Midlands IRELAND

Midlands ICT Cluster Action Plan
TO 2027

Contents

Introduction

The Midlands Region consists of four counties, Laois, Offaly, Longford and Westmeath and is located in the central area of Ireland.

While the region is rural there is a natural balance in population across its main population centres Portlaoise (population: 22,050), Athlone (population: 21,349), Mullingar (population: 20,928), Tullamore (population: 14,607), Longford (population: 10,008). The Midlands is home to 292,301 people (2016). There is a relatively low population density (46 people/km²) with a relatively young well educated population. The economic landscape of the Midlands Region has increasingly been transformed by the growth of Foreign Direct Investment (FDI), indigenous companies and national investment in high technology industries such as ICT (Information and Communications Technology), advanced manufacturing and financial services creating a critical mass of economic activities around these sectors.

The region has a long tradition of global leadership in ICT communications and internet technologies driven by the long established presence of Ericsson in Athlone (Ireland's largest software centre), indigenous technology companies and academic leadership in undergraduate teaching, research and innovation at Technological University of the Shannon (TUS) Athlone. Global economic development is driven by Digital Innovation delivering new innovative products and services across industries such as advanced manufacturing, food and drink, financial services, agriculture and energy.

The ICT Sector is recognised as an area of Smart Specialisation within the Midlands Regional Enterprise Plan (MREP) to 2024. As a key action of the MREP, the Midlands Communications and Technology Community together with the regions academic, public and private sector stakeholders has established a regional Midlands ICT Cluster to 'embrace all elements of the ICT industry' towards economic growth and to achieve the optimal potential from ICT for enterprises and people within the region. This is in line with both the National Smart Specialisation Strategy for Innovation 2022-2027, and the national prioritisation of regional clustering (Government of Ireland White Paper on Enterprise 2022 – 2030), to deliver a dynamic, connected and trust-based ICT cluster across the Midland Region. There are a number of other national policies that are supported by the vision of the Midlands ICT Cluster, these are outlined later in this Action Plan.

The development of clusters has been a key European instrument for regional economic development for the last 25 years. There are approximately 3,000 clusters located across Western Europe. Clusters account for almost 25% of total EU employment. A recent review of the operations of European clusters by an expert group reaffirmed the capacity of clusters to successfully drive change and make European value chains more resilient especially during Covid-19. Clusters are proven to strengthen enterprises, especially SMEs, improve their competitiveness, innovation capacity and capability, technological uptake, skills and internationalisation as well as accelerating and embedding Digital Innovation at regional level.

This Midlands ICT Cluster Action Plan is a response to a Request for Quotation developed by the Midlands ICT Cluster with the objective to:

- **Identify and document international best practice in the design and operation of clusters.**

- **Identify case studies of successful regional ICT clusters which can inform the implementation and operation of the Midlands ICT Cluster.**

- **Assess the region's current strengths, weaknesses, opportunities and threats (SWOT) in relation to developing an ICT cluster in the Midlands.**

- **Engage with the Midlands ICT Cluster Steering Group and associated working groups to develop an action plan.**

The overall process to achieve the required outcome followed established best practice in considering a vision, objectives, principals, smart specialisation and ultimately an action plan for the Midlands ICT Cluster.

Central to the process was close engagement and collaboration with the existing Midlands ICT Cluster Steering Group, and its themed focused Working Groups. [1]

These Working Groups (WG) brought to the table a diverse and expert set of committed regional stakeholders from across public (including enterprise agencies) and private sectors (including large and small enterprises) and academia.

Through this process the vision for the Midlands ICT Cluster emerged:

To be Europe's leading ICT cluster in Digital Innovation, creating opportunities for people and business in regional growth sectors, driving knowledge creation, sustainability and resilience.

The focus on digital innovation grounds the ICT Cluster on the ultimate value of digitalisation, which is in its application, ensuring that the full potential of ICT can be realised for enterprise and society in the region.
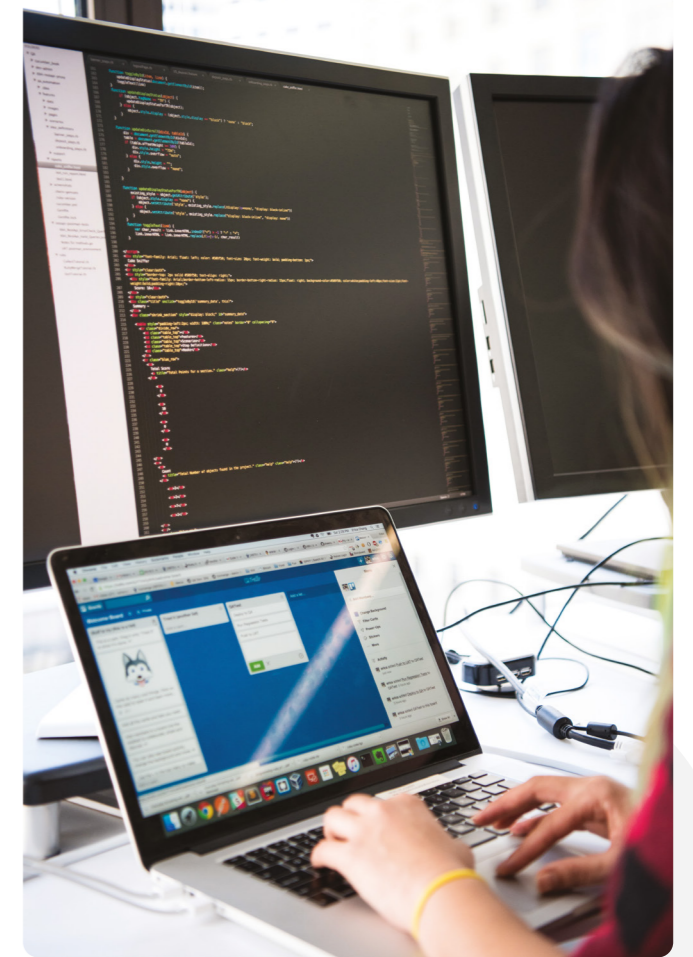
This vision is the cornerstone of the Midlands ICT Cluster Action Plan. This Midlands ICT Action Plan is ambitious towards the realisation of an effective and leading ICT cluster, and comes with a huge level of existing commitment from regional stakeholders. The actions are set out in a way, and at a level, that are strategic yet practical. Paramount to the success of this Action Plan is the collaborative and co-ordinated approach to its implementation, including monitoring, measuring and enhancing the plan to ensure that its vision and goals for the Midlands Region are realised.

In this regard it is critical that this is carried out by a dedicated, and full time, Cluster Development Team that is adequately funded and resourced, a team that will co-ordinate and manage the cluster in achieving its goals, this is essential to the success of the cluster.

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[1] *See Appendix 1 for membership of Midlands ICT Steering Group and Working Groups*

Objective of the Report

The Midlands ICT Action Plan is a set of co-ordinated actions for the already established Midlands ICT Cluster Steering Group and associated working groups, actions that have been aligned to European, national and regional policy context, informed by international best practice in terms of ICT cluster development (case studies), and a stakeholder centric SWOT analysis of ICT in the Midlands Region.

These actions will move the Midlands ICT Cluster towards its vision to be a leading ICT cluster in Digital Innovation, on a journey framed by the agreed Principals, Objectives and Smart Specialisation of the Midlands ICT Cluster.

A key overall goal of the Midlands ICT Action Plan is to enable deep collaboration across academia (including Technical University Shannon (TUS)), industry, enterprise agencies and the Local Enterprise Offices (LEOs), and the research and business communities in support of the cluster's vision. In doing so, support people and their careers in the region, existing Midlands' companies of varying sizes, and also to serve to position the region as an ideal location for ICT companies to establish (including second site location) and grow their business.

This Midlands ICT Action Plan has been developed in consultation with members of the Midlands ICT Cluster Steering Group and Working Group members, and includes the following:

- **Enterprise policy context including National Smart Specialisation Strategy**

- **SWOT analysis of the current ICT ecosystem, including for LEO clients and emerging companies and their pathway to development and the supports available for the ICT sector in the Midlands Region**

- **Identification of the skills gaps that exist and propose how to address the gaps identified**

- **Awareness raising and peer learning of existing career pathways and supports available**

- **International case studies of best practice**

- **Identification of actions for the future development of the Midlands ICT Sector in the region aligned to the established Working Groups of the cluster:**
  1) **Cluster Development Working Group**
  2) **Marketing Working Group**
  3) **Skills & Talent Working Group**
  4) **R&D, Collaboration and ICT Eco-system Working Group**

Enterprise Policy Context

White Paper on Enterprise 2022–2030 [2]

The recently published Government of Ireland White Paper on Enterprise 2022–2030 sets out an overarching approach and ambition for an enhanced role for clustering as a part of Ireland's enterprise policy toolkit to sustain competitive advantage in areas of strength and exploit new opportunities. This will be implemented through a centrally coordinated and cross-Government approach with a target to have 5 national cluster organisations funded under a new National Clustering Programme by 2025.

The Midlands ICT Cluster is proposed within this policy context and has the ambition to be one of the envisioned 5 national cluster organisations.

Smart Specialisation [3]

In July 2022, the Department of Enterprise, Trade and Employment launched an updated Smart Specialisation Strategy (S3) for Ireland, covering the period to 2027, and embracing a regional approach to addressing Ireland's Research, Development and Innovation (RD&I) challenges.

Smart Specialisation is an innovation policy concept that aims to boost regional enterprise innovation, contributing to growth and prosperity by helping and enabling regions to focus on their strengths.

Within the Midlands Region an entrepreneurial development process was undertaken through extensive regional stakeholder consultation during the development of the MREP Midlands Regional Enterprise Plan to 2024, with ICT identified as an area of Smart Specialisation (S3) for the Midlands.

The Midlands ICT Cluster, and corresponding Action Plan, is perfectly aligned to this national strategy and the need for a place-based approach to focus innovation investment in carefully chosen specialisations, and where the impact can be greatest. The approach involves thoroughly assessing economic, higher education and other innovation assets to identify and select a limited number of priority areas for knowledge-based investments, focusing on a region's strengths and comparative advantages.

Midlands Regional Enterprise Plan [4]

The Midlands Regional Enterprise Plan to 2024 identified ICT as an area of Smart Specialisation and Digitalisation for the Midlands Region. This is a firm basis for development of the Midlands ICT Cluster and this ICT Cluster Action Plan.

