

# Responsible Innovation and Happiness: A New Approach to the Effects of ICT's

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## 1. Project rationale

Recent literature on responsible innovation (RI) is centered on the idea that new technologies must be “ethically acceptable, sustainable and socially desirable” (Von Schomberg, 2011: 9). In spite of the increasing consensus on the need to focus on ethical and responsibility issues in innovation research and production, however, there is still lack of clarity in this field about what responsible innovation means and what business and policy implications this concept may concretely lead to. As pointed out by Stahl et al. (2013: 203): “since we have no agreed substantive view of what is good, right, and desirable, RI can be understood as an attempt to give a procedural answer to the question of how to deal with the uncertainties around innovation”.

Specifically, what does “responsible” mean, and who should define and answer this sort of ethical questions? Most of the recent literature on RI emphasizes the interaction and communication between different agents involved in the production and diffusion of new technologies, but this research has so far had a dominant focus on the role of technology experts – such as producers, advanced users and policy makers. It is this type of agents on the supply-side that provide the knowledge base to carry out technology assessment, foresight and other related methods to shape innovation activities towards responsible trajectories.

Our project is motivated by the idea that, although technology experts provide an invaluable point of view, a comprehensive evaluation of the socio-economic effects of new technologies and their ethical implications has to be bottom-up based and start from the individuals who use these advanced technologies in their everyday life. It is first and foremost the individual users of advanced technologies that experience their effects, both in terms of increased welfare as well as possible risks.

“Careful consideration is thus required of the *status quo* as experienced by the people, the level of disruption or disorientation likely brought about by the change and the likely ramifications from adopting the change. The perspective of the public is essential as it is they who are to be steered, and so it is things *as they are seen by the public* that are the object of the enquiry. (...) The technology expert alone is not likely to be well equipped to discern the relationship between a technological change and its every ramification in terms of a way of life. It is there that the perspectives of social actors are required as it is these perspectives that inform what a change in technology *means*. (Rainey and Goujon, 2011: 50-51).

Shifting the focus from the production of innovation to the individual users’ side, and rooted in a “non-consequentialist individual responsibility” philosophical view (Grinbaum and Groves, 2013), this project intends to develop a brand new line of research in the responsible innovation literature. The key idea of this project is that what responsible innovation is must be defined by

investigating how new technologies affect individual users' *subjective well-being* – or *happiness*. This provides a new, still unexplored, bridge between responsible innovation, on the one hand, and happiness research, on the other.

Inspired by classic utilitarian economists such as Jeremy Bentham and John Stuart Mill, a strand of happiness research has recently flourished in the social sciences. In this literature, “happiness” and “well-being” are not meant to indicate feelings of temporary pleasure or euphoria, but rather stable assessment that individuals give of their own life satisfaction and quality of life (Layard, 2005). Experimental evidence and psychological research show that people do indeed experience happiness (or unhappiness) feelings; that these are measurable experiences, which are comparable across individuals. Measures of subjective well-being (SWB) and happiness are also well documented by large-scale surveys such as the World Value Survey and the European Social Survey, which report, among others, measures of individuals' perceptions of their happiness and life satisfaction (Dolan et al., 2008; MacKerron, 2012). The main endeavor of the happiness literature is to investigate the socio-economic characteristics that explain differences in subjective well-being and happiness across individuals, social groups and countries. Surprisingly, however, happiness research has never taken into consideration the role of advanced technologies and how these may shape SWB through positive effects as well as new risks (Castellacci, 2013).

### ***Do ICTs increase happiness?***

We build up this bridge between RI and happiness research by focusing on one of the central technological paradigms of our time: Information and Communication Technologies. ICTs have in the last few decades transformed substantially several aspects of our everyday life, enabling a terrific progress for human beings both at the workplace and as individual consumers, agents and citizens. More recently, emerging ICTs trajectories – social networks, the Internet of things, robotics and artificial intelligence, neuroelectronics and bioelectronics, cloud computing – provide formidable opportunities, while at the same time their development path are still uncertain and they inevitably open up new ethical questions (Stahl et al., 2013).

