

ALSO INSIDE**HOW TO THRIVE IN THE AGE OF DISRUPTION**

Harnessing digital technology and becoming a data-driven organisation

UNLOCKING EUROPE'S GREAT ENGINEERING MARKETS

Tapping into Europe's historic engineering prowess

PORTS OF CALL

Benelux leads the evolution of Europe's major ports

CONSTRUCTION TURNS TIDE ON IRELAND'S CONTINENTAL DRIFT

Irish construction moves beyond the UK

CAUTION: UNICORNS CROSSING

Nordic customers embrace innovation

WINNING SALES OVERSEAS



THE MARKET

The Eurozone

19 markets: one currency



THE EXPERTS' EXPERT

We are Actavo, an engineering solutions company with global reach. We operate in diverse and demanding markets, offering a breadth of services, from energy to events, business support to building solutions, communications to construction. We manage, maintain and mobilise the vital infrastructure that everyone depends on.

We always look to innovate, to perform better and to think smarter.

We are the experts' expert.

Going Beyond



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THE MARKET

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Enterprise Ireland launches Eurozone strategy for 2017-2020

Enterprise Ireland has launched a strategy for 2017-2020 aimed at inspiring companies with limited exports to the Eurozone to enter these markets and working with Enterprise Ireland clients already in the region to deepen their presence.

The target is to increase Eurozone exports by €2bn per annum. This would represent one of the most significant shifts in client exports into the Eurozone – a move seen as particularly important in the context of Brexit. Priority sectors include construction, engineering, life science and medtech and food.

With two prongs, focused on 'Eurozone Start' and 'Eurozone Scale'

clients, the strategy aims to support companies on their export journey from market opportunity awareness, research and capability assessment to product localisation, market entry and growth. It will also involve Enterprise Ireland offices in the Eurozone identifying new market and sector opportunities for clients.

It is to be supported by increased resources in the Eurozone, coupled with increased assistance for companies, including market access grants, business innovation funding, market opportunity reviews, management development programmes and access to trade missions/market study visits.

The #Global Ambition campaign will showcase companies achieving success in the region and is to be backed by market guides, information, sector workshops and insights. Enterprise Ireland also plans to launch 'Advantage Ireland' in-market digital communication campaigns in key markets to stimulate awareness among buyers of Irish innovation and capabilities. Commenting on the strategy, Enterprise Ireland CEO Julie Sinnamón noted that innovation at a company, sectoral and national level to differentiate Irish products would be key to success in these markets.

Strategic ambitions for the Eurozone 2017-2020



Eurozone exports

+50% increase in exports to Eurozone

+€2bn increase in exports pa by 2020

Shift in the global footprint of Irish exports from UK to Eurozone



Eurozone priority sectors

Construction

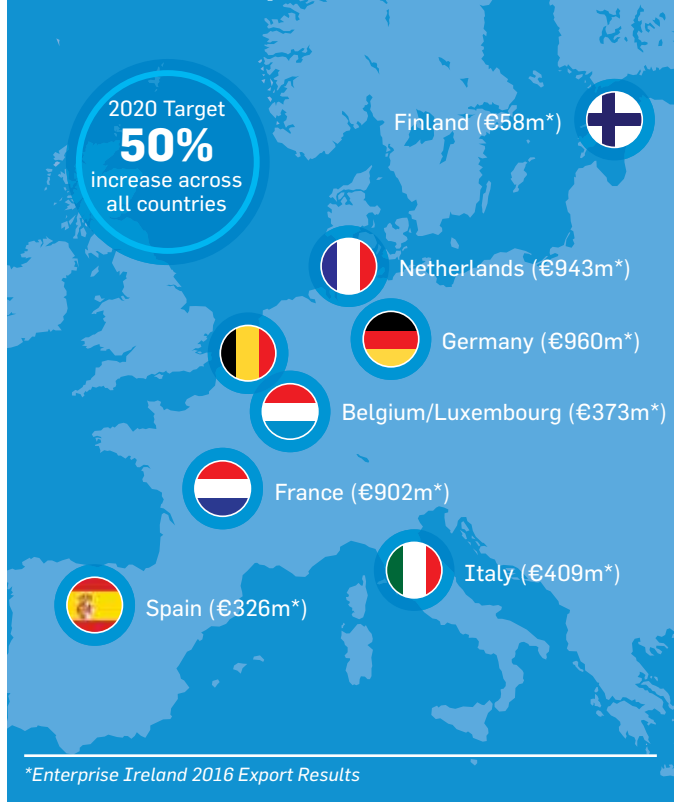
Engineering

Life sciences

Medtech

Food

Current client exports



Trade missions to Germany and Belgium

As part of the drive to increase export market penetration and the diversification of Irish companies post-Brexit, Enterprise Ireland coordinated trade missions to Germany and Belgium this April.

On April 20, the Minister for Employment and Small Business, Pat Breen TD, led Enterprise Ireland's trade mission to Antwerp on 20 April. The programme, aimed at promoting this country's extensive experience and capability within the high-tech pharmaceutical, engineering and construction sectors, provided four key networking opportunities for the 25 participating Irish companies to make new business contacts in Belgium.

Meanwhile, on 6 April, the Taoiseach Enda Kenny TD led Enterprise Ireland's trade promotion programme in Frankfurt, Germany, as part of his official visit to further develop links between Ireland and Germany. During the half-day programme, the Taoiseach launched the Enterprise Ireland Going Global – Exporting to Germany Guide and made three announcements for Enterprise Ireland clients.

Family-owned Collen Construction marked its launch in the Europe data centre market, with the official launch of a new Frankfurt office. Start-up Solgari celebrated a new partnership with OnDemand4U to bring cloud business communications to SMEs in Germany, Austria and Switzerland. In addition, Cubic Telecom announced plans to open an office in Munich to support its growing customer base in the German market.



Scorecard and road shows to help companies prepare for Brexit

Enterprise Ireland has launched the 'Brexit SME Scorecard' as an online platform to help SME management teams work through the process of developing a robust action plan to respond to the risks of a hard Brexit and to capitalise on any upside. The self-assessment and feedback focuses on the six key areas of business strategy, operations, innovation, sales and marketing, finance, and people management. The tool is available at the www.prepareforbrexit.ie website.

While the SME Scorecard is available to all companies, Enterprise Ireland's exporting clients that use the online platform can then engage with the agency's advisers domestically and

through the overseas network.

Enterprise Ireland will also provide funding up to the value of €5,000 to exporting clients to support the development of a business action plan and work with these companies on a one-to-one basis to support the implementation of the plan.

Separately, Enterprise Ireland has announced a series of nationwide 'Prepare for Brexit' road shows. Designed to encourage SMEs to prepare for a hard Brexit, these events will provide a platform for robust discussion, information sharing and practical advice around the key issues facing Irish companies. See www.prepareforbrexit.ie



3D4Medical appoints medical professionals to advisory board

3D4Medical, a developer of 3D medical technology applications, has announced the creation of a medical advisory board, comprising a group of professionals, representing leading medical and research institutions around the globe. The objective is to ensure that the 3D4Medical product portfolio and roadmap meet the requirements of a fast-changing healthcare market.

The board appointments come at a time when 3D4Medical gears up for the release of the first product from its Complete Consultation suite, which will cover areas such as orthopaedics, cardiology, internal medicine and trauma. Members of the medical advisory board have contributed widely to the development of these products to date.

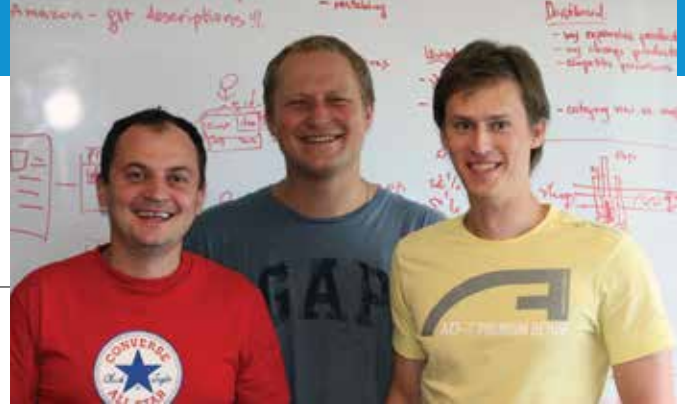
"3D4Medical digital applications like Complete Anatomy have the potential to transform the way anatomy is both taught and applied in clinical settings," explained board member Dr Jules L. Dienstag of Harvard Medical School. "Anchored by a creative technology platform and vivid artistry, such digital tools are ideal for anatomic learning and communication, for explaining medical and surgical disorders and planning therapeutic interventions. Excited about the technological advances that such digital tools represent, I look forward to engaging in strategic planning for their deployment in education, practice and research."

PM Group expands US operations with new Boston office

The PM Group has announced the official opening of its new, expanded Boston office, marking further growth of the company's presence in the USA.

PM Group has been established in Boston for seven years, where the company has been working for multinational clients, including AbbVie, Alexion, Avecia, Regeneron, EMD Serono and Sanofi.

"The expansion of PM Group's business in the USA is part of our strategy for further growth in the USA and serving USA companies internationally," said CEO Dave Murphy. "The Greater Boston area is one of the biggest centres for the life science industry in the United States. As one of the world's leading pharma engineering companies, it is a natural decision to expand our operations here."



PROFITERO CO-FOUNDERS VOLODYMYR PIGRUKH, DMITRY VYSOTSKI AND KANSTANTIN CHERNYSH.

Profitero expands to capitalize on e-commerce opportunity in Japan

E-commerce analytics company Profitero is now offering digital shelf expertise for both global and local brands in Japan, the world's fourth-largest e-commerce market.

The company recently added Amazon Japan to its Amazon FastMovers report series, which is released monthly to show which products have the best sales performance across key categories on Amazon.

An increased focus on Japan is also important to Profitero's strategic alliance with Nielsen, which already offers Profitero's

Digital Shelf 360 product suite to its global brand clients, helping them to correlate online performance with actual sales data.

eMarketer estimates that despite having the world's second-highest digital buyer penetration (82 per cent), Japan's online activity is geared toward local merchants, and the country still has one of the lowest cross-border buyer penetration rates in the world. Digital shelf data is critical as more global companies seek to enter the Japanese market.

Stable growth momentum predicted for the OECD area

The OECD's composite leading indicators (CLIs) analysis for the six to nine months ahead points to stable growth momentum in the OECD area as a whole.

The CLIs anticipate stable growth momentum in Japan and the euro area, particularly in France and Italy. Meanwhile, growth is expected to gain momentum in the United States, Canada and Germany.

In the United Kingdom, the CLIs also point to tentative signs of growth gaining momentum, although there is uncertainty related to Brexit.

Amongst major emerging economies, CLIs in China, Brazil and Russia point to growth picking up, while the CLIs for India signal easing growth momentum.

Combilift signs €1m contract with the Kingfisher group in France

Combilift, the Irish manufacturer of multi-directional forklifts, based in Monaghan, has signed a contract with Kingfisher, Europe's largest home improvement retailer, worth an additional €1m to deliver 50 Aisle-Master forklifts to the company during 2017.

The contract signing was witnessed by Leo Varadkar, Minister for Social Protection, and Geraldine Byrne-Nason, Ireland's Ambassador to France during an Enterprise Ireland trade visit to France in March. A further six Enterprise Ireland clients – Novareus, Ecowash, Ding, VigiTrust, Xintech and Gaellectric – also signed contracts with French partners during the visit.

IdentiGEN nets two international deals in a month

IdentiGEN, the Dublin-headquartered provider of DNA identification solutions to the international agri-food and seafood industries, landed two major seafood related contracts this March.

One of the deals will see the company, which currently has laboratory operations in Ireland, UK, USA and Canada, play a lead role in the future of the Norwegian salmon farming industry.

IdentiGEN will serve the multi-annual breeding objectives of two of the world's leading salmon breeding companies, Marine Harvest and SalmoBreed, together with the Norwegian Institute of Food, Fisheries and Aquaculture Research (Nofima). The initial contract, which involves DNA analysis of hundreds of thousands of fish, provides a foundation for the future DNA analysis of millions of salmon farmed throughout the world.

Through the power of genomic selection, traits of significant economic value, including growth rate, disease resistance and product quality, can be advanced by naturally harnessing the genetic variation that exists within the breeding population.

"We are particularly excited to work with the consortium, as the Norwegian industry sets the pace for global innovation," explained

IdentiGEN's managing director and Founder Ciaran Meghen. "As aquaculture production recently surpassed wild-caught fisheries, the importance of genetic improvement across diverse farmed fish and shellfish species cannot be underestimated."

The Dublin company's second recent deal involves the first-ever 'farm to fork' programme for shrimp production, offering consumers DNA-based assurance on the origin and quality of shrimp.

The technology offering – already available in animal meat – has been developed by IdentiGEN in partnership with the international seafood producer Seafresh, which is producing the shrimp in Central America, processing in the UK and supplying to Marks and Spencer. The traceable shrimp will be sold at Marks and Spencer outlets in the UK, the first time such an offering has been brought to the consumer.

"Our industry has been dogged by claims of child labour, poor production practices and use of unapproved feeding regimes," commented Seafresh CEO Lasse Hansen. "The unprecedented levels of supply chain transparency will help us convey more effectively to our customers and the consumer the care we take to meet the growing consumer expectations for a top quality, sustainable and ethically sourced shrimp supply."



EIMEAR MCGOVERN, CFO, AND MARC MURPHY, CEO, FENERGO

Fenargo plans to create 200 new jobs to support global growth

Dublin-headquartered Fenargo, a specialist in client lifecycle management software for investment, corporate and private banks, has announced plans to create 200 new jobs due to rapid global expansion.

In January 2013, Fenargo employed 36 people. This will increase to 500 with the new job creation plans.

Most recently, Fenargo announced its foray into Spain, signing up the country's second biggest bank, BBVA, which will deploy Fenargo's solutions across its corporate and investment banking divisions in Europe. This follows deals by the company with other world-leading financial institutions, including HSBC, UBS, BNY Mellon, Scotiabank, Bank of Montreal, Westpac, RBS, RBC, SunTrust and Nikko Americas.

Fenargo's growth comes on the back of Insight Venture Partners and Aquiline Capital Partners together investing €85m in the company in August 2015. Having stated its ambitions to IPO by 2020, Fenargo is using this to expand its global footprint, opening new offices and increasing employee numbers, investing in product and technology R&D and creating a global partner enablement programme. The company has also invested in creating a community of banks, with which it collaborates to align its regulatory and product roadmaps.

To date, Fenargo has opened six new offices in New York, Boston, Sydney, Singapore, Japan and Abu Dhabi and relocated its Dublin, London and Boston headquarters to cater for growing personnel. Most recently, the company took up residence in a 21,000-sq. ft building in Dublin's Point Village.

The company has also appointed Spencer G. Lake, a former vice chairman of HSBC Global Banking and Markets, to its board of directors in the capacity of vice chairman.





KTI DIRECTOR ALISON CAMPBELL; SENIOR PARTNER AT KATAWAVE, AIDAN MCCULLEN; AND JOURNALIST AND BROADCASTER, RICHARD CURRAN.

KTI's impact awards highlight the benefits of research for industry

Knowledge Transfer Ireland's (KTI's) 2017 impact awards, recognising the achievements of knowledge transfer professionals in the public funded research system, highlight the benefits working with a higher education institute or publicly funded organisation can bring to Irish businesses.

