KTI
Knowledge Transfer Ireland
Where Research & Business Connect

Review of the outcomes reported in the KTI Annual Knowledge Transfer Survey 2017

Contents

Executive Summary

Knowledge Transfer Ireland (KTI), in conjunctin with the Higher Education Authority, publishes the Annual Knowledge Transfer Survey (AKTS). The AKTS is the review of business engagement and commercialisation (knowledge transfer) by the Research Performing Organisations[1] (RPOs) within Ireland and it has been published by KTI for the past five years (2013 - 2017). This study, commissioned by KTI and undertaken by IP Pragmatics2, highlights some of the outcomes reported in the AKTS 2017.[3]

The main objectives of the study were to: collect in-depth information on the new products and services launched to market in 2017 based on RPO licences and to collect information on those spin-out companies that were reported as "active" at year end 2017. This report summarises those findings.

In 2017, 22 products and services which derived from licences from RPOs were brought to market by 17 different companies. This represents a decline over the past two years from a peak of 36 in 2015. The dominant sector this year was ICT at 50%. Of the 116 products and services that were launched from 2013-2016, 85 (73%) are still available on the market.

At the end of the year there were 113 Active Spin-outs (active for at least three years) that had brought in investment funding or recorded turnover and had at least one full time employee. The majority of Active Spin-outs were in the ICT sector (35%) and Health & Medical Technologies (28%). This is consistent with the previous year. The survival rate for Active Spin-outs is encouraging, with 65% over five years post-formation.

The commercialisation activities of the RPOs show strong support for the local economy, with 95% of the licensee companies and 97% of the Active Spin-outs reported in 2017 as having an Irish base. The spin-outs support at least 1,160 jobs in Ireland, and the licensee companies support many more.

The most commonly licensed forms of intellectual property (IP) underpinning both product and services were patented IP and software, each representing a third of the IP licensed.

The proportion of these outcomes that arose from the Institutes of Technology and from the Specialist and State Research Institutions was 32% for products and services launched onto the market in 2017 and 20% of the Active Spin-outs reported in 2017.

State funding played a key role in supporting development of technology and IP that led to products and services launched to market and in the creation of spin-outs which achieved "active" status. Both types of outcome have particularly benefitted from State funding, in particular: Enterprise Ireland's (EI) Commercialisation Fund and High Potential Start Up programme; support for collaboration under the EI Innovation Partnerships programme; and funding through the SFI Centres. This does not take into account the other investments made by the State that underpinned the research and infrastructure within the RPOs from which these commercialisation outcomes stem.

1 Irish Higher Education Institutions and State research organisations

2 www.ip-pragmatics.com

3 http://www.knowledgetransferireland.com/About_KTI/Reports-Publications/KTI-Annual-Review-and-Annual-Knowledge-Transfer-Survey-2016.pdf

2017 **Highlights**

22

new products and services launched to market by 17 companies based on RPO licences in 2017

113

Active Spin-outs based on RPO intellectual property as of the 31st December 2017

85

products and services that are still on the market after being launched in 2013, 2014 2015 or 2016

1,160

is the total number of jobs Active Spin-outs are estimated to support

95%

of the companies bringing RPO-related products and services to market in 2017 are based in Ireland

97%

of Active Spin-out companies are based in Ireland

1

Introduction

The Annual Knowledge Transfer Survey (AKTS) provides data and case studies to convey the range of activities, outcomes and benefits to enterprise that come from knowledge transfer and commercialisation with the Irish research base. Knowledge transfer brings many benefits, including a closer understanding of industry challenges within academia, new entrepreneurial activity, higher business activity, more jobs, more investment into Ireland and the application of academic research for the wider benefit of society. The AKTS covers a range of topics from invention disclosures, IP activity and licensing to collaborative research with enterprise and the formation of new spin-out companies. The survey measures these activities over a calendar year (January to December).

The data for the AKTS are provided primarily by the Technology Transfer Offices (TTOs) of the RPOs.

The 26 state-funded RPOs requested to submit data are:

- The seven universities
- The fourteen institutes of technology
- Three specialist research institutes: the Royal College of Surgeons; the National College of Art & Design and; the National College of Ireland
- Two state research bodies: The Marine Institute and Teagasc (the national Agriculture and Food Development Authority)

In this Outcomes Study, IP Pragmatics was commissioned to take a deeper look at two of the indicators which are reported in the AKTS survey for 2017:

1. the number of products and services which were brought to market during 2017, and
2. the number of spin-out companies from RPOs that are deemed to be "active" at least three years post formation as of 31 December 2017.

The study also looked back at all the products and services which have been launched since 2013 (the first year of this survey), to track their progress and to understand the impact that they have contributed in that time.

2

Products and services launched on the market based on licences from RPOs

The AKTS 2017 reported 24 new products and services launched on the market in that year as the result of a licence from an RPO. This is likely to be an underestimate of the actual number launched, due to the challenges of obtaining accurate data which may be viewed as commercially sensitive by the licensee. In some cases, the RPO may only be informed about the new product if and when royalties become due, rather than at the time of launch. The survey period of January-December 2017 relates to the product or service launch date, rather than the date of the licence, which may have been signed earlier.

After validation by the study team, 22 launches were included in the analysis. The majority of these were for products, but also included services, products with a service element, and tools which are used internally by the company to deliver their products and services. The final 22 products and services examined included fifteen from Universities (one product was based on a licence from technology jointly developed by two universities), five from Institutes of Technology and two from specialist institutes or state research bodies. In all, seven different RPOs reported product or services launches this year.

2.1 Pathways to licensing

The study team examined the relationships that led to the licences that underpinned product and services launches. They found that around a third (8) of licences were issued to an RPO spin-out. This is a lower proportion than in previous years and reflects the licensing of multiple products to some existing (non-spin-out) companies. Many of the other licences arose from collaborative research projects with industry, either funded exclusively by the partner company, or through specific funding for collaboration with industry, most often from Enterprise Ireland or through SFI Centres.

The TTOs were actively involved, often from the initial research stages, supporting identification of industry partners and application to suitable funding schemes. They then worked with the Principal Investigators (PIs) at the RPO to identify tangible and intangible intellectual property arising from the research and to put appropriate protection mechanisms in place. The TTO routinely led the negotiation of the licence agreements.

2.2 Types of intellectual property underpinning products and services launched in 2017

Products and services brought to market may build on multiple types of IP. Not all of which may emanate from an RPO. Of RPO-derived IP, in 2017, a total of 32 different types of IP were transferred to generate the 22 products and services. About a third (31%) of the licences are based on software code and algorithms and 28% on patents originally filed by the RPO.

