European Innovation Policy and Political Processes in the Light of Information and Communication Technologies

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1 Setting the Stage

The launch of the Lisbon Program for Growth and Innovation in 2000 was a first attempt by the European Commission to stimulate economic growth, job creation, and Europe's global competitiveness through a focus on research and innovation. The Lisbon Program stressed the importance of innovation in the digital economy and the need for reforms in the minds of European and national decision makers; the results have been modest.

The 2010 passing of the Europe 2020 and Innovation Europe agendas[1] with their 'European Union's Ten-Year Growth Strategy' was a new attempt. Reaching beyond just overcoming the economic and financial crisis, Europe 2020 aims at offering conditions for smart and sustainable growth while ensuring a new foundation for adapting national welfare systems and 'greening' the economy. With the Digital Agenda Europe[2], one of seven flagship initiatives, the European Union and national authorities plan to mutually reinforce their Europe 2020 efforts. The idea is to reboot Europe's economy and help Europe's citizens and businesses to get the most out of digital technologies, which are seen as instrumental in building the knowledge-based, globally competitive European economy.

Having launched Europe 2020 with the Digital Agenda Europe, the Commission places Information, Communication Technology (ICT) innovations in pole position for supporting European competitiveness, economic growth, and social welfare. Accordingly, we organize our thoughts around those innovations. The remainder of the essay is structured as follows. After a discussion of technological innovations as drivers of change, we explore the current European innovation policy framework for promoting ICT innovations and reflect upon ICT innovations as drivers for eco-

1 See ec.europa.eu/europe2020.
2 See ec.europa.eu/digital-agenda.

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nomic growth and social welfare in Europe. Further, as "[t]he delivery of Europe 2020 relies heavily on the new governance structures and processes"[3], we also elaborate on the potential impact of ICT innovations on new decision making rules and practices. We conclude with a brief summary and outlook.

2 Technological Innovations as the Driver for Change

ICT innovations have only emerged as a very major technology trend in recent decades. For a much longer period of time, a broad spectrum of new technologies has been the driver of change. Over centuries, great waves of technological innovations brought harmonious interaction between economic uptake and spread, public support and the adaptation of political support. Regulatory waves were the result of major technological innovations: The feudal and later the monarchic, centralized state corresponded to the pre-industrial age. The modern state, which emerged in the mid-19th century and fully developed in the 20th century, was both consequence and reason for the industrialized society and its consumer-driven economy. Innovations including electricity, railways, and the automobile are just a few examples from the last two centuries. They have – each in their own way – led to deep changes in society (see Perez, 2009). The latest innovations and the pervasive nature of new technologies – not just in information and communication, but also in manufacturing and in agriculture – continue the basic pattern. They bring equally profound shifts in the dominating cultural paradigm and demand adaptations of public governance systems.

Nowadays, the impact of technological innovations reaches beyond geographical borders. And, with numerous globally consumed ICT innovations, globalization is no longer just an economic phenomenon. Sociocultural paradigms are changing, too (see Luyckx-Ghisi, 2008). The values of the middle classes, the dominant social group in industrialized or mature economies, converge around the globe. A global 'culture of the Internet' (see Castells, 2001), characterized by belief in technological progress and ubiquity of information, has gained presence throughout all social groups. Similarly, the business side shows early developments of

3 Cited from ec.europa.eu/europe2020/europe-2020-in-a-nutshell/index_en.htm.

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globalized norms of corporate behavior and ethical standards (e.g., the Extraction Industries Transparency Initiative – EITI[4]). Only public governance has remained fragmented. It is still far behind the globalization trends which it unleashed. At best, first signs of catching up have become visible in public-private cooperation.

