2017

EU TECH STUDY TOUR

First Report 2017

Directorate-General for Innovation and Technological Support
Directorate for Innovation and Resources
Innovation department

European Parliament

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Introduction

As European Institutions, we strive to integrate technological innovation into our processes and services to improve delivery, efficiency and security.

At the European Parliament, this effort is led by DG ITEC in the framework of the Strategic Orientations 2014-2019 adopted by the Bureau's Working Group on ICT Innovation. These Strategic Orientations include a comprehensive approach to innovation and focus on three priorities: mobility, connectivity and interoperability.

To implement the Strategic Orientations, DG ITEC decided to establish in 2016 a dedicated department that would identify technology scouting fields to be closely monitored: Mobility; Location based services, Data analytics, the Internet of Things, Collaboration and Communication, New tools and services. Additionally, the DG ITEC Innovation department has set-up an idea management platform named INNOVATE!, which fosters social engagement via a bottom-up and inclusive approach to innovation.

Capitalising on such efforts, for 2017, we have proposed to focus on the EU ICT landscape as a valid and alternative source of innovation for the activities of the EU institutions.

Every 2 or 3 years, members of the Interinstitutional IT Committee (CII) take part in a Study Tour with the aim of learning more about new trends and opportunities to improve the technological services provided in their respective institutions. The target destination is mainly the Silicon Valley in the United States, for the obvious reason that there is a large concentration of very high-level technological companies in that area.

We felt it was now time to assess the maturity of the EU's tech industries, the capacity of EU tech companies to offer interesting products, and the possibility of working with these companies as partners in our efforts to innovate. The EU Tech Study Tour was designed to address these questions and highlight the most recent technological developments in a variety of companies, start-ups and technological poles in the EU.

The main purposes of this Study Tour are:

- To understand the evolutions and the different approaches concerning the topics selected for the tour and to identify the opportunities to use them in the EU institutions;
- To learn from the working methods of these companies and, in particular, understand their agile approach;
- To share our findings with our different political bodies in order to raise awareness on the potential of technical evolution for the institutions in terms of improved services and efficiency;
- To provide a comprehensive update on the EU technological landscape.

Echoing DG ITEC's wish to continue developing a strong cooperation with other EU institutions and bodies, the European Commission (DIGIT) and the Council (DICT) have joined this initiative, enabling the deployment of interinstitutional teams for each stage of this Tour so far. This is an important feature of this initiative since all our institutions are called upon to reinforce further our cooperation and possibly find common solutions for our services.

The first stages of this Study Tour aimed at exploring the widest possible range of interlocutors, from start-ups and established companies to government agencies and Innovation Networks. All these actors can provide insights both on technology and on how the EU technological landscape is perceived from within, namely in what concerns its enabling conditions, its peculiarities and its outlook.

This approach required also to adapt the format of each visit to the diversity of interlocutors and objectives. This included participating in a Convention and meeting face-to face with as many start-ups as possible (Spain), a workshop-like type of visit with a single, multi-faceted organisation (Germany), field visits to several ICT players in a single territory (Italy), and a Government-led seminar with relevant stakeholders (The Netherlands).

As the promoter of this Study Tour, DG ITEC is delighted to present a first report that includes the highlights of the visits to Spain, Germany, Italy and the Netherlands. For each visit, you will find useful information on the technologies and actors encountered, as well as important takeaways that can contribute to the internal reflections on innovation in our institutions and bodies.

SPAIN: Salamanca

26 and 27 April 2017

Background

The Tech Study Visit to Spain focused on the StartupOlé event that took place in Salamanca on 26th and 27th April. StartupOlé is a creative meeting place where start ups match with relevant players in the technological ecosystem, like investors, accelerators, policy makers, universities and innovative companies.

The event was composed of different workshops, with a view to establishing a forum for start-ups, SMEs, investors and potential customers to get to know each other and network. Every start-up/SME had a dedicated individual exhibition space.

The objective of the visit was to increase our knowledge and understanding of the start-up environment in Europe. At the same time, we tried to get hold as much as possible of the enthusiasm, the positive spirit and the innovative approach which are main characteristics of the start-up world.

During the visit, we met several start-ups in two rounds of exclusive one-on-one closed-door meetings, where the companies could come and present their innovative solutions. On top of these meetings, we have toured the stands, where the most relevant innovative ideas revolved around augmented reality, food waste management and reduction, online energy management, file encryption on cloud storage services, health and orthopaedics (using 3D printing) and language learning.

Topics and interlocutors

During the one-on-one interviews, we have met with around 20 start-ups that presented their products and services and shared their views on the EU ICT landscape. Here are the most significant experiences that could trigger interest in the context of our institutions:

Media Interactive: mobile communication tools

This company, based in Slovenia, operates in the Telecom domain. **Media Interactive** has applied to the EC SME 2020 scheme without obtaining funding but they expect to be funded by the Slovenian national government.