Figure 1: Source of products and services brought to the market in 2017 by type of institution (n=22)

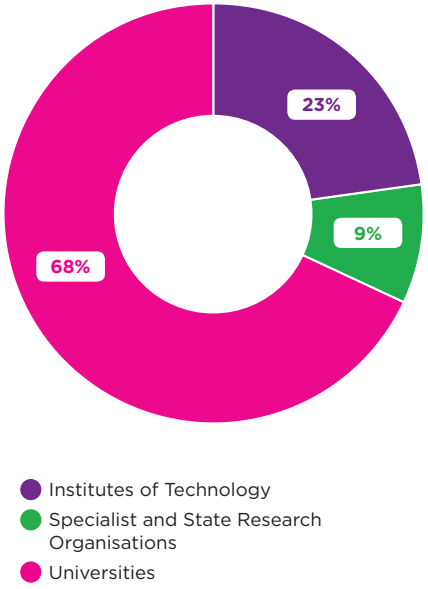
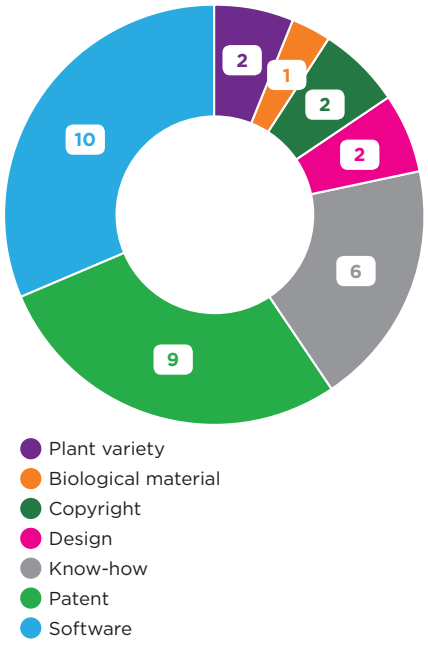


Figure 2: Types of IP rights licensed from RPOs that led to products and services launched in 2017 (n=32)

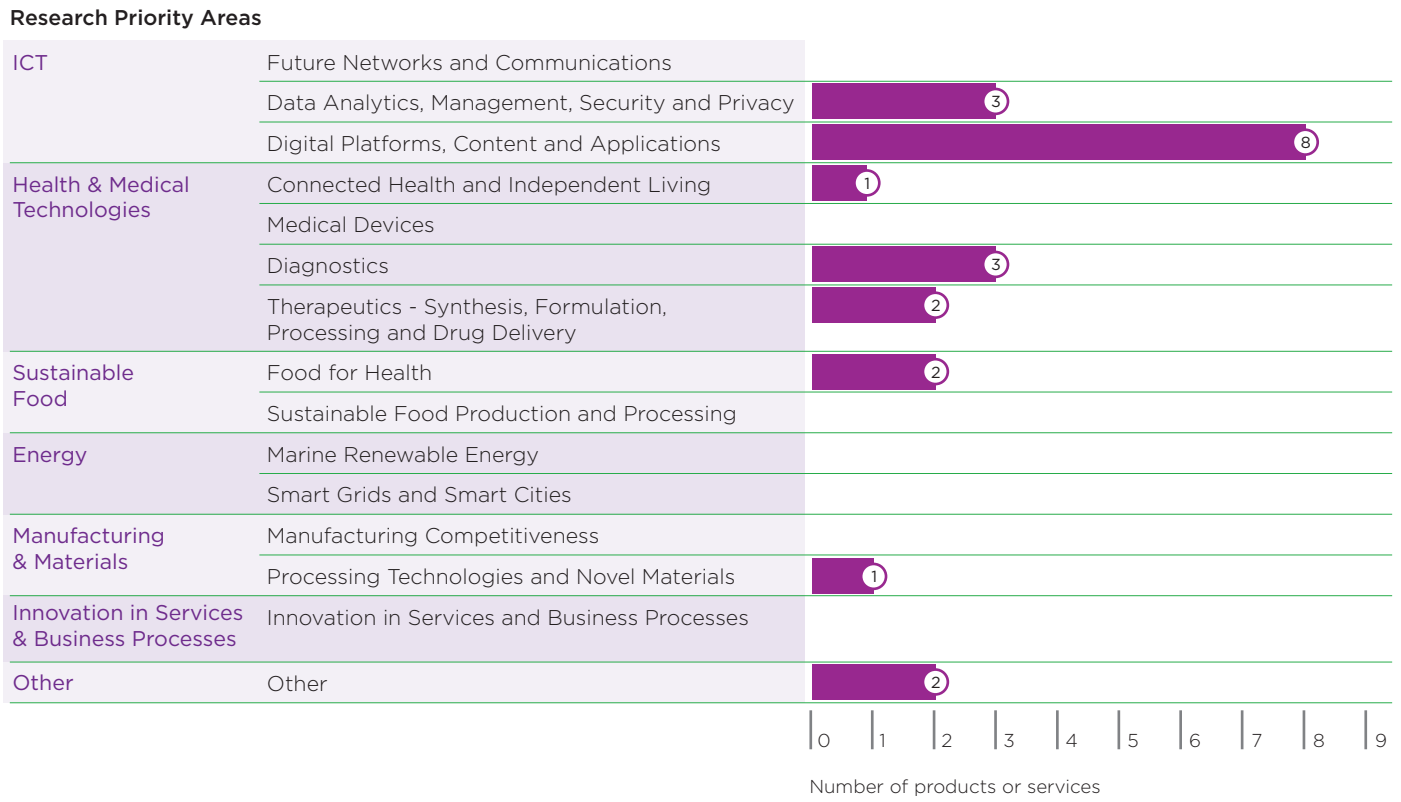


2.3 Research Prioritisation Areas

The TTOs classified the product and service launches against the fourteen national Research Prioritisation Areas and six high level Research Prioritisation Themes[4]. Although these have recently been updated for the period 2018-2023, as part of a government-led review, the previous categories have been used as these were in place and reported against during the 2017 reporting period. Where the interdisciplinary nature of a licensed technology could have allowed multiple categories, the most relevant area was selected.

The majority (50%, 11 launches) were categorised in the field of ICT, followed by Health & Medical Technologies at 27% (6 launches).

Figure 3: Licensed technologies launched in 2017, mapped against research themes and priority areas (n=22)



4 See Appendix B

2.4 Characteristics of licensee companies

The study team looked into the licensee companies launching RPO-based products and services.

In some cases, the same company brought more than one of the 2017 products and services to market, with a total of 17 different companies launching the 22 products or services in 2017. These companies range from small start-ups to multinational corporations with the majority being small companies. Nine (53%) of the licensee companies were spin-outs from RPOs.

82% (14) of the licensee companies had less than 30 employees, and 47% (8) less than 10 employees. Three companies launching products or services were larger companies with over 100 employees. The chart to the right categorises the licensee companies according to number of employees. These data are difficult to obtain accurately, and a variety of sources including the RPOs, licensee reported data, public websites and company LinkedIn profiles were used to estimate the information.

All but one (94%) of these licensee companies are either based in Ireland or have locations both in Ireland and abroad. Of the Irish based companies, the majority (69%, 11 licensees) are located in the Dublin area.

