

TECHNOLOGY CENTRE PROGRAMME

GET THE COMPETITIVE EDGE
GAME-CHANGING TECHNOLOGY
DELIVERS

CLOUD, ANALYTICS
& LEARNING
TECHNOLOGIES

ENERGY

MANUFACTURING
& MATERIALS

FOOD & HEALTH

BUSINESS
PROCESSES &
FINANCIAL SERVICES



The Technology Centres Programme is a Government-funded initiative to develop the innovation and R&D capabilities of companies in Ireland delivered jointly by Enterprise Ireland and IDA Ireland.



AN ENTERPRISE IRELAND
& IDA IRELAND INITIATIVE

Foreword



The Technology Centre programme which is Ireland's largest initiative to support industry-led research, development and innovation. A joint initiative of Enterprise Ireland and IDA Ireland, this programme focuses on identifying new sources of industrial growth and job creation in Ireland.

The establishment of Technology Centres was a goal set out in the current Programme for Government,

“We will establish a network of Technology Research Centres focused on applied technological research centres in specific areas, to be linked to appropriate higher education institutions. The centres will accelerate exploitation of new technologies by providing infrastructure that bridges gap between research and technology commercialisation.”

The aim of the Technology Centres programme is to introduce companies to the research expertise in Higher Education Institutes in order to generate innovative technologies. The ultimate objective is to use these technologies to sustain existing industries, identify and grow new business sectors to create jobs and increase exports.

It is vital that we do our utmost to encourage and support collaborative relationships between business and research institutions for the benefit of the Irish economy. The Technology Centres are public-private research centres of excellence structured to lie at the boundary between the academic environment and industry to increase the generation and

availability of new, industrially relevant knowledge. They are resourced by highly qualified researchers associated with research institutions who are empowered to undertake market focussed strategic research and development for the benefit of industry.

The Government is investing €100 million in these Technology Centres because they create skills and jobs that add value, help to make Ireland a destination of choice for advanced manufacturing, develop world class technology and research and benefit Irish companies.

I commend Enterprise Ireland and IDA Ireland on their partnership over recent years to deliver this platform for key sectors of industry to develop the next generation of technologies that are directly relevant to the companies involved.

More than 300 companies are already benefiting from Ireland's largest industry-led research programme driving innovation and delivering results in a range of areas: cloud, analytics and learning technologies; manufacturing and materials; energy, food and health; financial services and business processes. It is our ambition that the Technology Centre initiative will continue to develop and grow, bringing more companies into the existing centres, and establishing new centres in sectors that have similar growth potential.

The Irish economy needs Technology Centres to continue to enhance our reputation as a centre of innovation where companies collaborate with each other for the good of entire sectors of the economy and where our people are flexible, smart and creative. I look forward to seeing the impacts of our largest industry-led research programme over the coming years.

A handwritten signature in black ink that reads "Richard Bruton". The signature is written in a cursive style with a horizontal line underneath the name.

Richard Bruton TD

Minister for Jobs, Enterprise and Innovation

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GET THE COMPETITIVE EDGE IN CLOUD, ANALYTICS AND LEARNING TECHNOLOGIES

TECHNOLOGY CENTRES

Learnovate Centre

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Irish Centre for Cloud Computing and Commerce – IC4

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Centre for Applied Data Analytics Research – CeADAR

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Learnovate Centre

CENTRE PROFILE

The Learnovate Centre is an industry-led centre of excellence for research and innovation in learning technologies, hosted by Trinity College, Dublin. Our mission is to enhance the competitive advantage of Ireland's learning technology industry. Through targeted research projects, and a series of industry-focused services, we provide innovation support, driving growth and job creation. Our agile research projects are focused on investigating areas of interest to our industry partners, from schools/K12 through to Higher Education and into Corporate Learning.

To date, the Learnovate Centre has completed 12 projects and is currently embarking on our year three schedule with four new research projects.

RESEARCH THEMES

- Assessment Methods
- Content Analysis & Delivery
- Content Curation
- Gamification
- Immersive Learning
- Intelligent Content Delivery
- Interoperability
- Learning Analytics
- Maturity Model - Edtech
- Mobile & Informal Learning
- Personalisation
- Search
- Social & Collaborative Learning
- Talent Management
- Usability/User Experience

INNOVATIVE TECHNOLOGIES

Personalised Learning Dynamically recomposes content from multiple sources

Composer Publisher and open content into bite-sized learning, personalised to meet the individual's just-in-time learning needs

Social Search Employs social search technologies to leverage the past learning experiences of the community to rank future search results

Semantic Search Retrieves relevant resources by understanding the student's intent and the contextual meaning of their search terms

Reflection Encourages learners to develop critical thinking and problem solving skills

Learning Analytics Dashboard Delivers intuitive visualisations that support just-in-time learning analytics in real-time for improved performance management

Topic Extraction Automatically extracts a list of topics discussed within documents

Expertise Finding Identifies domain experts for extracted topics to leverage tacit organisational knowledge

Data Capture Leverages an organisation's existing communication channels, e.g. instant messaging, to construct a social network between the members

Social Network Analysis Analyses how the network members interact to identify key influencers and their impact on the knowledge network

Visualisation Framework Provides an intuitive visualisation of the organisation's knowledge network

K12 Social Search Locates relevant publisher and open content rated by the community and personalised to the student's needs

Recommender Encourages students to develop their problem solving and meta-cognitive skills

Community Networks and Rating Leverages the power of the student group by sharing highly rated content

Activity Ticker Applies novel game-like techniques to motivate students to participate

Web Curation Enables the curation of existing and new content into structured, coherent learning episodes that can be shared across communities of learners

Higher Ed Personalisation Adaptively retrieves content appropriate to the student's knowledge levels

Content Composition Constructs a coherent learning episode from relevant resources personalised to the student's immediate needs

Immersive Recommender Dynamically updates results by retrieving resources recommended by other learners

Content Analysis Automated analysis of large content repositories to facilitate discovery and reuse of content

Learning Analytics Framework Enables real-time capture and analysis of just-in-time learning analytics

Big Data Management Provides flexible, non-intrusive technologies for capturing and warehousing big data to deliver enhanced analytics and reporting capabilities

Data Analytics Offers extensible and customised analytics that can be adapted to meet evolving business requirements

FACILITIES

Self-contained centre in the Trinity Technology & Enterprise Campus (circa 3,000 sq ft)

RESEARCH PARTNERS

- Trinity College Dublin
- University College Dublin
- National University of Ireland Galway
- Waterford Institute of Technology