Their idea consists in developing an innovative collaboration and education platform that brings together the functionalities of videoconferencing and webstreaming. So far, the main international actors in this sector focus on either one or the other.

Media Interactive does not develop its own software, they use the best solutions available in the market.

The key features of this platform, based on mobile technology, are user friendliness and easy customisation. The company considers this solution highly scalable and deployable on private clouds, which they considered extremely important (Slovenia has right now an ongoing project aimed at creating a private cloud for public administration).

Wetech: wearable technology

Wetech is a Spanish start-up that develops solutions focusing on innovative payment methods, secure identification notifications and geolocation (IoT).

They mainly integrate their solutions in existing or specifically designed devices. Their main markets are banking (Santander) and watchmakers (Festina).

According to **Wetech**, payment methods are an easier area to develop because there are standards to comply with; in other domains, it is more difficult to develop software due to the variety of existing protocols.

Tento: protection of valuable products

The core business of this company based in London – an environment they consider start-up friendly – is the protection of valuable products from falsification.

The proposed solution is to print a QR code unique to every product item (a bottle of wine or of oil, a package of drugs, etc.). By scanning the code with a smartphone, the user receives the level of reliability of the product. For example, if the code of a wine bottle has been scanned several times, there is a larger probability that this bottle and its label have been copied or counterfeit; in that case, therefore, the user will receive a warning on the authenticity of the product. On the other hand, the producer also receives reports on the scanned events registered in the central system.

While the solution in itself might not be applicable inside our Institution, it is worth mentioning that this example shows how regulatory environments can foster, or hamper innovation, and how standardization plays a key role in providing a positive environment for start-ups.

REEP: paper recycling

The idea of REEP (an Israel-based company) is to de-ink printed paper to reduce waste.

REEP recognises that paper is needed as a material and proposes to shorten the recycling process by installing in offices (near the printers) a de-inking scanner that enables the removal of ink from paper, making it reusable. The real innovation is in rethinking the paper itself, by changing its properties in order to make it re-usable in a very short time.

The de-inking process allows also to scan the paper to transfer the written content to an electronic format, facilitating the creation and sharing of knowledge and offering efficiency and time gains.

The proposed benefits are the reduction of the recycling process, the improvement in security, the enabling of multiple resource productivity and paper savings by a factor of ten.

REEP takes the approach of circular and digital economies; their methodology is oriented to a B2B model, with big printer manufacturers integrating this idea on their own machines. The paper becomes then part of the digital infrastructure and is given for free.

Takeaways and lessons learned

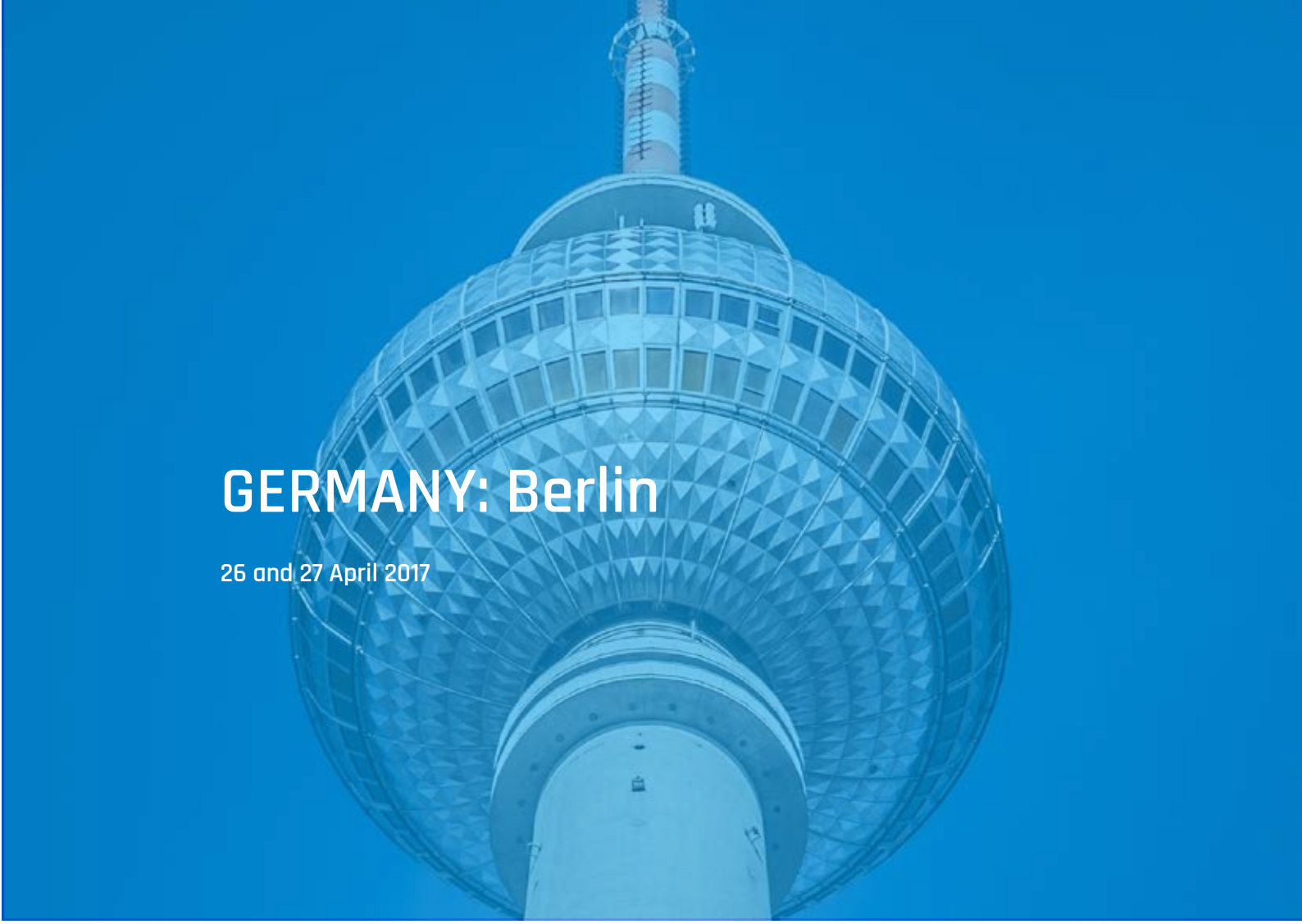
The intensive meetings at StartupOlé provided some important takeaways, both in terms of innovative technologies and in terms of understanding the EU ICT landscape and beyond.

