreover, it was considered important to ensure the involvement of all key stakeholders in the strategy process. Stakeholder involvement should be intensified in order to improve the entrepreneurial discovery process. Peers also observed a need to improve the SWOT analysis underlying the strategies and to better include obstacles, bottlenecks, and opportunities as well as to develop better indicators to monitor and evaluate strategy implementation.

At the initial development stage a set of 3-5 indicators could be introduced and a benchmarking exercise with other similar regions across Europe could be conducted. One recommendation was to explore the benchmarking model jointly developed by the S3 Platform and ORKESTRA.<sup>11</sup> To explore ICT capabilities, the EIPe database developed by the Joint Research Centre is worthwhile exploring.<sup>12</sup> The region was recommended to make a clear distinction between the indicators to measure success (e.g. start-up companies, number of jobs created, etc.) and the means to achieve success, for instance by trying to change the innovation culture. The region was also advised to find an appropriate balance in defining priorities in terms of focus and broadness.

## **2.6 Lodz (PL)**

In Lodz, the ICT industry is rapidly growing mainly thanks to the great abundance of skilled ICT professionals. The city of Lodz has many universities with over 100,000 students. Also the concentration of fresh graduates and ICT skilled students is high. Furthermore, good relations between universities and industry in the area of ICT have been built up. The Lodz University of Technology has established a new ICT centre of excellence where the university and industry train students using technologies provided by industry. Of particular importance is also the collaboration between the ICT Cluster Central Poland and universities in Lodz.<sup>13</sup> Jointly developed university programmes/curricula to meet the specific needs of employers are one of the specific outcomes of this collaboration. Still, there is a perceived need to support elementary and secondary schools in providing digital education (digital society), create IT public services and enhance the uptake of eServices.

In Lodzkie region, there is no standalone digital growth strategy, but ICT has been integrated in the RIS3 strategy called LORIS 2030, which is the follow-up strategy to the two previous regional innovation strategies LORIS 2005-2013 and LORIS+. LORIS 2030 is a complex regional innovation strategy that was prepared in collaboration with universities, SMEs, and large enterprises as well as the national government. The initial idea was to focus on five areas, each accounting for at least 5% of the total regional GDP. This would however have left out the highly dynamic ICT sector as a standalone specialisation. Particularly the Central Poland ICT Cluster made an effort to show the importance of ICT to the local economy; it has grown by over 40% in only 3 years. As a result, ICT was finally included as a priority in its own right but also as a tool to enhance innovation in the other specialisation areas. The ICT priorities as envisioned at the moment of the strategy's adoption are:

- Education in ICT (all levels);
- Strengthen innovation culture;
- Strengthen entrepreneurship culture;
- Integrate digital systems owned by government;
- Develop services for external regions;
- Establish R&D centres and achieve growth of existing ones.

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<sup>11</sup> <http://s3platform.jrc.ec.europa.eu/regional-benchmarking-tool>.

<sup>12</sup> <http://is.jrc.ec.europa.eu/pages/ISG/EIPE.html>.

<sup>13</sup> <http://ictcluster.pl/en/aktualnosci/lodz-university-of-technology-ict-central-poland-cluster>.

During the S3P peer review workshop in Lodz in September 2014, participants mainly discussed three topics: (a) ways to promote and develop training programmes for ICT professionals and eSkills; (b) ways to publicly support open data applications (for health and transport), and (c) the creation of an ecosystem supporting the development of ICT entrepreneurship.

Regarding the first topic, a number of specific issues were raised: motivating ICT professionals to improve their skills, different interests of universities and needs of companies, quality of curricula, and the development of soft skills for ICT professionals (including entrepreneurial skills). It was recommended to deepen cooperation within the ICT Cluster in order to look for more common ground and jointly create lifelong learning curricula. Additionally, it was suggested to set up an alumni network, which could enhance and sustain a new educational culture in the region.