REGIONAL ENTERPRISE PLAN
MIDLANDS

STRATEGIC OBJECTIVES SUMMARY

1 Supporting the Midlands in its transition to a climate neutral economy
2 Capitalising on strengths of the Midlands through Smart Specialisation and Digitalisation
3 Positioning the Midlands as the destination of choice to live, work, visit, invest and learn

Rialtas na hÉireann
Government of Ireland

[2] https://www.enterprise.gov.ie/en/publications/publication-files/white-paper-on-enterprise-2022-2030.pdf
[3] https://enterprise.gov.ie/en/publications/national-smart-specialisation-strategy-for-innovation-2022-2027.html
[4] https://enterprise.gov.ie/en/publications/publication-files/midlands-regional-enterprise-plan-to-2024.pdf

Future Jobs Ireland [5]

The Midlands strategic ICT message is consistent with the Future Jobs Ireland report (2019) which is explicitly clear on, and gives greatest priority towards, ICT and its future importance and impact on our businesses and economy.

"..technology continues to herald new ways of doing business and new economic opportunities."

"..rapidly adopting new technologies to boost productivity & ensure that Ireland continues to be competitive internationally."

The Midlands ICT Cluster aligns to all five pillars identified within this report to build resilience into the Irish economy:

Pillar 1: Embracing digital innovation and technological change.

Pillar 2: Improving SME productivity.

Pillar 3: Enhancing skills and developing and attracting talent.

Pillar 4: Increasing participation in the labour force.

Pillar 5: Transitioning to a low carbon economy.

Project Ireland 2040 – National Planning Framework.
National Strategic Objective 3: National Strategic Objective of Strengthened Rural Economies and Communities.

The Midlands ICT Cluster directly supports the National Strategy and the Regional Spatial and Economic Strategy, towards 'helping to diversify employment opportunities in rural areas, supporting the development of rural communities and improving their quality of life'. The development of the Midlands ICT Cluster aims to strengthen the local rural economy by providing sustainable, graduate employment opportunities in the Midlands. The Midlands ICT Cluster will help sustain and strengthen the economy of the four counties in the Midlands Region and it will provide support for new opportunities for higher value-added employment within this region and create an attractive and supportive cluster environment for new and emerging enterprises.

The Midlands ICT Cluster is an important contributor within this framework as a key strategic asset that presents opportunities and challenges as outlined in this Midlands ICT Cluster Action Plan.

The Midlands ICT Cluster is a clear example of an action to achieve:

National Policy Objective 16:
Target the reversal of rural decline in the core of small towns and villages through sustainable targeted measures that address vacant premises and that deliver sustainable reuse and regeneration outcomes.

National Policy Objective 21:
Enhance the competitiveness of rural areas by supporting innovation in rural economic development and enterprise through the diversification of the rural economy into new sectors and services, including ICT-based industries.

[5] https://enterprise.gov.ie/en/publications/publication-files/future-jobs-ireland-2019-first-progress-report.pdf

Methodology applied to regional assessment and output determination

Methodology applied to regional assessment and output determination

The methodology used to perform the SWOT analysis on the preparedness of the Midlands region to develop and implement an ICT Cluster was based on the internationally tried and tested CRIPREDE Regional Analysis Methodology©.

The detailed methodology to achieve the Midland ICT Cluster Action Plan was as follows:

Agreement on project parameters with the Midlands ICT Cluster Steering Group:

Developing an ICT Cluster is not an easy task. Developing such clusters is a complex process. An underlying fault-line in developing clusters is the general lack of understanding, awareness of and commitment to the process of developing such a cluster. Therefore, an initial step in the process was to have clarity of understanding and agreement on outputs between the consultant team and the Midlands ICT Cluster Steering Group.

Identify the industry stock currently involved in ICT:

The focus here was on identifying first of all the major enterprises that are involved in the generation and propagation of ICT solutions, both in the domestic and international domains, in the Midlands Region. The analysis did not consider ICT users, it considered the innovators, developers and providers. The idea was to provide a benchmark of the ICT capability in the region.

Identify the depth and breadth of the Midlands region ICT ecosystem:

This activity involved identifying all the stakeholders that are, or should be, involved in the process of developing a comprehensive, healthy, expansive and sustainable ICT Cluster in the Midlands region. The activity included identification of the academic knowledge development and application capability and pathways for the development of new products and services by regional SME's in particular.

Perform SWOT analysis [6] of the Midlands Region in relation to ICT activities and the development of an ICT cluster in the Midlands region:

This activity involved
(i)   defining a protocol to perform the SWOT analysis;
(ii)   identifying and reviewing sources of secondary data;
(iii)   identifying and engaging with key informants; and
(iv)   performing the SWOT analysis.

A graphical representation of activities required to develop an effective creation and operation of an ICT Cluster in Figure 1.

A key part of the development of the Midlands ICT Cluster Action Plan was the evaluation and validation of the Midlands ICT Cluster's vision, objectives, principles and smart specialisation.
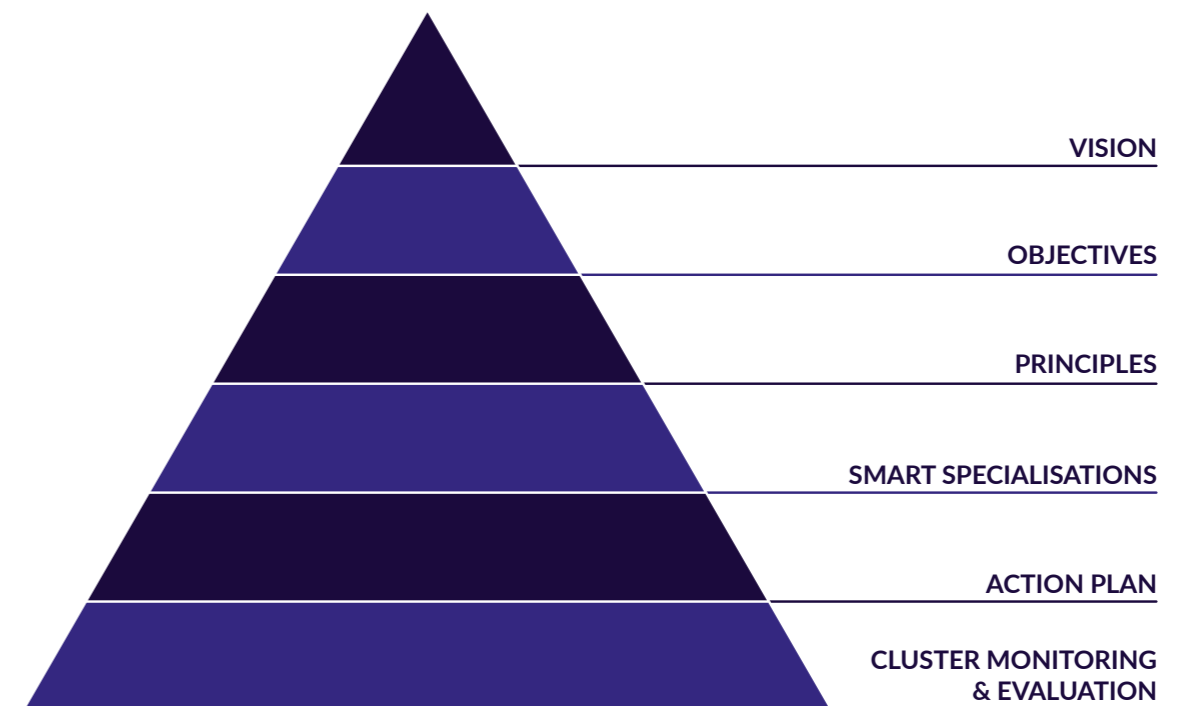

Figure 1. Steps in the SWOT analysis process leading to the Midland ICT Cluster Action Plan

Outputs from the SWOT analysis of the Midlands ICT Clusters included, in the first instance, its Smart Specialisation based upon which the vision, objectives and principles of the combined collaborative Working Groups could be articulated. These are key anchors for the development and implementation of the Action Plan.

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[6] *The template and methodology used for the SWOT was the internationally tried and tested CRIPREDE Regional Analysis Methodology©.*

Presentation of initial SWOT findings in an Interim Report:

Before finally concluding the SWOT analysis and commencing the development of the Action Plan there was an Interim Review session with the Midlands ICT Cluster Steering Group. The purpose of the Interim Review was to:
(a) present preliminary results of the SWOT to the Steering Group;
(b) for the consultant team to receive additional insights from the Steering Group; and
(c) to agree the next steps in the process of developing the Midlands ICT Action Plan.

Continuation and reiteration of SWOT analysis:

Based on the feedback from the Steering Group, the SWOT analysis was continued, with the Working Group Chairs addressing any gaps or additional requirements based on the Interim Report.

Selection and review of a number of comparative international clusters for review and analysis:

Performing a SWOT analysis and developing an Action Plan in isolation of an awareness of international good practices can be a "pathway to nowhere". Therefore, a good number of comparative regions were assessed and three were selected for further analysis and benchmarking upon which to correlate the Midland Region's assessment of its preparedness to implement a sustainable ICT Cluster. This comparative analysis, along with the SWOT analysis, set the foundation for developing an Action Plan to implement an ICT Cluster in the Midland Region.

Preparation of Action Plan:

Based on the SWOT analysis, the review of the three comparative International Clusters (Finland, Latvia, and Transylvania), and the four Working Groups (Cluster Development, Marketing, Skills & Talent, and R&D Ecosystem) an Action Plan was developed. The Action Plan contains details on what is required to achieve an ICT Cluster in the Midland Region. This document also contains guidance as to how the Midlands ICT Cluster Steering Group, along with the working groups and other relevant stakeholders, implement the Action Plan.

Presentation and reiteration of the Action plan:

The proposed Action Plan was presented to the Midlands ICT Cluster Steering Group. The purpose of this meeting was to present the specific actions that need to be performed and to help prepare the Steering Group to consider a structure, for the implementation of the Midlands ICT Cluster Action Plan.

Implementation of the Action Plan:

It must be noted that the outline developed and presented should be considered as the first step in the process to support the development, implementation and monitoring the Action Plan for an inclusive, sustainable, iterative and continuously expanding Midland Region ICT Cluster.

SWOT analysis.

The members of the ICT Cluster Steering Committee and Working Groups are to be commended for the level of engagement with the SWOT analysis process. Of particular importance was the level of openness and reflection which helped to create a realistic and detailed understanding of the strengths, weaknesses and challenges associated with the creation of a successful ICT Cluster in the region.

