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