Most recent research on RI and ICTs have so far focused on privacy and data protection issues, since some of the emerging ICT trajectories noted above enable the storing and processing of large amounts of personal information, thereby threatening the users' privacy (Von Schomberg, 2011). For instance, the well-known projects ETICA and FRRICT have recently undertaken an analysis of ethical questions in ICTs focusing on experts' perceptions and opinions. However, as noted by (Rommetveit, 2011: 79-80), “privacy and data protection are not sufficient tools for governance of ICTs. (...) ICTs and responsible innovation must be seen in the broadest possible terms, taking into account issues of social justice, distribution and sharing of resources, access to information and political decision-making”.

The breadth and complexity of ICTs and the pervasiveness of their effects on individuals' welfare and well-being call for a threefold effort, which our project will carry out. The first is to build up a broad, holistic and multidisciplinary framework taking insights from innovation studies, STS, economics and psychological approaches. The second is that, at the same time as pointing to the possible risks posed by emerging ICTs, a SWB-focused perspective also leads to emphasize the amazing achievements and welfare effects that ICTs have for human beings, thus leading to a more balanced discussion of ethical aspects broadly defined and not only of negative impacts and potential risks. The third effort to be carried out by this project is to explicitly adopt an international comparative perspective: ICTs effects on individual well-being are highly dependent on the country-specific cultural and institutional context in which agents live, and hence RI research arguably demands for cross-country comparisons between advanced, emerging and less developed economies, taking both a top and a bottom of the pyramid's viewpoint.

## 2. Conceptual framework

The effects of ICTs on individual SWB and happiness are complex and multifaceted. Innovation research has so far only focused on the *indirect effects* of ICTs on well-being – i.e. those mediated by income growth and changing consumption patterns – and almost entirely neglected a set of potentially important *direct* channels. This project’s conceptual framework comprises both indirect and direct effects of ICTs on life satisfaction. This framework is summarized in figure 1.

**Income-mediated effects.** Focusing on economic factors, ICTs shape individuals’ welfare and SWB through income-mediated channels, and specifically via absolute income effects and relative income effects. *Absolute income effects* represent the traditional focus of economics and innovation research. ICTs are typically regarded as general purpose technologies (GPTs), i.e. a constellation of new technologies characterized by two crucial features. First, they are radical innovations, and they therefore tend to have disruptive and long-lasting effects on the dynamics of the economic system. Secondly, their pervasive nature implies that these new technologies may not only drive the growth of ICT-producer sectors, but may also be adopted in many other ICT-using industries (Freeman and Louca, 2001).

Thus, ICTs increase consumption possibilities of individuals for at least four reasons: (1) they lead to productivity and wage growth, which increase the income level of individuals over time; (2) they lower the prices of existing and older products (product competition effect); (3) they increase the quality and efficiency of other consumption goods and services (process innovation); (4) they make available a larger variety of new products (product differentiation). By increasing the real wage and purchasing power of consumers, ICT-related innovations spur consumption patterns and wealth dynamics.

*Relative income effects* do also link innovation to SWB and happiness through income dynamics, but they have so far not been investigated in innovation studies and happiness research. These effects may be related to two distinct factors. The first is due to the fact that subjective well-being depends on the relative income of an individual in relation to her reference group, since individuals rely largely on social comparisons to infer their SWB (Senik, 2005). Innovation will thus increase the relative income of successful innovators and decrease the life satisfaction level of less successful individuals. The net outcome of this process is not easy to determine. It will partly depend on the share of innovators in the market (winners *versus* losers), and partly on the spatial clustering of innovative activities – since the reference group that is considered relevant by an individual is often closely located (e.g. in the same region or sector).

The second type of relative income effect is due to habituation and adaptation mechanisms. An individual’s perceived well-being is among other factors related to the income she expects to earn in the future. Innovation tends to increase the individuals’ expected income in the future, and this can possibly moderate its present effects on happiness. Relative income effects – both through social comparisons and adaptation mechanisms – suggest that, although innovation and ICTs diffusion have increased rapidly in the last decades along with GDP per capita, we should not necessarily expect individuals’ SWB and happiness to follow the same pace and dynamics of economic growth (Easterlin, 1995; Frey and Stutzer, 2002; Clark et al., 2008). It is the complex combination of absolute and relative income effects that explain the dynamics of life satisfaction experienced by individuals in different social groups and national context.

However, this is only part of the story. In addition to the indirect (income-mediated) effects of ICTs on SWB, there exists a set of other potentially relevant channels providing a direct link between ICTs innovation and happiness. Extending previous studies in happiness research, we highlight four main dimensions that are directly relevant to shape life satisfaction and SWB.