The KTI collaborative research award recognised how Ceramicx, a Cork-based heat processing specialist, worked with a team of engineers from Trinity College to develop a first-of-its-kind 3D infrared IR heat detector, delivering waste and cost savings for manufacturing industries. The product has helped Ceramicx increase sales, which have grown by 32 per cent since 2015, and employee numbers, which have increased by 50 per cent since the project began five years ago.

The Licence2Market KTI award went to Teagasc, which licensed new technology to Ornua Cooperative (formerly the Irish Dairy Board) to enable cheese manufacture in countries with a shortage of fresh milk. This led to Ornua opening a multi-million euro cheese manufacturing plant in Saudi Arabia. With plans to extend its product range in 2017, the company has strong growth plans to fill capacity over the next five years.

Kastus, a spin-out from Dublin Institute of Technology, received the spin-out company award. The company, which attracted venture capital investment in 2016, is commercialising technology that can be used to render any glass, ceramic or metallic surface 99.99 per cent resistant to superbugs like MRSA, *E. coli* and fungi.

The consultancy award went to researchers at the University of Limerick for work with Rusal Aghinish Alumina aimed at ensuring that product quality is not impacted in the event of a loss of power at the plant.

Oneview announces technology development collaboration with Intel

Oneview Healthcare has announced a technology development collaboration agreement with Intel, focused on accelerating time-to-market patient experience solutions and services.

As government policies shift towards reimbursing healthcare providers for patient outcomes versus procedure or fee-based care, the opportunity for patient engagement solutions is expected to grow.

Through the partnership, Oneview and Intel are seeking to develop a long-term roadmap of joint solutions that use their respective technologies to deliver best-in-class patient engagement solutions and customer experiences across

acute, elder care and community care environments. The collaboration could include using Intel's products, technologies and investments for advanced analytics and artificial intelligence, network, storage, wearable computer, security and other development tools, along with engineering resources.

"We are very excited about the prospects for this collaboration, which will enable us to expand and accelerate the development of new patient engagement solutions," commented James Fitter, CEO of Oneview. "This in turn will enable healthcare providers across the continuum of care to better achieve their goals using best-of-breed technologies."

ARCH launches remote clinical trials study with industry partners

AARCH, the Centre for Applied Research for Connected Health, has launched a collaborative study to assess the feasibility of collecting clinical trial data remotely within a care home environment.

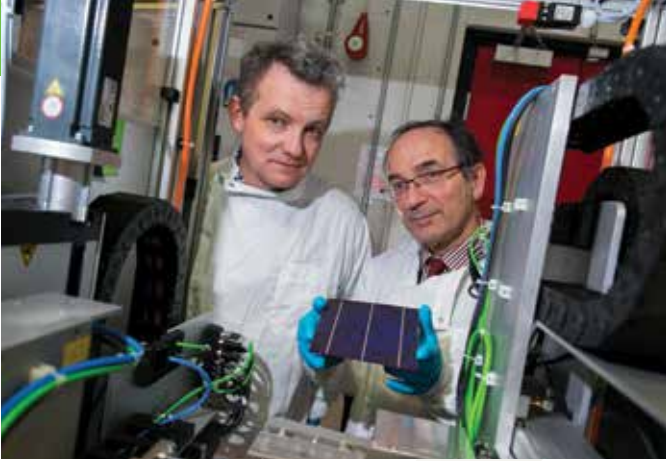
ARCH is undertaking the study in collaboration with industry partners ICON Clinical Research, Kinesis Health Technologies, a University College Dublin spin-out and US-based Big Cloud Analytics.

Clinical trials traditionally

take place in a hospital setting, which often restricts participation from patients with limited mobility and independence due to problematic logistics and limited travel ability.

Led by a team of ARCH researchers, the study will assess the feasibility of collecting clinical trial data remotely in a care home, Mount Hybla Private in Castleknock, Dublin, using a selection of mobile and wearable solutions provided by the collaborating companies.





PICTURED ARE ED DUFFY, FOUNDER AND CEO OF NINES PV (LEFT) AND JAMES WRIGHT, HEAD OF DEPARTMENT OF ELECTRONIC ENGINEERING, IT TALLAGHT.

Nines Photovoltaics invests in €1.5m pilot-scale demonstrator

Nines Photovoltaics, a Dublin-based SME specialising in advanced equipment manufacturing and process development for the photovoltaic (PV) solar industry, has invested €1.5m in a pilot-scale demonstrator at IT Tallaght, with the aim of bringing new solar cell etching technology closer to the market.

The newly commissioned atmospheric dry etching pilot-scale demonstrator, supported by EU funding, is to be used to commence trials with international solar cell makers. The Department of Electronic Engineering at IT Tallaght is also supporting the development.

Solar cells are currently manufactured using a wet chemical process. Nines PV has pioneered a high-throughput, atmospheric-pressure, dry etching (ADE) technology used

to etch away layers of silicon from a crystalline silicon wafer to facilitate the creation of a solar cell.

According to the company, this significant breakthrough will enable solar cell manufacturers to cut their production costs by up to 25 per cent, which, for a typical solar cell producer, could equate to savings of up to €20 million per year.

"This progression is an important milestone and the beginning of an ambitious development programme to address a compelling market need," said Ed Duffy, Founder and CEO of Nines PV. "Our new demonstration centre will enable work on further valuable process techniques and intellectual property that will help our customers to integrate Nines ADE into their manufacturing processes."

Davra networks launches integrated Internet of Things platform

Davra Networks has launched ConnecThing.io, an integrated IoT (Internet of Things) platform dedicated exclusively to the solution provider and IT/OT channel seeking to accelerate their IOT practice.

In development for four years, ConnecThing.io is a complete IoT platform offering hundreds of real IoT sensors and gateways, a complete AEP middleware platform with integrated vertical solutions, training and developer and vendor partner programmes.

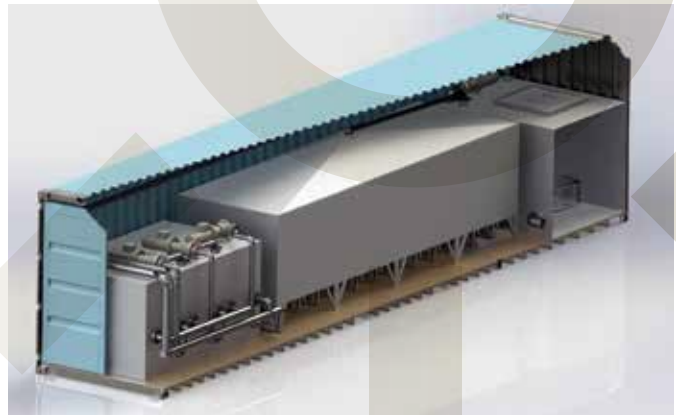
"Hackathons and IoT meet-ups in partnership with our local ConnecThing.io channel will be launched around the globe in May 2017, with the inaugural ConnecThing Meetup taking place in Davra US headquarters in Sunnyvale, CA" said Brian McGlynn, Davra COO and co-founder.

Over €10m in EU funding for five Irish SMEs

Five Irish SMEs are to receive a total of over €10m in the latest round of funding from the EU's Horizon 2020 instrument for SME. The objective is to help the companies take concepts from the lab to the market. Each company will receive up to €2.5m to finance activities such as demonstration, testing, piloting and scale up or miniaturisation as well as the development of a business plan for their product. The companies will also receive 12 days of business coaching.

Three of the SMEs are operating in the life science area. Luxcel Biosciences in Cork is to use the funding to develop advanced solutions for high-sensitivity metabolism and toxicity assays. AltraTech in Shannon is developing a portable battery-operated kit for the quick detection of HIV, while Slainte Beoga in Galway is commercialising a non-antibiotic treatment for bovine mastitis.

In the cleantech area, DesignPro in Limerick will use the funding to bring a new and affordable hydro-kinetic renewable energy turbine to market. Meanwhile, Axonista in Dublin is to commercialise a video app for smart devices.



Alchemy Utilities launches waste food-powered water purifier

Dublin company Alchemy Utilities has launched a new water purification plant that runs on energy generated from waste food at the SEAI Energy Show this April. The Alchemy H20 Optima aims to reduce the carbon footprint of food production and agriculture in Ireland, particularly for meat and dairy processors, which are heavy water and energy users.



Enterprise Ireland incubation space available in New York

This July, three private office spaces will become available in the business incubation facilities at Enterprise Ireland's New York office. Hotdesk space for up to 12 days usage a month is also available in the incubation centre at Ireland House on 51st and Park Avenue.

"We have 10 private offices that are generally full but three are becoming available at the end of July," Rory O'Doherty told The Market. "Located in the centre of Midtown Manhattan, clients are a stone's throw from many of the businesses they may wish to deal with. The address alone, 345 Park Avenue, has been known to help open doors."

Internet, printing, kitchen and boardroom facilities are available for use. There is also business support in the form of development sessions and networking lunches with other clients, as well as sales development, legal and HR sessions.

"This is intended to be a soft landing as a first step into the New York or North American market," O'Doherty says. "Ideally clients will move on from our space after a year. We have partnerships developed with many of the leading incubator and co-working spaces in the city, which will offer reduced rates for clients graduating out of 345 Park Avenue."

Sky's the limit for OCE Technology

OCE Technology, headquartered at NovaUCD, the Centre for New Ventures and Entrepreneurs at University College Dublin, is introducing a new range of satellite subsystems to the growing European commercial space market. The company made the announcement at the 2017 Paris Space Week exhibition, Europe's premier B2B space event dedicated to launch vehicles, satellites and space related technologies.

The OCE Technology subsystems are derived from those in use in the Chinese space programme and have been operational on Chinese satellites over the past 20 years. The company is currently working with European customers to customise the products for the commercial satellite market.

OCE Technology develops software for technical applications and supplies radiation-hardened chip-level components targeted primarily at the space and high-reliability sectors. The company's new subsystems can be used to bring a satellite into a desired orientation in space and to a desired spin rate.

Steps to Success road show for female entrepreneurs

Enterprise Ireland and Network Ireland, in conjunction with the Local Enterprise Offices (LEOs) and the Entrepreneurs Academy, has launched the second nationwide Fuelling Ambition Steps to Success road show, targeting existing and potential female entrepreneurs.

The aim of the road show is to encourage, support and drive the ambition of female entrepreneurs nationally by showcasing the 'Steps to Success' of thriving Irish business women and entrepreneurs who are either Enterprise Ireland or LEO client companies.

Building on the successful

'Fuelling Ambition' initiative introduced in 2016, this year's road show will introduce an Elevator Pitch competition with a prize package worth €4,000 at each location. This will include 10 sessions with Enterprise Ireland mentors and attendance at Enterprise Ireland's Excel at Export Selling training programme, annual membership of Network Ireland and a leadership training programme with the Entrepreneurs Academy, a national entrepreneur development organisation that has trained and supported 30,000 start-ups and small businesses. See www.enterprise-ireland.com/ambitiouswomen

OncoMark to commercialise new diagnostic test for breast cancer

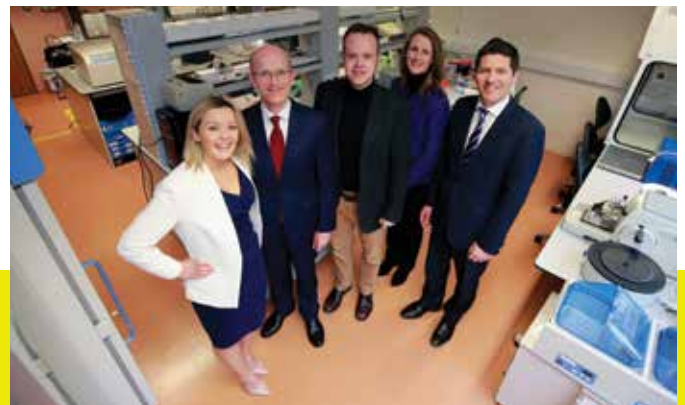
OncoMark, a University College Dublin (UCD) spin-out, has secured €2.1 million in funding from the Bank of Ireland Kernel Capital Venture Funds and other investors.

OncoMark is focused on the development of novel panels of cancer biomarkers, to aid treatment decisions and allow more tailored patient management, ultimately improving the quality of life for cancer patients.

This investment round will fund the commercialisation of OncoMark's lead product, OncoMasTR, which it plans to launch in 2018. OncoMasTR is a novel prognostic test for early-stage breast cancer that will reduce the number of breast cancer patients receiving unnecessary chemotherapy.

The company was previously awarded €2.7m through the Horizon 2020 SME Instrument to clinically validate the OncoMasTR test. This new funding round will allow the translation of the test from clinical validation to regulatory approval and full commercialisation.

DAWN WALSH, KERNEL CAPITAL; DES O'LEARY, CEO, ONCOMARK; PROFESSOR WILLIAM GALLAGHER, DIRECTOR, UCD CONWAY INSTITUTE AND CO-FOUNDER, ONCOMARK; DEIRDRE GLENN, MANAGER, LIFESCIENCES SECTOR, ENTERPRISE IRELAND AND KEVIN HEALY, SENIOR MANAGER, CORPORATE BANKING IRELAND, BANK OF IRELAND.





Artificial intelligence to have dramatic impact on business by 2020

According to a Global Trend Study by Tata Consultancy Services, artificial intelligence (AI) will have dramatic impact on business by 2020. The study, titled 'Getting Smarter by the Day: How AI is Elevating the Performance of Global Companies', polled 835 executives across 13 global industry sectors in four regions of the world.

Exploring the views and actions of decision-makers from global companies with average revenues of \$20 billion, the study found that 84 per cent of companies see the use of AI as "essential" to competitiveness, with a further 50 per cent seeing the technology as "transformative".

The biggest adopters of AI today are, not surprisingly, IT departments, with two-thirds (67 per cent) of survey respondents using AI to detect security intrusions, user issues and deliver automation. However, by 2020, almost a third (32 per cent) of companies believe AI's

greatest impact will be in sales, marketing or customer service, while one in five (20 per cent) see AI's impact being largest in non-customer facing corporate functions, including finance, strategic planning, corporate development, and HR.

Examples include guiding customer service representatives to more quickly resolve customer problems and anticipate future purchases; quickly and securely reconciling mass overnight transactions for financial institutions; or giving time back to HR professionals by managing the time consuming on-boarding processes for new hires.

As AI becomes a mainstream technology, financial investments are set to rise, as 7 per cent of companies each earmarked at least \$250 million toward AI in 2016, and 2 per cent already plan to invest more than \$1 billion by 2020, looking to gain a competitive advantage as early adopters.

Small Business Innovation Research challenge launched in Cork

Cork County Council together with the Cork Smart Gateway initiative and the Age Friendly Alliance has launched an €80k Small Business Innovation Research (SBIR) challenge with Enterprise Ireland.

Through this call, Cork County Council will explore low-cost, innovative and accessible solutions to help its older citizens maintain a good quality of life and enable them to remain and feel secure in their home. Solutions sought should address one or more of the effects of being or feeling isolated and insecure and, in particular, increase the resilience of older people to respond to the impacts of critical events. The closing date for applications is June 2, 2017.



MICHAEL MURPHY, CHAIRMAN, IRISH VENTURE CAPITAL ASSOCIATION

Seed funding exceeds peak levels of 2014

Irish-based technology firms raised a record €888m in 2016, up 70 per cent from €522m the previous year according to the Irish Venture Capital Association Venture Pulse survey published in association with William Fry.

"This performance is particularly significant as venture capital activity in the US declined by 13 per cent in 2016 and in the UK by 4 per cent," commented Michael Murphy, chairman, Irish Venture Capital Association (IVCA).

"The figures demonstrate the continuing attraction of Irish tech firms by international investors. International syndicate investors, working with local venture capital firms, invested €548m in 2016 compared to €294m in 2015."