First, the enthusiasm of the interlocutors and their awareness of being part of a European movement was quite striking. Networking and sharing experiences is part of the process of innovation, but also contributes to create and consolidate a European identity for SMEs.

This enthusiasm is, nevertheless, constrained by the perceived difficulties in obtaining funding and the hurdles faced in setting standards on the basis of innovative solutions. This leads some of the start-ups to look elsewhere (Japan, for example) in order to continue growing.

A corollary of this perception is the impression that the EU is a distant actor, a shared view amongst the interlocutors met. Some start-ups have failed to receive subsidies from the SME 2020 programme and this influences notably their views on the EU. This somewhat clashes with the presence and sponsorship of the Start-up Europe project at the StartupOlé event.

On the other hand, the variety of services, innovations and products proposed rarely, if ever, focuses directly on public administrations. However, some solutions can indeed be applicable in our contexts. For this reason, further exploration through POCs or demos should be encouraged, possibly including start-ups that, at face value, do not necessarily match our business needs.



GERMANY: Berlin

26 and 27 April 2017

Background

The German stage of the EU Tech Study Tour focused on the **Deutsche Telekom T Labs** and its approach to innovation.

Deutsche Telekom has created a transversal team to tackle the complexity of the innovation process. The digital co-innovation lab has the mission of working in collaboration with different entities to deliver the solutions of tomorrow.

The digital co-innovation lab works mainly with:

- **T-Systems:** Big projects, scale
- **T-Labs:** Agile approach to deliver prototypes and POCs

T-Systems has a consulting arm named DETECON operating mainly in Europe and marginally in the Middle East, with the aim of helping other industries in the business of digitalisation. With automation, production costs are under control, so insourcing can start back in Europe. **Deutsche Telekom** also operates a CERT, including penetration testing.

The co-innovation lab methodology combines soft methods based on participatory workshops, collaborative workplaces and pure engineering to help clients develop solutions. The lab can address the “innovation cycle” from end-to-end (from problem statement to production of the solution) or only specific sections of it. The focus is on how to use soft methods to leverage on the company's technologies and know-how.

Topics and interlocutors

Smart Data

There is a dedicated data office structure in the organisation (Data Lab) led by a Chief Data Officer.

Deutsche Telekom realises it has considerable wealth in data (e.g. client location, habits, relationships). The personal data treatment as such is tackled by giving to the clients access to new services in exchange of allowing access to their personal data. The obstacle is still the lack of internal understanding of the potential use of Big Data to create new business models.

The role of the CDO (Chief Data Officer) is to create this understanding by launching initiatives with the data owners themselves and helping them as a centre of expertise with data scientists. They are trying to understand what they can do with customer data (besides the normal usage). To get the data, they are relying only on the user's consent but with the guaranty that **Deutsche Telekom** will not misuse the data and will be compliant with EU regulations.

Robotics

Deutsche Telekom's competitors are not anymore Telco companies such as Vodafone or O2 but start-ups such as WhatsApp. Hence the trend to follow all the emergent technologies like robotics and Industry 4.0.

Activities of **T-Systems** in robotics span from personal, humanoid-like robots able to engage in simple conversations (useful for giving simple explanations to visitors in big buildings or providing some kind of companionship for elderly people), to large scale industrial robots.