**Effects on quality and type of work.** The increasing use of ICTs in the workplace has substantially modified work organization both within each company and in the linkages between firms. Specifically, innovation research shows that, in order to have visible productivity and

profitability effects, ICTs must often be accompanied by organizational innovations. While these changes in the organization of work and the value chain lead to high productivity gains, they may also profoundly shape individual workers' satisfaction, e.g. by affecting their creativity, goals, stress levels and social relationships in the workplace.

**Effects on private life.** In addition to the consumption-related effects noted above, ICTs also improve directly an individual's social life, which is one of the central factors highlighted in happiness research (Layard, 2005). A prime example here is how mobile communication technologies are currently transforming human beings' communication habits. ICT-based communication provide on the one hand greater possibilities for individuals to communicate with their families, friends and social community, while at the same time creating new risks for social groups which are excluded from these new forms of communication, and those that abuse them and progressively substitute them to ordinary face-to-face communication modes.

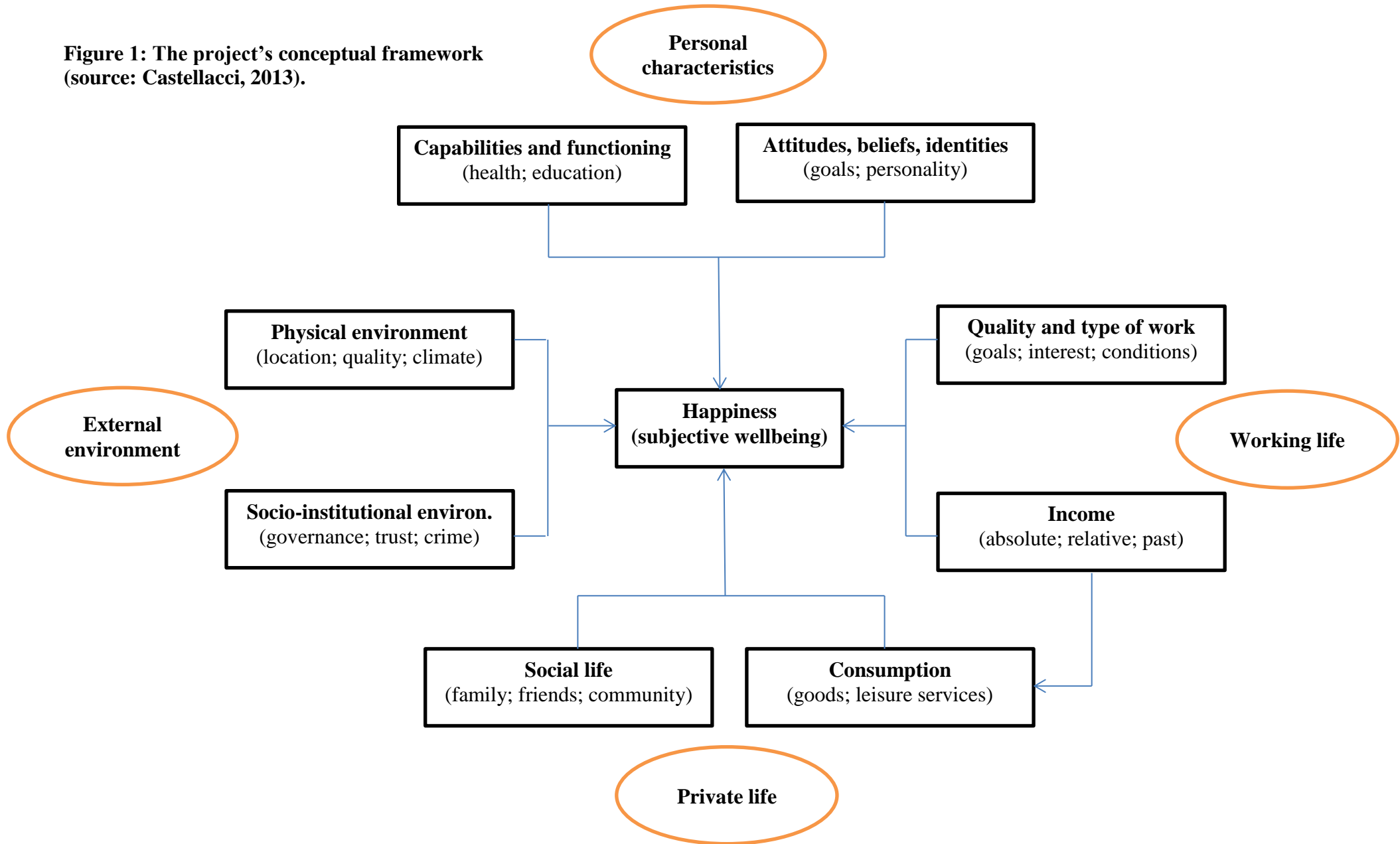
**Effects on personal characteristics.** According to happiness research, life satisfaction is greatly shaped by individuals' framing and personal characteristics, such as capabilities, on the one hand, and attitudes, beliefs and identities, on the other (Dolan et al., 2008). For instance, the use of ICTs in the health sector strengthens capabilities and functioning of sick persons, thus contributing tremendously to their SWB. ICTs use can also shape and affect individuals' attitudes, beliefs and identities, in both positive and negative ways (e.g. TV and new media services; computer games). ICTs have potentially important effects on happiness through both of these channels, although we currently lack theoretical and empirical knowledge to identify these impacts.