The summary of the strengths, weaknesses, challenges and opportunities for the region clearly validate the viability of the Midlands regional ICT Cluster. The SWOT analysis process also provided a solid basis for the development of a robust Midlands ICT Action Plan to support the delivery of the Midlands ICT Cluster, and each element of the SWOT drove important consideration for the individual actions outlined.

Midlands ICT Cluster Action Plan SWOT	
Strengths	**Weaknesses**
1. A strong commitment to the cluster. 2. Presence of Ericsson a huge asset. 3. A belief that there is good talent in the region. 4. Strong leadership towards the cluster creation (including cross-agency). 5. Good quality of life on offer. 6. Strong academic environment: TUS Athlone and regional ETB's.	1. Cluster team still forming with diverse opinion on vision and goals. 2. ICT as a regional smart specialisation is not exploited to its full potential. 3. Many disparate activities in the region – requires co-ordination. 4. Talent does not automatically think of working in the region. 5. Appeal to younger people. 6. A potential over dependency on a single large entity.
Opportunities	**Threats**
1. To create economic leadership through alignment with European Digital priorities (Digital Innovation). 2. To target ICT consumers with regards to the cluster. 3. Secure immediate national support funding, as well as other funding. 4. Connect with similar clusters (on the Island and across Europe). 5. Exploit synergistic value for regional CoEs (I-LOFAR, IMR, BNM). 6. Remote ICT workers.	1. An inability to implement a common vision, value proposition and purpose. 2. Fail to achieve the right culture of trust and collaboration. 3. No cluster co-ordination / management post cluster 'launch'. 4. Lack of needed investment (statutory and from partners both financial / time). 5. Targeted verticals do not engage – key players. 6. Too Athlone centric.

Table 1: Summary of the SWOT analysis.

International Best Practice in the Design and Operation of ICT Clusters

International Best Practice in the Design and Operation of ICT Clusters

The concept of clusters is a well–established economic concept. Nevertheless, it is worthwhile providing a definition. Michael Porter (1998) in his seminal paper, Clusters and the New Economics of Competition, defined clusters as "geographic concentrations of interconnected companies and institutions in a particular field".

Clusters encompass an array of linked industries and other entities important to competition, including academic institutions and government agencies. While the concept of economic clusters originated in the United States it has been fully embraced as a vehicle for regional economic development by the Europe Union. In fact, Clusters have been a key European Instrument for regional

economic development for the last 25 years. In 2022 the European Union (EU) enhanced the cluster definition by incorporating the concept of location. The EU defined clusters as groups of firms, related economic actors, and institutions located near each other and with sufficient scale to develop specialised expertise, services, resources, suppliers and skills. The EU recognised that SME involvement in clusters enhances their innovative capacity, increases their IP portfolio and employment levels.

However, for clusters to successfully achieve their economic potential, there must be interactive, iterative, collaborative and cooperative engagement between all actors in the cluster, whereby the engagement is mutually beneficial to all actors in the cluster as opposed to the engagement being 'master – supplier' based.

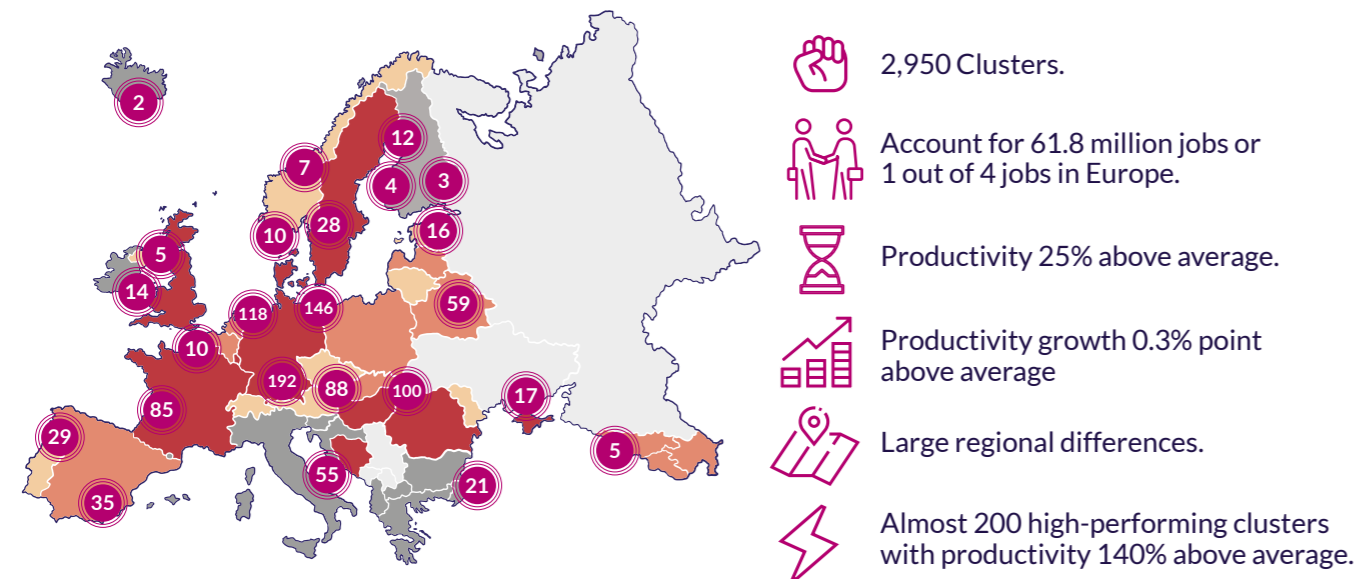Today there are approximately 3,000 clusters located across Western Europe.

- 2,950 Clusters.
- Account for 61.8 million jobs or 1 out of 4 jobs in Europe.
- Productivity 25% above average.
- Productivity growth 0.3% point above average
- Large regional differences.
- Almost 200 high-performing clusters with productivity 140% above average.

Figure 2: Distribution of Clusters across Europe and the Impact of Clusters on European Economic Performance.

The data presented above on the economic impact of clusters speaks for itself and validates the logic of developing the Midlands ICT Cluster to support European and National Policy on Regional Development. Therefore, it is important that in developing the Midlands ICT Cluster Action Plan that it reflects cluster best practice in cluster organisation structure, governance and operations.

Identifying best practice for the development of Regional Clusters.

This section provides a summary of the detailed cluster analysis part of the Action Plan development framework, designed to identify and articulate international best practice in the design and operation of the Midlands ICT Cluster. It is based on an in-depth analysis of the performance of European Clusters. There is a wealth of documented experience and knowledge generated from the 3,000 clusters already established and operating across Europe. It is hugely challenging and virtually impossible to conduct a review of all the individual European Clusters. Fortunately, we had access to multiple Cluster comparison and performance reports, as well as the data analysis conducted at a European level.

For example, there are a number of key European level associations which support engagement and cooperation between European Clusters such as the European Cluster Alliance and the European Cluster Collaboration Platform. The European Cluster Collaboration Platform facilitates collaboration and knowledge exchange between European clusters and non-European clusters providing important benchmark statistics on cluster performance.

Likewise, the Cluster Alliance is a bottom-up initiative that gathers 13 National Cluster Associations, representing more than 740 clusters, where 123,000 of our most innovative businesses collaborate with thousands of universities, research centres and public institutions to boost their competitiveness. The Alliance's mission is to provide a common voice, facilitating connections and opportunities to meet the challenges clusters face. The European Cluster Alliance promotes the view that the European business innovation ecosystem should be integrated around clusters which actively support, as agents of change, the transformation of European industry around digital innovation, green and circular economy.

In addition, there are a substantial number of reports which compare and evaluate the economic impact of clusters in regions of similar scale and focus. The challenge, therefore, was to mine the substantial database of information available within Europe to the benefit of the Midlands.

The process was aided by the fact that Clusters can be broadly divided into

(i)   clusters which are centred on large population centres such as Paris, Berlin and Barcelona and

(ii)   clusters which are regionally focused.

We prioritised clusters which could be defined as regional clusters and whose regional profile was similar to the Midlands Region in population, size and industry profile. In addition, we cross-referenced the information generated from the evaluation of regional clusters with evaluation reports which incorporated analyses across both cluster groups to ensure that we did not omit some valuable generic principles relevant to the Midlands Region.

Therefore, in terms of generic principles for cluster development, we identified the following which are essential for the successful operation of clusters, irrespective of cluster type

- **Smart Specialisation**
- **Geographical and Utilitarian proximity**
- **Network Characteristics of related Process**
- **Openness and Trust among Organisations**
- **Knowledge Diffusion**
- **Capacity to create an Ecosystem of Innovation**

Clusters are most successful when they have a clearly defined smart specialisation and when they are composed of members who are connected by location and who are focused on practical challenges and solutions. The focus of the cluster activities is around the process of networking rather than the demands of individual organisations.

Clusters promote a culture of trust and openness among partners which promote knowledge sharing and diffusion across partner organisations resulting in the creation of an ecosystem of innovation among stakeholders across the region.

The analysis of the available cluster data enabled us to define a checklist for the creation of an effective cluster organisation as highlighted in Figure 3 below.

Checklist for effective cluster organisation

√ **A clearly defined area of smart specialisation reflecting regional scientific and technological leadership.**

√ **Trust-based collaborative platforms.**

√ **Member-based networks built around future growth industries.**

√ **Engine of economic growth based on stakeholder commitment to knowledge creation and sharing.**

√ **Solving industry level challenges & creating new market opportunities.**

√ **Private-Public Partnerships developed by design.**

√ **Development of large scale collaborative projects.**

√ **Key driver of regional and national economic growth.**

Figure 3: Checklist for the development of effective ICT Clusters

Both the general principles and checklist validate the organisational structures established by the Midlands ICT Cluster and provide key reference data for the undertaking of the SWOT analysis process.

Identification of Cluster Case Studies

A key objective of the cluster review process was to identify regional clusters whose regional profile was similar or complementary to the Midlands Region in population, size and industry profile.

For the purpose of this report, in identifying case studies it was important to identify clusters which are committed to regional economic development rather than development of large population centres. The second criteria was to focus on regions which were from countries which have a similar population size to Ireland and also are at the periphery of Europe. Finally, it was important that the Midlands ICT Cluster members can leverage the experience from these clusters to optimise the impact of their cluster.

Therefore, we identified three clusters in Latvia, Transylvania and Finland which matched these criteria as to Table 2 below.