Most changes caused by technological innovations are broadly considered positive and widely supported. Based on real or presumed benefits, consumer uptake creates self-enforcing economic growth. But there is also some 'collateral damage'. Companies' production, distribution, and sales activities may come under public scrutiny. The ecological or social effects of corporate activities may cause widespread public concern and opposition, and drive public actions by efficient, well-funded non-governmental organizations or even lead to political and regulatory intervention by public authorities. For instance, the chemical explosions in Bhopal and Seveso, the maritime disaster of the Erica before the Normandy coast, and the recent financial crisis encouraged or forced regulators to intervene in markets, not least due to the magnification of public outrage through ICT and social media.

Companies need to be aware of the potential effects that technological innovations and their applications may have on society and public governance. Understanding and incorporating them into corporate strategy and operations has been shown to be a source of competitive advantage (see, e.g., Schepers, 2010). Failing to understand them often causes expensive social and political tension (e.g., the situation in financial services). Nevertheless, the analysis of subsequent political and regulatory developments and their impacts on a company's sustainable well-being still receives less corporate attention than action-points helping short-term turnover and quarterly profits. While companies typically analyze the potential attitudes of consumers, they often forget that their customers are a minority of the citizens who determine social actions, electoral outcomes, and thus policy orientations. For instance, in the case of international mobile telephony, relevant players may have prospectively underestimated the political impact behind the widespread applause which the European Commission and Parliament enjoyed in the context of forcing down roaming costs.

Whether innovations have major social impact depends on their diffusion and effects on other companies, industry sectors, and national com-

4 www.eiti.org.

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petitiveness. Only some innovations are so radical as to affect large sectors or even the whole economy (see Sood & Tellis, 2005). ICT innovations are the most obvious contemporary example; they are expected to stimulate a new wave of economic growth, social progress, and public involvement in political decision making.

3 ICT Innovations and European Innovation Policy Management

The present political discussion with regard to ICT innovations in the European Union focuses on research and the allocation of project-related funds within various industries rather than on fostering market opportunities and large-scale rollout throughout society. In the context of the 7th Research Framework Program, the European Commission has undertaken a major effort to stimulate innovations in a wide area of economic sectors including ICT. The support of laboratory-based research has led to numerous new or improved products and services. However, such research does not fully match those new products and services with market regulations by national governments and the European Union, which are needed in order to achieve economically relevant innovations. Hence, the 7th Research Framework Program has seen only modest participation of companies – the ultimate transmitters of innovations into markets. Especially multinational companies find it increasingly difficult to cope with bureaucratic hurdles and operate with the complex EU decision making system resulting from the very nature of a supra-national institution (see Schepers, 2012).

Fostering innovations in Europe requires reaching beyond products, services, and processes to also include governance innovation. Traditional rule-making and governance structures are not sufficient for managing the growing complexity. They do not provide a framework either for building the competitive knowledge-based economy or for optimally fostering European integration and cooperation in and across the fields of business, culture, and politics.

A new European innovation policy requires attending to the steering and management of innovation processes, both on an industrial and governmental level. In order to reach beyond industry-specific regulation and to be truly supportive and comprehensive, such innovation policy needs to focus on the simplification of horizontal regulatory processes, the reduc-

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tion of bureaucratic barriers for companies and citizens, and the encouragement of multi-faceted public involvement.[5]

We see some insightful examples at the World Bank and the OECD as well as in some European Union member states and companies. However, we also identify shortcomings in the European Union. One shortcoming concerns the support of commercialization processes by smart regulation and facilitated access to funds. Governance and policy innovations in the public and private sector could provide significant cost savings and productivity gains. Another shortcoming relates to the support of public involvement in innovation processes by exploiting ICT-based communications strategies – aiming at increased public and social acceptance of innovations. The system needs to be set up for interaction, feedback loops, and courageous initiatives in a way that is beneficial to all stakeholders. It needs to be ready for companies, non-governmental organizations, online activists, and citizens 'engaging' with public policy-makers.

Today, such engagements are so greatly facilitated by the digitization wave that the digitization, in turn, may shape 'basic democratic processes' on the local, regional, national, European and global level – even if this does not fit easily with traditional views of representative democracy.