Peers and experts who discussed the second topic underlined that even if there were good ICT systems and applications (possibly provided by businesses), there is no guarantee that citizens will use them. While there is an identified need to support digital solutions for accessing health and transport data especially in non-urban areas, it should be carefully assessed whether to develop technologies in-house or outsource them to private companies. It was, therefore, recommended to start with small ICT pilot projects in Lodzkie region on health and transport (via hackathons or similar initiatives) and to up-scale them to other regions if they prove to be promising. Consequently, it would be possible to raise interest and build digital skills. Ensuring that regions and the national level apply interoperable solutions is crucial for success.

Finally, the group discussion generated recommendations that are generally applicable to all regions, which were recommended to take a holistic approach in creating ICT ecosystems. Apart from financial incentives, also the legal framework and support to networks are important. Peers and experts specifically suggested improving business regulation, reducing administrative burden, improving procedures, and increasing the demand of citizens for advanced digital services. The approach to digital growth should be forward-looking and based on business needs.

## **2.7 Summary**

In the table below we summarise the findings from the case studies. Not too surprisingly, issues, processes and instruments presented and discussed vary strongly between regions. The issues brought forward as essential to the regions vary and it is hard to identify a panacea that solves all problems in all places. Digital growth strategies need to be based on a strong evidence base and effective collaboration among regional and national actors working on multiple levels and issues.

Table: Transnational policy learning in terms of policy processes, instruments and lessons learnt

ICT capabilities <sup>14</sup>	Region & major ICT priority	Processes	Instruments	Lessons learnt
2 <sup>nd</sup> tier	<b>Noordvleugel:</b> big data	<ul style="list-style-type: none"> <li>- First analyse societal needs</li> <li>- Shared policy making with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>- Link information infrastructures of different sectors through broadband &amp; skills</li> </ul>	<ul style="list-style-type: none"> <li>- Functional regions matter</li> <li>- Manage both territorial &amp; virtual connections</li> </ul>
3 <sup>rd</sup> tier	<b>Lombardy:</b> clusters, eGovernment & smart communities	<ul style="list-style-type: none"> <li>- Identify social challenges</li> <li>- Define objectives together with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>- Steer via public and inter-regional calls &amp; strategic procurement</li> <li>- Open up data to drive (public sector) innovation</li> <li>- Use clusters for learning</li> </ul>	<ul style="list-style-type: none"> <li>- ICT as enabler</li> <li>- State being entrepreneurial</li> </ul>
	<b>Scotland:</b> public sector innovation	<ul style="list-style-type: none"> <li>- Engage companies very early</li> </ul>	<ul style="list-style-type: none"> <li>- Promote innovation driven by open data by competitions</li> <li>- Build common &amp; interoperable procurement systems</li> <li>- Provide common platforms for sharing data from public &amp; private actors</li> <li>- Differentiate policy tools for data innovation in large companies vs. SMEs</li> </ul>	<ul style="list-style-type: none"> <li>- Digital-era government &amp; business opportunities</li> </ul>
4 <sup>th</sup> tier	<b>Andalusia:</b> broadband	<ul style="list-style-type: none"> <li>- Take a more global perspective and develop a shared vision for broadband policies</li> <li>- Align with relevant innovation and digital strategies at regional &amp; national level</li> </ul>	<ul style="list-style-type: none"> <li>- PPPs to share commitments and risks</li> <li>- Set up a Broadband Competence Centre to plan cost-effective interventions in areas of market failure</li> <li>- Stimulate broadband supply and demand &amp; deploy public services in key areas (e.g. eSchool, eHealth)</li> <li>- Design complementary procurement model to connect rural and underserved zones</li> <li>- Support public collaboration on interoperability</li> <li>- Encourage municipalities to combine efforts in promoting broadband deployment</li> <li>- Consider concession model</li> </ul>	<ul style="list-style-type: none"> <li>- Innovative business models for a connected region</li> </ul>
	<b>Malopolska:</b> cloud computing	<ul style="list-style-type: none"> <li>- Ensure coordination between regional &amp; national level</li> <li>- Involve all key stakeholders to improve the entrepreneurial discovery process</li> <li>- Identifying obstacles, bottlenecks &amp; opportunities</li> </ul>	<ul style="list-style-type: none"> <li>- Conduct benchmarking exercises with other similar regions across Europe</li> <li>- Develop better indicators to monitor &amp; evaluate strategy implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Governing innovation across levels &amp; actors</li> <li>- Situate region within broader context</li> <li>- Measure progress</li> </ul>
	<b>Lodz:</b> ICT cluster	<ul style="list-style-type: none"> <li>- Mobilisation of resources</li> <li>- Communication</li> </ul>	<ul style="list-style-type: none"> <li>- Clusters</li> <li>- Skills development</li> <li>- Attract R&amp;D centres</li> </ul>	<ul style="list-style-type: none"> <li>- ICT is an emerging sector, not yet aware of ways and needs to mobilise interest and participate in regional processes</li> <li>- Government as intermediary in communication between academia &amp; industry</li> </ul>