Figure 4: Size of the licensee companies launching products and services during 2017 (n=17)

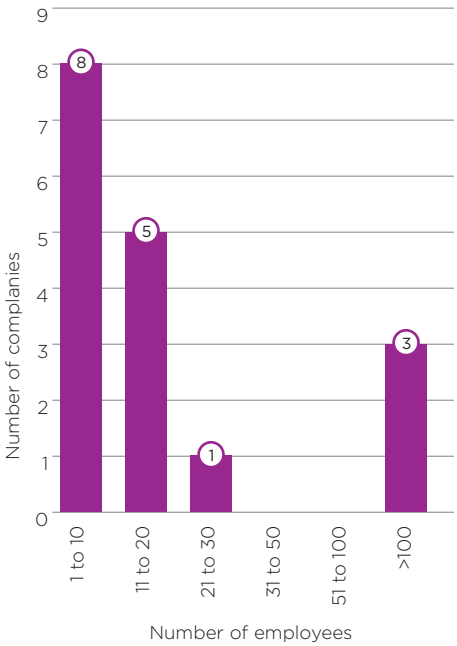


Figure 5: Location of the Irish based companies launching products and services in 2017 (n=16)

CASE STUDY

PolyPico Precise: a high-impact solution for the scientific community

PicoPrecise is a new product launched in 2017 using technology licensed from the University of Limerick (UL) to PolyPico, a UL spin-out. PolyPico's dispensing technology offers a unique solution for dispensing miniscule volumes of fluid that range from nanolitre (10-9) to picolitre (10-12) scale using disposable fluid cartridges. It was designed for scientists who wish to dispense reagents, biomaterials or cells with ultra-high precision in an affordable way. The core technology used by the company is based on the research activity of Dr. Gabriel Leen, who continues to work as a Senior Research Fellow at the Faculty of Science and Engineering at UL. This acoustic dispensing platform technology was licensed from UL to the company in late 2013 and it was very well received by the scientific community following its launch in 2014. To expand the capabilities and applications of the technology, the company launched PicoPrecise in 2017. This is a robot-based product which revolutionises the deposition of cells into well plates/slides, serial dilutions, biomolecule arrays, PCR and 3D biomaterial printing. The robot control allows exceptional accuracy when placing these tiny fluid volumes. PolyPico's clients include some of the top universities and research performing institutes as well as commercial customers globally. The PolyPico Technologies team continues to be actively involved in a number of research projects and has ongoing relationships with Diamond Light Source, which is the UK's national synchrotron facility. PolyPico technology will be also used to introduce pico-litre volumes of material into the x-ray beam line in a series of crystallography experiments at the European XFEL.

The TTO team at UL has proactively participated at many stages of the commercialisation journey for the technology which included assisting the team in applications for funding (the company has received Commercialisation Fund from Enterprise Ireland), license negotiations and marketing activities, as well as support to help Polypico spin-out from the University.

Added value from the RPO: Commercialisation funding application support, licence, spin-out support, ongoing advice

Research Prioritisation Area: Therapeutics-Synthesis, Formulation, Processing and Drug Delivery

3

Products and services – trends and progress since 2013

Over the five years that national data have been collected through the AKTS, the number of products and services launched each year has been relatively constant, with a peak of activity in 2015. In total over this period, 138 new products and services have now been launched, based on the research from 16 different RPOs. The Specialist and State Research Organisations, and the Institutes of Technology have become more active following investment from the Enterprise Ireland Technology Transfer Strengthening Initiative funding programme[5], and these now consistently represent 30% or more of the activity. Over the five years, 64% of the new products and services launched have been based on technology developed in the Universities, 25% in the Institutes of Technology and 11% from the Specialist and State Research Organisations.

3.1 Types of IP underpinning product and services launches over time

Over the past five years, patents and software have consistently formed the basis of the majority (around 60%) of the products and services that have been launched. Several products also involved access to know-how (21%), which is most often licensed alongside other IP. New plant varieties and other biological materials or reagents make up 7% of the total products.

3.2 Research Prioritisation Areas

Categorising new products and services launches against Research Prioritisation themes reflects the strength of the ICT industry in Ireland. Over the past five years ICT continues to be the most active research theme in which new products and services were launched , with Health & Medical Technologies, and Manufacturing & Materials also key areas for the introduction of new products and services. Within these individual themes, the most common Research Prioritisation Area to yield commercial products and services from RPO licences has consistently been Digital Platforms, Content & Applications (18%), followed by Processing Technologies & Novel Materials (12%).

Over the years, products and services falling into the "Other" category have included: Online training; Animal health; Research tools (including instrumentation and reagents); Consumer products; LED; Product security; Financial risk management; and Sensors.

Figure 6: Source of products and services brought to the market 2013-2017 by type of institution (n=138)

