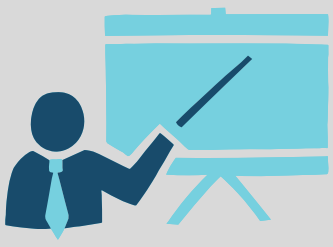
DISTINCT

Disruptive Technologies Transforming Northern Periphery and Arctic Communities

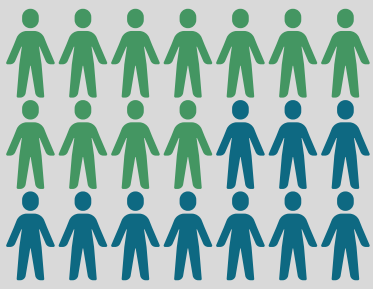
BEST PRACTICES RECOMMENDATIONS FOR DISRUPTIVE TECHNOLOGIES-DRIVEN PUBLIC SERVICES

Health and social care

Environmental management



Education and Training



All

Based on the work carried out by the DISTINCT partnership:

ERNACT

Karelia

UMEÅ UNIVERSITY

Northern Periphery and Arctic Programme 2014–2020

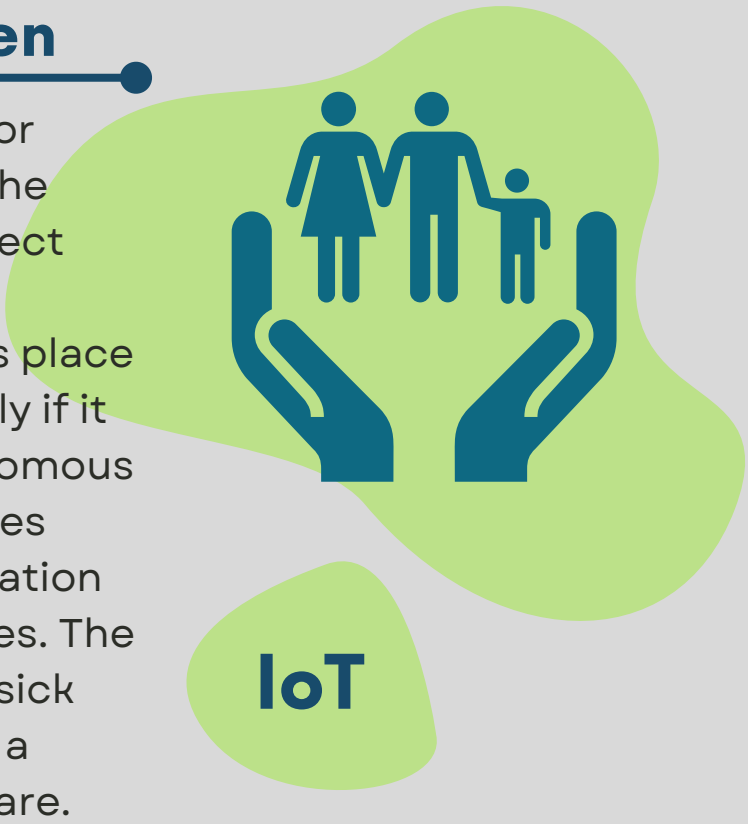
EUROPEAN UNION

Investing in your future
European Regional Development Fund

Recommendation 1

Awareness Raising About the Existing Expertise and its Potential Application

Drones and Good Care - Västerbotten, Sweden



IoT

"Tomorrow's carrier pigeons for good and close care - first in the countryside" is a Swedish project whose purpose is to enable a change in how transport takes place in health care. More specifically if it is possible to introduce autonomous and electrically powered drones together with IoT in daily operation to carry samples and medicines. The background is that caring for sick elderly people in rural areas is a difficult challenge for healthcare. But by connecting virtual health rooms in sparsely populated areas with hospital cabins or hospitals, examination, sampling and medication can be done as if the patient were in the hospital.