Industry 4.0

This is the next industry revolution by which the whole production process is facilitated thanks to the integration of IoT (Internet of Things) and cloud computing technologies.

Industry 4.0 (I4.0) is already used by Adidas, which has built in Munich a new fully automated production line in order to deliver personalised shoes based on the data that has been gathered from the client's experience.

The other experiments in the port of Hamburg (sensors on containers) and on a large scale harvesting activity showed a 10% increase in productivity thanks to the data generated. Another case study was presented on “smart houses”, where home automation, also known as domotics, allows for the optimisation of domestic appliances and their efficiency (heating, lights, music) through the Internet and connecting to smartphones.

Deutsche Telekom is collaborating with universities for more advanced research and development covering all aspects above and leveraging on internal know-how.

IT Security

During this visit, a SCADA Demo (Supervisory Control and Data Acquisition) was presented: **T-Labs** is experimenting with a new way to detect security failures by adding a parallel layer to the existing process. This layer can be either a physical box or can be fully operational from the cloud.

T-Systems develops a solution for cyber security called Virtual Security Officer based on an appliance target-

ing SMEs, which do not have the capacity to develop an internal cybersecurity force. It is a relatively low-cost solution to detect intrusion, mainly used by SMEs that do not wish or do not have the financial assets to invest in (full-time) security experts.

T-Systems is also working on protecting large-scale industrial facilities, such as power plants or grids, against cyber attacks, by relying on Telco solutions. The focus here is on relying on the Deutsche Telekom Telco network to provide an independent channel for monitoring and security updates, but also to improve telecom security.

T-Systems' role as the data trustee for the Microsoft cloud

Microsoft is a subcontractor of **T-Systems** for cloud computing. The technical solution is only based on Office 365, but hosted by **T-Systems** on German grounds, and entirely subject to German law. This mechanism is built to provide an additional layer of legal protection, as it is totally within the boundaries of an EU Member State's jurisdiction.

T-Systems has invested in a new data centre and offers a cloud solution that:

- Fully respects Microsoft policies and services
- Provides a fully isolated network (German and public cloud separated)
- Stores data and is fully mirrored in Germany
- Operates as a dedicated service

The contractual setup is twofold: there is a cloud contract and also a data trustee agreement between Microsoft and **T-Systems**. **T-Systems** is playing the role of trustee to manage the stored data. It is compliant with the German laws and Microsoft does not have a direct access to the data without authorisation given by the client.

5G

For **T-Systems**, 5G will primarily aim at reducing latency and improving quality of service. It is an enabler of IoT at industrial scale and it is necessary for Industry 4.0 and autonomous transportation. 5G is also linked to Edge Computing in order to reduce latency. Edge computing can be defined as a method of optimising cloud computing systems by performing data processing at the edge of the network, near the source of the data. Investments and development in hardware are mainly in Edge cloud computing and technologies, aiming at reducing latency.

Deutsche Telekom will also heavily rely on the evolution of software layers. The company considers that the 5G evolution will be mainly about software evolution. It will offer the opportunity for continuous progress instead of requiring the wait for a new generation cycle (5 years).

The big challenge with 5G is dealing with vertical business needs. How to include heterogeneous demands into one single infrastructure? A solution to this challenge may be to move all the connectivity into the cloud in order to be agile in delivering specific services, basically trying to "softwarize" all the boxes that are meant to provide connectivity between the devices.

Takeaways and lessons learned

Many lessons can be drawn from this intensive visit to **Deutsche Telekom**.

First, the company's approach to innovation. The structured two-step approach to innovation enables them to deal with what is feasible in the first place and then with what is scalable, through the confirmation of interest by a business entity in a specific innovative solution. By doing so, the push for innovation is in any case anchored into a concrete, short-term context.

Second, the dynamics of innovation revolve around a virtual-like structure using partner resources (and universities) on single opportunities. This organisational approach enables the assembly of the best expertise available on given issues during the development phase.

Third, the value creation on existing enterprise assets (such as data in the case of **Deutsche Telekom**) appears to be a trend that is shared by other actors at EU level, as the visit to Italy demonstrated. This trend can be valuable for EU institutions as EU based cloud services will increasingly be available in the near future.

Fourth, the attention to data has triggered the establishment of an organisational role such as the Chief Data Officer. It is debatable whether this role is – partially – covered in our institutions, nevertheless, it is an approach that is worth evaluating.

Fifth, the considerable investment in IoT and the cases presented offer an important reflection on assets and appliance management for the future in EU institutions' buildings. We have already moved towards this approach with the more recent buildings, however, technology is moving fast and constant updates will be necessary.

Finally, the alliance Microsoft-Deutsche Telekom appears at this stage as an important breakthrough in what concerns EU-compliant cloud services. A direct consequence from our visit is the in-depth technical evaluation of the T-Systems German Office 365 solution, organised by the European Commission in order to assess its readiness and compliance with the EU institutions' requirements.