4 ICT Innovations Promoting Economic Growth and Social Welfare

Being on the radar screen of almost every consumer, ICT innovations are heavily diffused into economic sectors and private households. They enjoy widespread socio-cultural acceptance and overall foster economic growth.

A high-speed broadband ICT infrastructure (fiber, mobile) is an almost ubiquitous ICT innovation in industrialized economies. It is essential as scaffolding for developing further innovations in many industries (see, e.g., Noam, 2009) and thus for productivity improvements and increased social welfare in the digital economy. A reliable and predictable regulatory framework with adequate regulatory investment incentives would encourage large players, often telecom incumbents, and numerous small and mid-size players from within or outside the telecom sector to invest in further expanding the current ICT backbone (see, e.g., Wieck, 2010).

5 For an extensive conceptualization on governance innovation, especially with regard to strengthening the role of public involvement and improving decision makers' competencies, see for instance Kruse (2011) and Kruse (2012).

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Large-scale ICT innovations with high degrees of technical 'newness', such as high-tech-robots or nano-technology applications, are mostly driven by engineers and scientists residing in huge and expensive research laboratories. Bringing those ICT innovations to market success requires appropriate ex-ante governance regulations such as European patents or data protection and security rules – comparable to regulations in agriculture, pharmacology, or materials. Today, we find several large-scale ICT innovations in the field of 'Health and Safety'. Such innovations apply technologies such as Radio Frequency Identification (RFID) for piracy prevention,[6] 'on-board' diagnostic technologies (intelligent clothes, in-body devices), GPS-based patient tracking, 'patient cards', or the eCall system,[7] They are mostly promoted by industry leaders and public authorities. Being too expensive to demonstrate their benefits to consumers or other stakeholder groups such as health insurance providers or automobile clubs, they need regulatory support to reach sufficient consumer awareness, critical mass, and sufficient market development. They gain this support typically based on predicted economic results from saving in public (health) budgets, marketing campaigns, foreseen jump-starts on a global scale, and the humanistic approach underlying the European Society as the positive impact on social wealth and welfare seems indisputable.

ICT innovations with lower degrees of technical 'newness', such as Facebook or Twitter, have gained major public attention, too. As a matter of fact, the digitization of content and communication genres (e.g., press, broadcasts, movies, music, dictionaries, maps, online services, political debates, individual communication) has not only changed the economic landscape, but also our socio-cultural system and the underlying political processes and governance structures. Whereas many traditional stakeholders and public authorities still differentiate between diverse content genres, consumers barely do.

Digitized and converged content and communication products and services are about to change complete industries (see, e.g., Loebbecke, 2010) and subsequently the society as a whole. Creators and aggregators of digi-

6 For similar applications in other sectors, see for instance Loebbecke (2004).

7 In September 2011, the European Commission adopted a Recommendation asking mobile network operators to prepare their networks to correctly transmit automatic 112 emergency calls (eCalls) generated by cars (see ec.europa.eu/information_society/activities/esafety/ecall).

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tal content often suffer from their traditional business models[8], however, digitization with all its consequences is here to stay. If European societies want consumers to be informed and have the competences to choose, they need to respect consumers' choices. Schumpeter (1911) referred to the negative consequences of 'creative destruction'. When an innovation like the Internet (infrastructure, products, and services) expands, no regulation, governance structure, or decision making rule-set can protect traditional business models and management structures against citizens taking advantage of the innovation. Instead, ex-post regulations and rules may well hinder and delay the roll-out of add-on innovations resting upon the Internet infrastructure and early applications.[9] Artificially (legally) protecting copyrights in order to avoid piracy and thus gain market share seems to offer short-term release at best (see Bhattacharjee et al., 2006).

