

Framework for Responsible Research and Innovation in ICT

	Process Speed of innovation and diffusion	Product Ubiquity and pervasiveness Applied and fundamental research	Purpose Logical malleability	People Problem of many hands
Anticipate (Opportunities)	Is the planned research methodology acceptable? Lab health & safety Ethical approval/Informed consent Risk assessment Methodology Data management plan	Will the products be socially desirable? Foresight Vision assessment Scenarios How sustainable are the outcomes? Materials Green ICT Energy	Why should this research be undertaken? Addressing grand challenges Economic growth Social need Scientific curiosity Extended impact statement	Have we included the right stakeholders? Principles of stakeholder engagement (Sciencewise & BScienceAssoc)
Reflect (Considerations)	Which mechanisms are used to reflect on process? Advisory board Internal workshop 'Stage-gating' 'Midstream modulation' Sociotechnical integration Backcasting / Hindsight Alternatives: How could you do it differently?	How do you know what the consequences will be? Systematic evaluation of technologies in situ What might be the potential use? Intended and unintended Misuse cases What don't we know about? Blind spots Ethical prototyping How can we ensure societal desirability? Privacy by design Ethics by design Alternatives: How could you do it differently?	Is the research controversial? Ethical Social Political Alternatives: How could you do it differently?	Who is affected? Who might care? Who benefits? Who is in control? Who will decide? Who will take responsibility if things go wrong? What is the gender balance in the project? Alternatives: How could you do it differently?

Engage (Alternatives)	How to engage a wide group of stakeholders? Identify stakeholders Participatory processes Process evaluation	What are viewpoints of a wide group of stakeholders? Public engagement mechanisms Prototype / demonstrator evaluation (public)	Is the research agenda acceptable? Public engagement mechanisms	Who prioritises research? Public engagement mechanisms For whom is the research done? Public engagement mechanisms
Act (Capacities)	How can your research structure become flexible? Agile project management Document emerging perspective, views and norms Recalibrating the vision of the project What training is required? Research integrity Research management Skills and methods in public engagement Data management What infrastructure is required? Departmental ethics committee capable of addressing ICT concerns Funding for engagement activities Tools to support the ICT community Database of project 'lessons-learned'	What needs to be done to ensure social desirability? Create incentives for thinking about research outputs Encourage appropriate development approaches What training is required? Understanding of regulation What infrastructure is required? Accessible participatory tools and methods Open access to data and publications	How do we ensure that the implied future is desirable? Consider implied future state at project/programme inception What training is required? Understanding of ELSI Understanding current debates and controversies What infrastructure is required? Reflection on purpose part of funding mechanisms Reflection on purpose part of project evaluation criteria	Who matters? Stakeholder participation What training is required? Contextualise projects as sociotechnical What infrastructure is required? Community building Leadership council Champions / Advocates Science education to allow the public to engage intelligently