ITALY: Aosta, Pavia and Milan

18 and 19 May 2017

Background

The ICT landscape of Northern Italy is characterised by a blend of long-standing technological firms and emerging start-ups. Such blend offers the opportunity not only to assess advanced solutions for cloud computing and data management, but also to gain a deeper understanding of the variety of organisational realities that shape the EU ICT landscape.

The Italian stage of the EU Tech Study Tour included three main cities: Aosta, Pavia and Milan. Three sites were visited with the objective of understanding both operational and service solutions that revolve around the cloud and of capturing possible applications in the ICT environment of the EU Institutions.

Topics and interlocutors

Engineering, Aosta

The visit started in Aosta, at the data centre of **Engineering**, the Italian ICT company with the highest revenue (ca. 1 billion euros) amongst the ones selected. **Engineering** is a 35-year old company that is deeply rooted in the Italian ICT landscape. They have a dedicated service area for public administration and health services.

Our visit provided the opportunity to explore the facilities (server rooms, cooling systems – using the nearby river – and control room) and to obtain insights on the way **Engineering** turned an operations-based business into a service platform. With this approach, a variety of services is provided both to enterprises and users, from SAP-based services to data analytics, asset management, customer relations management, information management and applications management.

Engineering is also promoting a wide reflection on digital transformation in public administration (focusing so far on the Italian experience) and in society at large through the digital platform Ingenium, bringing together tech specialists, public administrators and experts in other fields.

Engineering is currently a provider at EU level. Based on their experience, the major issue to tackle in order to foster an EU-based IT offer is the administrative burdens generated by the tendering procedures.

The Pavia Technological Pole

Our second stop was in Pavia, a place renowned for its university and a Technological Pole that is hosting today 25 tech-intensive firms in a 5000 square metres surface.

At the Pole, we first met with **FacilityLive**, a start-up that developed an information flow management platform providing a range of functionalities in one software suite. Their specific goal is to move up the value chain from data management to information management, which will become even more important since data volumes are set to grow exponentially due to the increase of devices that will be connected to the Internet, a widely recognised phenomenon known as the Internet of Things (IoT). The term "augmented information" encapsulates the value proposition of **FacilityLive**.

Through the demo of their main software product applied to different contexts (from libraries to service desks to tourism information offices), we could see how information from many different sources can be brought together on a user friendly, interactive platform, which handles user requests in an intuitive way through a number of innovative interfaces such as the InfoBag and the HyperLense. In order to prepare data to be served up on their platform, **FacilityLive** offers its customers three different models: fully automatic data treatment, semi-automatic treatment, and fully manual treatment, the latter option offering better results and a better user experience than the previous ones, but also requiring more work and more investment.

During the visit, Gianpiero Lotito, one of the company's founders, gave a very insightful overview of the recent history of the ICT industry, as well as his vision on the industry's future. In his view, Europe cannot simply copy the Silicon Valley model of doing things. Instead, Europe should strive to set up a "network of small valleys", connecting medium size creative cities built around an historical university (such as Pavia, Leuven, Cambridge, Salamanca, Uppsala, etc.), with efficient communication links, and with businesses tightly woven into the local fabric. To use Dr. Lotito's image, one should be looking for places where the university, the city hall, and a start-up cluster are all within walking distance from one another. Such places offer the opportunity to experiment with new technology using the local community as a testing ground, especially if local authorities have an open mind set on regulating innovation. Dr. Lotito further shared his concern that the economy is too dependent on several large platforms, and that we, as Europeans, should care about the upward scalability of our tech companies, lest our crown jewels be bought by American or Asian money before they have the chance to evolve into global players.

The second meeting at the Technological Pole was with **Funambol**, a world-wide cloud provider for Telcos that offers a "white-label" service which enables them to quickly personalise and brand the cloud services offered to customers. **Funambol's** main customers are traditional telecom operators, who are facing the problem of quick client turnover based merely on cost considerations. In order to allow telecom companies to have better customer retention, and to compete on other aspects than mere price, **Funambol** developed an offer consisting of a number of cloud based services such as advanced photo sharing and the like, that telecoms can sell together with their mobile subscriptions. That way, telecom customers get less inclined to switch providers, because they get used to the cloud based services of their current provider, which they stand to lose in case they switch to another company. **Funambol** states that, for a typical telecom company, this reduces turnover

of high-value subscribers by a factor of 6, and of medium-value subscribers by a factor of 4.

Funambol's offer no doubt provides significant added-value for Europe's telecom operators. The advantage of their offer for end users is, of course, somewhat harder to discern. Nonetheless, in the EU institutions' context, this type of service could become interesting in the perspective of an innovative workplace that includes the use of connected tablets, hybrids and smartphones.