Cluster	Driver	Impact	Key Lessons
ICT Finland	Nokia's role as international leader in mobile	Creation of a more diverse and sustainable innovation-led communications ecosystem	The presence of a leading-edge technology company in the region can act as a platform for the growth of a regional ICT cluster
ICT Latvia	Liberalisation of the communications and e-service sector by government	Creation of an internationally recognised SME-led indigenous ICT industry sector	Targeting market opportunities through coordinated networking of public and private resources
ICT Transylvania	Digital transformation of established industry base (manufacturing, agriculture)	European leader in digitisation of its industry base	Strategic use of European Innovation infrastructures to complement regional expertise, services and financial resources

Table 2- Identified Clusters

There are key similarities between the leadership provided by Nokia in the development of the Finnish Cluster and Ericsson's role in the Midlands ICT Cluster. Both organisations acted as a catalyst for the development of deep knowledge around communications technologies. ICT Finland leveraged Nokia's industry leadership role, its supply and university partnerships to define the smart specialisation and establish the collaboration platform.

Latvia is a prime example of how small countries and regions develop to be agile and responsive to market opportunities, and to create an ecosystem of world leading indigenous companies which in turn makes that country/region a location of choice for FDI and research investment. The key lesson from the Latvia experience for the Midlands ICT Cluster is the value of coordinated public – private resources to address a market opportunity such as digitalisation.

The establishment of ICT Transylvania is relatively recent (2013). The challenge which the cluster addresses is the sustainability of regional industries such as manufacturing and agriculture through the application of ICT. The region has limited ICT resources and has taken a unique, innovative and successful approach to bridging the regional ICT deficit. The approach is to leverage European Technology and Business support infrastructure to provide services to Transylvanian entrepreneurs and industry.

Validating the Midlands Cluster Smart Specialisation choice

Digital Innovation and economic resilience are at the heart of Europe's and Ireland's economic and social policy. As part of the review of Clusters we sought to validate the Midlands choice of digital innovation as its smart specialisation. In 2020, the European commission expert review of the performance of Clusters and future activities identified digital transition and building resilience as key priorities. The Midlands' focus on Digital Innovation is further validated by the fact the clusters in Finland, Latvia and Transylvania have also identified Digital Innovation as a strategy cluster priority.

International Best Practice conclusion

With over 25 years of experience in the development of European Clusters it is clear that clusters can have a major economic and social impact on regional economic development. It is important, therefore, that the Midlands ICT Cluster leverages this experience and identifies role models which it can learn from and possibly develop strategic alliances with. It was also important that the development of the Midlands ICT Cluster Action Plan optimised its alignment with what is international, and particularly European, regional development best practice. We believe that the detailed analysis and the application of the outcomes of that analysis in informing the operation and governance structures for the Midlands ICT Cluster, as well as the crucial task of defining its Action Plan, optimises its potential for regional impact. Further detail on European cluster analysis and case studies analysis is available in Appendix 2.

Digital Innovation and Digital Transformation

Digital Innovation and Digital Transformation

The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate–neutral Europe by 2050. The strategy is supported by an investment of €250 billion over the lifetime of the Horizon Europe framework. The Commission is determined to make this Europe's 'Digital Decade'. Europe's focus is to strengthen its digital sovereignty and set standards, rather than following those of others – with a clear focus on data, technology, and infrastructure.

Financially, ICT represents 4% of the European Economy. However, it has a central role in the realisation of the European Digital Strategy through the application of **Digital Innovation and Digital Transformation** to European society and industry.

The European Industry agenda is focusing on ensuring European industry leads the transition towards climate neutrality and digital leadership. Europe's Digital strategy is realised through ICT Clusters supported by Europe-wide Digital Innovation Hubs. The case studies presented in this ICT Cluster Acton Plan highlight the outcomes of the Expert Panel review of the future role of ICT clusters in Europe which clearly identifies clusters as driving European Digital Innovation.

They also show that regional ICT Clusters have placed Digital Innovation at the heart of their future strategic development. The following section provides a definition of both Digital Innovation and Digital Transformation which are complementary concepts. While the focus of the Midlands ICT Cluster will be on Digital Innovation it will also enable regional companies to embrace Digital Transformation going forward.

Digital technologies have the potential to modernise the economy, but **Digital Innovations** are disruptive. Therefore, policies need to be comprehensive and go beyond the support of the ICT sector as well as address a variety of issues: increasing returns to the use of data, heterogeneity of the digital innovation actors and ecosystem, digital skills in the non-ICT sectors, entrepreneurial culture, funding for scaling-up of new entrants, technological interoperability and intellectual property protection. At the same time, they need to counterbalance the costs of digitally driven disruptions. We will highlight the main peculiarities of digital innovation and its implications for policies aimed at reaping the benefits of digital technologies.

In a narrow sense, **digital innovation** means the implementation of a new or significantly improved digital product, e.g. a semiconductor, a motion sensor or a piece of software. In a broader sense, digital innovation refers to the use of digital technologies to create a new product or improve an existing one.

Digital innovation supports companies to improve business/production processes, products, or services using digital technologies. The key digital technologies are Software Systems, Communications Technologies, AI and Data Analytics.

Digital Transformation is focused on embedding these technologies in non-digital products, improving their performance and efficiency. As a result, the economic potential of digital technologies lies in their economy-wide application rather than in the information and communication technologies (ICT) producing sector. Using the full potential of digital technology to intensify innovation activities in vertical markets such as Agriculture, Advanced Manufacturing, Tourism or Construction to improve the efficiency of their innovation processes requires a deep understanding of the role of ICT in the respective sectors production and market processes. Digital transformation is the process by which enterprises use digital innovation to create new or modify existing products, services, business processes and customer experience to meeting changing business and market requirements.

Midlands ICT
Cluster Action Plan

Midlands ICT
Cluster Action Plan

Following extensive engagement with the Midlands ICT Cluster, principally through its Steering Committee and Working Groups, the following direction and actions emerged for the Midlands ICT Cluster to deliver on its overall vision to be Europe's leading ICT Cluster in Digital Innovation, and consistent with the Midlands ICT Cluster's objectives and principles.

The governance and operational structure of the Midlands ICT Cluster should continue to follow the format of Steering Committee, giving overall strategic leadership and support, with Working Groups focused on the advancement of the specific themes of the cluster (figure 4 below). However, an essential and required support will need to be put in place with the Cluster Development Team, for which it is envisaged that the Steering Committee will identify and secure funding covering a 5-year period.

Smart Specialisation: Since 1926, the region's smart specialisation is firmly embedded in information and communication – gathering, generating and transmitting [8]. In today's current terminology this is translated into Information and Communication Technology (ICT). One of the world's largest communications companies, Ericsson, has been in Athlone since 1974.

Projecting forward, the focus of the Midlands ICT Cluster is progressing the sustainable future development of information and communications technologies research, processes and practices through the frame of DIGITAL INNOVATION- Figure 5 below

Midlands ICT Cluster Vision

To be Europe's leading ICT Cluster in Digital Innovation, creating opportunities for people and business in regional growth sectors, driving knowledge creation, sustainability and resilience.
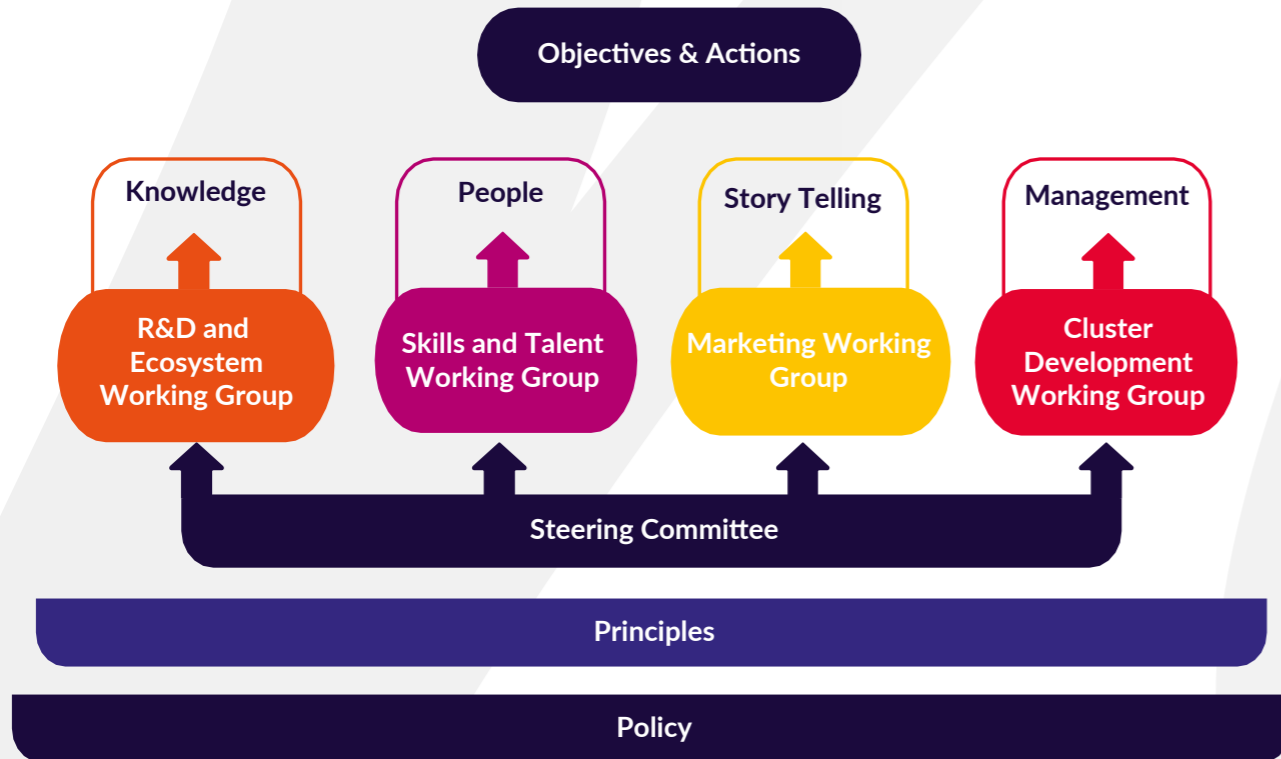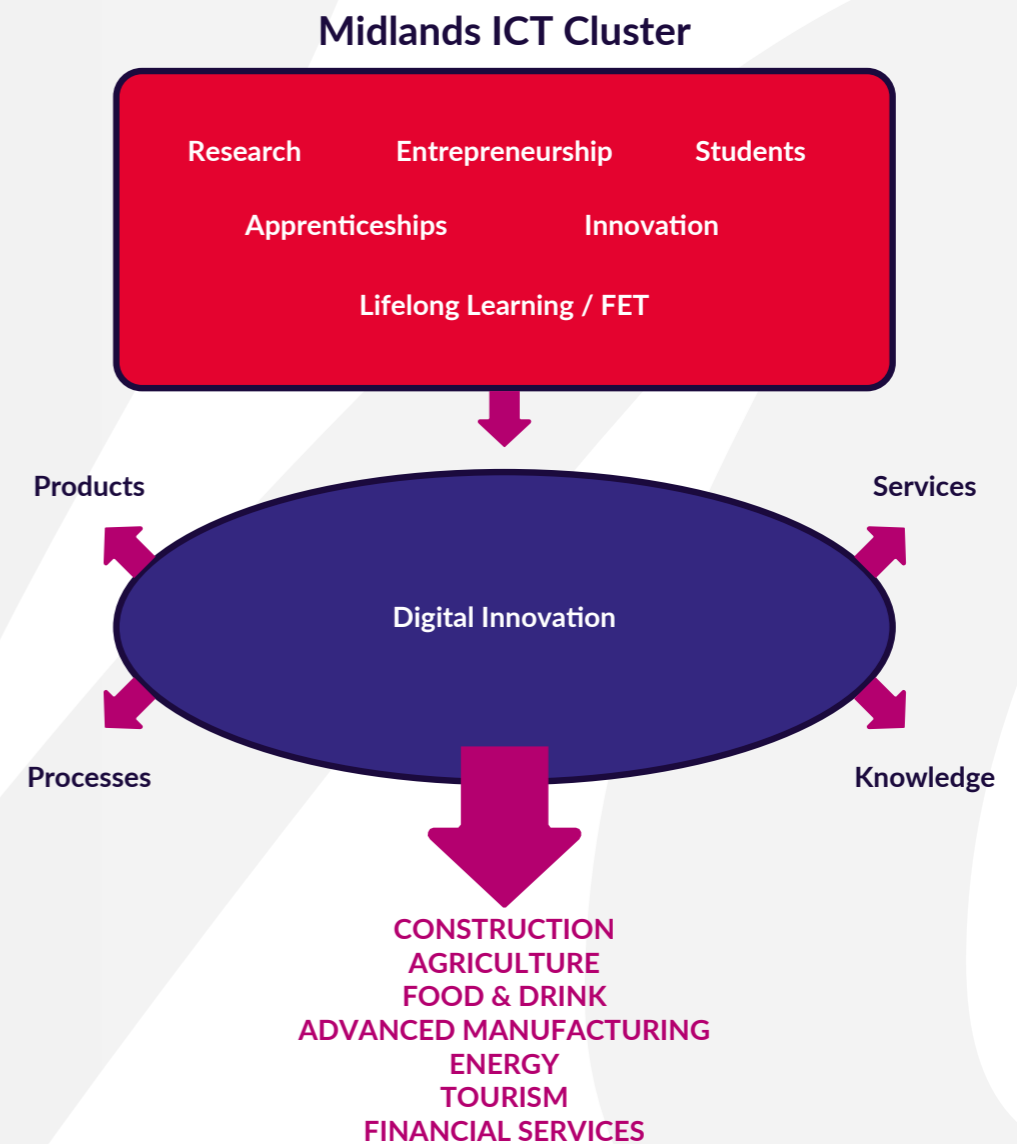