INDUSTRY MEMBERS

- Apierian
- aPperbook
- BlikBook
- BNY Mellon
- Carr Communications
- Chris Mee Group
- City & Guilds Kineo
- CJ Fallon
- DataFlow International
- Edco – The Educational Company of Ireland
- EmpowerTheUser
- Enovation Solutions
- fishtree
- Google
- Gotcha Ninjas
- H2 Learning
- Hayes Culleton
- Heystaks
- Hibernia College
- Houghton Mifflin Harcourt
- Intel
- Interactive Services
- Intuition
- Logicearth
- Microsoft
- Novartis
- Radii
- Riptide Academy
- Samsung
- Simvirtua
- SlateState
- Steljes
- SureSkills
- VSware
- Wriggle
- Writing for Tiny

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Learning Innovation

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Irish Centre for Cloud Computing and Commerce – IC4

CENTRE PROFILE

The Irish Centre for Cloud Computing & Commerce (IC4) is a multi-institutional research centre located at Dublin City University (DCU) and includes researchers from University College Cork (UCC) and Athlone Institute of Technology (AIT). IC4 carries out applied technical and business research in cloud computing, in areas that are chosen by its industrial members and that are strategically important for the future growth in the Irish economy.

IC4's mission is to:

- i) generate and transfer knowledge and technology to its industry members, in areas they can commercialise
- ii) accelerate the rate at which businesses adopt cloud computing
- iii) showcase Ireland's capabilities in cloud computing

One of IC4's main research priorities is "**building trust and dependability in the cloud**", whose goal is to address the need for compliance to standards, quality-of-service, data privacy, auditability and reliability of service. These issues permeate the cloud ecosystem and are relevant to cloud platform or application developers, cloud service providers, cloud solution resellers and to cloud consumers.

RESEARCH THEMES

- Design for Growth
- Design for Best Service Provision
- Design for Widest Acceptance

INNOVATIVE TECHNOLOGIES

- Cloud Migration Technologies
- Cloud Interoperability Technologies
- Cloud Infrastructure Monitoring Technologies
- Quality Assurance Methodologies
- Cognitive Aware / Self-Organising Technologies
- Mobile Encryption Technologies
- Data Provenance Technologies

RESEARCH PARTNERS

- DCU
- UCC
- AIT
- Overseas**
- collaborations with:**
- University of Central Florida (US)
- University of West England (UK)
- University Darmstadt (Germany)

INDUSTRY MEMBERS

- Alphazar
- Bluemetricx
- CloudCompare
- Clouidium
- CloudSure
- Danu Technologies
- Edelman
- Egenera
- Fujitsu
- GxP Systems
- Health Founders
- Huawei
- IBM
- Inishtech
- Intel
- KantanMT
- LifeStor
- Microsoft
- Novartis
- Qumas
- SPL
- Storm Technology
- The Tourism Company

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Cloud Computing

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Centre for Applied Data Analytics Research – CeADAR

CENTRE PROFILE

CeADAR (the Centre for Applied Data Analytics Research) is an industry-led technology centre initiative for innovation and applied research that accelerates the development, deployment and adoption of Data Analytics technology and relevant innovations.

RESEARCH THEMES

- Advanced Analytics
- Data Management for Analytics
- Intelligent Analytic Interfaces

INNOVATIVE TECHNOLOGIES

- High-throughput, Scalable Data Stream Clustering
- Advanced monitoring of entities in online media sources
- Forecasting Technology Platform
- AI for Business Process Modelling
- Querying With Confidence
- Passive Analytics: Contact Centre Assistance
- Changing User Behaviour: Nudge Along
- Customer Segmentation: SmartSeg

RESEARCH PARTNERS

- University College Dublin
- University College Cork
- Dublin Institute of Technology

INDUSTRY MEMBERS

- Accenture
- Adaptive Mobile
- Climote
- Cylon
- Dell
- eBay
- Fidelity
- GBR
- HP
- Nathean
- NVP
- Qumas
- Vidiro

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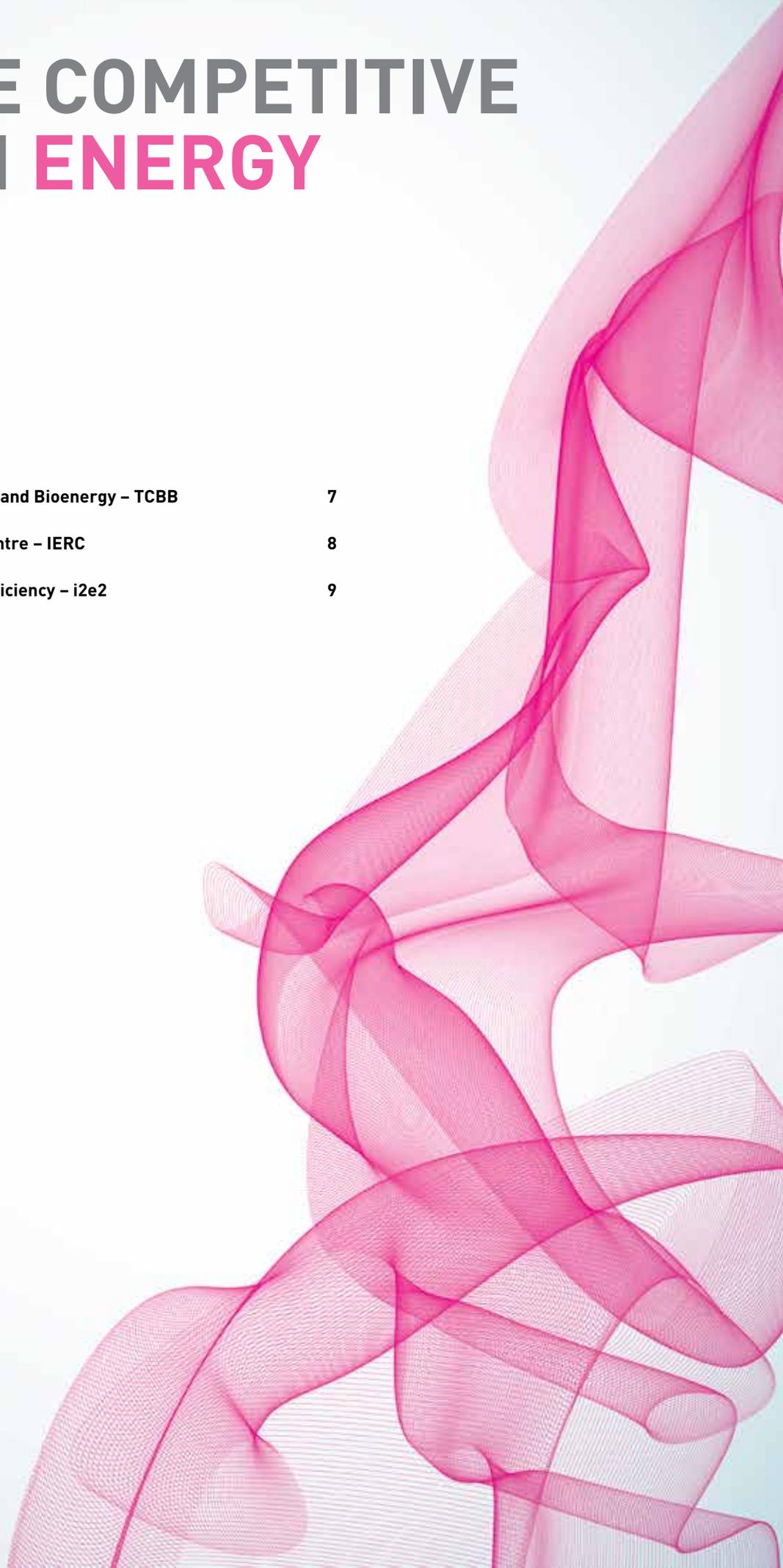
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GET THE COMPETITIVE EDGE IN ENERGY