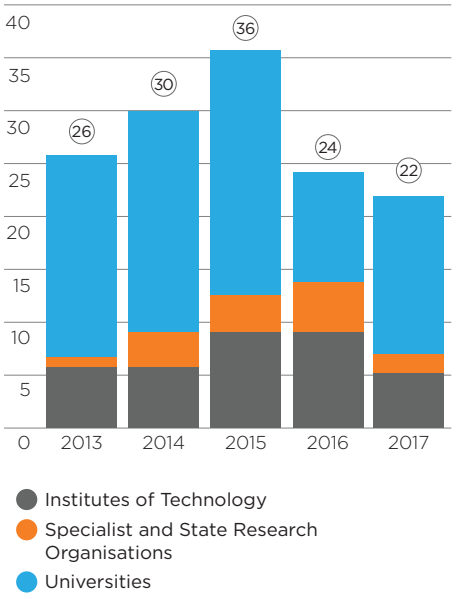
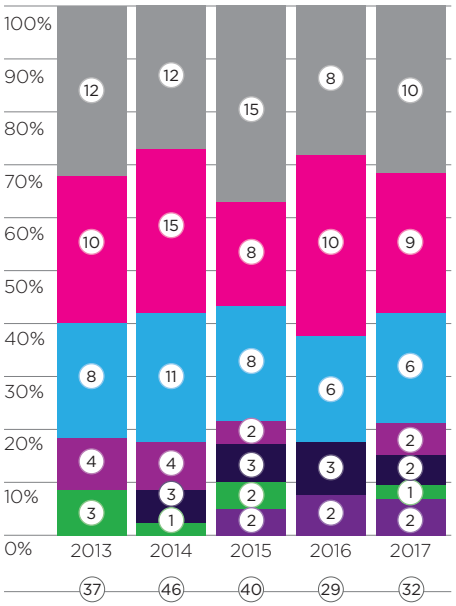
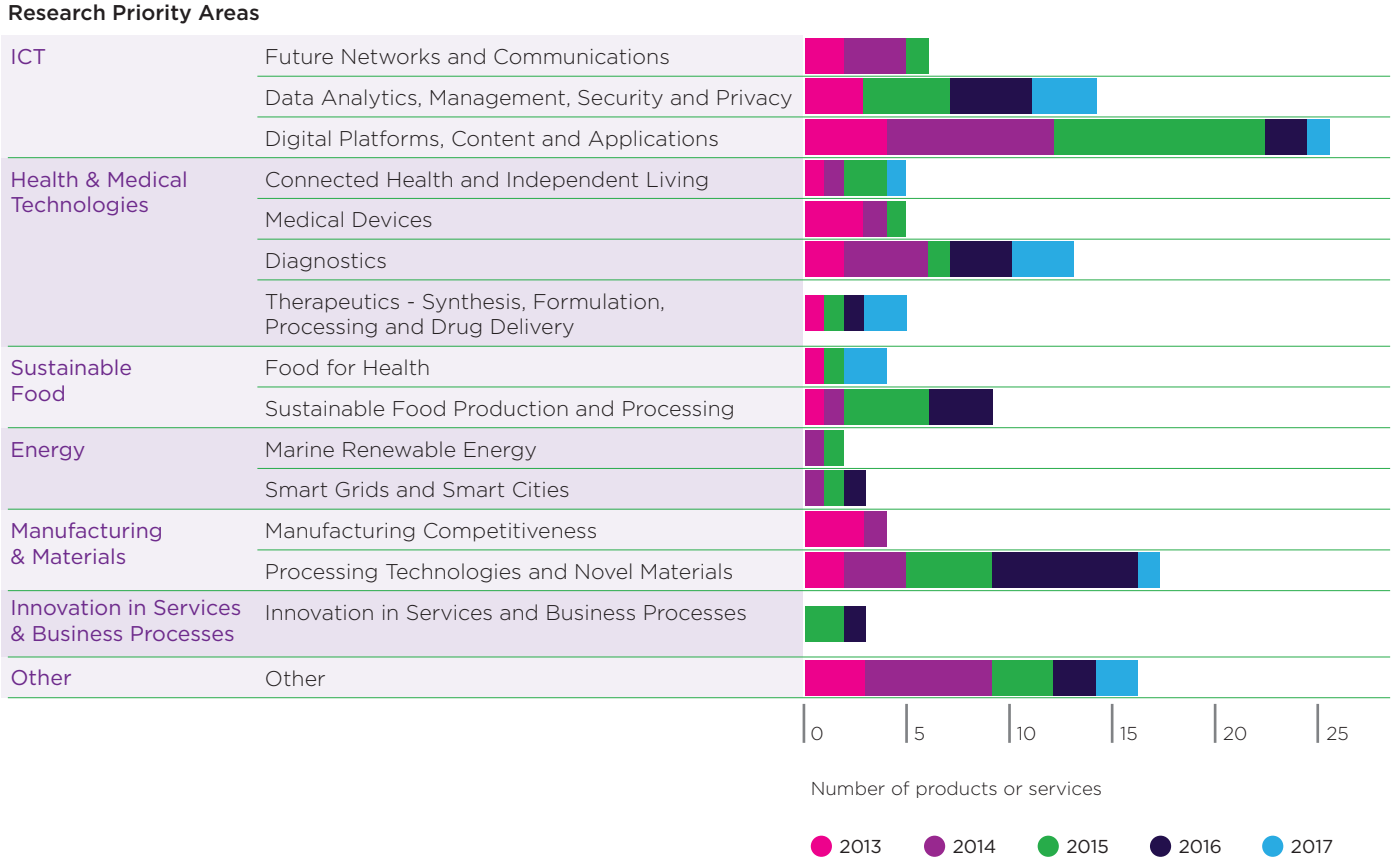


Figure 7: Types of IP rights that led to products and services launched 2013-2017 (n=184)



5 http://www.knowledgetransferireland.com/News/Minister-Halligan-announces-%E2%82%AC34-5M-in-funding-for-the-Technology-Transfer-Strengthening-Initiative.html

Figure 8: **Licensed technologies launched 2013-2017, mapped against research priority areas (n=138)**



CASE STUDY

Software solutions lead to improved project planning in the renewable energy sector

Exceedence, a spin-out company from University College Cork (UCC), has developed a software package that offers insights into the viability of projects within the renewable energy industry sector. By providing a detailed analysis of technical and financial project metrics, their tool creates an opportunity for project developers, investors, consultants as well as device developers & supply chain professionals to improve project planning and optimisation across wind, offshore wind, wave and tidal platforms. The underpinning technology came out of the work of Dr Raymond Alcorn and Dr Chris O'Donoghue at the MaREI Centre for Marine and Renewable Energy at UCC, supported by Enterprise Ireland Commercialisation Funding grants. The IP was licensed to the company, co-founded by Dr Alcorn and John Keating, in 2015 and the product was launched on the market that year. The product has now been developed into a flexible, cloud-based solution which is available in scalable modules ranging from a 'Lite' version of the package to multiple customised enterprise add-on applications and a Finance module. The company has been able to grow based on its early successes which include completing a crowdfunding campaign which has allowed them to attract new international partners.

The TTO at UCC helped with the company setup and licensing and provided access to incubation space at the Western Gateway, before they entered the entrepreneurship program at the Irish Maritime and Energy Research Cluster (a partnership between UCC, the Institute of Technology Carlow and the Irish Navy). The company continues to have a relationship with UCC and actively participates in community projects organised by the university. It has also expanded its collaborations to include other research-performing organisations across Ireland and internationally.

Added value from the RPO:
Support to apply for commercialisation funding; licence, incubation space

Research Prioritisation Area:
Marine Renewable Energy

3.3 Characteristics of licensee companies

A significant proportion of the licensee companies launching products and services based on RPO IP over the last five years have been spin-outs from the RPO. This has varied between 39% - 68% with a four-year average of 53% launches from spin-out licensees.

The proportion of these companies that are based in Ireland has remained constant, at an average of 87%.

3.4 Products and services that are still in use

This year's study investigated all the products and services that had been launched onto the market between 2013 and 2016 based on IP licensed from the Irish RPOs to establish whether these products and services are still in use and, if not, whether this is because the licensee company is no longer active or because the technology is no longer being used. The study team used a combination of public data and information reported by the licensee to the TTO. A total of 85 products and services were found to be still on the market. This is likely to be an underestimate, as the team was unable to establish the definitive status for some of the products and services through the available information.

Most of the products and services remain in use from all the years of the survey. As technology progresses and market needs evolve, some of the older products are no longer offered. A small number of the licensee companies have gone out of business and so can no longer provide the licensed technology. As would be expected, the products and services launched longest ago show the highest attrition rates (2013: 62%; 2014: 73%; 2015: 75%; 2016: 83%).

Given the small numbers involved, it is difficult to draw any conclusions about differences between those products and services which remain on the market, and those which have disappeared. The profile of the products and services seem to be relatively consistent in terms of the type of IP transferred, the research themes and priority areas, and the ownership of the licensee company. The products and services which are associated with RPO spin-out companies do seem to be slightly more long-lived, however; 62% of the products and services from 2013-2016 that are still active were launched by RPO spin-outs, compared with 57% of the total number of products and services that were launched based on RPO technology in the same period.