<sup>14</sup> Based on the analysis of the EIPE project: <http://is.jrc.ec.europa.eu/pages/ISG/EIPE.html>.

### 3 General observations

Apart from the region-specific lessons learned described so far, some broader conclusions can be drawn from the peer review discussions.

Four broad topics have an overarching significance: (a) the importance of infrastructure; (b) governance structures and processes; (c) inter-regional cooperation; and (d) policy mix and instruments. In all four, state institutions and policy makers have a central role to play.

#### 3.1 The importance of high-speed internet infrastructures

A reoccurring topic of the discussions at all workshops is the significance of a well-functioning technological infrastructure. Workshop participants emphasised the need for building appropriate infrastructures to further develop eServices, eBusiness, eSkills, etc. It needs to be borne in mind that investments in broadband infrastructure are a crucial pre-condition for the development of ICT as a sector and as an enabler, and subsequently also for the development of a digital economy.

Participants stressed the need for proper analyses of market conditions and for exploring different kinds of operating models in order to increase coverage of high-speed broadband. For this, policy makers should involve all stakeholders in order to achieve the right balance between public and private funding.<sup>15</sup>

#### *Key findings:*

- Broadband infrastructure is crucial for the development of the digital economy.
- Policy makers need to involve all stakeholders to achieve the right balance in funding.

#### 3.2 Governance and stakeholders

In the context of digital growth strategies, many actors could potentially become game changers. For strategies to be successful, it is vital to adopt a governance mechanism with an inclusive approach involving relevant stakeholders that can manage and balance bottom-up and top-down processes and interests.

How encompassing or selective should stakeholder involvement be? The answer to this question will very much depend on the regional context. For instance, the decision whether to include well-established cluster organisations that represent several companies or rather individual companies will have to be taken at the regional level. A good starting point is to begin with the most motivated individuals and organisations and then enlarge the group incrementally (snowball method). One way to do this is to identify the entire eco-system of large and regionally relevant companies connected through supply chains. Avoiding a bias towards large corporations is important to ensure inclusiveness and representativeness. It is vital for the success of a strategy to adopt an inclusive approach involving all relevant stakeholders. Public consultations and focus groups, for instance, are suitable governance tools to engage stakeholders; but they are only the starting point for the governance process that should be continued also during the implementation stage of the strategy.

Governments have to learn to partly delegate responsibilities and involve stakeholders in designing and implementing digital growth programmes and strategies. Local and regional governments need to spell out ambitions and visions for their digital growth activities, and encourage relevant stakeholders to participate in these processes. Institutionalised peer groups that encompass business, clusters, research/universities, citizen groups, and government in different ICT domains

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<sup>15</sup> More information on broadband models can be found in the European Commission's 2014 Guide to High-Speed Broadband Investment.

should be established to manage the design and implementation of ICT programmes. Finally, peer learning of regions with similar levels of development in ICT can be an important governance mechanism to review and up-date strategies regularly.