TECHNOLOGY CENTRES

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Technology Centre for Biorefining and Bioenergy – TCBB

CENTRE PROFILE

Mission:

The TCBB will facilitate research and development of a viable and prosperous Irish biorefining and bioenergy sector, recognised by its industry members as:

- a highly valued research and development partner
- a means to access state-of-the-art pilot plant technologies
- a highly valued professional development network
- an advocate for regulatory reform
- a gateway to international developments
- a sustainable, respected and value-adding technology centre

Holistic approach directed at enabling:

- a collaborative effort between industry, academic and institutional stakeholders
- a community of interested parties - membership base
- development of an indigenous bio-based economy

Success to be evidenced by development of an indigenous bioeconomy offering routes to expand into the global market.

RESEARCH THEMES

- Energy production and wastewater treatments; advanced anaerobic digestion; advanced wastewater treatment technologies; biogas utilisation; enzyme biotechnology: enzyme pre-treatments & enzyme hydrolysis; glycobotechnology; biochar production
- Biofuels, peat chemistry and waste management; thermal technologies, pyrolysis; acid-catalysed biorefining; biochar production
- Bioplastics; polyhydroxyalkanoate; polymer extraction; upcycling; waste transformation; biocatalysis; enzyme technology; protein engineering; extraction of nutra-chemicals
- Polymer processing; polymer nanocomposites; bio based polymers; separation technologies, and conducting polymer composites
- Recovering valuable materials from waste to supply future industrial processes

INNOVATIVE TECHNOLOGIES

Substantial IP portfolio in stages of commercialisation

1. New enzyme cell factories
2. Acceleration catalysts x 2 (Patent applications pending)
3. Process know-how – volatile fatty acids(VFA) production and extraction
4. Single-stage catalytic butyl butyrate synthesis
5. Process know-how – PHA/PHB fermentation
6. Process know-how – lactic acid fermentation and separation
7. Process know-how – GOS from dairy residues
8. Process know-how – biochar activation, utilisation
9. Fluidised bed thermal technology

FACILITIES

- Biorefining pilot plant in development
- Pilot plant facilities in place at Premier Green Energy, bhsl (Biomass Heating Solutions Limited), Glanbia, Arrabawn and Kerry Group

RESEARCH PARTNERS

- NUI Galway
- University of Limerick
- University College Dublin
- The TCBB also engages the expertise of Trinity College, Dublin
- The TCBB also collaborates with Queen's University, Belfast in the EU-wide RENEW network (recovering valuable materials from waste)

INDUSTRY MEMBERS

- Abbey Scientific
- AER
- Alltech
- Arrabawn Dairy
- Biomass Heating Solutions
- Bioplastech
- Bord Gáis
- Bord na Móna
- Carbonsole
- Cellulac
- Clare County Council
- Country Crest

- Department of Agriculture, Food & the Marine
- Department of Communications, Energy & Natural Resources
- Dillon's Waste and Recycling
- Environmental Protection Agency
- Glanbia
- GTX
- Imperative
- IrBEA
- Kerry County Council
- Kerry Group
- McDonnell Farms
- Monaghan Biosciences
- Mr Binman
- Nucleus
- Pannonia (Hungary)
- Premier Green Energy
- Prime Energy
- Renetech
- Seprex
- Sustainable Energy Authority of Ireland
- Teagasc
- TOKN Grain

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Biorefining & Bioenergy

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International Energy Research Centre – IERC

CENTRE PROFILE

The International Energy Research Centre (IERC) is an industry-led, collaborative programme of research and innovation in integrated sustainable energy systems. It has a large scale ambition to develop globally applicable solutions with a research budget of over €30m. The IERC works with international companies and researchers to find energy demand side solutions with the potential for real commercial impact.

The IERC has developed a number of research themes, through industry workshops and dedicated scoping studies. The current research themes are in the areas of Commercial Buildings, Home Area Networks and Smart Factories, with five projects currently underway: Phase Change Material based heat store, Energy Monitoring Wireless Networked System, Robust Wireless Sensors for Building Usage Technology, Autonomic Home Area Network Infrastructure and Total Energy Management for Production Operations. We are also carrying out Innovation Needs Assessments in the areas of Wireless Sensor Networks and Human-Machine Interfaces. Each of these projects involve collaborations between several industry and academic partners.

RESEARCH THEMES

- Wireless Sensor Networks
- Human-Machine Interfaces
- Commercial Buildings
- Home Area Networks
- Smart Factories

INNOVATIVE TECHNOLOGIES

- Phase change material thermal energy store
- Fault diagnostics of air handling units using modelling approaches

FACILITIES

- Hosted by Tyndall National Institute, one of Europe's leading research centres
- Works closely with the NIBMUS Centre, CIT, accessing the National Sustainable Test Bed
- A member of Energy Cork, an industry-driven cluster pursuing coordinated actions to strengthen enterprise and employment within the energy sector in the Cork region

RESEARCH PARTNERS

- Cork Institute of Technology
- Dublin City University
- Dublin Institute of Technology
- Limerick Institute of Technology
- NUI Galway
- NUI Maynooth
- Tyndall National Institute
- University College Cork
- University College Dublin
- University of Ulster

INDUSTRY MEMBERS

- Alcatel-Lucent
- Bilfinger
- Bord Gais Energy
- Bord Gais Networks
- General Motors
- i2e2
- United Technologies Research Centre

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Energy Integration

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Innovation for Ireland's Energy Efficiency – i2e2

CENTRE PROFILE

i2e2 is a 'not-for-profit' research company, limited by guarantee (membership not shareholding) that is carrying out research in areas of energy efficiency in industrial, manufacturing and commercial facilities. It includes areas of research in energy from low grade heat, appropriate working environments such as HVAC, energy management methods, compressed air and industrial smart grid.