Figure 9: Type of licensee company launching products and services 2013-2017 (n=124)

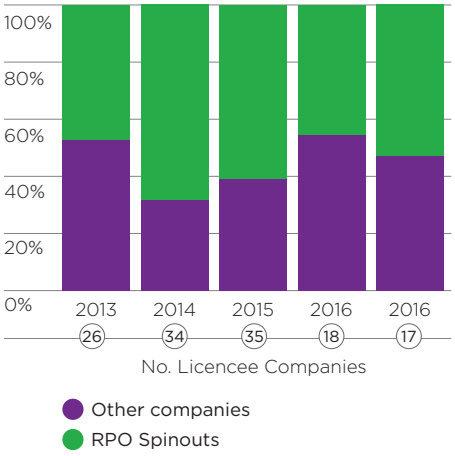
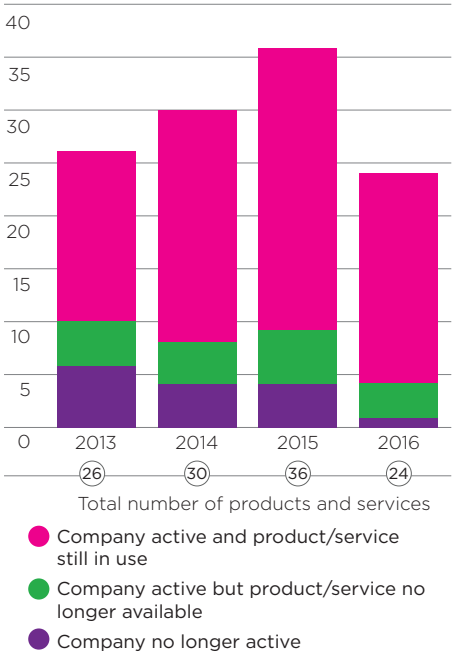


Figure 10: Current status of products and services by year of original launch (n=116)



CASE STUDY

International uptake for a cloud-based file management solution

Waterford Technologies, an Irish developer and supplier of email and file archiving solutions, established close collaborative links with the Telecommunications Software & Systems Group (TSSG) at Waterford Institute of Technology (WIT) which led to the development of a new product, SISCIN. SISCIN is a cloud-based file analysis and archiving solution. It provides users with an affordable, secure and seamless way of moving and managing data in the Cloud. The software package offers a transparent platform to oversee the data stored on internal and external servers. The solution assists clients to better control their use of the storage space on servers by developing and executing data migration strategies, which might involve moving data to more cost-effective systems.

The collaboration with WIT arose following an industry showcase event and, with co-funding from the company and Enterprise Ireland, TSSG worked alongside the international team at Waterford Technologies to develop the new product, which was licensed by WIT to the company in 2016. This licensed technology has promoted further growth of Waterford Technologies and it now forms an integral part of the developer's portfolio. Following a soft launch in 2016, the product has seen steady uptake by market leaders across many industries with headquarters distributed across the world in locations such as Denmark, India and the United States. Waterford Technologies now has offices in Ireland, the UK and US. The company is engaged in active discussions with large multinational cloud storage providers about potential channel partnerships and new routes to market.

Enterprise Ireland has always strongly supported the company right from the early stages of its development. Moreover, the collaboration between TSSG and Waterford Technologies was greatly facilitated by the technology transfer office at WIT, which smoothed the licensing process with their pragmatic approach to problem-solving.

Added value from the RPO: Collaborative funding support, license negotiation

Research Prioritisation Area: Data Analytics, Management, Security and Privacy

4

Active Spin-outs

This study investigated those spin-outs with an "active" status at the time of census, i.e. on 31st December 2017. There were 113 Active Spin-outs identified as part of this analysis. As the survey has developed, there have been some changes and clarifications to the definitions used which has resulted in some companies which were counted in previous years being excluded from the current survey, in particular those which have been acquired or merged with another company. Comparisons between the findings in this study and previous versions of the Outcomes Study may therefore not always be on the same basis.

Universities account for 81% (92) of all Active Spin-out companies with 15% (17) arising from the Institutes of Technology and 4% (4) from the Specialist and State Research Organisations.

The RPOs that have formed the highest numbers of spin-outs that are still active are Trinity College Dublin (TCD), University College Dublin (UCD) and NUI Galway, which between them have launched half of the active Spin-out companies. Seventeen different RPOs have now reported at least one Active Spin-out at the end of 2017. New institutions reporting Active Spin-outs this year were the Institute of Technology Tralee and the National College of Art & Design. The oldest recorded Active Spin-out goes back to 1983 (UCD).

4.1 Pathways to achieving Active Spin-outs

The impetus to start a spin-out can come from many directions. Sometimes it is the academic who wants to see their research used in the real world. Sometimes an entrepreneur spots the value of a technology, and sometimes the TTO realises that there is a commercial opportunity which could be exploited. Wherever the drive begins, a spin-out is a collaborative effort between the RPO, the inventors, the TTO and the new company management team. The role played by the TTO during spin-out is adapted to each specific opportunity, for example by identifying commercial opportunities and suitable routes to market, introducing mentors or finding translational funding sources and investment. The TTO will routinely lead the negotiation of the licence agreements and the foundation documents for the spin-out company. Many of the RPOs host accelerator programs and provide incubator space which can be used by the new companies in their early years. Several of the Active Spin-outs started life in these spaces and are beginning to find larger premises as they have grown.

Frequently cited supports are the Enterprise Ireland Commercialisation Fund which helps to prove the commercial value of the technology and the Enterprise Ireland High Potential Start Up (HPSU) programme[6], which gives access to advice and grants to help with developing the proposition, getting investor ready, or starting to internationalise.

4.2 Types of intellectual property underpinning Active Spin-outs

The underlying IP that is used to found these spin-outs will most often include patents, software and algorithms, and/or know-how. Patent-related IP accounts for 34% of the reported intellectual property licensed from the RPOs to the Active Spin-outs. A further 29% of IP was related to Know-how and 28% to Software. More than one type of IP may be used by a company. As more than one type of IP may be used as the foundation for any individual spin-out the total number of different types of IP reported was 157.

Figure 11: Origin of the spin-out by type of institution, 2017 (n=113)

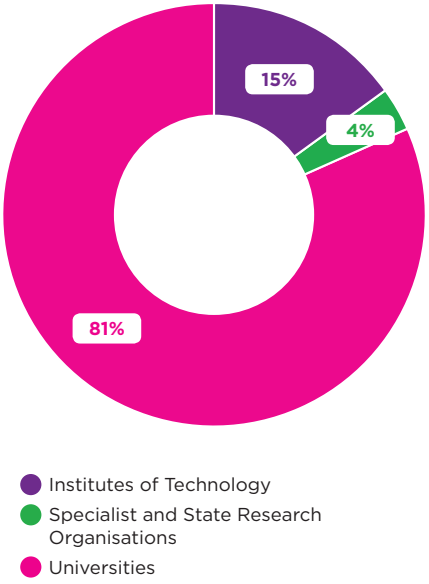
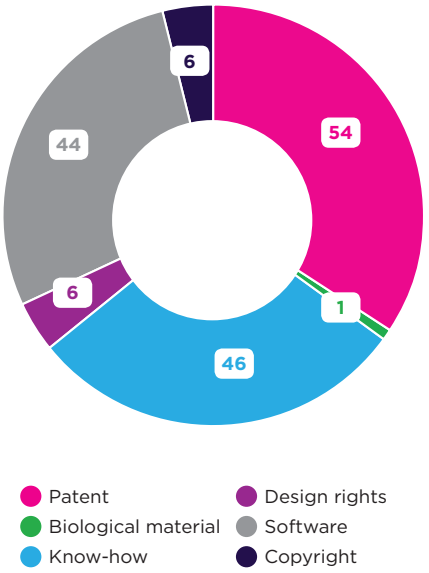


Figure 12: RPO intellectual property (n=157), by type, used by Active Spin-outs, 2017



6 HPSUs are ambitious new companies capable of creating 10 jobs in Ireland and realising €1 million in sales within three to four years of starting up

4.3 Research Prioritisation Areas

The TTOs classify Active Spin-outs according to the national Research Prioritisation Themes and Research Priority Areas listed in Appendix B. Where a company could fit into more than one category, it is assigned to the one which most closely fits their commercial focus. The two dominant research themes in 2017 continue to be ICT (35%) and Health and Medical Technologies (27%) followed by Manufacturing and Materials (19%). This is consistent with last year's analysis.