Enter, Milan

Enter is an Internet Service Provider (ISP) since 1996, a cloud provider since 2012, and a data centre operator based in Milano. **Enter** focused their presentation on the company's evolution from a traditional ISP to a fully-fledged cloud provider, that can offer cloud solutions guaranteeing that 100% of the data is kept in Europe. The platform software is Open Source (Open Stack), reflecting the company philosophy to generate innovation through sharing ideas. **Enter** is also a provider for EU institutions since it participated in the interinstitutional call for tender for cloud services (Lot 2).

Enter shared their innovative views on how to run a data centre, including an open source hardware platform (which, allegedly, is not 100% production ready yet) called rugged pod, which uses organic oil for cooling instead of traditional ventilation and spectacularly increases a data centre's Power Usage Effectiveness. **Enter** went into some detail explaining their modus operandi, stating their very strong preference for independence: they prefer to work with employees or small subcontractors rather than farming out tasks, and prefer to buy some spare material to handle breakdowns, rather than shelling out money on service contracts.

Enter's strong commitment to innovation of all sorts is illustrated, among other things, by the fact that they run a FabLab on their premises.

Takeaways and lessons learned

Four main lessons can be taken from the Italian stage of this Study Tour.

The first one is that cloud solutions and suites are becoming more and more sophisticated and the services we encountered are increasingly integrated and oriented towards new, innovative ways of working that place mobility at the centre. These solutions can also include open source and be 100% European. In view of a possible shift of part of our services to the cloud, we can count also on the EU-based offer.

The second lesson has to do with the diversity of the ICT landscape and the need to foster cooperation between a wide range of areas in order to enable advanced proofs of concept with start-ups and scale-ups that need to find a proper tendering framework since the financial burdens might be too heavy. This solution might also provide an incremental context where EU start-ups and scale-ups learn the logics of EU tendering and start to consider the EU institutions as a possible "market" for their innovations.

The third lesson that can be drawn is related to the cultural specificity of EU ICT companies. We have encountered in all cases a strong territorial root and a wish to be part of the local community. We believe this can be a distinctive feature of the EU ICT landscape and should be further investigated.

Fourth, data is the next oil. Enterprises that previously only stored data have started to invest in exploiting it to provide services. With this trend, it is even more critical that the EU guarantees 100% European data centres and storage facilities.

Finally, it is worth mentioning that the wish to “give back” in such cultural and locally-rooted environments is also distinctive. While Enter invests in extremely affordable coworking spaces and a FabLab, FacilityLive runs an initiative whereby all fourth graders from the local primary schools get a full immersion in the company and can spend a day coding. The founder of Funambol, on the other hand, heads an initiative (“Mind the Bridge”) aimed at fostering partnerships and mentoring in the start-up community.

THE NETHERLANDS: The Hague, Eindhoven and Amsterdam

6 and 7 June 2017

Background

The Dutch stage of the EU Tech Study Tour provided yet another facet of technological excellence in the EU. While the first three stages focused on the enterprise side of innovation, our visit to the Netherlands was the occasion to look at how public administrations embrace innovation and provide the canvas for all actors (government, start-ups and established companies, universities, funding partners) to create added value partnerships.

From the onset, this visit was under the sign of innovative working. The train trip to The Hague was a good occasion to use DG ITEC's mobile equipment and solutions in order to follow the launch of the new EP Intranet.

The visit was organised around intensive seminars; this allowed meeting with a considerable number of interlocutors on a variety of topics, enabling us to grasp the complexity of the policies developed by the Dutch government and its concrete results both for administrations, ICT companies and, more broadly, for innovation.

Topics and interlocutors

Ministry for industrial development - International Innovation Division

The visit started by a meeting with representatives from **the International Innovation Division of the Ministry for industrial development.**

Mr. Pool and Ms. Buis introduced us to the Dutch government's vision on new ways of working and the results achieved so far. While employee engagement through objectives' setting and constant awareness creation

is essential to ensure that distance working takes place effectively, a clear top-down mandate to pursue an innovative working policy in Ministries is recognised as a crucial step in managing change.

While new ways of working are not a new topic for EU institutions, the Dutch case provides interesting insights as to how diversity and hybrid solutions might actually resolve the long-standing issue "open space vs. office".

Ministry of Economic Affairs – Dienst ICT Uitvoering (DICTU)

DICTU is an Agency of the Ministry for Economic Affairs dealing with the implementation of ICT services for Dutch Administration.

Aiming at security, independence and quality of services and solutions, the Dutch government transformed DICTU from a small services Agency to a government-wide ICT solutions provider that takes care of the entire lifecycle of systems, from design to operations development.

DICTU has also developed a private cloud, available since December 2016. They have defined their own stack and architecture for the cloud and aim to have a unique redundant data centre instead of two.

One of the added values of **DICTU's** operations is the rapidity of service deployment (server, database, middleware jboss, etc.) that is achieved by executing automatic procedures (with a click).