It is an embedded research company that carries out a substantial amount of its research in the manufacturing facilities with specialised research taking place in University labs as required.

It has an open membership policy with membership today from cross sector high tech manufacturing sectors in Ireland/UK such as Food/Beverages, ICT, Bio-medical, Pharmaceutical, Aviation, Heavy industry.

RESEARCH THEMES

- Chilled Water Systems
- CHP
- Compressed Air
- Energy
- Energy from Low Grade Heat
- Energy Metrics & Standards
- HVAC
- Lighting
- Water

INNOVATIVE TECHNOLOGIES

- HVAC – new exciting fault detection capability for air handling systems
- Compressed Air – using sophisticated acoustic array technology to detect air leaks
- GMM – Green Mode Methods – breakthrough management methods – capability to map out, identify and risk access energy saving opportunity from factory management systems to sub-components in the tool

RESEARCH PARTNERS

- UCC
- NUIG
- TCC
- Limerick IT
- Tralee IT
- Greenfarm
- Central Solutions
- Exergyn
- RR Projects
- i Acoustics

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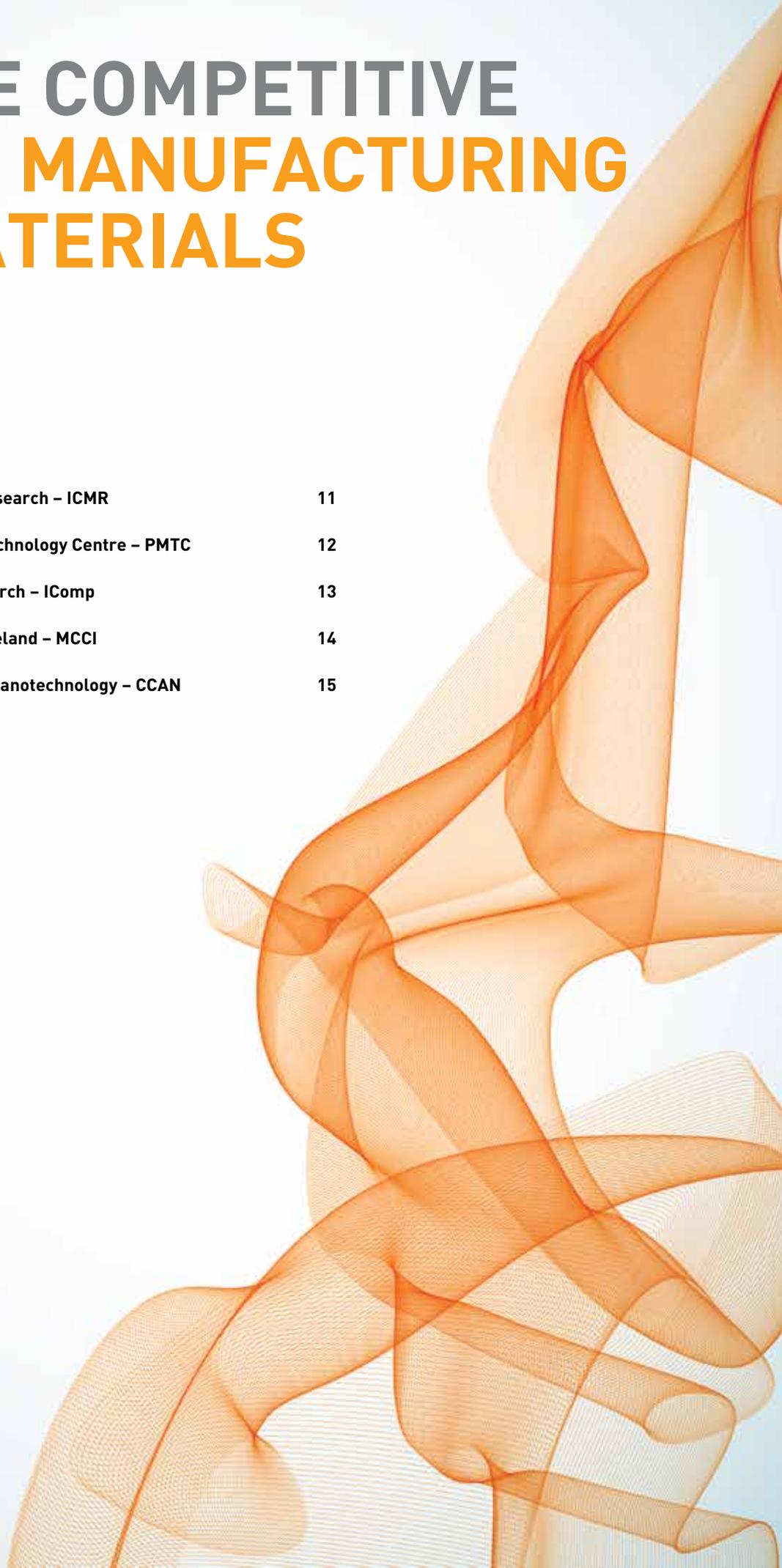
INDUSTRY MEMBERS AND PARTNERS

- Boston Scientific
- Carbery
- Cylon Controls
- Crowley Carbon
- Dalkia
- Diageo
- EMC
- GE Healthcare
- GSK
- Intel
- J&J (DePuy & Vistakon)
- Pfizer
- RUSAL Aughinish
- Seagate Technology

GET THE COMPETITIVE EDGE IN **MANUFACTURING AND MATERIALS**

TECHNOLOGY CENTRES

Irish Centre for Manufacturing Research – ICMR	11
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Microelectronic Circuits Centre Ireland – MCCI	14
Collaborative Centre for Applied Nanotechnology – CCAN	15



Irish Centre for Manufacturing Research – ICMR

CENTRE PROFILE

ICMR is a 'not-for-profit' research company, limited by guarantee (membership not shareholding) that is carrying out research in areas of manufacturing productivity. It includes areas of research in training and development, virtual metrology or artificial intelligence, cycle time, predictive maintenance, data analytics and supply chain.

It is an embedded research company that carries out a substantial amount of its research on the manufacturing floor with specialised research taking place in University labs as required.

It has an open membership policy with membership today from cross sector high tech manufacturing sectors in Ireland/UK such as Food/Beverages, ICT, Bio-medical, Pharmaceutical, Aviation, Heavy industry.