Regional policies concerning digital growth strategies need to be aligned with the DAE (Digital Agenda for Europe) and coordinated with the policies defined at national level. Moreover, digital growth strategies should be well integrated with the national/regional RIS3. To bridge the gaps between the definition and the implementation of a digital growth strategy at regional level, regional authorities should translate the strategy into concrete operational plans and pay particular attention to the execution phase.

*Key findings:*

- Appropriate governance and stakeholder involvement mechanisms are vital to the success of the design and implementation of strategies.
- Authorities should avoid a bias towards large incumbent interest.
- Governments have to learn to delegate responsibilities and involve stakeholders in designing and implementing digital growth strategies.
- Regional policies concerning digital growth need to be aligned with all relevant strategies, such as digital agendas, national ICT strategies, and RIS3.

### **3.3 Inter-regional collaboration**

At the workshops, the question of the potential advantages of interregional collaboration has emerged. Connecting regions carries a number of benefits such as learning from each other's experience, sharing knowledge and good practices, as well as establishing cooperation in different ICT areas.<sup>16</sup> Some challenges have also been mentioned related to the internal organisation of regions. Finally, participants made concrete suggestions for areas of collaboration and tools.

First, it is important to engage in learning exercises and to establish learning communities that can support learning processes and the dissemination of information. Learning can improve internal functioning through new practises, improvement of existing ones, as well as help to find tools and solutions to overcome different challenges. Possible tools are a) learning platforms for regions in similar circumstances where policy makers can post problems, search for partners, and find relevant knowledge; b) collaborative/twinning programmes; and c) mobility programmes for stakeholders to exchange across regions.<sup>17</sup> At the workshops, peers and experts have also put an emphasis on the need for a marketplace that could support partner search and knowledge sharing in order to help regions to help each other. Participants suggested a pan-European quadruple helix network in the form of an innovation platform as a basis for such a community that could reduce the knowledge gap.

Second, networks/consortia of regions can collaborate in a number of ways and in different intensities that can support their region's innovative efforts, e.g. collaborating regions can put forward joint projects in specific ICT domains, apply for R&I grants, and collaborate on other tools such as public procurement or bids for procurement projects.<sup>18</sup> Also, networks could be used for pre-validation of ideas for different market niches in Europe, and in later stages also for

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<sup>16</sup>To learn more about inter-regional collaboration in research and innovation see Uyarra, Sörvik and Midtkandal (2014).

<sup>17</sup> Recently, the new programme Erasmus for Young Entrepreneurs was established. It funds the exchange of young entrepreneurs with more experienced ones for stays between 1 and 6 months. See [www.erasmus-entrepreneurs.eu](http://www.erasmus-entrepreneurs.eu).

<sup>18</sup>The first new platform to emerge from on-going work on RIS is the Vanguard Initiative. It is driven by regional governments and promotes regional strengths in advanced manufacturing. Among others, the initiative seeks to align strategic roadmaps and investments. See here for more information: [www.s3vanguardinitiative.eu](http://www.s3vanguardinitiative.eu).

prototyping and pilot service testing. Tools like living labs could also be used in this context, where participants can get in contact with EU-wide test and development networks. In addition, participants have suggested that regions should collaborate more on open data, its diffusion and making it inter-operable. This would help companies in the regions themselves. Easier access to EU-wide public sector data that is comparable increases the possibilities for innovation, for instance in tourism and public administration applications.

Guidance is needed for selecting projects for joint collaboration. These projects should: 1) be strategically relevant to the region's broader innovation agenda; 2) involve partnerships with other regions and quadruple helix actors; 3) include measures to be implemented and evaluated based on their results; and 4) be financed preferably by the private sector or adopting at least a cost sharing model between private and public to ensure the right incentives. Regions that are in a more or less similar situation with regard to the development along the lines of the DAE indicators<sup>19</sup> could come together and work jointly. INTERREG funding and projects and EIT KICs could be used to connect European poles of excellence.<sup>20</sup> Another potential tool is the alliance model, in which public and private actors create platforms to collaborate in projects.