Monitoring the Sewer System in Real Time - Västerbotten, Sweden

IoT

In Sweden Vakin, the sewer company owned by Umeå municipality, have set up a project together with the company Flow Below to test the usefulness of IoT. They have placed around 180 sensors measuring leakage in the sewer system in one city district in Umeå. The sensors are wired to the LoRa-net which means that Vakin can monitor data continuously from the sewer system in real-time.

Recommendation 1

Awareness Raising About the Existing Expertise and its Potential Application

Hidden City of Pipes - Norrbotten, Sweden

In Sweden, the company CGI has set up a project, Hidden City together with Kiruna municipality. Hidden City uses data on the exact specifications of pipes in conjunction with a precision GPS that relies on satellite systems to keep track of what types of pipes are laid and where. The data is put in nto the HoloLens and projected onto a grid on the ground. This helps visualize what is underground without actually having to dig. The technique of adding images to reality through HoloLens makes it possible to visualize, for example, water or power lines underground. In Hidden City CGI and Kiruna municipality produces prototypes and demonstrators to show the potential of the XR technology.

VR/AR

AR Development Courses in Karelia UAS - North Karelia, Finland

In Karelia University of Applied Sciences' media programme there are AR development courses.

VR/AR

AI Courses at Umeå University - Västerbotten, Sweden

During the last three to four years Umeå university has developed a number of AI courses, including a Master´s programme in Artificial Intelligence. The courses include, among others, AI and business development, AI methods and application, Machine learning, Desing of interactive intelligent environments and Interactivity in smart environments.

AI

Recommendation 2

Closer Collaboration Between Universities, Research Centres, Companies, Public Sector and Community

SENDOC - Wearable Technology Testing - North Karelia, Finland

Wearable technology testing was carried out in the SENDoc project. It is an example how how Siun sote and Karelia works closely together, and how Siun sote takes advantage of the NPA-project.

IoT

Measure Probes in Wood Constructions - North Karelia, Finland

In Finland, the wood construction is one of the focus area in Karelia UAS. One of the R&D topic related to wood construction is digitalization in the construction sector - for example a new 14-storey wooden apartment building Joensuu Lighthouse. The outer walls of the building have been equipped with measure probes which measure temperature and humidity from the different layers of the wall structure.

IoT

HUMANEAI-NET a Network of Centres of Excellence Within AI - Västerbotten, Sweden

In Sweden HUMANEAI-NET brings together top European research centres, universities and key industrial champions into a network of centres of excellence that goes beyond a narrow definition of AI and combines world-leading AI competence with key players in related areas such as HCI, cognitive science, social sciences and complexity science.

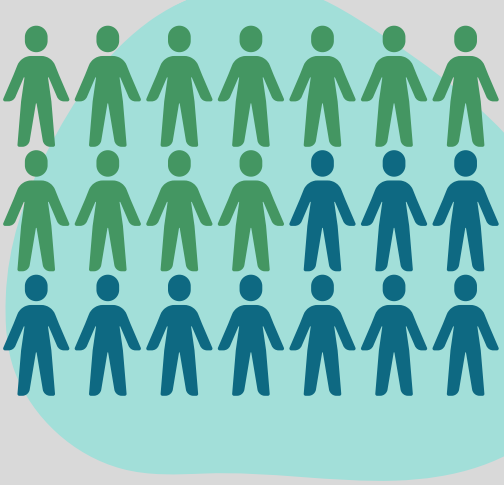
AI

Recommendation 2

Closer Collaboration Between Universities, Research Centres, Companies, Public Sector and Community

University-Public Sector Collaboration Around IoT - Donegal, Ireland

In Ireland, Letterkenny Institute of Technology (WisarLab) works closely with Donegal County Council in the definition of new services supported by IoT technologies (i.e. traffic management, flooding prevention