Ten of the companies that did not fit naturally into a research priority area and have been listed as "Other". These include: Engineering consultancy; Creative arts for social projects; Electronic Circuit Design; On-line genealogy; Road-noise monitoring; Hand-wash monitor; Environmental Services; Policy consultancy; and Animal health.

4.4 Company maturity

Examining the year of registration of each of the 113 Active Spin-outs shows that the majority of companies are between 6-10 years old (42%) with 35% at 3-5 years old. 23% of Active Spin-out companies are over 10 years old.

The Technology Transfer Strengthening Initiative programme (TTSI1) was introduced in 2007, and the effects of this funding can be seen in the significant increase in spin-outs registered after this date which still remain active in 2017. 26 of the 2017 Active Spin-outs were registered prior to 2007 and 83 registered in the eight years from 2007-2014.

Figure 14: Age of the Active Spin-outs at December 2017 (n=113)

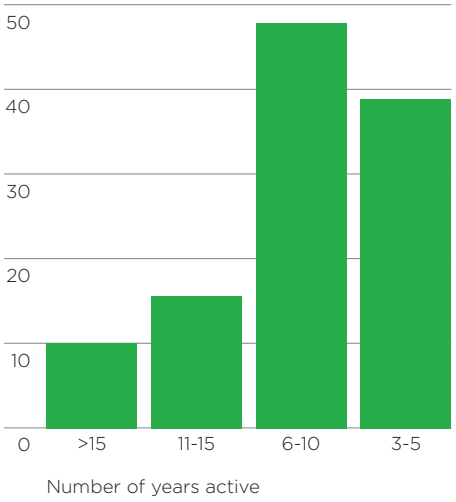


Figure 13: Active Spin-outs at the end of 2017, mapped against research themes and priority areas (n=113)

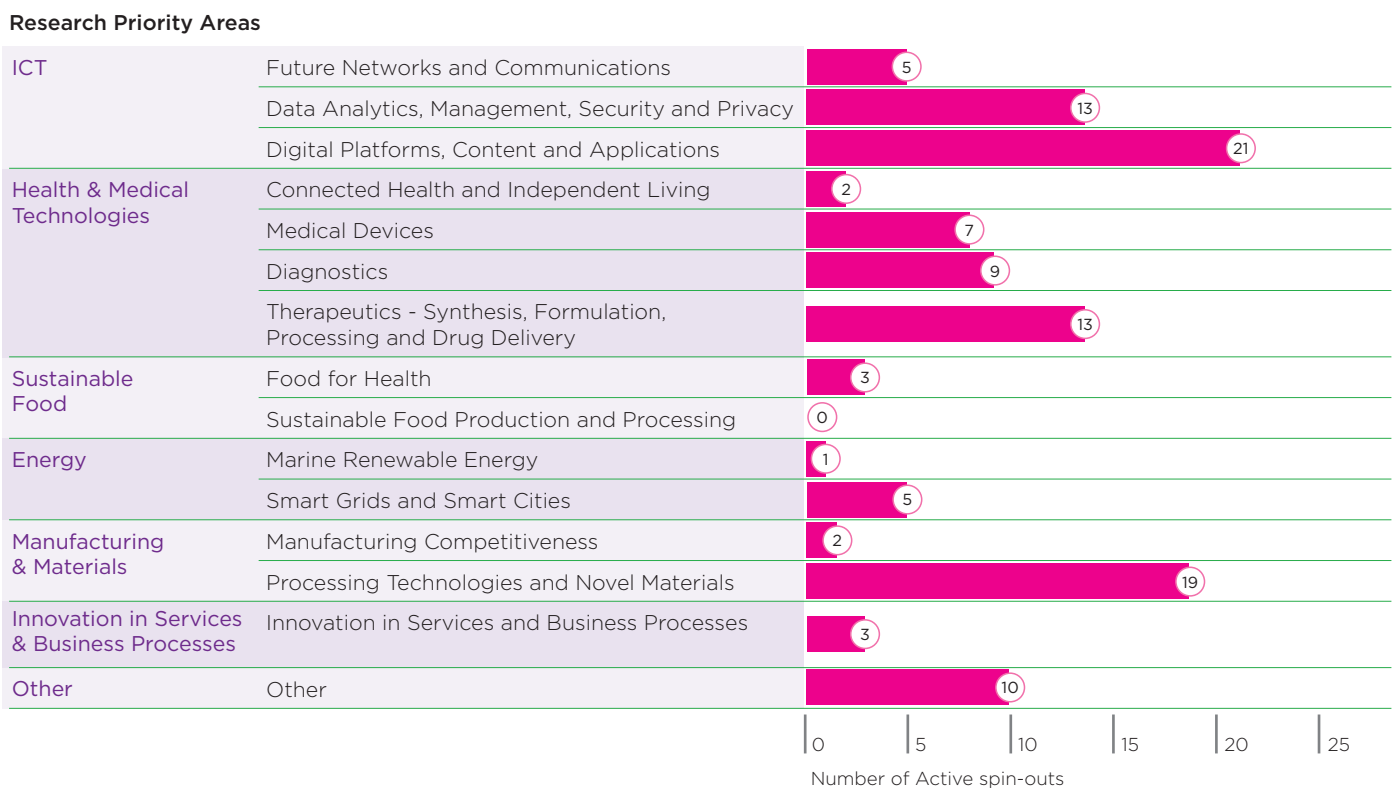
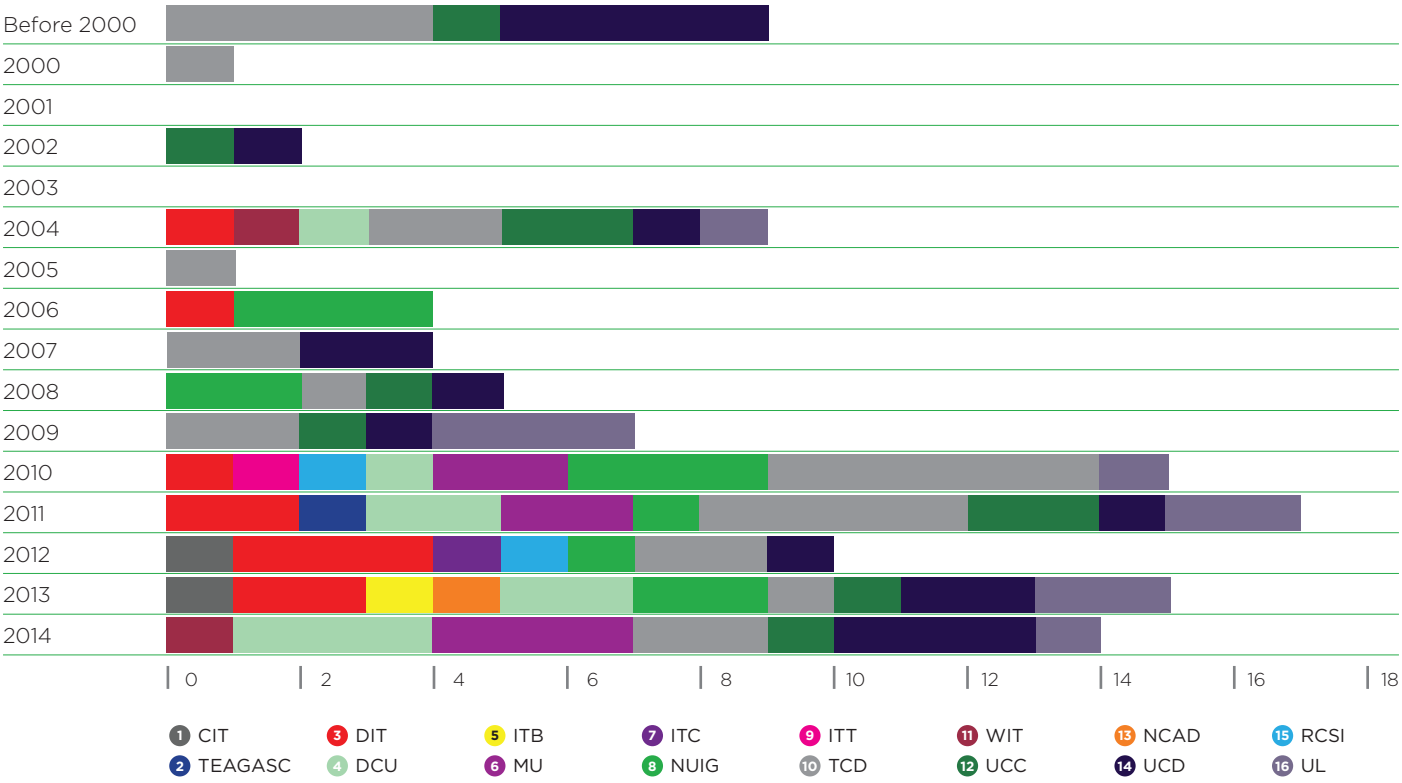