The digitization of content and communication reconfigures the relative power and value share of players along the 'content' value chain (see, e.g., Oberholzer-Gee & Strumpf, 2007). Former ICT providers have successfully entered traditionally non-ICT sectors (see, e.g., Loebbecke, 2010). For instance, telecom infrastructure providers increasingly substitute their classic low-margin access business with up-scale services around e-mobility, energy metering, and e-health (see Noam, 2009). Device manufacturers, entertainment incumbents, and retail giants tackle online content sectors with their app stores and their download platforms.

Further, the digitization of content and communication has opened the door for providers of so-called disruptive technologies (see Christensen, 1997, 2000). The mass market success of those innovations, which are neither radically new nor especially technologically difficult, has been eye-opening. Although disruptive technologies show inferior performance compared to an incumbent standard, their specific performance attributes are attractive to niche markets. Hence, they quickly reach market coverage and achieve capitalization. Then they impact incumbents – pointing to the need to manage innovation and organizational change processes quickly

8 For early analyses, see for instance Shapiro & Varian (1999), Smith & Telang (2009), and Zentner (2006).

9 Analogue to Hardin's 'Tragedy of the Commons' (see Hardin, 1968), some view the Internet as a commons with negative externalities, i.e., with individuals who benefit from exploiting the resource while the costs fall on all. They argue for intellectual property rights to internalize those externalities which allow for maximizing individual return, but not necessarily societal ones.

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(see Markus, 1987). Well-known examples of such disruptive ICT innovations are digital cameras ('disruptive' to analog cameras) and voice over IP telephony ('disruptive' to fixed line and mobile telephony services).

Disruptive technologies typically originate from startups or small and medium-sized enterprises (SMEs), which are seldom promoted in the European innovation landscape and its governance structure. Regulatory constraints often hinder their research and development; ex-ante support beyond funding is missing. Even the contrary occurs: When disruptive innovations spread successfully, regulators are quick to defend the established incumbents. Reasons for regulators to take this side are obvious; many incumbents are huge. They provide – at least for some time – a lot of jobs and profoundly contribute to the GDP. However, they do not necessarily help fostering innovations. Rather the opposite, they prefer investing in lobbyists to defend their terrain than in innovations to out-compete newcomers on market ground.

The overall economic effect of ICT innovations reaches far beyond the ICT sector and its direct effect on GDP. A vast body of research (see McAfee & Brynjolfsson, 2008; McKinsey Global Institute, 2001) points to ICT-based productivity improvements in various industries and sectors. However, the impact of ICT innovations in terms of economic measures (GDP, prices, and employment) and the underlying causal relationships between those measures and social wealth and welfare is complex (see Brynjolfsson & Saunders, 2010; Carr, 2003). "You can see the computer age everywhere *but* in the productivity statistics" (Solow, 1987, p. 36). Especially ICT innovations disseminated in the consumer market are, to a large extent, excluded from the GDP. In fact, often the rapidity of their roll-out can be explained by the absence of direct market-related transactions. For instance, when citizens take advantage of information available online (newspaper, travel guidebook, or lecture notes). This has no effect on the GDP, whereas buying a newspaper at the newsstand adds to the GDP.

5 ICT Innovations Influencing Political Decision Making

ICT innovations enjoy broad acceptance throughout the society. Thereby, also influence political decision making and public behavior as much as law does (see Lessig, 1999). ICT innovations have become "means and

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motive for much activism" (The Economist, 2013, p. 17). Online platforms and social media are almost everywhere.[10]

The more 'general purpose' platforms or social media such as Facebook are fed with content by the users – be they public authorities, non-governmental organizations, industry players, or – as we know them best – citizens (consumers, customers, surfers, gamers, and the like). Such platforms have quickly entered many individual screens and living rooms; entry costs for using them are perceived as being close to zero.

Also, the entry barriers for providing a 'platform' have fallen drastically. This applies to both, to sites and accounts on 'general purpose' social media and to organizations' own platforms – regardless whether the providing organization is a public authority, a non-governmental organization, a loosely organized initiative, or, for the following analogy, a gaming company.