Disruptive Technologies Innovation Fund (DTIF) - Ireland

In Ireland, the national government launched in 2018 the Disruptive Technologies Innovation Fund (DTIF) that will see investment in the research, development and deployment of disruptive technologies and applications on a commercial basis. Broadly, projects must include the use of disruptive technologies that will significantly alter the way we work and live, involve collaboration, innovation and/or be disruptive in its impact on one of the sectors in the competitively-funded Research Priority Areas designated by Government, i.e. ICT; Health and Wellbeing; Food; Energy, Climate Action and Sustainability; Manufacturing and Materials; Business Services and Processes. Within each of these six themes they have identified specific priority areas such as Robotics, Artificial Intelligence, Augmented and Virtual Reality, Advanced and Smart Manufacturing, and Smart and Sustainable Food Production and Processing. The DTIF is about exploiting research to deliver new technologies and new solutions. The Fund will drive collaboration between Ireland's world-class research base and industry as well as facilitating enterprises to compete directly for funding in support of the development and adoption of these technologies.

Recommendation 3

Skills Provision

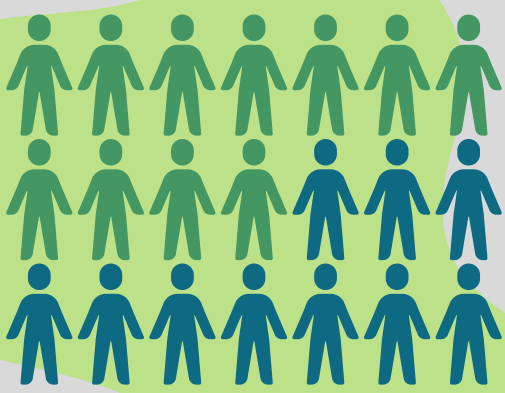
AI

AI Courses for Professionals - Västerbotten, Sweden

Together with AI Competence Sweden Umeå University offers introductorily AI courses for professionals in both industry and public sector. The courses include, among others, AI for industry: Reasoning and decision making, Ethical, social, legal and cultural aspects of AI and AI for industry: Machine learning.

Msc in Leadership & Innovation in the Public Sector - Donegal, Ireland

In Ireland, Letterkenny Institute of Technology runs the Master of Science (Msc) : Leadership & Innovation in the Public Sector which aims to deliver a range of learning experiences that empower participants to develop their knowledge, understanding and applied skills in the field of innovation and transformational change within the delivery of public services.



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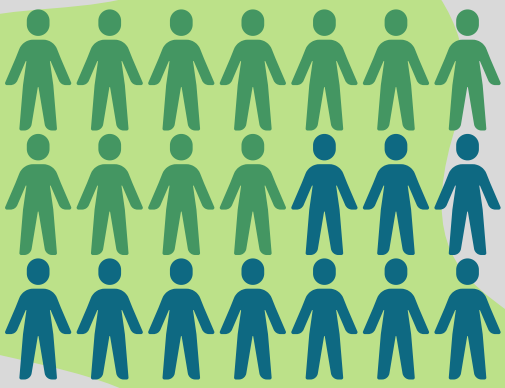


AI

Elements of AI Courses - Finland

Elements of AI is an online course made by Reaktor and the University of Helsinki, where all EU citizens can acquire basic understanding of Artificial Intelligence. This was an initiative by the Finnish Presidency aiming to respond to the challenges posed by the transformation of work and to reinforce the digital leadership of the EU.

Recommendation 4

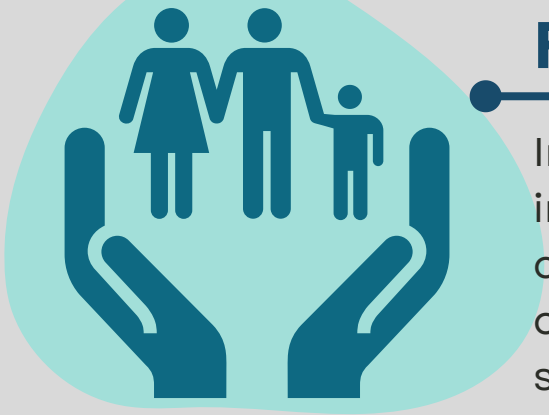
Early Adopters/ Local Champions

Artificial Intelligence Chatbots - Northern Ireland and Sweden

In Northern Ireland, Derry and Strabane District Council is using AI conversational chatbots to provide meaningful information to their citizens on how to go for a zero-waste district. The Region Västernorrland in Sweden, is using AI conversational chatbots to support energy advisors in their task to provide information to citizens and business to become more energy efficient.