RESEARCH THEMES

- Manufacturing Informatics
 - Scheduling
 - Virtual Metrology
 - Predictive Maintenance
 - Data Analytics
 - Process Modelling Simulation
- Operational Excellence
 - Tacit Knowledge
 - NPI
 - Operational Excellence
 - Innovation Management
- Supply Chain Management

INNOVATIVE TECHNOLOGIES

- Data Analytics
- WKS – Workplace Knowledge Management System
- KAP – Knowledge Awareness Prediction
- Tacit Knowledge Survey – 1st in the world – organisational tacit knowledge readiness

RESEARCH PARTNERS

- UL
- NUIM
- DCU
- Trend Technologies
- SteriPack
- Dataworks
- Lotusworks
- Sprism
- Warwick Analytics

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INDUSTRY MEMBERS AND PARTNERS

- Amgen
- Bombardier
- Boston Scientific
- EMC
- Glanbia
- Intel
- J&J (DePuy & Vistakon)
- Newell Roofing Products
- Pfizer
- Seagate Technology

Pharmaceutical Manufacturing Technology Centre – PMTC

CENTRE PROFILE

The vision of the PMTC is to support and develop the Irish pharmaceutical industry (small and large molecule) by improving manufacturing competitiveness and enhancing the research and development mandate and activity of Irish pharmaceutical manufacturing sites and companies.

The goals of the Centre:

- 1) The PMTC will conduct and coordinate research in advanced pharmaceutical manufacturing technologies which have a wide application across the Irish pharmaceutical industry.
- 2) The PMTC will assist in the coordination and be an easy access point for the Irish pharmaceutical industry to pharmaceutical related research facilities in Ireland including HEI facilities, Institutes and other Research Centres.
- 3) The PTMC will work closely with other Irish research centres and academic institutions to source additional funding for Pharmaceutical Manufacturing related research through company specific projects, collaborative projects and EU framework programmes.
- 4) The PTMC will be a one stop shop to showcase advanced pharmaceutical manufacturing expertise and support academic-industry collaboration in relation to advanced pharmaceutical manufacturing technologies and know-how for manufacturing industry and related service providers.

RESEARCH THEMES

- Advanced Rapid Microbial Analytical Techniques
- Enabling and Control of Continuous Processing
- Soft Sensor Modelling Tools
- API Real Time Release PAT
- Pharmaceutical packaging technologies for anti counterfeiting

INNOVATIVE TECHNOLOGIES

A number of very promising PAT related technologies have been developed in the initial interim research phase of the PMTC including:

- A novel rapid microbial apparatus for determining microbial contamination of excipients
- A Quality by Design approach (QbD) for continuous processing in Pharma production processes
- Soft Sensor modelling tools to maximise process robustness and operational efficiency
- PAT methods for assisting with at line analysis and Real Time Release of API's
- Pharmaceutical packaging technologies for product traceability, utility and integrity protection

FACILITIES

The PMTC will be hosted from 2014 by University of Limerick and will benefit from the very substantial investment at UL in physical infrastructure as well as the facilities at the research partner sites. The PMTC will also be partnering with NIBRT in biopharmaceutical related projects.

RESEARCH PARTNERS

- University of Limerick
- Institute of Technology, Tallaght
- Waterford Institute of Technology
- NUI Galway
- Dublin Institute of Technology
- University College Cork
- Cork Institute of Technology
- Tyndall National Institute

INDUSTRY MEMBERS

- Alkermes
- Allergan Pharmaceutical
- Applied Process Consulting
- Astellas
- BMS Swords
- Crest Solutions
- Eli Lilly
- Gilead Sciences
- GSK
- Helsinn Birex

INDUSTRY MEMBERS

CONTINUED

- Innopharma Labs
- Janssen
- Label Art
- Leo Pharma
- Merck Sharp Dohme
- Pfizer
- Process Analytics
- Roche
- Servier
- Sigmoid Pharma
- Takeda
- Techno-Path
- Teva Pharmaceuticals
- TopChem Pharma

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Pharmaceutical Manufacturing

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Irish Centre for Composites Research – IComp

CENTRE PROFILE

The Irish Centre for Composites Research (IComp) was established in 2010 under the EI/IDA Technology Centre initiative. It is hosted by the University of Limerick (UL), which is the leading composites research establishment in the Republic of Ireland, working in partnership with University College Dublin (UCD). IComp currently has 14 industrial members from across Ireland. Guided by our Director and Technology Leader who has a long history of R&D on polymers and composites in industry, IComp is supported by world class academics together with a dedicated team of highly qualified and experienced researchers and other staff in the relevant university departments. IComp provides a focal point for world-class composite research, innovation and technology transfer within an agenda set by its industrial members and agreed by them to be in the best immediate and longer term interests of the Irish economy.

RESEARCH THEMES

- Joining, Adhesive Bonding and Surface Engineering
- Processing of Thermoplastics
- Liquid Resin Infusion
- Damage Detection and Repair of Composites

INNOVATIVE TECHNOLOGIES

- Automated Tow Placement
- VARTM, RTM and HPRTM
- RF/MW/EMI Processing of Thermoplastics
- Induction Welding
- Atmospheric Pressure Plasma
- Environmental Testing of Composites

FACILITIES

The combined resources and facilities at the University of Limerick, including those at the Materials and Surface Science Institute (MSSI) at UL, and University College Dublin provides a suite of excellence for IComp members. These include, and are not limited to, an extensive analytical laboratory, micro fabrication facilities, clean rooms, polymer processing capability, Automated Tow Placement, physical and mechanical testing laboratory, surface analysis laboratory, thermal analysis, and support infrastructure. This extensive range of equipment facilitates private and publicly funded collaborative research as well as a comprehensive range of analytical services for industry. Further specialised equipment is available through our industrial members.

RESEARCH PARTNERS

- UL
- UCD

INDUSTRY MEMBERS

- Axis Composites
- B/E Aerospace
- Bombardier Aerospace
- Burgmann Packings
- Dorteck Ltd
- ÉireComposites Teo
- EJ Access Solutions
- Global Green Composites
- Haas Group International
- Henkel Ireland
- PT Technologies
- Scott Bader
- Turas Bikes
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Composite Materials

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Microelectronic Circuits Centre Ireland – MCCI

CENTRE PROFILE

MCCI is an EI/IDA funded technology centre focused on carrying out microelectronic circuit research for the benefit of industry. The MCCI vision is to be the number one industry-led analogue, mixed-signal circuit research centre in the world by 2018. After being set up in 2010, MCCI is already creating impact with 3 commercial IP licences to Irish based companies and over 50% of staff from completed projects transferring into industry. MCCI member companies have announced over 500 new jobs in the last 3 years, 120 of which have been linked directly to MCCI.