There is no way to avoid the presence or the effects of such platforms. If an organization decides not to entertain a site or a platform, they can be sure that soon a 'complaining' or 'opposing' Facebook site or a blog will be up – gaining 'friends and followers' and then momentum. Nowadays, any political protest has a social media face – the Tea Party, the Occupy Movement, the Muslim Brothers, the Pirate Party, and any initiative against a particular company.

Initiatives or groups on such platforms come into existence and disappear at remarkable speed. It takes just a few clicks to mobilize voters, disseminate opinions, run a crowd-funding campaign, or interfere in law-making processes. Typically, "bad news is better news"; protest grows faster than support. Even though some purely platform-based initiatives lose most of their support as quickly as they gain it, in between they sometimes exert a rather long-term influence or have a short-term but dramatic impact on business, governance structures, and the socio-cultural climate in a society.

Here, our analogy between gaming sellers and political decision makers comes into play: For decades, game sellers pursued a retail-oriented business model. Games, sorted in packaged products, waited on shelves of toy stores and electronic markets for their customers (who may or may not

10 For a discussion of shared digital platforms and business community platforms and their role in the business world, see for instance Markus & Loebbecke (2013).

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have been their users).[11] Driven by increased bandwidth and more connected devices, the situation has changed. The gaming industry – like many other industries – has undergone fundamental shifts in its make-up. Pursuing now a business model built upon digital delivery, game sellers offer end-users 'anytime and anywhere' access to relevant and hopefully valuable products and services. Delivering their products digitally to consumers not least requires some heavy re-organization from the gaming company. A competitive environment, where soon basically every player in the industry will deliver online, urges companies to get better and faster insights on what their consumers want, how they perceive the products and services, and what innovative suggestions they make.

Direct access to consumers provides gaming companies with new, data-rich environments. Having the data is one thing. Feeling obliged to do something meaningful with them is quite another. The pressure to analyze and exploit real-time big-data develops faster than expected. Success story after success story suggests that analyzing consumer data becomes more crucial than developing and delivering better products or services. This is not just a marketing issue. Digital delivery and interaction with the consumer *imply* that companies have consumer data at hand. If most industry players exploit their newly gained data sets somehow, "doing at least something with the data" becomes a competitive necessity – just another one in addition to the sheer presence on social media. The new situation is challenging. Most industry players are about to restructure their internal organizations and to roll out collaborative ICT tools such as video conferencing or cloud-based services to cope with the new mixture of opportunities and necessities – both driven by ICT innovations.

What does this mean for the impact of ICT innovations on political processes? The citizens – the public – in the digital era are increasingly used to playing online, to participating in platform activities, to accomplishing something, and to expressing opinions via the tip of a finger on a touch screen.

> "Today, every corner of the digital universe has its own interest group; consumer groups defend online piracy, hackers reject far-reaching software-patents, researchers push for open access to scientific journals online; defenders of transparency call for governments to open their data vaults – or take the opening into their own hands." (The Economist, 2013, p. 16)

11 For instance, companies such as Lego and Disney used to make the point that their largest customer groups are grandparents.

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The 'old retail model' of public involvement in politics – paper-based elections in a rather limited frequency where one can make one or two crosses referring to a variety of topics – loses importance.

Political, economic, and 'boulevard' experiences show that almost any confrontational subject quickly gains barely controllable momentum. In early 2012, online activists helped defeat anti-piracy legislation efforts such as the Stop Online Piracy Act **(**SOPA**)** in the United States and the Anti-Counterfeiting Trade Agreement (ACTA) in Europe. In Pakistan, they celebrated the delay, perhaps cancellation, of a national firewall; and in the Philippines they fought to delay a planned cybercrime law.

It seems that no ex-ante regulation can really limit what is said or to whom an opinion gets distributed on such platforms. Views and experiences – on games or on political issues – find 'friends'. Bad word-of-mouth spreads faster than good publicity – this is not new at all.