Some participants, however, emphasised that regions often face obstacles to even collaborate within their own territory due to different interests of organisations and government departments. Unless there are dedicated resources for European-wide collaboration, the internal logic of administrations will aggravate inter-regional collaboration.

*Key findings:*

- Learning exercises and communities are important collaborative efforts.
- There are a number of areas where regions can benefit from collaborating in ICT, including joint R&I projects, public procurement, test beds, interoperable open data solutions and quadruple helix platforms.
- Regions need to evaluate carefully which collaborative efforts to engage in.
- Regions face obstacles to collaboration within their own territory due to different interests of organisations and government departments.

### **3.4 Policy mix and instruments**

Significant gaps exist between the design and the implementation of digital growth strategies. This is why regional authorities should translate the strategy into concrete operational plans paying particular attention to the development of instruments and procedures meeting the challenges and needs identified both in the strategies and by involved stakeholder groups. Strategies should outline an intervention logic that sets out goals and visions to be achieved and then match these to adequate policies in order to achieve the desired change. Numerous policy tools exist that contribute to reaching outlined goals but their use has to be tailored to the specific needs of the regions at hand.<sup>21</sup>

In the area of digital growth strategies, many tools being implemented in the framework of broader RIS3 are still relevant but there are also ICT-specific tools. In the workshops the following tools have been mentioned:

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<sup>19</sup> <http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard>.

<sup>20</sup> The European Institute of Innovation & Technology (EIT) is running a Regional Innovation Scheme, which is a structured outreach activity to support the integration of the knowledge triangle and increase the innovation capacity in areas and regions in Europe not directly benefitting from the EIT and its Knowledge and Innovation Communities (KICs). See <http://eit.europa.eu/activities/outreach/eit-regional-innovation-scheme-ris>.

<sup>21</sup> See Nauwelaers, Periañez Forte and Midtkandal (2014) for more on policy mix.

- Regional authorities should promote open access to infrastructures while guaranteeing net neutrality and stimulating competition for services.
- Open data is a powerful paradigm for harnessing the potential of data, for instance in the context of smart cities, as well as for enabling web entrepreneurs to develop innovative products and services. The idea of building a common data framework in each region can bring significant benefits in terms of interoperability, the re-use of solutions, and cost effectiveness.<sup>22</sup>
- Cloud services on common platforms for eGovernment can be an efficient way to share costs for municipalities in delivering public services and to support SMEs by providing SME services through cloud solutions.
- Connecting different government services and networks can serve as the foundation for creating demand and financing the supply of high speed Internet in sparsely populated areas, which in turn can trigger other growth effects.
- The concept of 'digital champions' in organisations and the granting of awards can be instrumental for the experimentation and adoption of new technologies in the public/private sector.<sup>23</sup>

*Key findings:*

- Strategies should outline an intervention logic that sets out goals and visions to be achieved and then match these to adequate policies in order to achieve the desired change.
- For achieving regional growth, a number of specific ICT policy tools exist, such as open access, open data, cloud services and promoting digital champions.

## 4 Conclusions

The digital revolution is profoundly changing our societies and puts pressure on actors and organisations to embrace new methods and technologies to organise themselves and to identify relevant digital services. Pressure on policy makers is rising to adapt in order to harness the potential of ICT and to stimulate digital growth. This potential stems both from stimulating ICT as a growing economic sector and as an enabler for other areas of society and the economy. In order to reap the full potential benefits of ICT, broader skill-sets will have to be developed.

As illustrated by the six cases discussed in this policy brief, the key issues, processes and instruments vary strongly across regions given their different preconditions for innovation. In order to develop successful digital growth strategies, policy makers ought to begin by developing a proper analysis of regional capabilities, needs and future potential to create a strong evidence base. This includes analysing both supply and demand factors in the regions for ICT solutions, services and skills.