AI

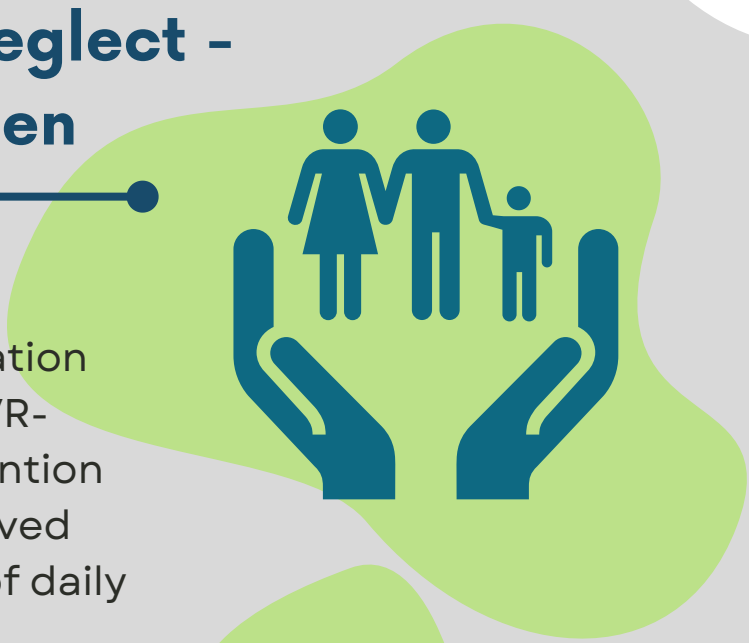
AI Services to Home Care and Nursing Home Clients - Finland



In Finland Gillie.AI is an artificial intelligence service enabling preventive care of home care and nursing home clients. It collects data on the care systems, patient health record systems and any devices the patients may use, analyses the data with artificial intelligence looking for weak signals in changes in the client's well-being and health, and alerts of potential deviations.

AI

VR-Method for Rehabilitation of Neglect - Västerbotten, Sweden

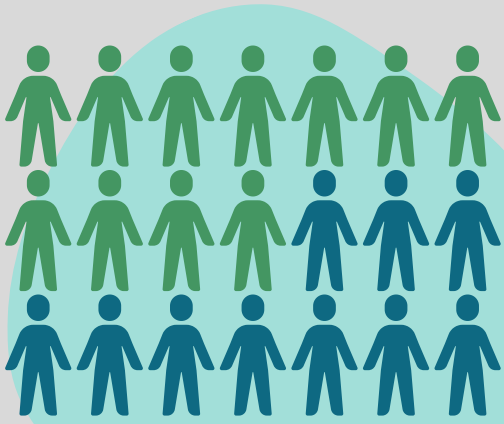


In Sweden the company Brain Stimulation has developed a method, RehAtt™ for rehabilitation of neglect. Training with this VR-method improved spatial attention and showed transfer to improved spatial attention in activities of daily living in chronic neglect. Brain Stimulation's results are promising and has been acknowledged by internationally leading scientists. However, RehAtt™ still needs more testing before taken into use in health care.

VR/AR

Recommendation 4

Early Adopters/ Local Champions



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Pre-Commercial Procurement of Innovation - Ireland

In Ireland SBIR (www.sbirireland.ie) is a mechanism which enables public sector to connect with innovative ideas and technology businesses to provide innovative solutions for specific challenges.