RESEARCH THEMES

- Digitally-Assisted-Analogue circuit research

INNOVATIVE TECHNOLOGIES

- World's first single chip radiometer for early cancer detection
- World's fastest transceiver for fibre broadband to the home
- Data-converter circuits for medical sensors including EEG & heart-rate monitoring

FACILITIES

Central research infrastructure hub for remote use by academic and industry partners nationally. This includes a central compute server, Computer Aided Design tools and process manufacturing kits. This central hub is unique worldwide.

MCCI also has access to state of the art equipment for testing of integrated circuits including a new RF lab in Tyndall which can test integrated circuits up to 110GHz. This lab is only one of two Agilent labs of this type worldwide.

MCCI has access to advanced manufacturing technology down to 28nm. To our knowledge it was the first university-based organisation worldwide to get access to design kits for TSMC 28nm technology through an industry partner.

RESEARCH PARTNERS

- University of Limerick
- NUI Maynooth
- University College Dublin
- Tyndall National Institute
- Cork Institute of Technology

INDUSTRY MEMBERS

- Analog Devices
- Xilinx
- Powervation
- U-Blox
- Intel
- Cypress
- S3 Group
- IC Mask Design
- Eagle IC
- Redmere
- M/A COM
- On Semiconductor
- Silansys
- AnaTech Silicon
- Ikon
- Hittite
- Firecomms
- Silicon Labs
- Texas Instruments
- Qualcomm
- Boston Scientific
- Ferfics
- Altratech

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Collaborative Centre for Applied Nanotechnology – CCAN

CENTRE PROFILE

CCAN helps Irish companies make more competitive products by applying Ireland's leading nanotechnology and advanced materials expertise to address the companies' technology development challenges. The CCAN approach makes it easy for multiple companies or research providers to collaborate in order to combine the variety of skillsets necessary to develop nano-enabled products.

We aim to **put nanotechnology to work**, creating value for our industry members and the Irish economy.

We deliver industry solutions by combining expertise from anywhere in the country into project teams focused on our industry members requirements. Our focus is on materials solutions for Life Science and ICT companies.

CCAN currently has 16 member companies, 10 of which are SMEs. In a 2013 survey, 100% of CCAN member companies would recommend CCAN membership to other companies. If your company is involved in materials development then come and talk to us today to see how CCAN membership can help your business.

RESEARCH THEMES

- Nanotechnology & Advanced Materials for Medical Devices, Diagnostics & ICT applications

INNOVATIVE TECHNOLOGIES

- X-ray opaque polymers for medical devices
- Polymer composites with reduced surface friction for medical tubing
- Nanoporous metals for electrochemical sensing
- Functionalised microneedles for continuous glucose & skin monitoring
- Best-in-world, CMOS compatible piezoelectric materials for energy harvesting and MEMS oscillators
- Ultra-thin, electrodeposited metal layers for metallic interconnects & conductive coatings

FACILITIES

- Access to the entire Nanolreland research pool and analytical facilities (www.ccan.ie/nanolreland)
- Full *Flexifab* access at Tyndall National Institute
- Full access to CRANN facilities at TCD
- Full access to labs at other research partners

RESEARCH PARTNERS

- Tyndall National Institute at University College Cork
- CRANN/AMBER at Trinity College Dublin
- University College Dublin
- Dublin City University
- NUI Galway

Other research partners are welcome

INDUSTRY MEMBERS

- Alere International
- Applied Materials
- Analog Devices
- Aerogen
- Biocroi
- Biotector
- Drop Technology
- GenCell Biosystems
- Innovative Polymer Compounds (IPC)
- Intel
- Irish Micro Mouldings
- Hewlett Packard
- Nanoflex
- Medtronic
- Moses Lake Industries
- Proxy Biomedical