Figure 4: Towards the Midlands ICT Cluster Vision

Midlands ICT Cluster

Figure 5: Digital Innovation: Smart Specialisation at the heart of the Midlands ICT Cluster

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[8] *Founded in January 1926 as 2RN, the first broadcaster in the Irish Free State, in 1933 the service became Radio Athlone (Raidió Áth Luain) and in 1938 was renamed as Radio Éireann*

Cluster Development

Challenges / Opportunities	Actions	Outcomes
Create a knowledge map of ICT data for the Midlands region:	• Develop a complete database of companies in the region, including both providers and significant users of ICT solutions. • Set out the key digital characteristics / features, benefits and challenges for the Midlands region, built on a specific digital innovation theme. • Put in place a process to continually assess and profile the Midlands ICT region.	A complete informational picture is in place for the region with an easily accessible and 'living' database of ICT activity in the region.
Promote the Right Culture within the ICT Cluster: Champion an entrepreneurial and open ICT innovation culture with openness and trust across the region.	• Create knowledge sharing channels and opportunities within a trusted regional environment. This includes Learning Workshops, and supports to embrace existing networks and enable new networks. • Champion innovation support applications to various national and European agencies and programmes. e.g. Enterprise Ireland, European Union. • Set-up and lead an active Mentorships programme for the ICT Cluster, with an established network of mentors in place in the region. • Facilitate cross organisation visits including company and academic learning engagements.	The Midlands ICT Cluster has an established entrepreneurial cluster of openness and trust between organisations and individuals, allowing knowledge diffusion, open innovation and innovation partnerships to thrive with a strong regional commitment.

Cluster Development

Challenges / Opportunities	Actions	Outcomes
Develop inter regional linkages into similar ICT clusters nationally and internationally: Advance the ICT Cluster objectives through learning and partnerships. Align nationally and across Europe.	• Assess and facilitate strategic links beyond the region, across industrial, academic and research agendas. • Identify and connect with similar ICT clusters in Ireland and Europe. Share and learn with these clusters, for collaboration and synergy. • Identify world leading thinkers on ICT clusters, and leverage best practice. • Provide informational and access support to allow regional engagement with various strategic links / opportunities (e.g. Horizon Europe).	The Midlands ICT Cluster is well connected nationally and internationally with development agencies, innovation programmes and ICT regions of similar vision and purpose.
National and regional support agencies: Increasing the levels of co-ordination actions between regional stakeholders to deliver the Digital Innovation Region.	• Establish a stakeholder agency working group in the cluster to support the development of an information portal on funding and support opportunities for professionals and companies wishing to access supports. • Run a number of information workshops with agency members to promote the concept of the Digital Innovation Region and its economic and social impact.	A unified framework to implementing the Digital Innovation Region in the Midlands Region

Marketing		
Challenges / Opportunities	**Actions**	**Outcomes**
Promote the Midlands ICT Cluster: Establish the brand and reputation for the cluster.	• Identify the diverse audiences within and outside the region, and lead on key messaging for all identified audiences. • Develop and implement a marketing and communications plan for the Midlands ICT Cluster that includes a suite of marketing materials to support the cluster. • Develop and implement a social and PR plan for the Cluster. • Capture regional ICT success stories and a means to tell them (audio / video etc). Creating exemplars of ICT enabled success stories.	The Midlands ICT Cluster is known and understood within and outside the region, with a relevant understanding for diverse audiences.
Ensure information is circulated within the cluster, and from the outside to the cluster: An active cadence to information channels and events for the cluster.	• Identify story tellers / Ambassadors both nationally and internationally. • Lead on a cadence of events for the ICT Cluster, targeting Industrial seminars and Workshops – e.g. A CIF Digital transformation event. • Establish ICT Cluster Awards as a recognition and motivation for entities in the region. • Facilitate entrepreneurial evenings across the region (can be informal but supported).	Information and knowledge share is a regular and vital heartbeat of the cluster.

Skills and Talent		
Challenges / Opportunities	**Actions**	**Outcomes**
Education: Early pathways to ICT: Develop more ICT aware educators to encourage higher take-up of STEM, ICT and computer science programmes among learners	• Deliver suitable programme for young people (primary level) to be introduced to ICT – demystify ICT. • Develop and implement STEM, ICT and Computer Science at secondary level. • Implement more industry focused projects at secondary level. • Increase the levels of practical engagement between students, industry and business.	Increased human capital as regards STEM, ICT and computer science at primary, secondary, third and fourth level.
Education: Covering educational lifecycle (3rd Level): Provide ICT graduates with technical knowledge of innovation changes in targeted industrial sectors.	• Embed "live" case studies and industry informed projects in ICT courses. • Ensure industry participation in course design and delivery in ICT programmes . • Establish ICT student placement programme with industry which promotes problem solving. • Create structures to encourage students and researchers to take up employment with start-ups and SMEs.	Graduates who can deliver Digital Innovation solutions to targeted industry sectors

Skills and Talent

Challenges / Opportunities	Actions	Outcomes
Professional Development of active workforce: Creating the right professional skillset, mindset and approach.	• Provide additional skills to ICT professionals in the delivery of innovative ICT solutions to targeted vertical sectors. • Deliver a series of Inter-industry seminars creating awareness of target industry specific innovation processes and challenges for ICT providers. • Establish an inter-industry and interdisciplinary community of practice focused on identifying collaboration opportunities and technical solutions. • Establish a system of micro credits in advanced technologies and digital innovation by Education Service Providers.	Digital Innovation Product and Service solution provision experts
Growing the Regional ICT workforce: Increasing the number of ICT professionals in the region.	• Establish and promote ICT training and career opportunities to non-ICT workforce and return-to-work staff. • Provide ICT Digital Innovation conversion courses . • Establish an industry sponsored internship programme for graduates. • Promote accessible industry certification models and pre-apprenticeship programmes.	A critical mass of ICT professionals capable of delivering the regional Digital Innovation agenda

Skills and Talent

Challenges / Opportunities	Actions	Outcomes
Attraction and retention of talent: Enticing top-class international researchers, engineers, inventors, scientists, and entrepreneurs to work and settle in the Midlands.	• Create a database of ICT job opportunities in the region. • Create a relocation portal as a one-stop-shop for people wishing to relocate to the Midlands. • Establish an ICT professional network to promote training, employment, research opportunities, and career development in the region. • Target regional remote workers to avail of career opportunities in the region.	Establish the Midlands Region as a leading destination for ICT graduates, postgraduates and experienced professionals in Digital Innovation.