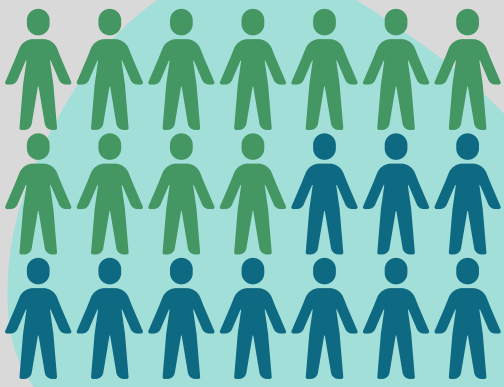
SBIR's aim is to drive innovation across all sections of the Irish Public Sector via robust engagement with technology rich companies and organisations, through competitive challenges. SBIR itself is underpinned by a sharing of both risks and benefits between Contracting Organisations and Suppliers.

SBIR falls under the category of pre-commercial procurement (PCP). PCP as defined by the European Union, involves the purchase of research by a Government entity, which is undertaken with the objective of stimulating innovation that the contracting authority or some other party may benefit from at a later stage, when goods or services are not currently available or developed from the outcomes of the research.

This an interesting model for public sector to become early adopter of disruptive technologies.

Recommendation 5

Revision of Digital Strategies That Take Into Account the Potential of Disruptive Technologies



Room for Improvement

This is an area with a lot of room for improvement. It is becoming difficult to identify strategies that include specific focus in the use of disruptive technologies in public services provision.

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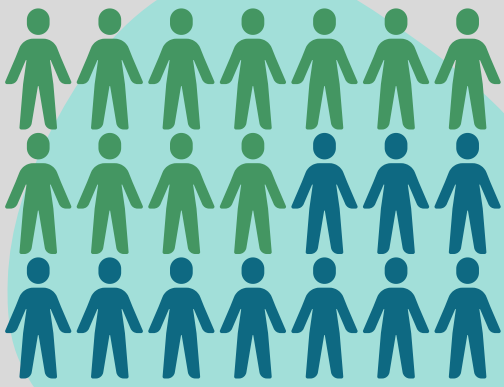
Recommendation 6

Make Aware and Open Up Existing Testbeds and Labs for Disruptive Technologies



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Things Connected IoT Testbed - Ireland

Things Connected, Northern Ireland
Things Connected is a national programme supporting Internet of things (IoT) development. A consortium of local government authorities in Northern Ireland, led by the Ulster University, has partnered with digital catapult to establish the free to use network for experimenting and prototyping in the region.

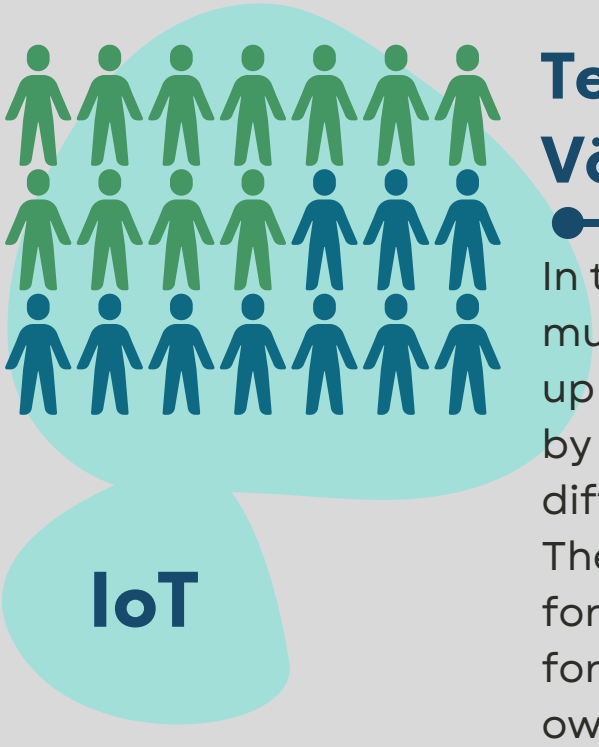
Access to the IoT network connectivity and hosting platform, breaks down barriers to technology adoption for start-ups and small businesses, de-risks innovation for enterprises and uncovers new commercial applications for digital technology in the fields of immersive, connectivity, data and artificial intelligence.