The life sciences sector was the star performer in 2016, accounting for 52 per cent of funds raised. Eleven companies in particular raised over 38 per cent of total funds.

While growth and expansion funding accounted for 92 per cent of total funds raised, new seed funds were already having an impact with first round funding growing again. "The good news for start-ups is that, at €70m for the year to end December, seed funds are now exceeding the peak levels of 2014," Murphy added.

Separately, the Minister for Jobs, Enterprise & Innovation, Mary Mitchell O'Connor, TD, has announced that up to €44 million is being made available for co-investment in seed and early-stage growth companies. Through Enterprise Ireland, she has issued an open competitive call to fund managers to signal their interest in establishing funds to invest in areas to include food, software, fintech, ICT, services, cleantech and life sciences. This is the third competitive call under the Seed and Venture Capital Scheme for 2013 to 2018.



JUNE

Digital Strategies for International Markets

June 15

Seminar on developing and enhancing online presence

L: Limerick

E: eoin.osiochru@enterprise-ireland.com

Paris Air Show

June 19 to 25

Event for client companies providing solutions to the aerospace industry

L: Le Bourget Parc des Expositions, Paris

E: xavier.python@enterprise-ireland.com

Effective Succession Planning

June 20 to 21

Part of the Finance4Growth workshop series for CFOs

L: Cork (20th), Dublin (21st)

E: claire.carroll@enterprise-ireland.com

US General Merchandise Event

June 22 to 26

Programme for companies looking to connect with large US general merchandise retailers

L: Orlando, Florida

E: hannah.webb@enterprise-ireland.com

Trade Mission to the US

June 24 to 28

Trade mission led by the Taoiseach

L: Pacific North West and Mid West, USA

E: sean.davis@enterprise-ireland.com

Money 2020

June 25 to 27

Largest fintech event in Europe

L: Copenhagen, Denmark

E: tom.holgersson@enterprise-ireland.com

Nordics Agri-Machinery Visit

June 27 to 30

Visit to the outdoor agri-shows Borgeby Field Days, Sweden, and Landsskuet, Herning, Denmark

L: Malmö, Sweden and Herning, Denmark

E: karin.angus@enterprise-ireland.com

JULY

Hong Kong International Education Expo

July 6 to 7

Market study visit

E: barry.odriscoll@enterprise-ireland.com

L: Singapore, Vietnam and China

AUGUST

Agritech Brazil

August 13 to 18

Participants will have the opportunity to exhibit on an Enterprise Ireland stand at the Agroleite 2017 event, organised by Castrolanda, a leading Brazilian agricultural cooperative

L: Castro, Parana

E: melissa.feddis@enterprise-ireland.com

International Business Women's Conference

August 20

Knowledge forum

L: Tralee

E: sarita.johnston@enterprise-ireland.com

SEPTEMBER

International Markets Week

September 4

L: Dublin, RDS

BIM Dialogue

September 4

Sales lead-generation event

L: Munich, Germany

E: vincenz.wagner@enterprise-ireland.com

Womenswear Trend Forecast

September 5 to 7

Forecast for autumn/winter 18/19, presented by Peclers Paris/Holbrook Studio, London

L: DIT, Dublin 2

E: stephen.hughes@enterprise-ireland.com

Meet the Buyer – National Children's Hospital

September 7 to 11

Lead-generation event

L: Dublin

E: tonia.spollen-behrens@enterprise-ireland.com

Travel Tech, China*September 10 to 14*

Market study visit

L: Shanghai**E:** lawrence.lee@enterprise-ireland.com**EAIE 2017***September 11 to 14*

Biggest international education event in Europe

L: Seville, Spain**E:** vivienne.nolan@enterprise-ireland.com**Benelux Port Logistics Eco-Systems***September 13 to 14*

Market study visit

L: Rotterdam, the Netherlands, and Antwerp, Belgium**E:** paul.barreveld@enterprise-ireland.com**Innovation Arena at National Ploughing Championship 2017***September 18 to 20*

Opportunity to exhibit new agri-tech innovations at the Innovation Arena

L: Scraggan, Tullamore, Co Offaly**E:** michael.brougham@enterprise-ireland.com**W:** www.enterprise-ireland.com/innovationarena**Expand your Business Internationally***September 19 and 20*

Part of the Finance4Growth workshop series for CFOs

L: Cork (19th), East Point, Dublin (20th)**E:** claire.carroll@enterprise-ireland.com**Asia-Pac Financial Software Trade Mission***September 25 to October 1*

With ministerial representation

L: Asia Pacific**E:** david.byrne@enterprise-ireland.com**OCTOBER****The Offsite Construction Show 2017***October 11 to 12*

Key event for clients, contractors and manufacturers looking to embrace new and more efficient methods for the design and construction

L: ExCel, London**E:** john.hunt@enterprise-ireland.com**GITEX Technology Week***October 13 to 17*

Ireland Pavilion during GITEX Technology Week Trade Fair for Irish telecoms and ICT solution provider companies to showcase their solutions

L: Dubai**E:** abdull.ali@enterprise-ireland.com**MIPCOM***October 14 to 17*

Enterprise Ireland will host an Ireland on Screen group stand at MIPCOM – a key international exhibition, conference and market for global TV and digital content

L: Cannes, France**E:** eileen.bell@enterprise-ireland.com**Access the Funding You Need to Grow***October 16 and 17*

Part of the Finance4Growth series for CFOs

L: Galway (16th) and Dublin (17th)**E:** tom.early@enterprise-ireland.com**MedInIreland 2017***October 19*

Showcase for Irish companies in the medical technologies sector

L: Dublin**E:** david.oflaherty@enterprise-ireland.com**Ministerial Education Visit to China**

Incorporating the China Education Expo, Beijing, and visits to second-tier cities

L: Beijing, Shenyang (tbc), Wuhan (tbc) and Shanghai**E:** peter.yang@enterprise-ireland.com**CPH Worldwide 2017***October 23 to 25*

Leading global event for the pharmaceutical industry, run in conjunction with ICSE (International Contract Services Expo), P-MEC (Pharmaceutical Machinery & Equipment), InnoPak (Pharmaceutical Packaging Expo and Conference) and FDF (Finished Dosage Formulation)

L: Frankfurt, Germany**E:** david.osullivan@enterprise-ireland.com**Digital Construction Show 2017***October 24 to 25***L:** London**E:** john.hunt@enterprise-ireland.com**Digital Strategies for International Markets***October 25*

Developing and enhancing an online presence for overseas markets

L: Dublin**E:** eoin.osiochru@enterprise-ireland.com**NOVEMBER****2017 UK Financial Services Embassy Dinner***November 2*

For senior executives of Irish companies targeting growth from the UK financial services sector

L: London**E:** gavin.mcwhirter@enterprise-ireland.com**Batimat 2017***November 6 to 10*

International construction products show

L: Paris, France**E:** xavier.pithon@enterprise-ireland.com**OCSC Higher Education Fair***November 11 to 12*

Higher education fair

L: Bangkok, Thailand**E:** terry.mcparland@enterprise-ireland.com**Asian Trade and Investment Mission***November 12 to 18*

To China and Japan

L: Beijing, Shanghai and Tokyo**E:** david.byrne@enterprise-ireland.com**Agritechnica***November 12 to 18*

Irish group stand at Agritechnica 2017 for Irish manufacturers of agricultural machinery and equipment

L: Hannover, Germany**E:** john.heike@enterprise-ireland.com**Dubai Airshow 2017***November 12 to 16*

Ireland will host a national stand at the Dubai Airshow

L: Dubai World Central**E:** Rachel.kouyoumdjis@enterprise-ireland.com**Medica 2017***November 13 to 16*

Enterprise Ireland will host an Ireland Pavilion at this leading global event for medical technologies

L: Dusseldorf, Germany**E:** jane.greene@enterprise-ireland.com**Turn Data into Strategic Information to Drive Growth***November 14 and 15*

Part of the Finance4Growth workshop series for CFOs

L: Cork (14th), Dublin (15th)**E:** claire.carroll@enterprise-ireland.com**AgriTech Market Study Visit - Africa***November 14 to 15***L:** South Africa and Kenya**E:** natasha.siniscalchi@enterprise-ireland.com**BMI Higher Education Fairs, Vietnam***November 15 to 19***L:** Hanoi and Ho Chi Minh City**E:** terry.mcparland@enterprise-ireland.com



Get with the programmers

A Dublin start-up is already gaining a global footprint for fast-tracking programmers to meet growing demands. Ian Campbell reports.

Any entrepreneur will tell you that the secret of a successful start-up is spotting a gap in a market and filling it. This usually involves solving a problem that prospective customers have been struggling with. For Anthony Quigley, it's been around education, focusing on increasingly in-demand professional skills that are poorly served by more traditional training. First he did it with the Digital Marketing Institute, empowering marketing professionals with new skills for the social media era. Now, he's tackled programming.

In 2015, he launched the Code Institute, a bootcamp for coders that sets out to address widely recognised skills shortages, hampering the growth of technology companies. With so many multinationals located in Ireland and a healthy indigenous sector, there was no shortage of local demand, but Quigley had an eye on a much bigger market that he could serve with 'one-to-many' online courses.

Jim Cassidy, chief executive, takes up the story. "By 2020, there are expected to be 800,000 vacant ICT roles across Europe and over a million in the US. So it became clear to Anthony that the traditional methodology being used for teaching in universities isn't fit for purpose," he said.

Third-level alternative

Founders of the Code Institute are not criticising what third-level technical courses teach; they're just setting out to do something different. A computer science degree that takes four years to complete will not provide the throughput of skills the tech industry currently needs, according to Cassidy, and the sheer pace of technological change means that a lot of what students learn may be out of date by the time they graduate.

With 48-week full-time courses and 4-month part-time, the goal is to get job-ready developers into the market faster and arm them with the skills that companies urgently need. The institute has been built from the ground up to be more agile than traditional colleges and will put on courses to meet spikes in demand. Its Industry Advisory Council, made up of corporates like Accenture and Morgan McKinley, recruits graduates from the institute and provides a useful barometer of the skills in demand. "We continually update, amend and change our courses based on their feedback, which helps us make sure courses are absolutely relevant," said Cassidy.

Programme director Brian O'Grady is keen to stress that it's not the aim or ambition of the institute to compete with





The biggest differentiator from bricks-and-mortar colleges is that 90 per cent of its courses are taught online, which is fundamental to the start-up's plans to grow internationally.



a full degree. He describes the courses as "narrow scope, deep learning," as opposed to universities that tend to be "broad scope, shallow on topics". The big difference is that each course is hugely condensed. "When I did my postgraduate studies, I would have done around 49 hours of coding in a year. We're doing 600 hours. It's a very immersive experience as opposed to something that's spread out over four years."

The other big difference is that course participants are treated more like employees than students and given projects and practical assignments on a daily basis. "We try to instil a workplace mindset from the beginning, to better prepare students for the real world of work," said Cassidy. "That's why it's project-rather than exam-based. When a student is being interviewed for a job, they can show work that they've actually done."

International credibility

For any courses to be credible, they need to be accredited and internationally recognised. The institute's diplomas conform to the requirements of the European educational framework and have been recognised by Edinburgh Napier University. Having identified the market and ticked the educational boxes, the focus has turned to growing the business.

Last year, the institute raised €500,000 syndicated investment from Kernel Capital and Enterprise Ireland, which has been used to fuel overseas expansion. The biggest differentiator from bricks-and-mortar colleges is that 90 per cent of its courses are taught online, which is fundamental to the start-up's plans to grow internationally.

A number of global partnerships have been established in the UK, US and Saudi Arabia to advance overseas expansion, with more to come in Canada and Australia. "We have identified learning partners in each of these jurisdictions that have the expertise and skillsets to sell and support ICT-based courses," explained Cassidy. "We have a 600-hour online course, so we need companies with a certain type of support capability."

None of this has been at the expense

Its Industry Advisory Council, made up of corporates like Accenture and Morgan McKinley, recruits graduates from the institute and provides a useful barometer of the skills in demand.

of classroom training. A new partnership with IBAT College, the industry-focused third-level institution in Dublin, will see its courses delivered on campus from June this year. "There's still a demand for face-to-face, so we provide both options and work with our partners to identify what's best for their jurisdiction and then work with them to deliver it," said Cassidy.

Like most start-ups, the company is lean and agile, only recently growing from 4 to 17 employees as it moved from establishing its courses to building out its sales and marketing capability.

Content and courses

Course content is a combination of video and printed materials with interactive elements. The chat and collaboration app Slack is also part of the online set-up. "We try to recreate the social aspect of being in a classroom, which is a very important aspect of learning. Students can interact with each other as well as a dedicated teams of mentors," said O'Grady. "It's like having a professional developer sitting at the desk next to you."

Two courses are currently running, a Full Stack Diploma that teaches the main programming languages (JavaScript, HTML, CSS) and a Diploma in Tech Fundamentals. The first appeals to first-timers with no tech experience as well as people with some programming under their belt.

"I'd say 70 per cent of people who take it have no software development background, and they're looking to find a new career, but we also have a good cohort of people who have been exposed to some level of software development and are now looking to upskill," said Cassidy. The age range is typically 24–35, and, just like traditional computer courses, it's still male dominated.

The second course is aimed at C-level managers as well as business owners and entrepreneurs who would benefit from a better understanding of code and programming. "Every business is now a technology business," said Cassidy. "Take the course and you'll see what's required to get a business off the ground faster."



Many analysts and business leaders have identified harnessing digital technology and becoming a data-driven organisation as the best way to secure a future in a fast-changing world. Ian Campbell talks to two of them.

How to thrive in the age of disruption





"If you're small and trying to get into a bigger market, you've got two options: position yourself to pick up the scraps from somebody else's table or disrupt."

DAMIAN COSTELLO
MANAGING PARTNER, DECODE INNOVATION

Unless you've had your head in the sand, you'll know that we're entrenched in the chaos of a post-industrial world, an age of disruption where established businesses are being superseded by technology-driven companies that are smarter, faster and unencumbered by outdated business models. There's a general understanding that the web, Big Data, analytics and automation are facilitating major change, variously described as somewhere between the third and fourth industrial revolutions.

Masters of the new models are the likes of Google, Amazon, and Uber, companies that have leveraged web-scale architecture to conquer global markets at unprecedented speeds. Technology has always trickled down, and it's the availability of a new generation of digital services and solutions that now allows smaller players to emulate these giant internet companies.

Specifically, it's running businesses in public and private clouds with huge computing power and the ability to analyse data on an industrial scale, something that was impossible a decade ago. The cumulative effect is a digital revolution, where the ripples are creating a domino effect that's toppling established players in one sector after another.

Identifying opportunities

Damian Costello, who runs a consultancy called Decode Innovation, cuts to the chase on what it all means for new businesses. "If you're small and trying to get into a bigger market, you've got two options: position yourself to pick up the scraps from somebody else's table or disrupt," he said.

His day job is advising established businesses on strategies to sustain growth and avoid disruption, which means recognising where they are vulnerable and doing something about it. Often it's a fear of cannibalising their own business that leaves a gap for disruptive new entrants – he cites the example of IBM hesitating to move on mini computers because it threatened its mainframe business, thereby leaving the door open for Intel and Microsoft.

Costello makes the strategy for disruptors sound wonderfully simple.

"Whatever the incumbents love most, reverse it. Whatever they're most proud of, reverse it," he said. "After that, you have to have insights that show you something about your customers that large scale competitors can't do well; you have to highlight an opportunity that they've missed, something that for them is negative, awkward, uncomfortable, and undermining."