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GET THE COMPETITIVE EDGE IN **FOOD AND HEALTH**

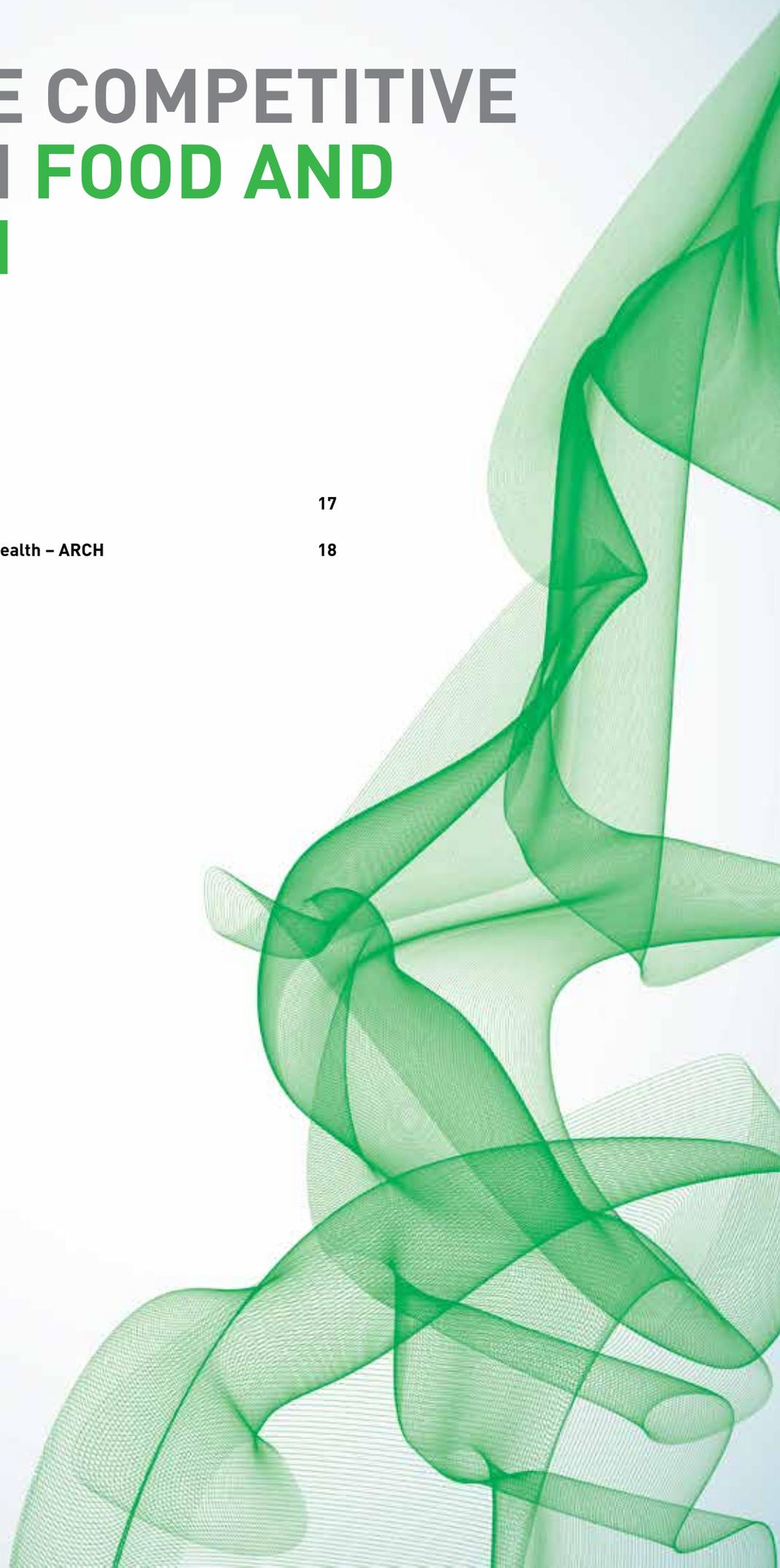
TECHNOLOGY CENTRES

Food for Health Ireland – FHI

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Applied Research for Connected Health – ARCH

18



Food for Health Ireland – FHI

CENTRE PROFILE

Food for Health Ireland (FHI) is a leading global innovation centre for the development of nutritional functional ingredients to improve health, wellness and quality of life. FHI's mission is to leverage the world class scientific capabilities of its Irish academic partners (University College Dublin, University College Cork, University of Limerick, Teagasc Food Research Centre Moorepark, Dublin City University, National University of Ireland Galway and National University of Ireland Maynooth), with the market expertise of its industry partners (Carbery Group, Dairygold Food Ingredients, Glanbia plc, Kerry Group and the Irish Dairy Board), into a pipeline of innovative, nutritional, functional ingredients / products for the global food industry.

FHI is funded by Enterprise Ireland and FHI's industry partners. On September 2nd, 2013, FHI started its second phase of funding, focusing on the development of its outstanding scientific capabilities and the commercialisation of the outputs of the first and second phase.

RESEARCH THEMES

- Healthy Ageing and Performance Nutrition
- Glycaemic Management
- Appetite Modulation
- Infant Nutrition
- Healthy Cheeses
- Technology

INNOVATIVE TECHNOLOGIES

- Enzyme hydrolysis
- Bacterial fermentation
- Nutrigenomics
- Metabolomics
- Proteomics
- Bioinformatics
- E-tongue
- Over 20 bioassays for functionality testing
- Personalised nutrition
- National nutritional database
- Pre-commercial scale-up
- Dietary intervention studies
- Thermic, non-thermic preservation
- Consumer insights through focus groups

FACILITIES

- Chemical, physical and biological laboratories
- Suites for human intervention studies
- Sport exercise laboratories
- Spraydryers
- Evaporators
- Heat treatment systems

RESEARCH PARTNERS

- University College Dublin
- University College Cork
- University of Limerick
- Teagasc Food Research Centre Moorepark
- Dublin City University
- National University of Ireland Galway
- National University of Ireland Maynooth

INDUSTRY MEMBERS

- Carbery Group
- Dairygold Food Ingredients
- Glanbia plc
- Kerry Group
- Irish Dairy Board

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Food for Health

AN ENTERPRISE IRELAND
& IDA IRELAND INITIATIVE

Applied Research for Connected Health – ARCH

CENTRE PROFILE

Applied Research for Connected Health (ARCH) is a research initiative which conducts innovative and applied research to support the deployment, adoption and reimbursement of Connected Health (CH) solutions. The research initiative is steered by a group of industry partners who are actively involved in the Connected Health sector.

ARCH is led by University College Dublin (UCD) and is based at NexusUCD, the UCD Industry Partnership Centre. ARCH also has researchers based in University of Limerick (UL) and RTI International (RTI). ARCH is aligned to the Dublin East Hospital Group, and is currently undertaking research in partnership with the Mater Misericordiae University Hospital and St Vincent's University Hospital.

RESEARCH THEMES

- Healthcare Economics
- Business & Revenue Modelling
- Implementation & Evaluation
- Standards & Quality

INNOVATIVE TECHNOLOGIES

- Integrated Connected Health solution to manage Dementia

RESEARCH PARTNERS

- University College Dublin
- University of Limerick
- RTI International (USA)

INDUSTRY MEMBERS

- ADA Security Systems
- Comfort Keepers
- DABL
- Hermitage Medical Clinic
- Intel
- Novartis
- ResMed
- Rigney Dolphin
- S3
- Two-Ten Health
- Vitalograph
- Vu2Vu

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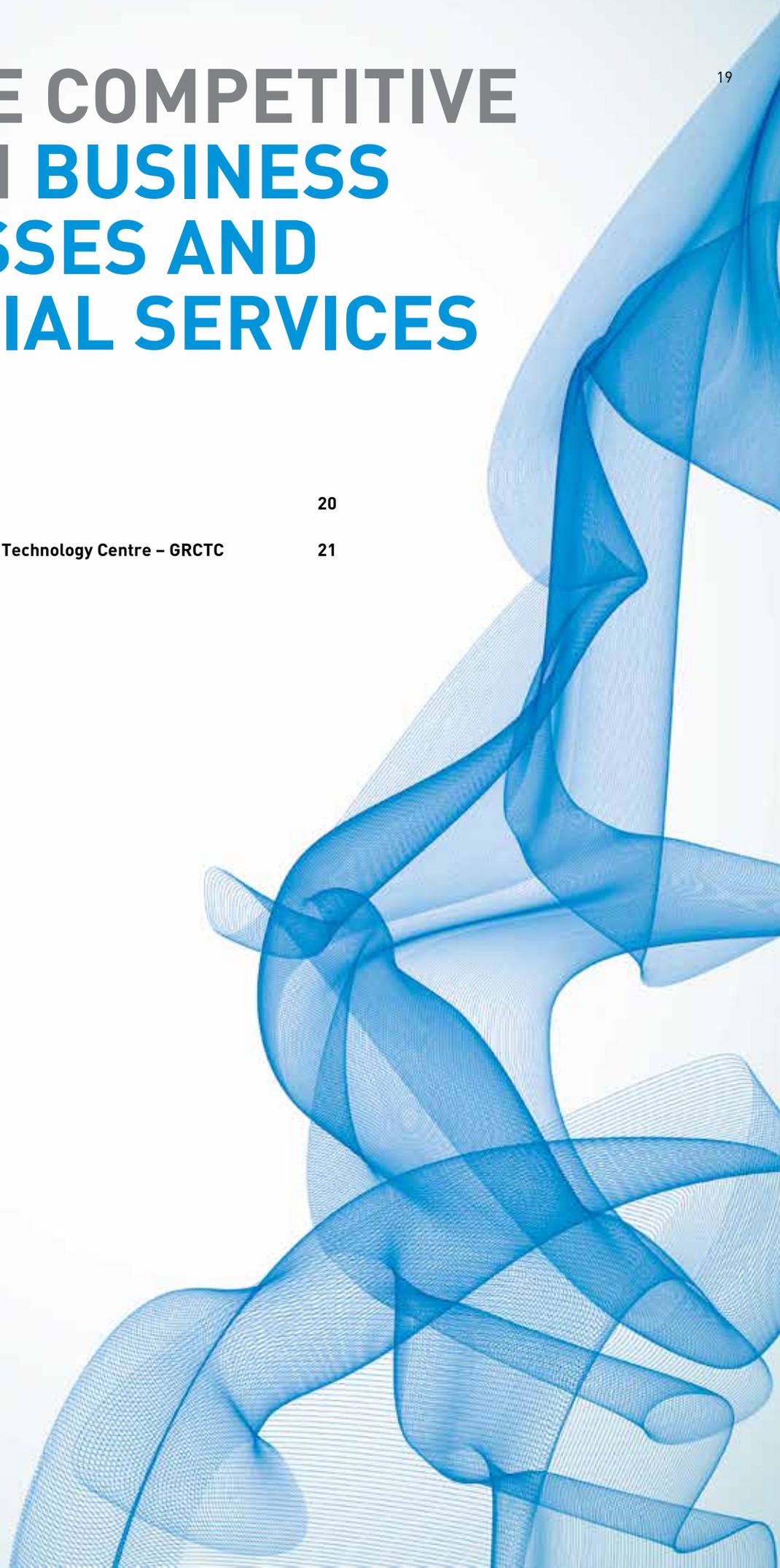
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TECHNOLOGY CENTRES