The consortium ‘Things Connected NI’ run a challenge programme in 2018 where NI SMEs were invited to explore a number of urban and rural challenges which could be addressed using IoT Sensor technologies.

The key objectives of this project are to:
• To implement a Lorawan IoT (Internet of Things) technology across most of Northern Ireland
• To stimulate the innovator community and raise awareness of the Things Connected IoT network for experimentation, prototyping and testing
• To support local companies to undertake R&D, to prototype and create IoT solutions, and to scale up business

Recommendation 6

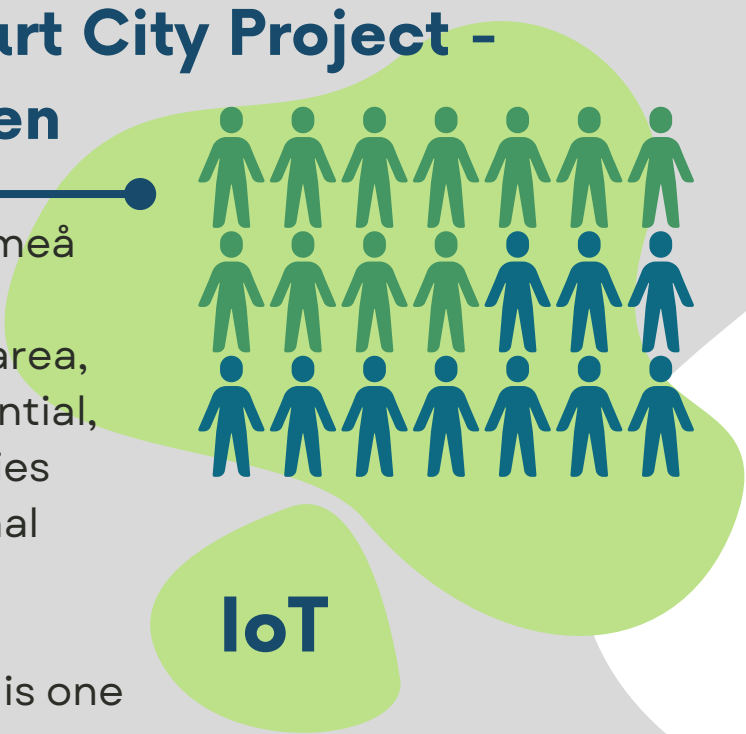
Make Aware and Open Up Existing Testbeds and Labs for Disruptive Technologies



Testbed for IoT Solutions - Västerbotten, Sweden

In the city of Umeå Umeå Energi, the municipality's energy company, has set up a LoRaWAN network that can be used by both industry and public sector to test different IoT solutions in different areas. The LoRaWAN network is a large testbed for IoT solutions and is used as such by for instance Vakin, the sewer company owned by Umeå municipality.

Ruggedised – A Smart City Project - Västerbotten, Sweden



In the project RUGGEDISED, Umeå municipality has developed a testbed at the University city area, which includes a mix of residential, academic and research facilities from two universities, a regional hospital, and community, recreational and commercial buildings. The neighbourhood is one of the least car-dependent neighbourhoods in Umeå. Amongst the smart solutions implemented on the testbed are solutions focusing on peak load variation management, shared use of energy and a smart, open- data city decision platform

Recommendation 6

Make Aware and Open Up Existing Testbeds and Labs for Disruptive Technologies

AI/AR

Testbed for eHealth - Västerbotten, Sweden

The testbed e-Health labs provide opportunities to test future digital tools for preventing diseases, increase wellbeing and diagnose and treat different medical conditions. It will to large extent be based on new technology such as artificial intelligence (AI) and interaction technologies that bridges distances and borders between physical and digital environments. New technology is developed and tested in laboratory environments, where co-creation and participatory design methods are applied. The available technology infrastructure includes humanoid robots, tele-presence robots, technology for augmented reality, and a research and innovation platform for rapid prototyping of knowledge-based applications.