He takes it further. The aspect of their business that they are most proud of is likely to be their Achilles heel and something you can do without: if it's trucks on the road brandished with fancy logos, outsource your supply chain. If it's a huge inventory, keep yours just-in-time. Running a business without components that were once considered fundamental is what digital technology is enabling. "If you're starting from scratch, you can build a global infrastructure purely in the cloud. Digital allows you to do everything – it's like building a business with Lego blocks," he said.

There is a perception that digital transformation is mainly about cost saving through automation, but Costello argues that it's much more than that; it moves businesses beyond silos that slow them down. "Operations, sales, marketing, and quality are all entirely different domains in the real world but in the cloud they're just ones and zeroes. And no matter how different and incompatible they are in the real world, an algorithm, translator or API can bring them together in the digital world in ways that were never possible before. It changes everything," he said.

Mashing up data

For a start-up or nascent business, digital also provides a platform for assessing market opportunities in ways that were impossible before the advent of Big Data. Now that infrastructure is taken care of by digital technology, new entrants can concentrate on testing market opportunities, quickly and affordably, with predictive analytics and modelling. "All the entrepreneur has to do is work out who their customers are and use data insights to decide on the value proposition," he said. "It's about identifying mash-ups and interconnects when you take data from entirely different fields."



Cronan McNamara does this for a living. His company, Creme Global, has developed a cloud platform where clients in the food and nutrition sectors combine unique and disparate data sets for predictive intake modelling that informs strategic decision-making. He argues that similar processes should be fundamental to any business strategy. “Finding a market fit for a product or service is a critical step for any new business, and data is key. You have to become a data-driven organisation.”

Cost of entry can be low. He talks about “growth hacking”, a suck-it-and-see approach to market experimentation where the investment can be as little as a webpage and some Google AdWords to ascertain if there’s any interest in an idea. “It takes a lot of creativity and experimenting, but it’s a good starting point for any business,” he said.

Open source languages like Python and frameworks like Hadoop make it possible to crunch huge volumes of data at scale for a fraction of what it used to cost. “You could do something for €10,000 today that would have cost closer to a couple of million ten years ago,” he said, “but you have to be scientific in your approach, testing your hypothesis and rigorously carrying out experiments.”

Without scientific analysis, he warned, you may have trouble distinguishing between real trends and random noise. It takes scientific training to understand the difference and to set up experiments where you can rely on the results. McNamara believes every business should have a

technical co-founder capable of creating programmes that connect up data sources.

Analytics as service

Data sets, including free open data, are now readily available, giving firms competitive advantage if they have the skills to mine it. “Only a small number of organisations are at this point,” he said. “More traditional companies don’t seem to understand the value of the data that’s out there on the web and on other platforms. But the companies that get it are starting to dominate.”

Because of what he calls “the democratisation of data”, organisations need some expertise but not all the expertise – that’s what third parties like Creme Global can deliver as a service. All this will increase the invisibility of technology, which Damian Costello believes is another phenomenon of the age.

“Kids don’t see their smartphones as monitors or processors; they just see a screen into the virtual world. The same thing will happen with entrepreneurs,” he said. “All the hype around data and the Internet of Things will disappear into the background because third-party companies will handle all of that for them.”

Costello believes the big challenge will be less about having access to the skills and technology and more about having the imagination to identify the opportunities. “Nothing’s impossible with digital, but a monumental amount of what will be done will be really stupid. About 10 per cent will have the capability to change the world.”



“Finding a market fit for a product or service is a critical step for any new business, and data is key. You have to become a data-driven organisation.”

CRONAN MCNAMARA,
CEO, CREME GLOBAL

New model for growth

Digital technologies are helping transform fundamental business models, according to Damian Costello. The traditional approach is to forecast market share based on assumptions, and then make investments to help achieve those targets. Now, using predictive analytics and modelling, you can make a projection and identify the assumptions that have to be proved true if the projections are to occur. You only invest when the assumptions are proved accurate.

Established model	Disruptive model
Make assumptions	Make projections
Build projections based on assumptions	What assumptions must prove true for the projections to happen?
Make investment decisions based on projections	Implement a plan to learn/test whether critical assumptions are reasonable
Implement the deliberate strategy	Invest when key assumptions prove valid



The Eurozone

19 markets:

one currency



ATLANTIC OCEAN

MEDITERRANEAN SEA

IRELAND

BRITAIN

NETHERLANDS

BELGIUM

LUXEMBOURG

DENMARK

GERMANY

FRANCE

PORTUGAL

SPAIN

ITALY

MALTA

CZECH REPUBLIC

POLAND

AUSTRIA

SLOVENIA

CROATIA

SLOVAKIA

HUNGARY

ROMANIA

BULGARIA

GREECE

LITHUANIA

LATVIA

ESTONIA

FINLAND

CYPRUS



The European Union is both the single largest economy and largest trading bloc in the world. With transparent rules and regulations and a secure legal investment framework, the EU also ranks first in both inbound and outbound international

investments, and its services markets are highly open.

It is the top trading partner for 80 countries worldwide, and even when the UK departs, it will be home to over 440 million consumers.

It provides Irish companies with a market that is free from tariffs and customs obligations; where there is free movement of people, capital, goods and services; and where all 28 members (27 after the UK's exit) share common regulatory and technical specifications for goods.

Within the EU, business risks are further minimised with the shared currency of the 19 members of the euro area: Finland, Germany, Austria, France, the Netherlands, Belgium, Luxembourg, Ireland, Estonia, Slovenia, Slovakia, Latvia, Lithuania, Italy, Spain, Portugal, Malta, Greece and Cyprus.

All these benefits add up to a valuable and strong market, enabling Irish companies to trade with comfort on a number of levels.

However, Europe is also an extraordinarily diverse land mass in terms of GDP levels and industry strengths. The bottom line is that a one-size-fits-all doesn't work. Research is essential to pinpoint precisely where the best opportunities lie. Moreover, when tackling the linguistic and cultural smorgasbord of Continental Europe, Irish businesses have to adapt to ensure that their customer is also in their comfort zone.

European Union countries' currency status

- ★ Euro area
- ☆ Currency pegged to euro
- Floating currency





Actung Germany



Germany

- Population: 81 million
- GDP growth (2016): 1.7%
- GDP per capita (2016, PPP): US\$48,200

Germany is the world's third largest exporting nation, with €1.21 trillion in goods and services exported in 2016. The German economy is the largest in Europe, constituting almost one third of the Eurozone. Enterprise Ireland client exports from Ireland to Germany in 2015 were €928m (up from €838m in 2014), a growth rate of 11 per cent. Some 440 Enterprise Ireland clients are active in the German market, and 58 Irish firms, employing an estimated 14,000 people, have investments in Germany.

There are opportunities in the life science; telecommunications and media; enterprise and financial software, construction and engineering services and engineering product sectors.

Germany is

- 1st in Europe and 5th in the world for dairy production
- 1st in Europe in the semiconductor industry
- 1st in EU for construction investment
- Largest financial services sector in the Eurozone
- 2nd largest European online retail market
- 3rd largest medtech market in the world
- 3rd largest spender worldwide on travel
- A leader in renewable energy

German culture is very accessible for Irish companies. However, care must be taken not to underestimate the language factor and the need to hire locally for long-term results. Irish companies should also note federal differences and the uniqueness of states within Germany; exceptionally high customer expectations of quality and service delivery; detail orientated and consensus decision making; and a culture of long-term partnerships. Germany is a mature market that requires a highly differentiated product offering. However, such an offering can command a higher price and, therefore, provide greater margins.

Source: Enterprise Ireland, Düsseldorf





Eurozone heavyweight No. 2



France

- Population: 67 million
- GDP growth (2016): 1.3%
- GDP per capita (2016, PPP): US\$42,400

The seventh largest global economy and the second largest in the Eurozone, France is a leading international industrial economy in the automotive, aerospace, and railways sectors, as well as in cosmetics, luxury goods, insurance, pharmaceuticals, telecoms, power generation, defence, agriculture and hospitality. France is also the world's leading tourist destination in terms of visitor numbers per annum.

With a population of over 66 million, France has as many consumers as the UK and has always been an important market for Irish exporters, particularly in sectors such as engineering, medtech, agriculture and aerospace.

Other areas of growing interest and potential include construction and financial and digital services.

- France is Ireland's fifth largest market for Irish indigenous company exports
- Ireland's exports to France are growing at an average of 5 per cent per year
- There are presently 60 Irish companies with a presence in France – twice as many as five years ago
- 5,725 French people employed in market by Irish clients (2014)

Relationship building is critical in French business. It takes time and regular personal contact to build up confidence and trust. Long lead-times are usual; it may take 18 months or more to land a first sale. This is due to two critical factors in French business culture: an aversion to risk and a tendency towards long-term planning. However, once a French buyer selects a supplier, they can expect loyalty and a long-term relationship.

Source: Enterprise Ireland, Paris



Europe's significant and historic engineering prowess offers a wide range of opportunities for Irish companies in areas ranging from sub-supply, precision and general engineering to automotive, aeronautical and materials handling capabilities. Donal Nugent highlights three companies targeting different parts of this vast market.



Unlocking Europe's great engineering markets



Taoglas tunes into Germany and France

Established in 2004, Taoglas provides advanced antenna and RF (radio frequency) solutions to the world's leading wireless and Internet of Things (IoT) companies. Over the last decade, the company has gained a reputation for innovation built on its world-class design, support and test centres based in Ireland, Germany, Taiwan and the USA. Since 2015, Taoglas has launched over 100 new products onto the market.

The County Wexford-based business works with its customers to provide solutions for their unique antenna and RF challenges. In-house manufacturing takes place in its Taiwan and USA facilities, and company expertise and experience applies across different wireless and IoT use cases, from LTE to GNSS, DSRC, and NFC and beyond to 5G, gaining it success stories in telematics, automotive, metering, smart grid, wearables, medical devices, remote monitoring and high-speed video broadcasting.

Taoglas has recently established offices in France. French sales manager Sam McCarthy explains that the decision to establish a presence in France isn't related to Brexit but rather builds on the success the company has enjoyed in the German market since setting up an office in Munich in 2015. For an Irish engineering company looking to this market, a flair for the cutting edge needs to be at the heart of the offering, he adds.

"For the engineering sector, in particular, you need to have innovation on your side. There are a lot of French companies that are very good at what they do and, if you are just good at doing something, you'll find

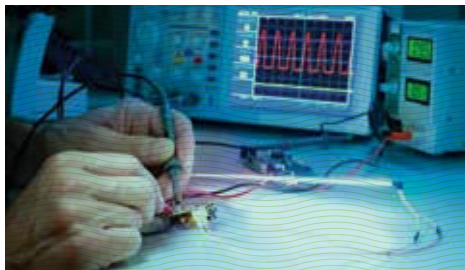
you have plenty of competition here."

In France, the company is targeting particular opportunities in the smart metering market, as well as the automotive and digital signage sectors.

The French office was opened in mid-2016 and McCarthy says the step of putting someone on the ground is a potentially transformative one for any ambitious Irish company looking to grow there. "The fact of having someone here, as opposed to managing the market from Ireland, is the difference between night and day. Customers here don't learn about the company in the same way unless they have someone in front of them and, equally, the company can't gain the same understanding of the marketplace without a presence on the ground."

Establishing that presence requires both fluent French and a strong grounding in French business culture: "Formality is at the heart of the French way of doing business. It's important to understand the subtleties of this as you set out to build relationships," he told *The Market*.

While France is famous for a certain level of bureaucracy around employment, he adds that establishing an office need not be an onerous decision. "As long as the company presence is focused on sales, things don't need to get complicated. As we grow and expand here, it will become a more sophisticated operation, but our experience is that for any company looking to set up a sales presence, there are solutions providers that eliminate the need to worry about excessive costs or paperwork."



"Having someone here, as opposed to managing the market from Ireland, is the difference between night and day."

Kerry Abrasives expands out from Germany, Switzerland and Austria

A precision manufacturer of engineered abrasives, Kerry Abrasives was established in 1998 in Listowel by co-founders Liam Brosnan and Peter Mc Kenzie-Vass. The company's diverse client base includes aerospace, automotive, cutlery and hand

tools, bearings and medical device, bringing a natural international focus to its activities. Sales and marketing manager Ina Baumann explains that the very diversity of its portfolio has to be factored into its growth and development strategy.



“Being in so many individual industries can be challenging in terms of focus. We tend to work by product or industry sector and develop markets both from a product focus and a geographic base.” The Kerry-headquartered business is in the somewhat unusual position of having its more established markets in central Europe, particularly Germany, Switzerland and Austria, and seeing the UK as more of a development opportunity.

Using a reseller model to sell to specific clients, the company is developing a distribution network to extend its reach in Central Europe, targeting growth particularly in Slovakia, Slovenia, Hungary and Poland, over the coming years.

Baumann says that the business leverages its standing in Germany through participation in events such as GrindTec, a flagship event for the industry. “GrindTec is the main industry trade event,

and it attracts a lot of interest from Eastern Europe businesses who want to see the latest development. It isn’t just the large companies with manufacturing facilities that are there; smaller indigenous companies also attend. They are looking to Germany and western Europe for new ideas,” she told *The Market*.

“The level we play at is a little above the normal abrasive. Our products are customised, and we go the extra step to deliver a better finish and real life efficiencies. If you can deliver that you can hold your customer; price is not the issue.”

While Brexit is creating uncertainty for some, Baumann says that for a company already focused on the Eurozone, “it’s very much business as usual. You have to put in effort with a new client, in terms of testing, modifying and getting approval, but growth is happening, and we are positive.”



“You have to put in effort with a new client, in terms of testing, modifying and getting approval, but growth is happening, and we are positive.”

Mergon targets Central Europe’s massive manufacturing base

Established in 1981, Mergon is an Irish company with operations in Ireland, the Czech Republic and the US. Recognised internationally in the area of technical moulding, the company designs, manufactures and assembles components for clients in the automotive, industrial and healthcare sectors.

Mergon made headlines in the 2014 World Cup when it was revealed that the 79,000 seats in Rio’s Maracana stadium had been manufactured by the company, both at its Castlepollard plant in Co Westmeath and its facility in Brno, Czech Republic.

In 2016, the company confirmed its standing as an international player with the opening of the Mergon Innovation Centre in Castlepollard.

Sales and manufacturing director Tom Mullen explains that the opening of the facility in Czech Republic in 2004 has been instrumental in its growth in Central and Eastern Europe. The facility opened at a time when costs were increasing in Ireland but also responded to developments in a part of Europe that was becoming a major manufacturing hub, particularly in

the automotive sector. This is an industry where “to grow sales and deal with rising costs, you needed to be close to the customer”.

Mullen says that achieving the success they’ve found in Central Europe “would have been very difficult without the Brno plant, as we wouldn’t have been able to grow sales as aggressively. If you don’t have presence, it can be hard to convince your customer that you can supply them. Once we established here, that presence has actually supported our manufacturing capability in Ireland. We can switch capacity and supply from both locations.” In its approach to Europe, the company divides the continent with strategic line supply from Czech Republic.

For an Irish company looking to expand in Central Europe, Mullen says it is “really no different to selling in any other part of Europe”, but adds that “having people who can speak the language and know the culture is certainly important. It wouldn’t be as effective if we were to try to do the same thing with an Irish sales team”.





The opportunity represented by the automotive industry in the region has, if anything, only increased over the years. The Škoda auto plant has its headquarters in Mladá Boleslav, Czech Republic, while neighbouring Slovakia holds the title of the world's largest producer of cars per capita, with Volkswagen, PSA Peugeot Citroen and Kia Motors all having major facilities there. While it is a prestigious industry to be part of, Mullen points out that winning clients will usually come down to the two particular drivers, namely being the best and the best value, and suppliers have to prove themselves in terms of technical capability, consistency, quality and ability to delivery on time.

