

# Framework for Responsible Research and Innovation in ICT

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

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