Figure 15: Active Spin-outs 2017 by RPO and year of registration (n=113)

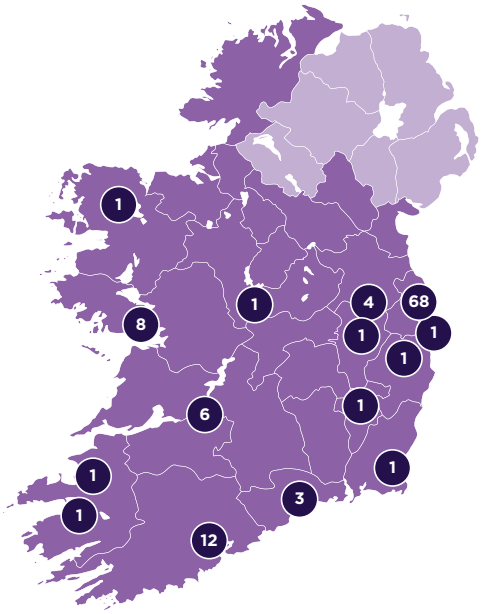


4.5 Location

Like many other spin-outs across the world, a large number of the Active Spin-outs have their headquarters within the same town as their parent institution. This allows them to retain close links and, in some cases, to continue collaborative research with their RPO. Several of these are located within RPO-associated incubation facilities. Nevertheless, many of them are also operating on a global stage, and at least 40 (35%) of the companies have established offices and/or appointed distribution agents in one or more overseas territory. Several of the other Active Spin-outs are trading abroad directly from their base within Ireland. Three of the Active Spin-outs are based outside Ireland (with registered offices in Guernsey, Portugal and Canada).

Dublin continues to be the most common location for the Ireland-based spin-out companies, with around 62% of the spin-outs based in Dublin. This maps to the proportion of Active Spin-outs (60%) which have spun out from RPOs which themselves are in Dublin or its surrounding area.

Figure 16: Current location of Irish-based Active Spin-outs (n=110)

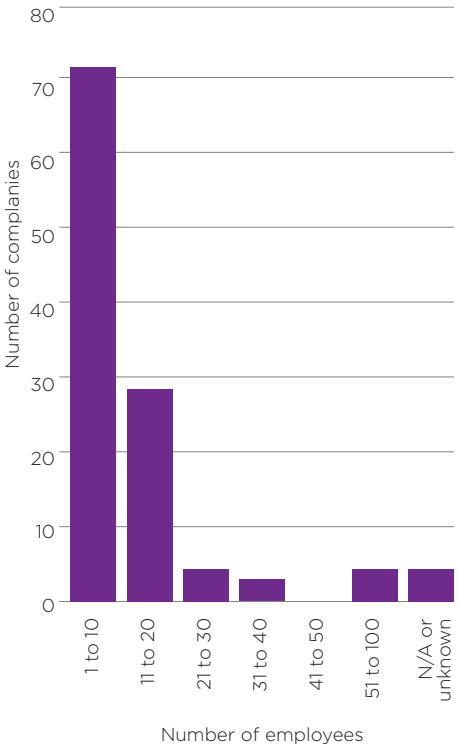


4.6 Employment

Accurate employment figures for the Active Spin-outs are challenging to obtain as this is not well reported to the RPOs and most of the companies are below the size where they are obliged to include headcount data in their published annual returns. The figures can also be misleading, due to fluctuations in headcount, particularly within early stage companies which often use flexible placements according to their current needs. The study team used a variety of sources including data held by the RPOs, public websites and company LinkedIn profiles to estimate the number of employees on 31 December 2017.

The majority of the companies remain micro companies (64%) and have fewer than 10 employees. Some of the companies have grown larger and four companies now have over 50 employees. As a group, the Active Spin-out companies are estimated to provide employment for at least 1,160 people, with the majority of these based in Ireland. This is an increase over the number reported last year (960), following a more consistent application of the definition of an Active Spin-out.

Figure 17: Size of the Active Spin-out companies as of 31 December 2017 (n=113)



CASE STUDY

UCD spin-out with global impact, helping people to maintain independent living

Kinesis Health Technologies has been highly successful in translating research into clinical settings. The company is a spin-out from UCD, formed as an outcome of a research collaboration between Intel, UCD, Trinity College Dublin and St James's Hospital called Technology Research for Independent Living (TRIL). The collaboration was funded by Intel, GE Healthcare and IDA Ireland. Kinesis currently offers two products based on wearable sensor technologies intended for clinical use to help prevent falls and mobility problems in older adults with further product developments in the pipeline. Kinesis QTUG™ is a medical device worn by patients which provides healthcare professionals with an accurate assessment of the patients' fall risk. Kinesis Gait offers detailed measurements and analysis of patient's temporal and spatial gait parameters. In 2014, the company established links with Care Innovations and Kinesis now work with many international clients from the public and private healthcare sectors. These solutions from Kinesis are ground-breaking for the healthcare industry, as they can significantly reduce the costs associated with the consequences of falls and limited mobility, addressing issues associated with ageing population worldwide enabling older adults to remain independent for longer.