As regards the tendency of Irish companies to focus on the UK, he ascribes it to a general trait

of "following the path of least resistance. If you're going to get business in the UK, then naturally you'll concentrate on that, but from a risk point of view, the broader the spread of your business the better. Our experience is that if you can sell successfully into the UK, then you have nothing to fear in other markets in Europe".

Setting up in the Czech Republic has undoubtedly been pivotal to its growth in Central Europe and, overall, the experience has been excellent, Mullen adds. "We have only had good experiences. It is another piece of the jigsaw, and it has allowed us to keep higher specification jobs in Ireland. The dual presence benefits both locations and has been an important part of our growth."



"Our experience is that if you can sell successfully into the UK, then you have nothing to fear in other markets in Europe."

Mapping Europe's engineering strengths

Germany remains Europe's industrial powerhouse as a leader in automotive and machine manufacturing. The fourth largest producer of cars in the world behind the US, China and Japan, the industry is dominated by household names like Audi, BMW, Mercedes-Benz, Opel, Porsche and Volkswagen. In addition, Germany controls 14 per cent of the global market for construction and material handling equipment. Doing business with some of the country's global giants can also open opportunities to enter the supply chain of these German-headquartered multinationals elsewhere in the world.

Central Europe's substantial and growing manufacturing hub now includes large portions of the Czech Republic, Hungary, Poland,

Romania and Slovakia. It is fast becoming one of the leading global destinations for domestic appliance, flat-screen TV and automotive manufacturing.

With strengths in agricultural machinery, energy, cleantech, transport and aerospace, the French engineering sector is worth an estimated €40bn, employs around 350,000 people and is forecast to grow by 7.4 per cent over the 2015-2020 period. Key trends include energy transition, maintenance and renovation, smart cities and intelligent transport.

Italy is also famous for its engineering sector and is home to leading global companies in sectors such as automotives, aerospace and oil and gas. Irish companies with innovative

solutions and niche products and international references can win business here.

The Nordic nations of Sweden, Norway and Finland are European leaders in metal ore mining, and Norway is a global player in the oil and gas sector. Sweden is home to an innovation-led automotive sector for cars and heavy and specialised vehicles, while Denmark is a European forerunner in renewable energy innovation, particularly in the areas of wind and biogas.

The Benelux ports of Rotterdam and Antwerp provide entry to Europe, making this a good market for logistics, fleet management and other solutions that can improve material handling and transportation efficiencies.



The great manufacturing migration



The migration of European manufacturing to EU member countries in Central Europe and to the Eastern European countries they border continues to be driven by a long history of manufacturing and well-educated workforces, combined with wages somewhat off EU averages.

The main Central European manufacturing hub now includes large portions of the Czech Republic, Hungary, Poland, Romania and Slovakia. Key to their success has been the ease by which existing supply chains into Western European countries, such as France and Germany, can be extended into Central Europe.

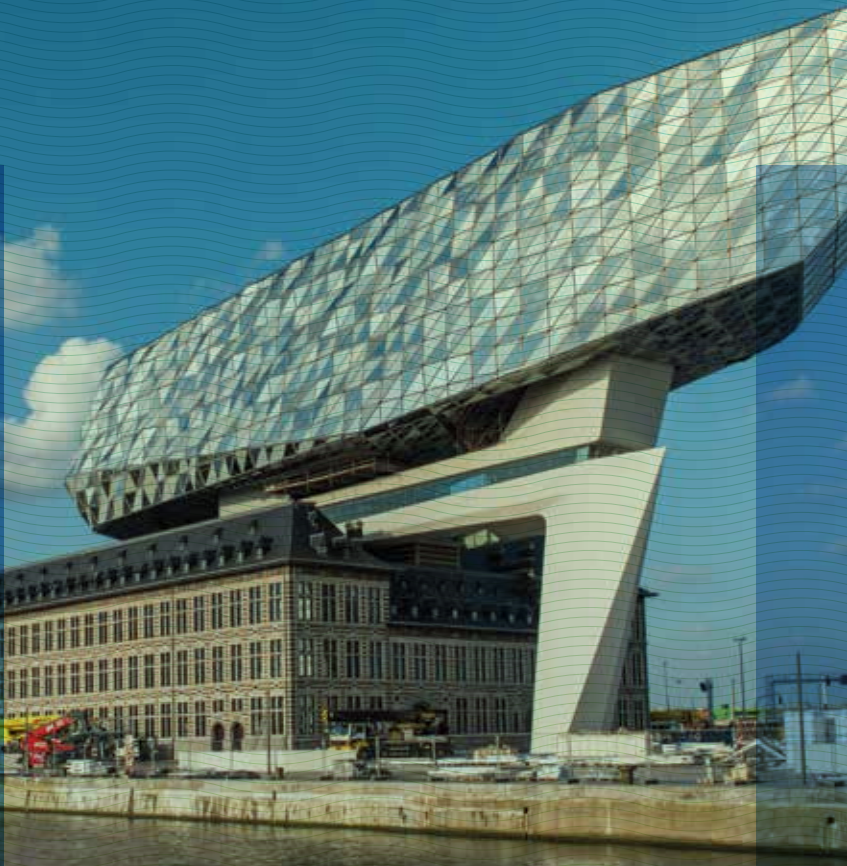
- Poland is the third largest producer of TV LCD screens in the world and Europe's biggest producer of domestic appliances such as washing machines and tumble driers
- Lithuania is the world's biggest producer of pico/industrial lasers
- Czech Republic is the most industrialised country in the EU. Industry accounts for 47.3 per cent of its economy
- Hungary is the largest electronics producer in the Central European region, providing 26 per cent of total regional production
- The Czech Republic and Slovakia have emerged as Europe's new automotive hub. The two countries together produce more than five times their levels of domestic automotive demand
- With the production of 183 cars per 1,000 citizens, Slovakia is the world leader in car production per capita

Source: Enterprise Ireland, Warsaw



Ports of call

Never mind Brexit, here's the Benelux, home to two of the continent's largest ports – Rotterdam and Antwerp – and very possibly a third, with the proposed merger of Ghent and Zeeland. All represent significant opportunities for Irish companies, reports [Gordon Smith](#).



Shipping may be one of the oldest forms of mass transportation for goods, but at Europe's largest seaports, age is no barrier to innovation and experimenting with the very latest technology. That's a significant sales opportunity for Irish companies looking to sell internationally, with the extra benefit that the ports provide a testbed of global scale within relatively close reach.

Rotterdam might have relinquished a 40-year term as the world's busiest port in the middle of the past decade, but its Port Vision 2030 strategy intends to cement its place as a major global hub. Less than 100km to the south, Antwerp's capacity is expected to expand by more than 20 per cent following €650m in private international investment that was announced last November.

The port of Ghent, which is a gateway for the steel industry, plans to merge with two ports in Zeeland – Vlissingen and Terneuzen – with the latter location linked to Ghent by canal. A combined entity would become the eighth largest European port.

"These ports are more than just transport nodes; they have essentially three functions. They are parts of supply chains and also huge logistics clusters and industrial clusters. The ecosystem is much bigger than just a few terminals," says Dr Peter de Langen, who heads the consultancy firm, Ports & Logistics Advisory, and is visiting professor at Copenhagen Business School.

That ecosystem provides a broad swathe of opportunities to supply products, technology or services

to customers in shipping, rail, fleet management, warehousing and logistics. Dr de Langen points to significant demand for technology in particular, driven by the transportation sector's most important trend: digitisation. "Global transport is already incredibly cheap. And it's getting even cheaper to a large extent because of the low cost of ICT systems and the ability to work with real-time data to optimise routing choices dynamically, which allows higher use of more 'green' modes of transport," he says.

"In the Netherlands in particular, there is an openness to innovation, and it's widely agreed that innovation is what's needed to move forward, so there is a culture of trying new things," says de Langen. "The best pitch to get in is to say, 'we have developed skills in Ireland, we now want to expand internationally and we regard the Benelux market as the test bed where we want to advance most rapidly'. That type of pitch resonates because that's how the ports in the Benelux are positioned."

Some of the most enthusiastic adopters of new technology are to be found in the shipping business, if some recently announced projects are any guide. The port of Rotterdam is piloting a project with IBM and Maersk using blockchain, the much-vaunted virtual ledger technology that's only starting to go mainstream. This project is targeting the paper-based processes in shipping and freight forwarding and replacing them with data-sharing tools. In the process, it's claimed this will improve inventory management and reduce waste,



"The best pitch to get in is to say: we have developed skills in Ireland, we now want to expand internationally, and we regard the Benelux market as the test bed where we want to advance most rapidly."

DR PETER DE LANGEN,
PRINCIPAL CONSULTANT,
PORTS & LOGISTICS ADVISORY



as well as decreasing fraud and error, and cutting down the time that products spend in transit and shipping. It's expected to be widely available to support multiple parties across the ocean shipping industry ecosystem later this year.

Not to be outdone, Antwerp is also working on a blockchain initiative that emerged from a hackathon competition last year. A Belgian port logistics start-up, T-mining, is focusing on secure handover of goods using blockchain.

Rotterdam's Smartest Port initiative has already built up an ecosystem of companies and projects looking at ways to make shipping and logistics smarter, efficient and more sustainable, using technologies ranging from 'we-nose' air sensors monitoring air quality, to programmes using open data and the Internet of Things. Rotterdam Logistics Lab is the port authority's initiative to bring real-time data sharing to all port users such as inland terminals, liners and shippers. Pilot projects are already under way in supply-chain visibility and port-call optimisation.

De Langen says ICT providers can play a significant role, especially where they can bring experience from other sectors.

An Irish company is already active in this space. Wicklow-based Druid Software, a specialist in enterprise cellular networks, has partnered with a Dutch telecoms and automation specialist Koning & Hartman to deploy private 4G networks at the port of Rotterdam. The networks provide continuous connectivity between

critical machines – such as gantry cranes, container tractor units and bridge cranes – and the port's automation management system to optimise container loading, unloading and stacking.

"The Benelux ports are kind of a test-bed. From the point of view of technology companies that want to make inroads into supply chains, if you can be successful in the Benelux market, that's where your most demanding and technically advanced customers are," de Langen says.

When it comes to laying the groundwork for doing business in the ports, he adds that investment decisions in ports and logistics typically involve multi-million euro contracts. Irish companies should undertake careful analysis of market trends and be aware of cultural differences.

"The Dutch are more direct, so in principle, when Irish companies have a strong product and strong track record, I think it's a matter of finding some entry channels, such as a customer they already serve or a business contact they already have. If Irish companies want to get in to the Flemish port market, they are probably better off in investing in social capital, or working with people who are very familiar with the companies in these ports," de Langen advises.

Benelux Port Logistics Eco-Systems

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E: paul.barreveld@enterprise-ireland.com



The Benelux



The Netherlands

The Netherlands is the third largest export market for Enterprise Ireland client companies, and, in 2015, client exports to the Netherlands grew considerably. Key success areas for Irish companies include construction, life sciences and international traded services and software.

- Population 17m
- GDP per capita (PPP, 2016) US\$50,800
- GDP growth (2016) 1.7%
- The Netherlands is the world's second largest exporter of agricultural products
- Amsterdam is the eighth largest financial centre of Europe
- Rotterdam is Europe's largest port.
- The Dutch are the best non-native English speakers in the world as ranked by the EF English Proficiency Index (EF EPI) 2016

Belgium

Belgium has three official languages. Dutch is spoken in the Flemish region; French in Wallonia; German is spoken in a small area in the east of Belgium, and Brussels has bilingual status. Proficiency in English also is high across the country. The multilingual status and high presence of multinational headquarters makes the country attractive for Irish companies wishing to test their strategy on markets with different business cultures.

- Population of 11.2m
- GDP per capita (PPP, 2016) US\$44,900
- GDP growth (2016) 1.4%
- Key opportunity areas include
 - Construction products and services targeted primarily at the pharmaceutical and biotechnology sectors
 - Logistics and transport solutions
 - Procurement, consultancy and services for European Union institutes, headquarters of international organisations such as NATO and the international headquarters of US and Asian multinational companies

Luxembourg

Luxembourg is home to a number of European institutions, including the European Court of Justice, European Court of Auditors, European Investment Bank and the General Secretariat of the European Parliament. Moreover, the Grand Duchy of Luxembourg is a global hub for finance and insurance. The three official languages are Luxembourgish, French and German, although the majority of the population has very good knowledge of English.

- Population 580,000
- GDP per capita (PPP, 2016) US\$102,000
- GDP growth (2016) 3.5%
- An estimated 60 per cent of the total EU market can be reached in one day
- Luxembourg's key sectoral strengths include financial services and fintech, ICT, telecoms, business process outsourcing and cybersecurity
- The financial sector accounts for a quarter of Luxembourg's GDP

Source: Enterprise Ireland, Amsterdam & Brussels



Construction turns tide on Ireland's continental drift



John Stanley talks to four Irish companies that have moved beyond the UK construction scene to achieve market success in Continental Europe.

Unlike most building companies, Collen Construction grew during the recession by identifying opportunities in new, technologically driven sectors such as data centres and biopharma. In 2010, the 210 year-old family business built its first data centre for a multinational client. Now, with close to 2 million sq. ft of high-tech space completed, it is one of the top Irish contractors in the 'hitech/data hall' space.



"One of the secrets for managing the risk is treating all the sub contractors as partners and stakeholders."

Thomas O'Connor, European operations manager, Collen GmbH

Collen Construction

In 2014, at the invitation of the same multinational client, Collen Construction built its first data centre in Germany, and last April, the company opened an office in Frankfurt from where it plans to pursue further opportunities throughout Europe.

The European operations manager of Collen GmbH, Thomas O'Connor, stresses the importance of having a clear focus in order to be credible overseas. Collen's reputation in Ireland for being good at a wide range of construction activities will not open doors or win business in Europe, he says.

"We've made data centres our sweet spot and built a reputation for knowing how to mitigate the risks involved. These types of projects impose challenging deadlines and require us to produce volumes of technical information. Since 2010, we've really got to know the suppliers in this specialised field, and we're comfortable in it."

One of the secrets for managing the risk, O'Connor reveals, is treating all the sub contractors as partners and stakeholders. "For our clients, it's all about speed-to-market, and, in that sense, it's a very unforgiving sector. In this type of specialised project, therefore, if one fails, we all fail. It really is that simple. So we adopted a partnership approach in 2014, and the model has not let us down."

PM Group

Like Collen, PM Group has followed its blue chip clients into continental Europe and has been active in the Benelux region, in particular, over the past 10 years.

Colm Fitzgerald, head of construction services at the engineering, architecture and project management firm, says there are a number of “bear traps” that construction firms need to be aware of. First and foremost is the need to respect other cultures. “Even something as simple as a turn of phrase that might be commonly used in Ireland could be misinterpreted,” he warns.

There are also differences in approaches to health and safety across Europe. “On the ground investigation and research is essential to identify exactly where the bar is set. In some countries, it’s not as high as in Ireland or the UK, for example.”

Fitzgerald also puts strong emphasis on identifying contractors compatible with the Irish company’s own way of approaching business. “We do a lot of work in the life science sectors, and our clients demand and expect world class standards. We put significant effort into the pre-construction phase of our projects in mapping out execution plans. This is key to establishing best-in-class construction quality and health and safety programmes, so that everyone involved in the project knows exactly what’s expected of them and is both willing and able to deliver. We have worked hard in establishing a solid supply chain, and this has paid dividends in terms of our successful project delivery.”