Yet, there are common challenges. The following four items are among the most pressing issues concerning digital growth strategies and ICT innovation: a proper digital infrastructure, inclusive governance and stakeholder involvement, inter-regional collaboration and policy mix.

<sup>22</sup> The Homer project is a good example for inter-regional collaboration efforts to share knowledge and agree on shared standards for open data. See [www.homerproject.eu](http://www.homerproject.eu).

<sup>23</sup> For more examples of policy instruments in the area of ICT, see Kleibrink and Sörvik (2014).

A proper broadband infrastructure is crucial for the development of the digital economy. Without this it is impossible to use ICT services. However, in order to build-up the infrastructure, governments need to analyse their situation to identify in which areas to intervene and to engage with all relevant stakeholders to achieve the right balance of public and private service provision and funding mixes.

Effective governance systems, smart management processes, and broad involvement of stakeholders that bring different skills and understandings of reality to the strategy process are key components to successfully harness the potential of ICT for regional growth. Policy makers should engage with different communities and employ people with boundary spanning capabilities to facilitate communication and to sustain long-term cultural change. Effective and stable governance of digital growth strategies is essential for a sustainable implementation of policies. Engaging relevant stakeholders and providing them with ownership over the processes, while sharing the risk of possible failure, is an important pre-condition for choosing the right priorities and receiving the necessary support from society, business and academia.

Likewise, regions should explore ICT activities and priorities of other regions in order to establish collaborative relationships, which can potentially improve service provision. The intensity of collaboration goes from learning to deploying joint collaborative projects. This policy brief mentions potential areas for collaboration such as interoperable open data platforms, quadruple helix networks, public procurement and test beds.

Policy instruments should foster innovative uses of ICT in the public and the private sector. The public sector plays a key role since it is a facilitator of digital growth and a client of ICT products and services. The role of the public sector is to ensure an appropriate infrastructure, open interoperable data infrastructures and transparent and efficient procurement. It can also support SME innovation and the ICT sector through venture capital, piloting and test activities, as well as through R&I project financing.

With regard to the peer review approach itself, it has been positive for stimulating inter-regional learning. It is a tool that could also be used by regions intra-regionally for the development of their strategies, in order to involve stakeholders, and to improve the understanding and communication between regional stakeholders (see also Rakar and Tallberg 2014). It is a tool that facilitates communication between actors to better understand how others perceive their reality before proceeding prematurely to solutions during the strategy development. It is a process tool both to generate ideas for creating strategies but also instrumental to secure more long term commitment during the implementation phase. For this, it is necessary to arrange regular and institutionalised meetings and places for interaction. One key advice for facilitators employing participatory methods is to engage all participants in the process and not let a few people dominate the processes.

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## **Abstract**

The development and implementation of regional development policies comprising information and communication technologies (ICT) is a complex process. ICTs play a crucial role in regional development as a horizontally enabling tool, such as high-speed internet infrastructures. At the same time, some regions have an interest in supporting the vertical development of ICT industries and emerging regional specialisations like eTourism. Due to the technical nature and the socio-culturally embeddedness of ICT, policy processes have to include technical, socio-economic and policy capabilities in order to work with ICT. Using participatory methods, policy makers can encourage transfer of knowledge amongst regions to address this complex reality. This policy brief presents the findings from three learning workshops where Andalusia (ES), Lodz (PL), Lombardy (IT), Malopolska (PL), Noordvleugel (NL) and Scotland (UK) have presented their work on ICT strategies and digital growth. The regions' individual experience is distilled into four general observations: i) the importance of an adequate infrastructure as a crucial pre-condition for the development of the digital economy; ii) the significance of involving stakeholder groups in ICT policy development and in governance structures and processes, since every actor is a potential agent of change; iii) the need for inter-regional collaboration both for learning and co-development of policies; and iv) the need for a broad array of policies tailored to the specific needs of each region.

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