Kinesis was co-founded by Seamus Small and Dr Barry Greene in 2013 from the UCD School of Public Health, Physiotherapy and Sports Science. Initially the company was based at NovaUCD and has since moved to grow on space at NexusUCD where it now employs seven people. UCD has been actively supporting the spin-out through its development with space in their incubator facilities, through the Venture Launch accelerator program and with assistance in applying for commercialisation funding offered by Enterprise Ireland. Kinesis and UCD are continuing to collaborate on an ongoing basis with both academic departments and local hospitals.

Added value from the RPO:
Support in applying for commercialisation funding, licence, spin-out support, incubator facility, Venture Launch accelerator program

Research Prioritisation Area:
Connected Health and Independent Living

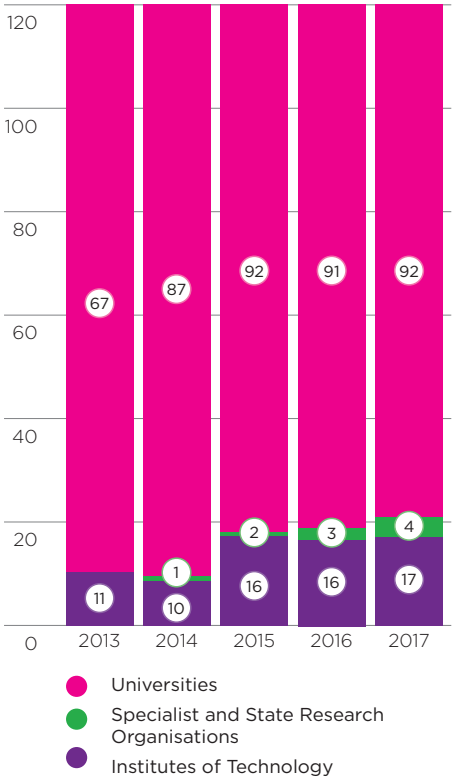
5

Active Spin-outs – trends and progress since 2013

The number of Active Spin-outs from RPOs in Ireland has been growing steadily since the AKTS began in 2013 and there has been steady progress towards older companies as a proportion of the total of Active Spin-outs reported each year, suggesting a degree of sustainability. Since the previous report, five of the spin-outs have been acquired by or merged with another company, delivering a successful exit to the RPO and the founding investors. Most of these companies continue to operate within Ireland and continue to contribute to the local economy.

Over the past five years, the number of spin-outs which have originated from the Institutes of Technology and the Specialist and State Research Organisations has begun to increase, and these now represent 20% of the total number of Active Spin-outs.

Figure 18: Percentage of Active Spin-outs in each age band, as reported in 2013-2017 (n=78-113)



Appendix A

Abbreviations, acronyms and definitions

Acronym	*Description*
AKTS	Annual Knowledge Transfer Survey
EI	Enterprise Ireland
HEA	Higher Education Authority
HEI	Higher Education Institution
HSPU	Enterprise Ireland's High Potential Start Up support scheme
IoT	Institute of Technology
IP	Intellectual Property
IPR	Intellectual Property Rights
KTI	Knowledge Transfer Ireland
RPO	Research Performing Organisation
SFI	Science Foundation Ireland
TTO	Technology Transfer Office
TTSI	Enterprise Ireland's Technology Transfer Strengthening Initiative Programme

Relevant definitions used in the AKTS2017	
RPO	Research Performing Organisations are Universities, Institutes of Technology and other research institutions funded primarily by public funds.
TTO	Technology Transfer Office is the team responsible for managing KT services, including intellectual property management, licensing, partnering with industry and the creation of new companies.
Spin-out	A spin-out company is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The rights to the company can be linked to a specific researcher who was within the RPO at the time of company formation and who would be considered an academic founder. The RPO will hold equity in the spin-out and/or has issued the company with a licence to the IP.
Active Spin-out	An Active Spin-out is an RPO-created spin-out company that is at least three years post-formation (and three years since being reported as an RPO spin-out) and, as at the end of the reference year, has at least one paid employee and has raised equity and/or has booked sales revenue. It is an incorporated entity which at the time of formation was dependent on the exploitation of specific intellectual property rights of the RPO. The RPO will have executed a licence to the spin-out for the IPR and/or will hold equity in the spin-out.
Licence	A contract under which IP rights are transferred from one party to another for the purpose of commercialisation.

Appendix B

Appendix B National Research Prioritisation Areas and Themes

Research Themes	Research Prioritisation Areas
ICT	A Future Networks and Communications B Data Analytics, Management, Security and Privacy C Digital Platforms, Content and Applications
Health & Medical	D Connected Health and Independent Living E Medical Devices Technologies F Diagnostics G Therapeutics - Synthesis, Formulation, Processing and Drug Delivery
Sustainable Food	H Food for Health I Sustainable Food Production and Processing
Energy	J Marine Renewable Energy K Smart Grids and Smart Cities
Manufacturing & Materials	L Manufacturing Competitiveness M Processing Technologies and Novel Materials
Innovation in Services and Business Processes	N Innovation in Services and Business Processes

Source: https://dbei.gov.ie/en/Publications/Publication-files/Research-Prioritisation.pdf

Note: Following an extensive review, these Research Prioritisation Areas have been updated for the period 2018-2023. This study uses the categories above which were in place during the reporting period (2017). Future versions of this study will report against the following refreshed categories:

Research Themes	Refreshed Research Prioritisation Areas 2018-2023
ICT	Future Networks, Communications and Internet of Things Data Analytics, Management, Security, Privacy, Robotics and Artificial Intelligence (including Machine Learning) Digital Platforms, Content and Applications Augmented Reality and Virtual Reality
Health & Wellbeing	Connected Health and Independent Living Medical Devices Diagnostics Therapeutics
Food	Food for Health Smart and Sustainable Food Production and Processing
Energy, Climate Action & Sustainability	Decarbonising the Energy System Sustainable Living
Manufacturing & Materials	Advanced and Smart Manufacturing Manufacturing and Novel Materials
Services & Business Processes	Innovation in Services and Business Processes

Source: https://dbei.gov.ie/en/Publications/Publication-files/Research-Priority-Areas-2018-to-2023.pdf

Appendix C
Methodology

The study and reporting were undertaken between June and September 2017. The methodology applied by IP Pragmatics to undertake this outcomes study combined the use of the previously collected information through the AKTS as well as data from previous outcomes studies and data held by KTI and EI. Other sources of information researched included publicly available information such as websites, press releases, databases (IP, market, technical); existing case studies and overviews on companies and technologies and previous reports and documents on Impact from research in Irish RPOs. Desk-based research was undertaken to update and validate the information collected in previous years, combined with TTO interviews from the RPOs that reported relevant outcomes in AKTS2017. For the case studies, these interviews were followed up with discussions with representatives from the spin-out company or licensee.

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