“We have tended to enter a country in stages. Typically we would begin with concept design work, then expand our services from there.”

Colm Fitzgerald, head of construction services, PM Group

Up until now, PM Group’s primary focus has been on Benelux countries, but the company is beginning to turn its attention to other opportunities across mainland Europe. “We have tended to enter a country in stages, first getting to know the people, understanding the companies and cultures, etc. It takes time to establish relationships. We’ll do it organically; typically we would begin with concept design work, then expand our services from there.”

Cork Plastics

Founded in 1969, Cork Plastics (CP) manufacturers a wide range of quality plastic products for the construction, building and agricultural sectors. Its main markets are Ireland and the UK, but the company is also rapidly expanding its European customer base, notably in France.

CP’s sales and marketing director Seward Lynch says that identifying the right products for, and route to, each market has been crucial. “The hardest part was identifying potential customers, using similar products to those we produce in Cork,” he told *The Market*.

CP chose France because it is large and the closest to Ireland after the UK, which is served by sister company FloPlast. “It has been a steep learning curve for us,” he confirms. “There are a lot of similarities, but a lot of differences, too. The French are slow to change, but there’s still potential there for us in the future.”

Freefoam Plastics

Another Cork-based company Freefoam Plastics began trading in 1990 and has grown into a multinational organisation, operating from sites in the UK, Belgium, France and Germany.

Freefoam entered the French market in 2002 with a trade offering of roofline and cladding products and expanded into the DIY sector at the beginning of 2009. For the last three years, the company has been selling a new cladding product developed specifically for the Dutch market and is developing plans for Germany. The continent now accounts for over 20 per cent of the group’s turnover.

“You need to find the right people to help you enter a new market and then integrate them into your organisation. You also have to find the right customers and distribution channels,” says managing director Aidan Harte. For Freefoam, innovation has been an essential core competency. “It’s important in new markets to adapt to meet the market’s needs, to find solutions that work there, rather than trying to force



your existing solutions on them," he emphasises.

Freefoam invests substantially in R&D, with support from Enterprise Ireland. "This allows us to grow our sales and stay ahead of our pan-European competitors," Harte says. "Our end customers always expect us to come up with new products and innovations – anything that will help them get their work done more efficiently."

Harte says that language is always something of a barrier, even though in Europe, in general, the command of English is very good. But Freefoam still sees real benefit in hiring people with multilingual skills that will suit its markets. "We have an inherent knowledge gap in language," he says, "which is why we make sure we bring those skills into the company by direct hires."

The Freefoam MD is also a strong advocate of doing homework on regulations and certification. Freefoam, for example, is the only maker of PVC cladding products with ATEC certification from the French building certification body, CTSB.

"It is very important for us to have a strong technical team, but you also have to be willing to tough it out to achieve the results you want," Harte concludes. "It can take a lot of time and money, but it really is worth it."



"You need to find the right people to help you enter a new market and then integrate them into your organisation."

Aidan Harte, managing director, Freefoam



Second and third language skills key to European markets

One of the keys to getting traction in European markets is a sharp focus on the product or service, according to Stephen Hughes, head of construction markets at Enterprise Ireland. "As a rough rule of thumb, the further you are from home, the sharper your focus needs to be," he says. "You need to be laser sharp in identifying the product areas or sectors in which you can make a major contribution. If you suggest you can do everything for everyone, you won't be taken seriously."

He also advises companies to be rigorous in their market research. "Too many companies don't spend enough time getting to understand the dynamics of the market, the scale, the existing players and where their own offering might fit within that in order to be compelling," he

told *The Market*. "There is only one opportunity to make a first impression."

Irish companies are doing well in the German and the Benelux construction markets, but all too often, they skip France and look further afield because of unjustified prejudices, he believes.

Tied up with overcoming this reticence – and getting to grips with European business culture in general – is the need for business leaders to embed second and third languages in their companies, he adds. "Because English is so widely used as a common language for business in Europe, there is a sense that we don't need to be able to converse in the language of a potential German or Belgian client. And even in companies that are able to speak to the

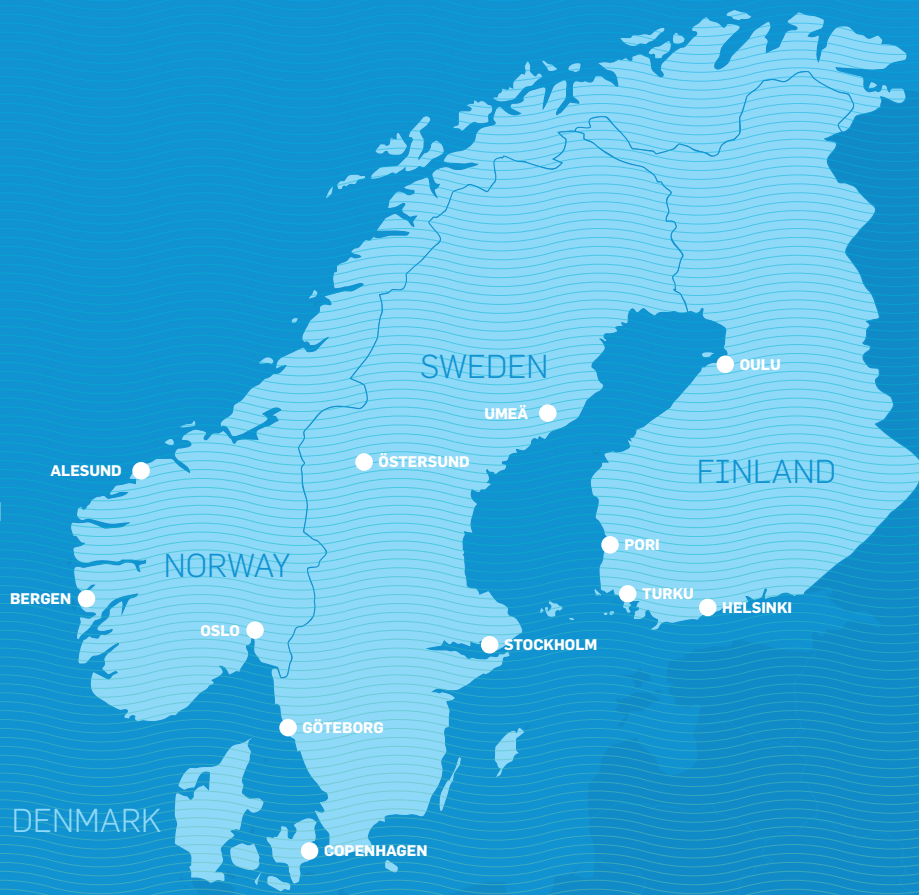
client in their own language, there are surprisingly few with the in-house capability to really engage in the detailed business and technical side of things. After 40 years of being in the EU, we might have hoped for more."

For Hughes, the language issue is all about demonstrating commitment. "Even if the customer has perfect English, it should be part of your culture to do business in the language of the country. Local hires can be a good starting point to demonstrate that level of commitment."

This holds true even in construction, which may involve one-off contracts. "They may be one-off projects, but that does not necessarily imply one-off relationships, between contractors and sub contractors, for example," he says.



Caution: Unicorns crossing



It's official: the Nordics are now the biggest unicorn factory in the world. This is according to Creandum's *Nordic Tech Exit Report 2016*, which shows that the region – comprising of Sweden, Denmark, Norway and Finland – has the world's highest share of billion-dollar exits relative to GDP.

With a population of just 27 million, but a land mass greater than India, the region is the twelfth largest economy in the world. It incorporates some of the most advanced technological nations, and this, coupled with the relative ease to adopt innovative products, makes it an attractive market for Irish exporters.

The wealthiest of the four is Norway, driven by oil and gas revenues. Denmark's economy is based on transport and agriculture, while Sweden is successful in manufacturing, pulp and paper, telecoms and design.

Finland is a member of the European Union and has adopted the euro. Denmark is an EU member but uses the kroner as its currency, having negotiated an opt-out option. Sweden is also an EU member with no opt-out; however, it is not a member of the Eurozone and has a floating currency. Finally, while Norway is not an EU member, its legislation is to a great extent

in line with that of the EU.

Across the Nordics, the healthcare, telecommunications, IT, engineering and construction sectors offer opportunities for Irish exporters:

- Sweden's automotive industry – incorporating the passenger car manufacturing and two of the largest truck manufacturers in the world, Volvo AB and Scania AB – accounts for 12 per cent of export income
- Data centre construction is increasingly active as Nordic countries are gaining better yearly rankings in the independently published DC risk indexes
- The development of energy-efficient and low-carbon cities is another priority
- The Nordic healthcare system, which was built on the principle of universalism, has become increasingly market-orientated in recent years
- The largest Nordic life science and healthcare cluster is the Medicon Valley region, stretching across Denmark and Sweden, with more than 200 international pharmaceutical companies and 170 medical technology companies, as well as a strong indigenous cluster
- The Nordics are home to a number of strong retail groups, including H&M, IKEA, ICA and Axel Johnson

- The region has experienced robust growth in the banking, insurance, pension and securities markets as well as in other non-bank financial intermediation. It is also one of the most advanced payments markets in the world
- Almost 90 per cent of the EU's iron ore mining takes place in Northern Sweden.
- The Nordic telecommunications sector is among the more progressive in Europe, and the digital media and gaming sectors also show promise

In Denmark, Norway and Sweden, the languages are similar enough to allow people to communicate across borders with each other using their own mother tongue. Swedish is also one of the official languages in Finland.

In terms of business culture, there is a clear distinction between personal and professional relations. Direct and honest communication is very important. Nordic people prefer to get straight to the point, dispensing with the need for small talk.

Business dress is often casual and modern. Business hierarchy is not something that is made obvious. Moreover, consensus is very important so a consultative approach to negotiation is recommended.

Source: Enterprise Ireland, Stockholm



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Spain

- Population: 49 million
- GDP growth (2016): 3.1%
- GDP per capita (2016, PPP): US\$36,500

Spain is currently experiencing a post-crisis renaissance in business, with the adoption of new technologies and innovations and the rise in the use of English in the workplace. The Spanish economy grew strongly in 2016, spurred by easing monetary policy in the euro area and fiscal stimulus. The expansionary phase is expected to continue in 2017 and 2018 with domestic demand leading the recovery, albeit at a slower pace.

The country is divided among 16 autonomous regions or communities, similar to a federal state system in other countries. Among the most important of these are the industrial pillars of the Community of Madrid, Cataluña, and El País Vasco (the Basque Country) as well as the touristic havens of Andalucía, the Community of Valencia and the Balearic and Canary Islands.

Exports by Enterprise Ireland clients reached €103m in 2015, led by a strong performance in the telecommunications and e-commerce, travel software, pharmaceuticals, engineering and construction, and financial business processing services and fintech sectors.

- The country has a strong, diversified communications market, which includes telecommunications services, digital content, IT, telecommunications industries, consumer electronics, and professional electronics. Spain is home to the leading telco Telefonica, and the annual World Mobile Congress in Barcelona has become a key international event for Enterprise Ireland clients
- Similarly, Barcelona hosted the annual CPHI fair for the pharmaceutical sector in 2016. Catalonia, the leading region for pharmaceuticals in Spain, is home to the five biggest Spanish pharmaceutical companies: Almirall, Esteve, Ferrer, Grifols and Uriach

- Tourism has undoubtedly been the darling of the Spanish economy for years. In 2016, Spain received a record 75.6 million inbound tourists, making it the world's third-most visited global destination, behind only France and the US
- Spain has historically been a banking powerhouse of the western world and is home to some of the largest global banking institutions such as Santander and BBVA. Given Ireland's strong cluster of innovative companies, fintech will be a key developing sector for Enterprise Ireland in Spain over the next three years.
- Other developing markets for Irish companies in Spain include agriculture, pet-care and retail

Source: Enterprise Ireland, Madrid



Italy

- Population: 62 million
- GDP growth (2016): 0.8%
- GDP per capita (2016, PPP): US\$36,300

The world's eighth largest economy, Italy is home to major global heavyweights such as FIAT (part of FCA now), Lavazza, Gucci, Olivetti, ENEL, Generali, Ferrero and Zanussi. Yet the country also has the EU's highest proportion of SMEs.

The country comprises a collection of very different regions, but the Lombardy region, which accounts for some 20pc of Italy's GDP, is the economic leader, particularly Milan. Other hotspots include Piedmont for aerospace and automotive; Regio Emilia for food production; and Lazio, and in particular its capital Rome, for the service industries that are located close to the seat of government.

There are currently around 400 Irish owned companies exporting to Italy, with approximately 50 having some form of presence in the market, ranging from a single person sales office to manufacturing operations. There are opportunities in almost every sector of the economy from medtech, engineering, aerospace and cleantech to fintech and ICT.

- As noted elsewhere in this issue, Italy is famous for its engineering sector and has a well-developed medical device manufacturing base
- Italy is the fifth most popular tourist destination worldwide and tourism accounts for approximately 8.5 per cent of Italy's GDP (€1.6 trillion)
- Despite the difficult economic conditions of recent years, the Italian ICT market remains one of the largest in Europe. Growth has been driven by segments such as cloud computing, online services on mobile devices, document digitalisation, social networks and smart communities

- Agents and distributors play an important role in this market as they have a deep understanding of informal business practices and networks of relationships. Relation building is of vital importance and the most successful Irish companies have invested in putting feet on the ground
- Italy's English language skills are among the weakest in Europe. This challenge is most apparent at senior management (>50yrs) levels in family-run SMEs

Source: Enterprise Ireland, Milan





Talking the customer's language

An ability to speak languages is becoming essential for business people as Ireland trades more with Europe and further afield, writes Lucille Redmond.

Over half of Europeans (54 per cent) can hold a conversation in at least one additional language, 25 per cent speak at least two additional languages and 10% at least three. Irish business people are becoming more fluent, but we have to make this push more efficient, and become – like the Dutch, whose merchant culture has long made them multilingual – fluent in the languages of others.

At the heart of our complacency is a misconception that globalisation means that we can all get by speaking English, and that as native speakers, we're alright. Another misconception is that we should speak our customers' languages simply to be understood in case their English is not great. But really the reason the language will get you ahead is because you can research the market better, understand who your local and international competitors are (and position yourself accordingly) and be more aware of the cultural nuances in conducting business in that country.

The good news is that learning and practising languages has never been easier. The universities have intensive courses – for example, UCD's Applied Language Centre. The specialist Sandford Language Institute in Milltown Park, Dublin, offers in-company courses, as well as courses in languages in demand, plus many courses in languages "subject to demand". And there are familiar courses in individual languages from associations like Alliance Française, the Goethe-Institut, and Istituto Di Cultura.

The Berlin-based Abroadwith arranges immersion stays and courses where individuals or groups can learn and improve a language by staying with native speakers and going to classes in the country where the language is spoken; it has just launched a specialist business course option.

For the daily, constant, non-stop practice that everyone needs to become first at ease in speaking and understanding, and then gradually fluent, it is not always easy to get to centralised courses. But a host of online resources are available now that were undreamed-of even twenty years ago.

Comprehension: watch films in your target language – first with English subtitles, then with subtitles in the language. You can often buy old DVDs with "subtitles for the deaf" for as little as a few cents on the localised versions of Amazon. Some TV subscriptions, like Netflix, come with own-language subtitles which you can turn on through the settings. On YouTube, there are TED talks in many languages with closed-caption subtitles in the language of the speaker.

Grammar: Duolingo – a game-like app that drills you daily in your chosen language – is played by over 100 million people learning European languages, Hebrew, Russian, Vietnamese, etc. It brings you to a notional 62 per cent fluency level, which means you have a solid basic vocabulary and can use the main grammatical structures. It's wildly addictive: many people start with one language and extend into learning several more.