**Effects on external environment.** In addition to the individual-level factors noted above, happiness studies indicate the importance of environmental conditions to shape life satisfaction, since these provide the physical frame and infrastructure of agents' everyday life and cognition processes. Two key environmental dimensions are relevant for this project: physical and socio-institutional. On the one hand, ICTs contribute to improve the *physical* environment, e.g. by leading to more efficient transport infrastructures, or by spurring environmental innovations and renewable energy technologies. On the other hand, the application and increasing use of ICTs in the public sector transform and strengthen the *socio-institutional* environment, e.g. by enabling new forms of transparent governance, hampering corruption, and leading to public sector innovation.

Taken together, the set of direct and indirect effects noted here suggest that the relationship between ICTs innovation and happiness is complex and multifaceted. Any specific ICT may have an impact on one of the channels pointed out above, or multiple effects through many of these dimensions. The ICT-happiness relationship could thus be conceptualized and represented through a vector, in which each component defines the effect of a specific technology on one of the effects noted here.

The traditional distinction between radical and incremental innovations does implicitly focus on the absolute income effect only. The framework proposed in this project calls for a new relevant dichotomy: the one between multiple-happiness *versus* single-happiness enhancing technologies, where the former (latter) have effects on several (only one) dimensions shaping individual well-being. In this view, a general-purpose technology would not be a radical innovation with pervasive income effects, as typically defined in the innovation literature, but rather one which leads to multiple increases in individuals' happiness levels and a sustained improvement in their life satisfaction.

**Figure 1: The project's conceptual framework**  
 (source: Castellacci, 2013).



### 3. Planned research<sup>1</sup>

**WP1: Research strategy and framework.** The first workpackage will set up a research strategy and overall framework that will guide the research to be undertaken in the following WPs.

**WP2: Data collection and methodology.** The second workpackage will carry out a data collection effort that will constitute the methodological basis for the empirical research to be undertaken in WP3 to 7.

**WP3: Income-mediated effects: International technology diffusion, catching up and the digital divide.** *How is the rate of ICT adoption related to the happiness level of the population?*

**WP4: Effects on quality and type of work: Telenor's Organization Culture Survey.** *How does the use of ICTs at work affect employees' SWB and life satisfaction?*

**WP5: Effects on capabilities, functions and identities.** *How does the use of ICTs shape individuals' life satisfaction through their effects on personal characteristics such as capabilities, on the one hand, and attitudes, beliefs and identities, on the other?*

**WP6: Effects on social life and communication patterns.** *How do new forms of ICT-based communication and social life affect individuals' SWB?*

**WP7: Digital infrastructures, environment and welfare.** *How do ICTs shape life satisfaction of citizens through changes in the environment?*

**WP8: Towards a responsible innovation policy.** This concluding workpackage will build up a summary overview of the main results of the empirical research carried out in WPs 3 to 7, and analyze the implications of these results for ICT's policy as well as innovation policy more broadly.

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<sup>1</sup> The extended version of this section of the document is not reported here and it is available upon requests from the project coordinator.

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