DICTU's outlook is that of a monopoly on all ICT activities of the Dutch Administration; that is the reason why they are also deploying an HR policy of internalisation to ensure the maximum levels of security.

The Hague Security Delta (HSD)

The Hague Security Delta (HSD) is a leading security cluster in Europe, organised in regional hubs – The Hague, Twente, and Brabant – where businesses, governments and knowledge institutions work together on innovations and knowledge in the field of cyber security, national and urban security, protection of critical infrastructure, and forensics.

In the context of **HSD**, we have met with several companies to discuss security and data protection issues. Among these interlocutors, **Storro** is a software development start-up that recently attracted investments from a regional venture capital company that is part of the East Netherlands Development Agency (Oost NV). They focus on solutions for secure communication of documents through blockchain and peer to peer technology instead of using the cloud. Security through design and true privacy are core to **Storro's** value proposition. The documents are encrypted, fragmented and spread by various trusted storing locations. The solution works also with clouds.

Eindhoven

The trip continued on the second day with a visit to Eindhoven's **Brainport Region**, a leading ICT player located in the South East, where a meeting took place with representatives from the **Eindhoven Technical University (TU/e)**, who plays an important role in streamlining innovation with known big companies (Philips, Shell, ASML).

The ecosystem created by the university and the start-ups provides a circular, beneficial relationship: while start-ups bring challenging ideas, provide technical know how and possibly fund the research, research groups in turn provide a highly qualified manpower, a growing academic network and the state of the art of science.

Through its Video Coding and Architecture Research Group (VCA), **TU/e** is fully dedicated to image analysis

and processing. The group concentrates on surveillance and health real-time systems and performs intensive industrial cooperation. One of its spin-offs, **ViNotion** is positioned as a computer vision expert focusing on statistical learning.

Automated vision is a big area for the future. Given the increase of information that we will deal with in the future, automation will inevitably grow in importance. The major technique is based on statistical patterns to detect objects inside an environment and then convert images to feature representation so that computers understand them. Increasingly, neural networks are used to make complex computation and learn from the different patterns they encounter. This kind of machine learning based on several layers is actually prefiguring the new processors of tomorrow's PCs.

Amsterdam

The third and last location visited was the **Amsterdam Science Park**, founded by the City of Amsterdam, the University and the Netherlands Organisation for Scientific Research (NWO) and home to several high-quality researches and knowledge intensive businesses.

During this visit, we have met a PhD researcher that structures data from the European Parliament (MEPs, plenary activities, etc.) to link it with different external sources to provide a richer spectrum of replies to general or specific questions raised by anyone in the European Parliament. Another research focuses on creating a repository of all European parliamentary proceedings to enable cross search that takes into account the timeline dimension: for example, one can see the evolution of the use of specific terms over time.

Among the highlights of this visit, **Commit2Data** is a multi-year national research and innovation programme based on a public-private partnership (PPP). It acts as a national framework for public-private collaborations in the field of Big Data and its applications.

The solution proposed by this programme is to build a secure digital marketplace mechanism that will collect data from competing organisations and make it shareable while respecting the ownership of each stakeholder. The solution can really push the expansion of cloud services because it reinforces the trust on data.

Commit2Data established Big Data Hubs as instruments for valorisation and dissemination of data by offering trusted data sharing facilities (secured data governance and state of the art tooling). The hubs are strategically spread out in the Netherlands in correspondence to regional economic clusters (Amsterdam, Groningen, Den Hagen/Rotterdam, Twente, Brabant)

Takeaways and lessons learned

During these two intensive days, we went through different cases of concrete innovative implementations with great potential. The efforts made by our different hosts in order to make personalised presentations matching our objectives were remarkable.

We can highlight five main takeaways and lessons learned:
Firstly, it is possible to implement new ways of working in large public organisations: a clear attention to the

actual needs of employees (ranging from personalisation of appliances' management to privacy at work) must be part of the change process, along with a new approach to spaces and ICT solutions.

Secondly, in the specific case of DICTU, the internalisation and centralisation of ICT services and infrastructure at government level generates added value both in terms of security and of efficient standard applications' management. The example of the multi-tenant community cloud deserves to be further explored in order to understand how "white label" cloud stacks could be rapidly customised for each institution. This could help different institutions to implement a private cloud on premises.

Thirdly, the network approach to innovation in the Dutch case is a concrete example of the "small valley" concept discussed in other visits. (Local) Government, university and funding agencies collaborating in a circular way with start-ups and more established firms is a common pattern that we have seen both in Eindhoven and Amsterdam. We could appreciate how locally rooted identities apply even in a country of relatively small size.

Fourthly, the experience of the Amsterdam Science Park demonstrated the importance and added-value of making data available in open format. As said before, data is today the new oil, even if there are security concerns when sharing it. The question, however, of the possible revenues deriving from using available open data could be in the future a deterrent for further research.