Speaking: The Mixxer is a language exchange website that puts people in contact to swap languages. English is in high demand, luckily for us. You put up a brief 'profile' of yourself, with only as much information as you want to share, and offer to swap languages with native speakers of the language you are learning. When you are contacted, or you contact others, you talk to native speakers of your target language on Skype – typically half an hour in English and half an hour in their native language. (I talked to a French civil servant, who was due to be moved to the US; she was speaking to 10 people a week.)

Reading and local knowledge: international newspapers' websites are updated at speed, and titles like *Le Nouvel Observateur*, *Bild*, *Kommersant*, and so on, are great vocabulary-builders. International TV is easy to watch online and will keep you au fait with the politics and business news of your target market.

Technical help: online dictionaries include the contextual, audio-enhanced, eight-language reverso.net – contextual meaning that you can enter a phrase and usually find an example of the phrase used in context, with audio.

TuneIn Radio: streams radio and podcasts from all over the world, with 'slow news' programmes in many languages.

One-to-one classes without leaving the office: most of the above are free. If you want dedicated professional

teachers, italki, again using Skype, is an aggregate site on which native-speaking language teachers offer their services and charge by the hour. The advantage of this is that you can often find a teacher with specialist vocabulary relating to your business. Babbel has drills and comprehension exercises – good teaching made digital.

Cultural insight: it is now very affordable to buy used books in many language on aggregation sites such as Alibris and AbeBooks: for basic vocabulary (and the slang that you may not wish to use but you need to understand), comic books, children's books, thrillers, cookery books, and for your own business need technical manuals, political works, business books in the language of your market. (A tip: you will learn faster if you do not look up the words you do not know as you go along, but instead underline in pencil any unfamiliar word, and when you finish the book go back and read it again – this time you will know most words by context.)

For when you are travelling: podcasts like the Irish learnfrenchbypodcast.com give you daily lessons – often free for the basic podcast, but with PDFs of the lessons with further help available for a small payment.

It will make such a difference when you walk into your supplier's or into that conference and greet people and speak in their own language – and even before you are fluent, it will break down barriers and warm the relationship. There is no better negotiating tool than a mother language.



Commercialising a medical device in almost any territory relies on cracking three things: authorisation, reimbursement and route to market, and in this, the European Union is no different. Anthony King reports.

3 steps to successfully launching a medical device in Europe

01 AUTHORISATION

Surmounting the first market hurdle – gaining authorisation to market a medical device in a particular territory – is pretty much universally seen as a faster, cheaper and easier process in the Europe Union than in the USA.

Atlantic Therapeutics, a spin-out from Bio-medical Research (BMR), has offices in Galway, London, and Salem in Germany and recently attracted €15m in venture capital to expand market reach for Innovo, a noninvasive device to treat urinary incontinence by strengthening pelvic floor muscles.

The European regulatory process is an easier place to start, agrees Atlantic Therapeutics CEO Steve Atkinson. Moreover, European Union authorisation has helped open doors in the Middle East where Innovo is about to launch, due to the similarities between the EU and local regulatory regimes.

In Europe, every marketed medical device must carry a Conformité Européenne (CE) mark indicating that it conforms to relevant directives set forth in the EC Medical Device Directives. “Once your product is classified as a medical device and gets CE accreditation, it can be commercialised in any EU market,” advises Jean Charles Moczarski at Enterprise Ireland’s Paris office.

Non-implantable medical devices are considered low risk, meaning that manufacturers themselves can certify compliance and apply a CE mark; whereas higher risk devices must undergo an external review and may require clinical and/or nonclinical evidence to support approval.

The application can be filed in any member state and is reviewed by a ‘notified body’ authorised by that state’s competent authority. Currently, there are over 70 notified bodies operating in the EU; typically, these are for-profit, private companies.





"It's all about resources. SMEs need to be strategic about the territory they enter. The European CE pathway, although still rigorous, can be easier."

Myles Murray
CEO, PMD Solutions



In contrast, in the US, medical device approval is overseen by a single authority – the Federal Drugs Administration (FDA).

In a comparison of the two systems, published in 2016, Gail Van Norman noted: "Before approval of a medical device in the United States, a device must not only be shown to be safe, but efficacious. Medical devices approved in Europe need only to demonstrate safety and performance... They are not required to demonstrate clinical efficacy."

Cork-based start-up PMD Solutions has developed RespiraSense as a continuous and accurate, discrete sensor that measures the mechanics of respiration to monitor general ward patients who are at risk of adverse events until discharge in hospitals. The device has been trialled in hospitals in Ireland, Europe and Asia.

Having selected Europe as an initial target market, CEO Myles Murray says: "It's all about resources. SMEs need to be strategic about the territory they enter. The European CE pathway, although still rigorous, can be easier."

If European industry and patient lobby groups have their way, this will remain the situation. However, it could be a case of watch this space. Proposed amendments to Europe's medical device regulations, which would bring it closer to the US system, include involving the European Medical Agency in device regulation, tightening controls over notified bodies and requiring more rigorous clinical evidence.

02 REIMBURSEMENT Gaining authorisation to market a medical device in a particular territory is only part of the battle. A second obstacle involves getting on the 'approved list' for reimbursement, so that the customer – whether a hospital or patient – will be reimbursed by the relevant health insurer if they purchase the device.

SMEs often make the mistake of assuming that the data they have used to file for the CE mark will be sufficient to get them included on a territory's list of products and services qualifying for reimbursement. However, according to Prof Alain Bernard, at École Centrale de Nantes in France, this is not always the case. In the era of value-based healthcare, companies need to prove that their product will deliver clinical, economic and, for patients, quality-of-life benefits. In this regard, success in one European market does not offer a free pass to the next one. Early on, companies should get to know how the various reimbursement schemes operate in intended target markets and consider what additional evidence might be required when setting up a clinical study. Specifically, they should analyse existing reimbursement arrangements for their product type or work on getting a new procedural coding.

The Haute Autorité de Santé assesses whether a product should be made eligible for reimbursement by France's national health insurance, based on clinical trial evidence for patient benefits and added clinical value. If the benefits are determined to be sufficient,



the medical device is registered on a list qualifying it for reimbursement. The manufacturer then negotiates a reimbursement with the public pricing committee, or CEPS as it's known, based on the clinical value and how it compares to existing products or therapies.

Atlantic Therapeutics found the French market relatively easy to navigate into, since a product code already existed for devices of Innovo's type, allowing for reimbursement for homecare use, Atkinson says. If Innovo is prescribed by a French doctor, the patient can simply call into a pharmacy with the reimbursement code to collect it.

The French medical device market is the second largest in Western Europe and the fifth largest in the world. Its formidable healthcare system has one of the highest spends in Europe, at \$278.8bn in 2015, representing 11.6 per cent of GDP. Public health chalks up 78 per cent of the total spend, and the country is in the midst of a hospital investment programme.

Germany is the only larger market in Europe. Healthcare expenditure represents around 11 per cent GDP, and medtech was valued at €26 billion in 2014.

"The German healthcare market is unique because 90 per cent of it is public, dominated by statutory health insurance," says Marco Kalms, CEO of Palms & Partner, a consultancy firm based in Berlin.

Kalms says entry into the hospital (inpatient) side of the market is easy, and even off-label use of devices is permitted. On the ambulatory (outpatient) side,

everything is forbidden unless approved. The Federal Joint Committee (G-BA) ratifies new procedures for coverage by the statutory health insurers.

"For the ambulatory market, you need to approach the Federal Joint Committee (G-BA), the highest decision making body, to see if there is potential. They assess the clinical evidence and decide on how much to pay for it," he explains.

"Once you have a CE mark, you can sell into the hospital market, using an existing code or apply for a new code to one of the healthcare technology assessment bodies of the Federal Ministry of Health (BMG)," Kalms explains.

Billing is based on the German Diagnosis Related Groups (G-DRG). The compensation amount is based on data continuously gathered from German clinics. On the hospital side, the InEK Institute determines price.

"The German public healthcare market is running a surplus, something in the order of €28bn to €30bn, which is very different from the UK, the US, or France," says Kalms. "There is a reason for that. They are always looking for opportunities to save money, so with a reasonable price, a product can do well."

However, it is not all about costs. "A misconception we see with a lot of clients is that having economic data will get you into the German market. The first data the health assessment technology bodies look at is clinical evidence and patient benefits. If there are proven sophisticated clinical studies, then you



Medical device industry: supplier opportunities

Having won business with medical device manufacturers based in Ireland, suppliers providing everything from design and prototyping through to sub-supply, manufacture, packaging and ancillary services can also find potential markets in Europe.

While Ireland is the second-largest exporter of medical devices in Europe, Germany is the largest, with particular strengths in diagnostic imaging, dental products and optical technologies. The area around Baden-Württemberg is

one of the strongest for medical devices manufacturing. The largest producers are B.Braun, Fresenius and Siemens.

Italy has a well-developed medical device manufacturing base, with a market size of €7.5bn, comprising a small number of large companies (Sorin, Gambro, CID Vascular, etc.) and a large number of SMEs, mostly located near Modena in the Mirandola district.

France also has a well-established medical device manufacturing industry, dominated



have a chance on the market, even if the product is considerably more expensive. If you have poor clinical evidence, you have no chance.

"A common mistake is for companies to put their workload into getting FDA and CE approval. Once they have it, they say now for reimbursement. They should have already started on this."

Atlantic Therapeutics' Steve Atkinson agrees, explaining: "The reimbursement system in Germany depends on a network of insurers. Which insurer you are with determines how much you will get reimbursed. As a seller, you need to make sure your product is covered by each insurer, and you should get that done ahead of your launch in Germany. Otherwise, you are not going to get paid. Culturally, Germans are not used to paying for healthcare out of their own pockets."

03 ROUTE TO MARKET

Having surmounted two major obstacles, companies have to address the issue that faces almost any exporter – route to market. Small medtech companies are usually best advised to sign up distributors. But they also need to be aware of the role of group purchasing organisations or GPOs. These are entities intended to help healthcare providers realise savings and efficiencies by aggregating purchasing volume and using that to negotiate discounts with manufacturers and distributors.

In France's public hospital system, for example, the Parisian Hospital Board is a central buying group, comprising 37 hospitals organised into 12 hospital groups with 23,000 treatment beds. Its annual budget is around €7bn.

In Germany, the leading group purchasing organisation is Prospitalia, with over 700 medical institutions and 135,000 hospital beds; 350 contracted suppliers; 500,000 listed items; and over €1bn in purchasing volume.

Internationally, the dominance of GPOs has been blamed for narrowing channels to market to the extent that developing an effective medtech product is, in itself, not enough for a company to reach its ultimate customer.

"Public buying groups are large, powerful players when it comes to negotiating procurement contracts. This can be a hindrance for smaller companies," says Moczarski.

Therefore, Irish companies must also work hard to create market pull, targeting influential surgeons, clinicians and patient groups to champion their products.

Medica 2017

November 13 to 16

Enterprise Ireland will host an Ireland Pavilion at this leading global event for medical technologies

L: Dusseldorf, Germany

E: jane.greene@enterprise-ireland.com

by multinationals and a well-developed base of indigenous SMEs. Production is focused on diagnostic imaging, orthopaedics and prosthetics and other medical devices, particularly hospital furniture. Three-quarters of the manufacturing industry is concentrated in four regions: Ile-de-France, Rhône-Alpes, Provence-Alpes-Côte-d'Azur and Alsace.

Commenting on a recent study tour to the life science hub of Grenoble, Jean Charles Moczarski at Enterprise Ireland's Paris office says: "The French audience was impressed by the Irish medtech companies and amazed by the talent. They hadn't realised that

Ireland, and especially Galway, was such a hotspot."

Dolmen Design participated in the visit. The Dublin-based product design consultancy's export strategy is centred on providing design services for medtech clients and was initially focused on the UK market.

"Then Brexit happened, so we adjusted our export strategy. We are not stopping with the UK, but we're now looking towards France too," says Frances Mitchell, Dolmen's business development manager.

This decision was influenced by the company's participation at Medica in Dusseldorf, Europe's

largest medtech trade fair.

Mitchell, who worked in France previously and speaks the language, had discussions with a number of French companies during brokering events set up by Enterprise Europe Network. "There was a vibrancy to the French interest there that we couldn't ignore," she says.

During the Grenoble visit, Mitchell says she was again impressed by the multinationals, SMEs and start-ups she met. "Some of the companies expressed an interest in coming to MedInIreland 2017 in the autumn to learn more about the support available here."



Cian Molloy reports on the evolution of the Internet of Things (IoT) and how Irish tech companies are empowering the smart city movement internationally.

Get smart!



When is a bin not a bin? When it is also an advertising hoarding, a Wi-Fi hotspot and an environmental monitoring station. Welcome to the world of the smart city, where ICT is creating multipurpose infrastructure with inbuilt features, making it easier and cheaper to manage.

Smart cities have been defined as cities that aim to achieve high levels of sustainability, economic development and quality of life through investment in physical capital (infrastructure), human capital, social capital and ICT. A more hard-nosed way of looking at smart cities is in terms of the commercial opportunities they offer ICT product and service providers.

Taoglas produces a myriad of antennae, because such is the nature of IoT that different methods of wireless communication are needed for different applications and locations. For example, Taoglas's 5-in-1 Storm product, typically used on police and emergency vehicles, houses two LTE MIMO antennae, two Wi-Fi MIMO antennae and one GPS antenna. Not only do officers remain in radio communication with their dispatch, their dispatchers can view the live, or recorded, video feed from the vehicles' onboard cameras and from the cameras worn on the officers' person. HQ also has live access to data about the officers' and vehicles' performance. In the case of the officers, they can track heart rates and whether the officers are standing, seated or prone, and, in the case of the vehicles, they



"In IoT, a lot of the solutions are made up of layers of different technologies from different companies, so that creates huge opportunities."

Brendan Carroll, CEO, EpiSensor

Where you bin?

Nevertheless, technology, and the internet of things (IoT), in particular, does provide a means for improving the efficiency of our cities and urban spaces. The 'smart bin' is a case in point – Dublin City Council is set to install some 800 solar-powered rubbish bins across the city this year. They are solar powered because they need energy to power internal compactors that reduce the volume of rubbish so that the bins have to be emptied three times less often. An additional smart bit is that, when they are full, the bins send an alert to head office letting them know.

These types of bins were first trialled in Dun Laoghaire, using bins manufactured by Massachusetts-firm Bigbelly. However, a key Bigbelly component, the antennae, was provided by Taoglas, an Enniscorthy-based firm that is a world leader in antennae design and manufacture.

can see where they are located, how they are being driven and when they next need a service.

Fair cop

Another Irish company is involved in the technology behind some of these smart police vehicles. Davra Networks, based in Dublin, is a world leader in the development of IoT application enablement platforms, a platform-as-service that allows IoT developers to easily deploy and scale their applications.

Davra's CEO Paul Glynn says IoT is about "people connecting things that they never connected before". He explains that by networking assets, by whatever means, Wi-Fi, cellular, satellite or via a low-power WAN such as Sigfox, it becomes easier to manage those assets individually or as a whole, "to solve management headaches be it in a factory, a power supply or a smart city".



Here, there and everywhere



An example of IoT everywhere is Wembley Park in London, a massive 85-acre urban regeneration project. As well as being billed as “the UK’s biggest buy-to-let building scheme”, Wembley Park is also being hailed as “the world’s best connected mini-city”, with Irish firm Magnet Networks, a specialist in FTTP (fibre-to-the-premises), providing homes and businesses with broadband connection speeds ranging from 100MB to 2GB.