R&D and Ecosystem

Challenges / Opportunities	Actions	Outcomes
Embedding a structure to support active and collaborative engagement between micro-enterprises – SMEs – MNEs – Academia – Research community: Develop an integrated, collaborative, iterative entrepreneurial ecosystem.	• To develop a common language between academics, researchers, micro-enterprises/SMEs/MNEs and support agencies to optimise engagement and collaboration in R&D. • Development a framework to support strategic engagement between micro-enterprises, SMEs and academia. • Establish a comprehensive research and innovation funding programme to deliver on the digital innovation agenda. • Establish structures to promote collaborative product and service development between regional stakeholders.	A co-ordinated, collaborative entrepreneurial ecosystem

R&D and Ecosystem		
Challenges / Opportunities	**Actions**	**Outcomes**
Establish Digital Innovation regional research capacity and capability: Focus on specific research themes to advance the development of information technologies smart specialisation in the Midland region.	• Identify emerging and future Digital Innovation challenges across supported targeted vertical markets. • Develop a regional industry-academic research plan focusing on the Digital Innovation agenda. • Identify and establish joint research programmes with academic strategic partners nationally. • Create an IP reservoir of available patents and know-how accessible by regional entrepreneurs.	The establishment of international standard research leadership in Digital innovation in the region
Development of capacity and supports for ICT entrepreneurs and start-ups around the Digital Innovation agenda: Develop coordinated and integrated research and innovation ecosystem, with the co-existence of academia, research and enterprises, within the Midlands region.	• Establish an integrated approach to ICT training, knowledge transfer and supports in collaboration with regional hubs and other key stakeholders. • Establish structures to facilitate micro-enterprises and SMEs to be more creative and innovative. • Establish a comprehensive set of programmes across regional Clusters and Innovation Hubs to develop "investor ready" entrepreneurs and enterprises. • Identify and engage with national "creative spaces" to agree access to regional SME's. • Create a framework to encourage SME owner/managers to mentor nascent entrepreneurs and start-ups. • Create a framework across cluster members to enable members staff to start a new business.	Establishment of the Midlands as the location of choice for entrepreneurs and HPSU's in Digital Innovation

Guidance towards implementing the Midlands ICT Action Plan

Guidance towards implementing the Midlands ICT Action Plan

For region-specific Action Plans, like the Midlands ICT Action Plan, to be successful, it is critical that all relevant stakeholders in the region engage in the process. Relevant stakeholders are likely to be individuals and / or organisations or groups of organisations (represented by individuals) that have:

√ **An expressed mandate to improve the economic wellbeing of the region and its citizens.**

√ **A desire to create a Regional Innovation (eco)System (RIS) in line with ICT as an enabler of innovation (Digital Innovation).**

√ **The capacity and capability to identify and develop the region's Smart Specialisations.**

√ **A commitment to a regional Action Plan (Midlands ICT Action Plan) to create a RIS.**

√ **The capacity, capability and authority to play an integral role in the region's ICT Cluster process.**

Guiding Steps Towards the implementation of an Action Plan

Step 1: Prioritising

The first step in working towards an improvement strategy requires members of the respective Working Groups to prioritise the factors that will be the focus for actions in the Action Plan. The spider diagram from the SWOT analysis gives an indication of the relative strengths and weaknesses of the Midlands Region with regards to the development, implementation and actuation of its ICT cluster. This, along with the Action Plan can be used to inform decisions on priorities for action.

It may be, for instance, that stakeholders decide to prioritise actions to improve an aspect that is already working well in the region (i.e. those aspects with higher scores on the spider diagram). On the other hand, they may decide to prioritise an aspect that is currently underdeveloped or not working particularly well (low scores on the spider diagram).

From a regional perspective, there are (at least) three factors that need to be considered in determining priorities for actions. These are as follows:

- **Impacts: on which aspects of ICT cluster performance are interventions likely to have the biggest impact in the region?**

- **Policy Gaps: are there areas of potential policy intervention which could affect ICT cluster performance that are not currently being addressed?**

- **Opportunities: are there aspects of ICT cluster performance where there are recognised opportunities and tangible actions that can be defined for implementation?**

The pro-forma table opposite could be used or adapted as a starting point to assist in this discussion and progress to the development and implementation of the Midlands ICT Cluster Action Plan.

Step 2: Feasibility check:

Having identified a priority area (or more than one) and begun the process of defining tangible actions and measures, the purpose of this next step is to look more closely at potential actions and to "test" their feasibility against a set of additional questions: These questions are as follow:

REGIONAL DELIVERY	Can these types of actions be implemented at the regional scale?
PARTNERS	How easy would it be to win support from appropriate partners to implement such actions in the region?
CAPACITY	Do you think the organisations will have the capacity to implement these actions?
FUNDING	Are the resources required to implement these actions likely to be available?
BARRIERS	Besides the above, how significant are other barriers that might limit your chances of success?

A Feasibility Check Pro-Forma can be used to facilitate this discussion. If the stakeholders wish, each test question can be given a score and these can be summed to give an overall indication of feasibility. This is a crude method, but it does give a means of quantifying overall feasibility and comparing different interventions.

This discussion can be repeated on many different actions and results compared either qualitatively or quantitatively. The process is therefore an iterative one which can be used to test a series of possible interventions. Once there is agreement between stakeholders within any given Working Group that enough discussion has taken place, it may be appropriate to proceed to Step 3.

Step 3: Filling the gaps; possible new actions

At this point, the stakeholders will have:

- **selected theme(s) for priority action**

- **considered in general terms the kinds of actions that might be taken**

- **tested the feasibility of actions against test questions**

Step 3 now involves developing new specific actions designed to improve this aspect.

Conclusion and next steps

Clustering is one of the key drivers for regional economic growth. Development of clusters is a dynamic process shaped by a variety of internal and external factors such as availability of skilled labour, presence of functioning networks and partnerships, technological changes, and market competition. As a result, the patterns of cluster growth may differ from one another. Although each cluster is unique in some way, there is sufficient data available to identify key features of a successful cluster which are presented here in this report.

It is clear from our engagement with the Midlands ICT Cluster members that there is a strong commitment to the creation of the Midlands ICT Cluster from all of the participants in the region. A key successful cluster requires a collection of organisations with a shared intent to collaborate. The engagement process highlighted a strong culture of openness, engagement and collaboration between the region's industry, government agencies and academia.

The SWOT analysis highlighted the strong commitment and leadership of the stakeholders to the creation and operation of a cluster of international standing within the region, and a very strong basis to build from.

The analysis of successful clusters has highlighted the importance of building the cluster around deep science and technology. The SWOT analysis process reaffirmed the leadership role of the Midlands

in Software Development and Communications Technology and a strong R&D collaboration platform between Technological University of the Shannon (TUS) and the ICT sector. Again, the SWOT analysis identified Ericsson as a key driver in the implementation of the cluster. This parallels the role of Nokia in the development of one of Europe's leading ICT clusters in Finland. The commitment of Ericsson and the regions ICT community to the cluster process was clearly evident throughout the engagement process.

The identification of Digital Innovation as the smart specialisation for the region reflects state of the art in European thinking in terms of European economic and social development as well as embracing the recommendations of the European expert group on Clusters, which identified the cluster as the key driver of the implementation of Europe's Digital Agenda. The focus of the Midlands ICT Cluster is ambitious and is not without its challenges, however, the SWOT analysis has helped to identify a clarity of purpose from the cluster members.

In summary, we suggest there are four critical next steps for the Midlands ICT Cluster to follow.

Connecting to other active and successful ICT Clusters in Ireland and across Europe.
As outlined in the ICT cluster case studies there are clear synergies between the goals of the ICT clusters in Finland, Latvia and Transylvania and the Midlands ICT Cluster. The European Cluster Alliance and the European Cluster Collaboration Platform facilitate collaboration and sharing of best practice between clusters. Therefore, it is important that the Midlands ICT Cluster establishes collaboration with these and other successful clusters so as to optimise its performance.

The Implementation of the Action Plan including ongoing Monitoring and Evaluation.
The SWOT analysis process identified a realistic and important set of actions to address the opportunities and the challenges of the Midlands ICT Cluster. These outlined actions need to be executed and the overall plan implemented. This report contains guidance towards the implementation of a cluster action plan. When it comes to implementing, monitoring and evaluating an action plan it is critical that the entire process from initiation to completion is carried out. This process, in fact, never ends as action plans are iterative, through continuous development and continuous improvement processes, informed by ongoing monitoring and evaluation.

Outreach to targeted verticals (markets).
The focus on Digital Innovation through the application of the region's Deep Tech expertise to vertical markets will have a transformative impact on the economic development of the region and will act as a template for similar developments in other regions. The Midlands ICT Cluster needs to target the appropriate verticals within the region and ensure active stakeholder participation within the cluster from each vertical market.

Securing necessary ICT Cluster development and management funding.
The analysis of the operation of successful clusters in Europe highlights the need for investment in a core full-time team to manage and oversee the actuation of the Midlands ICT Clusters Action Plan and ensure effective monitoring and feedback to the Midlands ICT Cluster Steering Committee. It is imperative that the cluster develops a funding proposal as the next phase in its development to provide the necessary framework within which the Midlands ICT Cluster Action Plan will be delivered.

Appendices

Appendix 1 – Membership of Midlands ICT Steering Group and Working Groups

Members of Midlands ICT Cluster Action Plan Steering Group:

- Sinead Pillion, Ericsson & Chair
- Dr Anne Cusack – Chair of Midlands Regional Enterprise Plan
- Pat Gallagher, CE Westmeath CoCo & Designated Regional Chief Executive
- Paul Madden, Zinkworks
- John Mee, Sidero, Chair of Skills & Talent WG
- Dr Enda Fallon, TUS, Chair of R&D and Collaboration/ EcoSystem WG
- Emmet Kavanagh, Midlands Ireland, Co-Chair of Marketing & Promotion WG
- Micaela Oster, Zinkworks, Co-Chair of Marketing and Promotion WG
- Colm Forde, Principal Officer, Department of Enterprise, Trade & Employment
- Aileen Cramer, Zinkworks
- Brid Somers, IDA Ireland
- Mark Atterbury, Enterprise Ireland
- Orla Martin, Offaly LEO, representing regional LEOs
- John Costello, Midlands Regional Skills Forum
- Sarah Morgan, Programme Manager, Regional Enterprise Development Plan
- Eileen O'Meara Hayes, Regional Enterprise Development Plan

Members of ICT WG – Marketing:

- Emmet Kavanagh - Midlands Ireland, Co-Chair of WG
- Micaela Oster, Zinkworks, Co-Chair of WG
- Brid Somers – IDA Ireland
- Richard Coen - Emarkable.ie
- Sarah Morgan – Programme Manager, Regional Enterprise Development Plan
- Eileen O'Meara Hayes, Regional Enterprise Development Plan

Members of ICT WG – Skills and Talent:

- John Mee, Sidero –Chair of WG
- John Costello – Midlands Regional Skills Forum
- Dr Enda Fallon – TUS
- Caroline Spollen – LOETB
- Tom Grennan – LWETB
- Cian Prendergast – Ortus
- David Caulfield - Zinkworks
- Christine Collins, Broadband Officer Longford CoCo
- Ray Bell – Head of IT Offaly CoCo / VEX Robotics
- Antoinette Brennan, Broadband Officer Laois CoCo
- Joe Connaughton - Appadvisor
- Richard Coen - Emarkable.ie
- Brian Egan - Purpledecks
- Barbara Quinn - Infuse Programme Ericsson
- Paul Hourican - Recruitment Ericsson
- Sarah Morgan – Programme Manager, Regional Enterprise Development Plan
- Eileen O'Meara Hayes, Regional Enterprise Development Plan

Members of ICT WG – R&D and EcoSystem:

- Dr Enda Fallon – TUS & Chair of WG
- Orla Martin – Regional LEOs
- Mark Atterbury – Enterprise Ireland
- Bert Farrell - Zoosh Group
- Brian Egan - Purple Decks
- Caitriona Mordan – Atim Cluster
- Business Development Manager – streamBIRR
- Seamus Duffy – i-LOFAR
- Evan Keane – TCD
- Sarah Morgan – Programme Manager, Regional Enterprise Development Plan
- Eileen O'Meara Hayes, Regional Enterprise Development Plan

Members of ICT WG – Cluster Development Team - TBC

Appendix 2: Cluster Analysis & Case Studies

Michael Porter (1998) in his seminal paper, Clusters and the New Economics of Competition, defined clusters as "geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialised inputs such as components, machinery, and services; and providers of specialised infrastructure. Clusters often extend downstream to channels and customers and literally to manufacturers of complementary products and to companies in industries related by skills, technologies or common inputs. Finally, many clusters include governmental and other institutions such as universities, standard-setting agencies, think tanks, vocational training providers, and trade associations that supply specialised training, education, information, research, and technical supports" (p.78).

This paper is based on Porter's initial work on clusters in his book, The Competitive Advantage of Nations (1990). However, in 2018, van Egeraat and Doyle suggested that "the operational concept in Porter's model is not cluster but clustering – the process that leads to the development of clusters" (p.108). Porter's definition of cluster in 1998, quoted above, is more akin to supply chain management as opposed to an integrated, collaborative, interactive network of entities working together to advance competitiveness and economic development in regions. Also Porter's use of the words "clusters often extend ……" and "many clusters include…." suggests that he was not taking a holistic, integrative, collaborative view of clusters. It may be as a result of this lack of clarity in, or misinterpretation of, Porter's model that policy in Ireland from the mid-1990s has focused more on the networking between organisations in the same industry sector (for example the engineering cluster, manufacturing cluster, and so on) as opposed to driving the broader collaborative engagement between industries in a sector and other key actors in the setting in which they are based.

According to the EU (2022), "clusters are groups of firms, related economic actors, and institutions located near each other and with sufficient scale to develop specialised expertise, services, resources, suppliers and skills. Together, SMEs can be more innovative, create more jobs, and register more international trademarks and patents than alone". However, there must be interactive, iterative, collaborative and cooperative engagement between all actors in the cluster whereby the engagement is mutually beneficial to all actors in the cluster as opposed to the engagement being 'master – supplier' based.

Based on our work to date, it is clear that the Midlands ICT Cluster is progressing in the direction of being an inclusive collaborative cluster. Therefore, it is very important that the relevant and appropriate processes, procedures, and practice are put in place to nurture the development, growth and sustainability of the cluster.

Identifying European best practice for regional cluster development.

The development of clusters has been a key European instrument for regional economic development for the last 25 years. There are over 1,500 clusters located in more than 200 EU-27 regions and 3,000 across the whole of western Europe. Clusters account for almost 25% of total EU employment. There is a considerable amount of data and intelligence available at European level on how to optimise the design and operation of clusters to ensure maximum regional impact. For example, there are a number of key European level associations which support engagement and cooperation between European Clusters such as the European Cluster Alliance and the European Cluster Collaboration Platform.

The European Cluster Collaboration platform facilitates collaboration and knowledge exchange between European clusters and non-European clusters.

The Alliance is a bottom-up initiative that gathers 13 National Cluster Associations, representing more than 740 clusters, where 123,000 of our most innovative businesses collaborate with thousands of universities, research centres and public institutions to boost their competitiveness. The Alliance's mission is to provide a common voice, facilitating connections and opportunities to meet the challenges clusters face. The European Cluster Alliance promotes the view that the European business innovation ecosystem should be integrated around clusters which actively support, as agents of change, the transformation of European industry around digital innovation, green and circular economy.

Clusters can be broadly divided into (i) clusters which are centred around large population centres such as Paris, Berlin and Barcelona and (ii) clusters which are regionally focused. We were particularly interested in identifying regional clusters whose regional profile was similar to the Midlands Region in population, size and industry profile. It is difficult to identify a complete match. However, the analysis process did identify three ICT clusters which have complimentary profiles to the Midlands Region and provide very concrete models which can inform the development of a successful Midlands ICT cluster. These three clusters are in Latvia, Transylvania and Finland.

ICT Cluster Latvia

The Latvia IT Cluster (LITC) is the first cluster in Latvia which started its initial activities in 2001 and was officially established in 2007. The LITC stakeholders are Latvian IT companies, as well as public bodies, industry associations, other clusters and more, because it operates according to the triple-helix principle. The LITC vision is to be the go-to partner in digitalisation projects, playing a major role in increasing the competitiveness of Latvian companies in global markets. The unique feature of the Latvian IT Cluster is the interaction between its innovative and export-oriented member

enterprises, which are at the same time market competitors. The LITC members understand that they will be able to compete successfully on a global scale only if they unite forces. They have started a cooperation in such specific areas as implementing joint standards for project management and quality assurance; establishing a joint model of competences; acknowledging potentially available human resources for their efficient exploitation in joint projects; strategic planning and market research; marketing activities for promoting the Latvian IT sector in target markets; coordination of cooperation with potential clients; and joint activities for attracting potential customers (to mention but a few areas of cooperation). Since 2018 LITC started to operate as the Digital Innovation Hub offering access to cross-industry and technological expertise, such as market insights, human capital growth, new technology trends, and so on.

There is a strong alignment between the work of the IT Cluster and Latvian government policy and investment strategy. A key objective of the Latvian government and the IT Cluster is to increase the level of digital innovation in Latvian SMEs, particularly in rural SMEs. Two key government policy documents include Information Society Development Guidelines 2014 – 2020. A key element of the guidelines was the implementation of open data principles in public administration and simplifying the delivery of public services through the creation of eServices and interoperable information systems as a driver for increasing the number of entrepreneurs (especially SMEs). The other policy document is the Technology Development, and Science Innovation Framework 2014-2020. These guidelines implemented a new horizontal approach to the science and innovation policy, linking research and industrial sectors into a single system. The ICT Cluster provides a platform for long-term cooperation between researchers and enterprises. Both government policy and the ICT Cluster provide good innovation support instruments for digital technology development and implementation within SMEs, including educational

programmes to improve the digital skills of employees. Despite this, SMEs, and especially SMEs in rural areas, lack the understanding of the possibilities of digitalisation and lack informative support. It is important, therefore, for regional ICT Clusters to organise educational campaigns and inspirational events in the region to encourage SMEs to digitalise.

Latvia identified ICT as a key smart specialisation strategy in 2014. In the smart specialisation strategy, the field of ICT has a horizontal impact on almost all sectors of the economy and areas of smart specialisation, but the development of the ICT sector itself and the readiness to create solutions for other sectors plays a crucial role in the development of the entire economy of Latvia. Investment in ICT research at the University of Latvia and Riga Technological University by the state as well as governments policy on e-services and communications infrastructure were key to the successful growth of the ICT sector. Academic – Industry collaboration in identifying ICT skills needs and the development and accreditation of ICT courses was key to the development of a critical mass of industry ready ICT graduates.

Digitalisation and ICT are changing Latvian everyday lives and creating new opportunities for both businesses and employees. In 2020 there were 39,000 people employed in the ICT sector in Latvia, and 7,056 number of ICT enterprises. For over 90% of companies in Latvia, the majority are indigenous ICT SMEs.

The following is a list of successful Latvian ICT companies :

- **Tet is one of the most experienced companies in Europe, providing integrated and innovative solutions in IT, telecommunications, and outsourced business processes. Also, Tet develops such projects as Claara, the first TV advertising and large-scale audience analytics online tool in the Baltics and manages a launch platform, Overkill, for start-ups and more.**

- **LMT is a mobile telecommunications operator and market leader in Latvia, currently amongst the most efficient mobile data network providers and 5G implementers worldwide. LMT has been recognised internationally as Best Mobile Technology Breakthrough, European 5G Pioneer, and nominated in Global Mobile Awards 2019 among such companies as Deutsch Telecom, Verizon, and Ericsson.**

- **MikroTik provides hardware and software for Internet connectivity in most countries worldwide, for example, for Mitsubishi Motors, Siemens, Hewlett-Packard, Ericsson, Motorola, and is even present in Mount Everest and used for travels to Mars. World Intellectual Property Organization has awarded MikroTik with WIPO IP Enterprise Trophy for innovative use of the IP system by the enterprise and successful corporate strategies for promoting respect for IP.**

- **Zabbix is one of the most demanded monitoring products in IT globally, used in Brazilian bank security systems, Japanese machine making, and world-known telecommunication companies, large retailers, airports, and ministries.**

- **Tilde provides localisation services, develops custom machine translation systems, and offers online terminology tools for a wide range of languages - even Facebook and Skype use Tilde's virtual assistants.**

ICT Cluster Transylvania

Transylvania is the 2nd most developed region in Romania after Bucharest-Ilfov. Large iron and steel, chemical, and textile industries, stock raising, agriculture, wine production and fruit growing are important occupations in the region. Agriculture is widespread in the Transylvanian Plateau, including growing cereals, vegetables, viticulture and breeding cattle, sheep, swine, and poultry. Timber is another valuable resource. The industry sectors are traditional manufacturing industries. However, ICT and advanced technologies such as IT, electronics and automotive industries are important in urban and university centres like Cluj-Napoca (Robert Bosch GmbH, Emerson Electric), Timisoara (Alcatel-Lucent, Flextronics and Continental AG). The region has a major problem in retaining qualified graduates as many leave to work in the rest of Europe.