Finally, what emerges from the last case discussed on Big Data is the spirit of "coopetition" that animates the actors participating in the Dutch ICT innovation landscape. This has led to developing a solution that allows the use of big data without compromising or exposing the nature of each participant's assets. A very interesting way to overcome an apparent deadlock thanks to innovation and a different way of looking at things.

Conclusion

This first report of the EU Tech Study Tour 2017 confirms the potential that the EU ICT landscape has to offer both in terms of solutions and reflections on the digital workplace. It also confirms the high added value of having composite teams from the institutions since it fosters the exchange of views and experiences right at the start of the innovation process, that is, in the scouting and study phase. We can therefore conclude that this first set of study visits was a considerable success and the objectives set out in the introduction of this report were met.

The four study visits provided insightful information on the EU ICT landscape, but also fostered important reflections on how our organisational and institutional context will change 5 to 10 years from now. The widespread call for efficiency and interinstitutional cooperation, on one hand, and the constant push for increased services to users on the other, will inevitably produce strategic investments on new technologies in the near future.

We can summarise the conclusions of this first report in five main themes:

Diversity as a distinctive trait of the EU ICT landscape

The diversity in scale, typology, organisational set-up and financial arrangements that characterise the many actors involved in these study visits poses the question of what ICT landscape model is pertinent in the EU case. Important arguments were brought forward by our interlocutors during the visits. It appears that a locally rooted, “small valleys” model, including universities and networks, could define the EU ICT landscape of the future. In that perspective, the idea of a single, US-like Silicon Valley in the EU is not a “must” to foster innovation.

Value generation through data

We have had in many cases the opportunity to see how data provides the ground zero for developing innovative services aimed both at users and enterprises with tangible productivity and increased well-being outcomes. In our efforts to be more and more mobile and connected, these services will be increasingly needed. This, of course, poses two important challenges in our institutional context: data ownership and privacy.

Cloud infrastructure and services

Cloud infrastructure and cloud-based solutions are the next step for different long-standing firms that we have met during these visits, and they are the solution by default for start-ups. While the legal aspects of the cloud (localization of the actual data and applicable regulatory framework) can be overcome by various solutions (see for example Deutsche Telekom in Germany or Enter in Italy), it appears indispensable to "draw a line" between what must be safeguarded as non-shareable information and what can be subject to a tolerable level of risk. What remains from this first set of study visits is the confirmed availability of EU-based solutions.

Innovation culture

Throughout the visits many different approaches to innovation were observed. Nonetheless, two important aspects should be highlighted here:

- First of all, innovation is an investment. There must be tolerance for a margin of error also in view of the tangible benefits it can bring in terms of efficiency and user experience. This could be even more tolerable if part of this margin is mutualized at interinstitutional level.
- Secondly, there should be a friendly environment where innovative ideas first take form and then are scaled-up. To support this, specifically dedicated calls for advanced proofs of concept with start-ups and dedicated structures inside the institutions could (as it is the case for the EP already) be part of the solution.

The role of the EU

The EU Tech Study Tour was also the occasion to confront ourselves with the sector's perception on the role of the EU in fostering innovation and supporting the EU ICT landscape.

The most common and relevant issue that has been discussed is indeed the difficulties encountered by many operators to participate in calls for tender at EU level. The administrative burden has often been mentioned, but also the lack of possibilities to test and validate innovative solutions. Parallels have been drawn with the US model where the government takes under its umbrella high-value start-ups to deliver innovative services, enabling them to grow and generate solutions in a friendly environment.

On the other hand, many interlocutors underlined the difficulties they face in Europe in finding funds, especially compared to other contexts (both intra and extra EU). The EU is sometimes perceived as a distant actor and a recurrent comment was made on the complexity related to the access to European funds. For this reason, some start-ups even consider moving to other countries.

The different issues that start-ups are dealing with could be brought to the attention of policy makers in the EU institutions, namely:

- Governments and big organisations are not agile enough in their contacts with start ups, often imposing long and slow processes for which cash-strapped start-ups have no time;
- Very often, start-ups are seen in the light of the old economy, where one had to present a business plan with specific income/expenditure proposals to get funding. Such plans are a poor fit for start-ups trying to introduce a disruptive technology;
- It would help start-ups to have European-wide, open standards;
- It would help start-ups if public procurement procedures dictated that a certain market volume should be set aside for SMEs and start-ups. Start-ups feel that public procurement is biased towards large established companies.

At the same time, Europe is perceived – also by its neighbouring countries – as a good environment to develop and expand businesses. This leads to the conclusion that more efforts should be made to continue improving the policies in this sector, especially if we consider the upcoming Brexit and the predictable strong action of the British government in view of attracting an increasing number of start-ups.

Finally, a common perception shared by the officials participating in the visits was the relative lack of knowledge on the EU institutions and their functioning. Much remains to be done in that perspective to foster fruitful collaborations between the EU institutions and the EU ICT landscape.

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