Public authorities in Europe need to position themselves accordingly. Surely, they cannot change their agenda after every accident, act of violence, market-sweeping non-European product launch, or any other 'digital upraising'. But decision makers (can) have 'direct' access to many citizens – to many more than they can time-wise afford to truly interact with in more detail. They will or could very soon live in data rich environments if they run apps on their tablets – apps that analyze the data of citizens who write to them on platforms or transmit their data in whatever other way. It will not be long before citizens will 'blame' public authorities and decision makers for not reacting to their online submitted requests.

Obviously, ICT innovations will not only foster public involvement in innovation processes – citizens expressing their product-related demands, likings, and ideas. ICT innovations will also drive public involvement in policy making – be it concerning the content of the local high school course or related to public health issues debated in Brussels. The recent debates about the Anti-Counterfeiting Trade Agreement (ACTA) and the related political reactions it received gave us a first taste of what may easily become the norm.

ICT innovations will also change the way companies get involved in comparable ways. Most of them already use the full ICT spectrum as a source of information, for communication and for influencing opinion generating processes. In their role as corporate citizens, they will be quick

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to participate openly in the public (increasingly online) debates and to systemically take account of government and citizen interactions.[12]

6 Conclusion and Outlook

The digital era will not go away; the on-going, impressive dissemination of ICT innovations across business and users drives adaptations in regulation and political procedures on various levels.

The current EU innovation policy is embedded in established EU institutions, based on objectives determined half a century ago, and equipped with governance tools appropriate for opening up markets and regulating their functioning rather than for responding to fundamentally new ICT-based challenges. But markets do not wait. Consumers take advantage of what is available globally; they drive innovations to market success – not knowing and not caring about the innovation origin. Here, political decision makers need to strike a balance between promoting competition in the search for the technologically best and most marketable solution on the one hand and upfront regulation in order to lay the humus soil for innovations which create welfare and wealth in Europe and set standards for global trends on the other hand.

So far, governance structures and regulatory procedures support mainly lawyers, lobbyists, consultants, and regulators, but not innovators. However, with the 'Digital Agenda Europe', European authorities show ambition to support the quest for new managerial models and to promote the diffusion of innovations by Europeanizing rules on, for example, patents or product releases. They aim to ease the access to risk capital and help with education and to allocate subsidies to offer fair chances for all stakeholders. Last but not least, they also want to foster exchanges between European and national authorities, outside experts, and various industry and user stakeholders in order to institutionalize structures and regulations that accommodate the needs of those who propagate specific innovations.

In parallel, ICT innovations may revolutionize public engagements in political procedures – support and opposition, per topic, per region, and per person. Already now, the Internet promotes easy and fast 'voting' on specific issues: It allows the involvement of different groups of delegates,

12 See for instance Matten & Crane (2005).

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experts, and decision makers per topic. Political decision makers face directly connected citizens. They count on voters with ubiquitous and permanent access to formal and informal sources of information and opinions and with almost anytime and anywhere opportunities to express their views (if they care enough). Watching the daily news sometimes suggests that the distinction between direct and indirect democracy could evaporate faster than any governance innovation policy or constitutional process would foresee.

Where to take it from here? Our thoughts are still at the beginning: We suggest accepting the fact that ICT innovations are ineluctable. We propose taking advantage of them instead of complaining about them and being constantly concerned about suppressing 'bad-mouthing' or wrong-doing. Hence, we support internationally preparing and allowing for periods and instances of the unavoidable 'creative destruction' instead of protecting the established. Limiting opportunities for offering new products and services seems to be the least efficient path. Regulation, law enforcement, and prosecution, which inhibit innovation, are not productive or efficient for anybody but the legal sector. Finally, we applaud any effort aiming at a closer cooperation between business, citizens, public authorities, and political decision makers in order to bring competitive advantage on all levels to the European Union's countries. The economic, social and democratic mid- and long-term benefits resulting from exploiting ICT innovations for economic growth and democratically sound knowledge societies are uncontested.

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