The Transylvania IT Cluster was established in 2013. It states that it works at the intersection between entrepreneurship, research, innovation, and public administration, pushing forward discussion and action around digital transformation thus enhancing community development through digitalisation. It has over 100 member organisations including regional and national government organisations, universities, and regional industries. It has established the Transylvania Digital Innovation Hub which contributes to regional digitalisation, through the synergies generated at ecosystem level, to the digital transformation of organisations, public administration and the formation of digital skills and competences.

The Cluster core services are categorised as company capacity building, innovation services and matchmaking. Capacity building is through course development and delivery of innovative processes for business and administrative professional development training courses and soft skill courses for senior and middle managers. Innovation Services are either standalone services or part of

European projects which address regional, national or international challenges or opportunities. Their innovation services include digitalisation solutions for industry or pilot and the development of innovative curricula for industry.

The unique aspect of the cluster is its approach to combining local services developed by the cluster with European innovation infrastructures. For instance, the cluster has established a European Innovation Laboratory as part of the European Network of Living Labs (EnoLL). The laboratory enables industry to develop and validate Digital services and products. The Cluster, through its Digital Innovation Hub is the national contact point for members of the European ICT Innovation for Manufacturing SMEs (I4MS). ICT Innovation for Manufacturing SMEs (I4MS) is promoted by the European Commission to expand the digital innovation of manufacturing SMEs in Europe. This enables regional SMEs to access technological and financial support to experiment with different technologies and services to improve the innovation skills of their staff and the technologies and services within their organisations. The funding is provided by the European Commission through the ICT Cluster.

The cluster matchmaker programme leverages the Enterprise Europe Network project to offer regional industry potential collaborations with partner companies that can benefit from access to prepaid international expertise to deliver innovation and business solutions directly to the company. The cluster is the regional coordinator for a national competitive HPSU programme funded through the EU (BOWI project). The programme provides access to business and technical training from the cluster but also provides the successful companies with access to technical expertise from Aachen University in Germany.

In summary, the Transylvania ICT Cluster acts as a provider of skills, know-how and innovation programmes to its members and regional start-ups and SMEs. It is committed to increasing the competitiveness of regional industry through Digitalisation by providing an innovative mix of technologies, skills, systemic approach, and business models. The cluster acts as a regional interface for regional industry to access European finance and know-how through initiatives such as European Living Labs, ICT Innovation for Manufacturing SMEs (I4MS) and the Enterprise Europe Network and is a model which could be emulated by the Midlands ICT Cluster.

The Transylvania ICT Cluster brought together companies, research institutes, software companies, public authorities, and universities and developed the Transylvanian Digital Innovation Hub. The leading technologies of artificial intelligence, big data, cybersecurity, robotics or virtual reality are now being developed and applied in creative industries, agriculture, furniture, energy efficiency and agriculture across the region, leading to valuable new jobs.

ICT Cluster Finland

The third regional ICT Cluster selected for evaluation is the Finnish ICT Cluster. Finland is a country of similar population to Ireland but with a larger land mass. However, Finland is considered as one of Europe's top performing ICT and Digital Innovation regions. Finland has identified 5 areas of smart specialisation including Information and Communications Technologies. The country has a long history of global leadership in mobile and telecommunication mainly through the international leadership of Nokia. Nokia acted as a catalyst for the development of the ICT Cluster. The interaction between industry and ICT-oriented universities (in Helsinki, Lappeenranta, Oulu and Tampere) supported the translation of university research and know-how into product and process development. An important part of this is the science-industry engagement and collaboration. In the early years of the cluster boundaries between industry and research organisations tended to blur in R&D cooperation in which the focus was not on intellectual property rights but on the delivery of new technology and products.

The establishment of active industry internship programmes for students have been strong drivers in cooperation between industry and academia. That cooperation extended to the development and delivery of training and courses to ensure industry ready graduates resulting in the collaborative design and delivery of training and courses by industry and academia. The ICT Cluster supported a culture of active collaboration across the product and service value chain driving the creation of innovative new products and services. This was particularly the case for industries who were Nokia suppliers and who leveraged the collaborative environment to create new products. Despite the demise of Nokia the Cluster continued to drive the growth of the ICT industry particularly in the Telecommunications and Wireless Communications Space.

Allied ICT Finland, the partner network of Finnish education and research institutes, cities and companies, has analysed the potential of the ICT industry and the digitalisation trend in Finland moving into the 2030s. It has studied the role and the combined impact of key ICT sectors from the perspective of the industry's internal development and competitive ability and from the point of view of the development of individual fields of application.

The results of the study highlight the importance of joint development and synergy in four principal areas of focus and spheres of application:

1. **Wireless technologies and communication networks**
2. **Software development**
3. **Cybersecurity**
4. **Artificial intelligence**

It proposes that these sectors need to be developed in collaboration, seeking to produce new added value in various spheres of application, such as the development of health technologies and solutions for personalised care needs, the development of the competitive ability of production facilities, the development of digital services for cities and other organisations, and the monitoring and impact assessment of atmospheric changes in climate work.

Analysis of case studies: Informing the development of the Midlands ICT Cluster

The core objective of the analysis of European cluster development, in particular the three selected clusters, is to inform the development of the Midlands ICT Cluster by ensuring that it leverages best practice from over 20 years of regional ICT cluster development in Europe.

The three case studies from Latvia, Transylvania and Finland may at first glance appear very different. In fact in each case the core objective of the cluster was to establish ICT as a regional smart specialisation. While all three regions had the same end goal, the approach taken to realising this goal is very different for each region. In all cases the cluster leveraged the ICT strengths of the region supported by the prioritisation of investment in research and innovation capacity building in the region or leveraging external partnerships.

In the case of **ICT Cluster Latvia** the government's commitment to liberalise the country's communications infrastructure and provide access to internet and electronic services to all citizens from an early stage acted as a catalyst for the growth of an ICT sector of international standing. The Latvian ICT cluster supported an internationally trading indigenous ICT industry and attracted major international ICT players. Its success was also based on the development of a strong ICT research and innovation culture within the university sector. ICT talent acquisition was enhanced through the development of partnerships between Latvian Academic institutions and international academic partners for the delivery of internationally accredited ICT programmes thus ensuring the generation of "industry ready" graduates.

The **ICT Cluster in Transylvania** is one of the most recent European ICT Clusters established in 2013. The region does not have a strong tradition of either ICT research or innovation at university level, or a large indigenous base of ICT companies.

However, its main universities do have strong links with ICT FDI MNEs located in the region. This has provided a basis for a degree of research and innovation in the universities through FDI collaboration. The cluster's main focus has been on supporting digitalisation of the region's vertical markets. This is in response to the government's commitment to using digitalisation as a driver for the growth of innovation in more traditional industry sectors. The region has compensated for limitations in the ICT infrastructure in the region through the development of a strategic collaboration with the European Framework. Rather than reinventing the wheel, the cluster has acted as a bridge for regional access to European platforms for training, innovation and development such as technology and product testing and validation through the European Living Labs infrastructure. It has also leveraged the European framework programme to deliver training, industry partnerships and market access through the Enterprise Europe Network. The Transylvania cluster has been identified by the European Commission as a exemplar cluster in its approach to driving the European Digitalisation strategy in the region.

The **Finnish ICT Cluster** is the longest established cluster of the three having been established in the late 1990s. The cluster developed around the country's international leadership in telecommunications technologies. Initially the key driver of the cluster was Nokia and its associated partner organisations. The growth of the cluster benefited from a strong tradition of collaboration between the country's academic community and industry.

The cluster initially leveraged the dominant international position of Nokia in mobile telecommunications to build a broader industry-academic research and innovation baseline. The cluster focused on leadership in mobile technology through the joint creation and application of IP generated through industry-academic research collaboration. This ensured a continual stream of qualified ICT graduates and professionals through the active participation of industry in academic training and graduate programmes.

The cluster promoted the leveraging of academic IP to develop new products and services by companies who were primarily outsourced service providers or service partners to Nokia. This enabled the cluster to continue its economic growth as Nokia's international market share decreased. The cluster's strategic plan for the next 10 years is based on the continued growth of Finland's international leadership around its deep knowledge of communications technology but enhanced by using that knowledge complimented by domain expertise in Software Engineering, AI and Cyber Security to drive the Digitalisation of Vertical Industry markets. This is an approach which is consistent with the Smart Specialisation approach proposed for the Midlands ICT Cluster.

Leading the green transition

The transition towards a clean, circular and climate neutral economy requires clusters, as agents of change, to connect bottom-up and top-down initiatives. This way, public authorities and groups of companies will co-design environmental and climate policies and adapt policy instruments to meet the needs of the industrial ecosystems. Clusters need to develop and implement circular economy strategies and promote an entrepreneurial culture for green businesses among SMEs. Clusters should participate in European green innovation alliances. Furthermore, capacity building will enable sets of green-tech firms to advise on the green transition and demonstrate its benefits.

Accelerating the digital transition

Clusters should develop a robust ICT industry and facilitate the uptake of digital solutions. Close cooperation with employment, education and research organisations makes these clusters part of the local education and training structures. Hence, clusters have to mobilise to implement the European Skills Agenda initiatives like the 'Pact for Skills'. The clusters should be an integral part of Digital Innovation Hubs and reinforce relevant public-private partnerships supporting the integration of physical and digital systems.

Building resilience

Policies should assist clusters in building and using the collective intelligence of their members to cope with challenges and undergo transitions. Groups of enterprises need to anticipate changes and operate as a network for finding supply and market alternatives. The matching of reskilling and upskilling with business needs will happen with an active role of clusters in local labour markets that need to receive support in social and ecological innovation. Clusters should be used to identify and implement shared value initiatives to address societal challenges (in local communities). Measures are required to create capacity for SMEs to enter global value chains and benefit from the EU's free trade agreements. Cross-sectoral, interdisciplinary and transnational collaboration should be encouraged through the creation of a new generation of strategic partnerships.

Recommendations mentioned require that clusters:

- are involved in the policy design and implementation at EU, national and regional level,

- engage in reskilling and upskilling of the EU workforce at the local level,

- lead networks of business, research, civil society and public bodies across the EU,

- provide specialised services to all actors in industrial ecosystems,

- collect and codify market and technological intelligence of their members,

- promote international activities beyond the EU

The Finnish, Latvian and Transylvanian clusters workplans have prioritised Digital Innovation and economic resilience.

Midlands IRELAND

REGIONAL ENTERPRISE PLAN MIDLANDS

Rialtas Áitiúil Éireann
Local Government Ireland