Building contractors aren’t especially interested in FTTP until they hear that it can reduce their M&E (mechanical and electrical) cabling costs by up to 65 per cent, says Magnet’s CEO Mark Kellett. “Because you can run multiple services on the fibre, you don’t need copper cable for the phone, cable for the temperature and humidity controls, cable for the TV and CAT5 cable for PC connectivity. It also means you only need one satellite

dish for the whole building – and only one satellite box.

“We are learning from each phase of the project. For example, the builders spent too much money on connection points in the first set of apartments because students don’t want to plug their laptops and devices into the wall. As long as they have three-bar Wi-Fi, they are happy.”

Wembley Park is built around Wembley Stadium and Wembley Arena (now officially the SSE Arena), and it is also home to the London Designer Outlet (LDO), an 85-store shopping centre that Kellett describes as “Kildare Village on steroids”. This is an example of a physical and economic investment to create a smart city environment, as the student residents have a source of weekend employment in the LDO. There is also part-time employment available when events are held in Wembley Stadium or the SSE Arena.

There is smart city ICT aplenty there too. “There is a number plate recognition system in the car park, so from the DVLA database, we know who each car belongs to and where each car owner lives,” says Kellett. “That has a security application, but we can also make a good guess as to a visitor’s spending-power, based on their address. And, if a visitor logs on to our free Wi-Fi, we will have some access to their browsing history, so we can direct them, via their smartphones, towards special offers they might be interested in. We can also follow them as they travel through the London Designer Outlet or past the shops on the way to the Wembley Stadium and see where they stop and what they are looking at. There are a number of Irish companies who are very good at tracking how people travel through a retail space, and we are working with them on that.”

Recently, Magnet ran a BrEntry promotion offering 10 Irish IT companies space in its Wembley Park HQ building



"Once you develop an app for, say, smart housing, try to think of how it could be used in other ways. A good example of this is that a sensor developed by Kingspan to measure oil tank levels is now being used in a river flood-detection system. Thinking vertically is a route to greater success."

**Jim Cudden, Coordinator,
Smart Dublin**

free for four months as a launch pad for expanding into the UK. Billed as BrEntry, an antidote to Brexit, Kellett was delighted with the response, with more than 40 companies expressing an interest. He said: "We want to help potential partner companies grow their capabilities, so when we go to clients, we can offer a full portfolio of services through these partner companies."

Back in Dublin, the city council's smart city coordinator Jamie Cudden says there is a great willingness among large companies to partner with IoT innovators. He says: "One thing I would say to developers is that once you develop an app for, say, smart housing, try to think of how it could be used in other ways for, say, smart cities. A good example of this is that a sensor developed by Kingspan to measure oil tank levels is now being used in a river flood-detection system. Think vertically; that is a route to greater success."

"The Internet of Things is very like what we used to call 'M2M' or machine-to-machine communication, with one small difference," says Glynn. "With M2M, data is siloed; with IoT, you are using multiple sources of data. A good example is in fleet management where with, say, a refrigerated truck, you have one solution, such as Fleetmatics providing GPS information and telematics. You have another solution, GreenRoad, providing data on driver behaviour. Another solution, Blue Tree, is monitoring the refrigeration in the trailer, and all the pallets in the trailer are tracked using RFID. In the world of M2M, each of these solutions works separately. With IoT, you put a network on the vehicle, using a Cisco or a Dell router, and you



Smart Dublin has launched a Small Business Innovation Research Challenge in partnership with Enterprise Ireland to promote cycling in the city. The aim is to provide a model that will make it easier for small, disruptive tech start-ups to supply local authorities.

collect the data from all those sources, and you use them together to work more intelligently.

"Also, you don't need to send all the data into the cloud on the network all of the time. For instance, the onboard computers fitted on most car engines since 1996 produce more than 25,000 data points every minute. You don't want to be sending all that over the network continuously. You need the system to send the data when it needs to be sent. We are involved with a connected light rail system in San Diego and a heavy rail system in New Jersey. Vibration levels are one of the things that need to be monitored: if the vibrations go beyond a certain threshold, an alert is sent to the operator. But the threshold varies according to the ambient temperature: the colder it is, the lower the vibration threshold before an alert is sent."



In the smart city sphere, Glynn sees IoT opportunities galore, especially in the areas of transport, energy and security. "One of the big issues is who is going to pay for it and, secondly, will you be able to get various parties to share their data," he says. "In some countries, you can force people to share their data, in other places you can't."

Because Dubai's smart city initiative is being driven by the country's ruler Sheikh Mohammed bin Rashid Al Maktoum, Dubai is on track to have the world's smartest city by 2020 (including connected police cars enabled by Davra Networks).

"Cities in Europe are a bit behind that," says Glynn, but he points to some very European initiatives that are already bearing fruit. "In Croatia, they have fitted all their

New wave

Brendan Carroll, CEO at EpiSensor, a Cork-based specialist in the Industrial Internet of Things (IIOT) space, says that the sector is a particularly good one for smaller companies. "Traditionally, when a company was having an IT upgrade or having a LAN installed, all the work would be done by a single large supplier, an integrator like Siemens or Honeywell or Schneider Electric. In IoT, a lot of the solutions are made up of layers of different technologies from different companies, so that creates huge opportunities."

EpiSensor offers a wide range of wireless sensors that can be deployed and configured without expert knowledge using a web interface on the company's IIOT



"We are involved with a connected light rail system in San Diego and a heavy rail system in New Jersey."

Paul Glynn, CEO, Davra

manholes with sensors, so they know when they are being lifted when an authorised person isn't present. As a result, they have become very good at tackling the growing problem of copper cable theft."

"There are great opportunities for those who will develop IoT apps, and it is something that is becoming easier to do. A developer can use our ConnecThing AEP platform for free with up to three devices to help them get their ideas beyond the proof-of-concept stage. Once an app has been tried and tested, it might be sold by our 65,000 reseller and system integrator partners. For example, we have a revenue share with the developer of a smart healthcare app that is sold per hospital bed and is now doing very well in the United States."

Gateway." Our greatest achievement," says Carroll, "was to see the wave coming before it arrived. We started working on this TEN years ago when we spotted three things coming together – mobile communications, cloud computing and wireless sensors. It wasn't called IoT then, but it is now very good for us to be able to say that we are an IoT company."

Enterprise Ireland development adviser Robert Bushnell believes that the IoT will become so ubiquitous, people will stop using the term. He says: "There was a time when people talked about digital cameras and digital music, but no one uses the term digital anymore." Glynn agrees: "It's like e-commerce: it's everywhere now and nobody uses that term."

Lucille Redmond looks at two books that provide insights into European markets.

Roadmaps to Europe



Terrence Guay's *The Business Environment of Europe* is a guide to the EU's market models, industries and legal structure. Guay – Clinical Professor of International Business at Pennsylvania State University's Smeal College of Business – cuts through the opacity of Europe's legislative and political structures to explain the relationship between Europe and the individual governments and laws that make up the union of states, which was famously born “in the 1950s [when] the founders of the European Union believed that economic integration could be the engine by which closer political cooperation would be achieved, thereby reducing the likelihood of another devastating continental war”.

However, business students “seem to have little understanding of, or appreciation for how, European history, politics, culture and institutions have shaped the region's business environment,” he notes. Guay explores the various models of capitalism across the EU and how their differences affect trading with different countries. Business people trained in Ireland's market capitalism might, without understanding these models, be confused by the values and methods inherent in the state capitalism of France, Spain, Italy, etc., and the new capitalist models burgeoning in Eastern Europe.

He advises on methods of promoting business in the union, outlining how the regulation of business differs within Europe. He gives an extremely interesting and detailed overview of globalisation and the individual corporations and industries.

The Business Environment of Europe is intended mainly as a textbook for business students. But it is worth far more than that – this is a useful guide for business people moving into the European market.

The Business Environment of Europe by Terrence R Guay, Cambridge
FinTech in Germany by Gregor Dorfleitner et al, Springer



FinTech in Germany explores the digital finance models that are increasingly used in Germany, the fastest-growing market for fintech in Europe, alongside new models of financing and lending, including crowdfunding, crowdinvesting, crowdlending, social trading, robo-advice, personal financial management, online payment and mobile payment.

Lead author Gregor Dorfleitner is Chair of Finance and Director of the Centre of Finance at the University of Regensburg; his co-authors are academics specialising in law and business.

“FinTechs generally aim to attract customers with products and services that are more user-friendly, efficient, transparent, and automated than those currently available,” the authors write. These models are proving themselves in an experimentative and brave Germany.

The authors estimate the total volume of the potential addressable markets of the financing and wealth management segments in Germany at almost €1.7trn. Fintechs represent a complement rather than a substitute to the market for financial services in certain cases, offering products that are already available in the conventional financial industry but are not yet available for all market participants: “Due to a unique cost structure fintechs are able to achieve as a result of digitisation, they are able to meet new kinds of small-scale demands previously not served by traditional financial institutions,” the authors write.

Some 1.2m Germans used independent personal financial management systems to manage their personal finances in 2015, and fintechs in the German payments segment had a transaction volume of €17bn.

This fascinating overview of current trends and the drivers of growth will interest those experienced in traditional financing; it is a goldmine of information on technologies that may revolutionise the financial services business.

Simon Cocking
checks out some
gadgets for the
active life.

Fun in the Sun

Elyxr Audio (from €39.99)

Elyxr is perhaps the most massively successful Irish headphone company that you have never heard of. A sister company of Jivo (which makes accessories and protection gear for GoPro and other devices), Elyxr makes a series of beautiful headphones, designed with thought and care for different types of listening experiences. While the company may not be that well known yet in Ireland, it is already doing great business around the world – available in markets as far afield as Indonesia.

The Fusion model, your more classic plug and play set of headphones, has a lush feel and works well in delivering a comfortable listening experience with great sound quality. If you're looking for something with style and quality at a competitive price, then it's a fun option.

The Air product offers a wireless earbuds experience. With wire-free music on the move, it will appeal to the ballet dancers in the household (and other movers and shakers). As with all Elyxr headphone products, the user experience is great, with an appealing tactile sensation. The metallic holder also looks and feels great, with the practical addition of magnetic functionality to keep your headphones close.

A third option, the Liberty Bluetooth earphones, with their rubberised cover and 10-metre Bluetooth range, are designed for use at the gym, running or just walking around. The earphones are linked to each other by one cable, passing through a controller, which will appeal to those looking to be active while out and about with their smartphone.



ELYXR FUSION



ELYXR AIR



ELYXR LIBERTY



GoPro Hero5 (from €430)

GoPro managed to steal a march on the rest of the action camera world when it first came out, and just as Hoover became synonymous with the vacuum cleaner, the brand became inextricably linked with the ability to capture footage while out and about, often doing cool extreme sports – to the extent that people would walk into camera or action-sports shops asking for a 'GoPro' without even realising there were possibly several equally good or even better products out there.

The last version of GoPro, the Hero4, certainly had many limitations. Fortunately, with the latest version, the Hero5 range, GoPro has listened to user feedback and remedied many of these annoying aspects.

Usability is much improved, and the default wide-angle views have been removed, eradicating those over-flattened images of earlier versions. The voice-activated function frees you from fiddling with the controls at times when you really need to be hands free, such as cycling down hills or kayaking in rough water.

The dual microphones are a smart addition, enabling the sounds in the surrounding environment to be captured. Moreover, the camera is now waterproof to 10 metres which is likely to be sufficient for almost everything you will be filming, while a waterproof casing comes in handy if you plan to go scuba diving.

The camera feels better too, with a more tactile, less slippery shell, and it also works well for capturing video in a static environment. Overall the GoPro Hero5 is a much better designed and functioning action camera than its predecessors, and one I would be far happier to recommend.

Canon EOS M5 (approx €1,000)

The digital world does not stand still, and as fast as the photographic abilities of smartphones are upgraded, so the traditional camera companies come back with their own improved offerings. With Canon in particular, as soon as an innovative technology has been proved to work in the higher price cameras, it soon finds its way into the rest of the range.

The Canon EOS M5 marks a transition by Canon into quality mirrorless cameras with a definite improvement on its previous offerings.

For those used to the Canon DSLRs, it may take a little while to get used to all of the settings not being in the same place on this model. But the camera does a good job of capturing high-quality images while still being small enough to fit into a large coat pocket.

Users can choose between a pretty decent automatic setting and more control with four different dials. Lenses from previous Canon cameras are not directly compatible, and while you can buy an adaptor to use them, that takes away the intended design advantage of the EOS M5 being a lightweight model.

With a price of around €1,000, this is more than just an entry-level camera, but you will be rewarded with great images.



City Guide

by Tony Clayton-Lea



Located in north-eastern Germany, with a population of approximately 3.5m, Berlin is the country's capital and largest urban centre. A recognised world city of achievements in politics, science, media and culture, Berlin's economy is grounded in technology and service sectors – including convention spaces, research facilities and media corporations – as well as industries such as biotechnology, construction, pharmaceuticals, retail, creative arts/entertainment and biomedical engineering. Research and development is of substantial economic significance, while the city is an established hub of business founders – in 2015, it generated the most venture capital for European start-up companies.

FROM THE AIRPORT TO THE CITY

Berlin Schönefeld is located in the south-east of Berlin, less than 20km from the City Ost district; Berlin-Tegel is situated in the north-west of the city, and is less than 10km from the city centre. Each airport has regular, efficient public transport options. (Currently under construction, the Berlin Brandenburg Airport will replace Tegel and integrate Schönefeld. It is scheduled to be in operation by 2019.)

EAT/DRINK

Lunch: You know the drill: you're hungry but you don't want to wait ages. Monsieur Vuong, Alte Schönhauser Strasse 46, is the ideal choice. Long regarded as a city food institution, the Vietnamese dishes are light, tasty and simple. And the time? You're in and out of here within 25 minutes. www.monsieurvuong.de

Dinner: If you're searching for the best steak in town, look no further than the upmarket but reasonably priced Grill Royal,

Friedrichstrasse 105b. A riverside favourite of politicians and other notables, the international fare here is cooked to perfection. www.grillroyal.com

Bar: Berlin is awash with cocktail bars, but Becketts Kopf, Pappelallee 64 is one of the best – and smallest. Located in Prenzlauer Berg, it is named after Irish writer Samuel Beckett. Expect warm décor, heavy curtains, an intimate atmosphere – and cocktail lists printed in worn paperback copies of Beckett's plays! www.becketts-kopf.de

Café: When you visit Berlin on business, you want traditions not trends, so coffee and cake at Café Einstein Stammhaus, Kurfürstenstrasse 58 are advised. The Viennese-style café is as refined as it gets – the strength of its coffee is on a par with the luxury of its leather sofas, while its apfelstrudel is a cake lover's dream come true. www.cafeeinstein.com/en

NOT TO MISS

If you're on borrowed time on a business trip (as most of us are), then you'll want to plan your spare few hours strategically. You'll pack in a lot in a short amount of time if you decide to pay a visit to the 18th century neo-classical monument Brandenburg Gate, which is not only Berlin's most readily identifiable attraction but also one of the most recognisable historical landmarks in Germany. Walk towards it via Unter den Linden (regarded as the city's version of the Champs-Élysées, it is lined with a boulevard of linden trees) and browse through the fine array of shops, theatres and cafés as you stroll along. On the north side of the Tor there is a dedicated museum, which outlines Brandenburg Gate's history as a symbol of both European conflict and accord. www.museum.de

FIND OUT MORE

www.visitberlin.de/en, www.berlin.de/en

Enterprise Ireland International Network

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