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Innovation Value Institute – IVI

CENTRE PROFILE

The Innovation Value Institute (IVI) was co-founded in 2006 by the National University of Ireland Maynooth (NUIM) and Intel to meet this need and create a global gold standard for IT management – the IT Capability Maturity Framework (IT-CMF). IVI's mission is to research, develop, and disseminate empirically proven and industry validated IT best practice through a unique open innovation and collaboration between leading academic and industry practitioners. Since its foundation, IVI has grown in strength and now has over 90 members drawn from top global organizations including BP, Chevron, Cisco, Lloyds Bank Group, Progressive Insurance, EY to name a few.

RESEARCH THEMES

IVI's research is focused on helping organizations understand how technology can improve business performance. The challenge many organizations face is how to assess and manage their IT capabilities in a fast moving dynamic competitive environment. This opportunity to help understand the importance and impact of IT capabilities has helped shape IVI's research through collaborative, open innovative initiatives with industry, government, and academia at an international level. **These research initiatives include:**

- Developing an understanding of the impact on IT capability maturity on organizational performance
- Defining and developing an IT capability framework for Small, Medium Enterprises
- Using capability frameworks to address current business challenges such as Cloud adoption for business value, managing information and big data, effective service management, IT risk management, identifying core capabilities to support emerging digital business strategies, and assessing the business value and impact of IT investments
- Contributing to developing a European framework for ICT Professionalism for the European Commission

IVI continues to develop and grow its research capability through the development of a multi-disciplined network of industry, academic, and government research partners.

INDUSTRY MEMBERS

- Abbott Vascular Ireland
- Archtexas
- AstraZeneca
- Auxilion
- BearingPoint
- Beaumont Hospital
- BNY Mellon
- BP
- C3Wave
- Castlebridge Associates
- Central Bank of Ireland
- Central Statistics Office
- Centre for Software Engineering
- CEPIS
- CGI Group Inc (Logica)
- Chevron
- CIE
- Cisco Systems
- Compugen
- Consumers Energy
- David Consulting Group
- Department of Agriculture, Food & the Marine
- Dublin City Council
- Enterprise Ireland
- ESB
- Eurasian Natural Resources Corporation PLC (ENRC)
- Europa
- EY
- Fingal County Council
- Genzyme
- Glanbia
- Global Process Innovation
- Greencore
- ICS
- IDA
- Infonomics Pty
- INOV
- Institute of Technology Blanchardstown
- Intel
- Irish Continental Group
- Irish Revenue Commissioners
- Irish Technology Leadership Group
- iSite Solutions
- Kingspan
- KPMG
- Lloyds Banking Group
- Logica
- Maat Consulting
- Mainstream Renewable Power
- Marine Institute
- Mitovia Inc
- Moulds Management Consulting
- Ness Technologies
- Newcastle University Business School
- NTT Data
- O'Donnell Keys & Co
- OECD
- Proact
- Progressive
- Public Appointments Service
- Rathbeau Technologies
- Royal Holloway University of London
- SAS Institute
- Saudi Aramco
- Shell
- SIAC Construction
- Tedcastle Oil Products
- The Boston Consulting Group
- The Thorp Network Inc.
- TNO
- Total
- Triangle
- TSSG
- United States Airforce Academy
- US DoD
- Vigitrust
- Wipro Technologies
- Xilinx
- Zurich Insurance

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Governance, Risk and Compliance Technology Centre – GRCTC

CENTRE PROFILE

The GRCTC is an industry-led centre of excellence for innovation and research in semantic technologies for GRC in financial services. Our mission is to research and develop industry-ready GRC solutions for the financial services industry to help industry stakeholders commercialise related GRC semantic technologies. The goal of the GRCTC is to build a portfolio of innovative, applied research projects that collectively address the significant challenges facing the financial industry in terms of Governance, Risk and Compliance. To achieve this we are in the process of developing a suite of GRC ontology and process models, domain-specific GRC maturity models, risk assessment tools, and a repository that contains the semantics captured by researchers undertaking research in these areas. These semantic knowledge bases and process models will provide the foundation for GRC solutions to be developed by software enterprises, financial services organisations, technology and services vendors, content providers, and regulators – nationally and internationally.

RESEARCH THEMES

- The Financial Industry Semantic Repository (FISR) based on the SBVR standard
- The Financial Industry Regulatory Ontology (FIRO)
- The Financial Industry GRC Ontology (FIGO)
- Financial Industry GRC Process Models (FIGP)
- Financial Industry GRC Maturity Model (FIMM)
- The Financial Industry Risk Assessment (FIRA) Toolkit

INNOVATIVE TECHNOLOGIES

- A semantic repository based on the Semantics of Business Vocabulary and business Rules (SBVR) specification from OMG. The regulatory and business vocabulary, which is expressed as a structured natural language, will contain interconnected business, GRC, and regulatory

concepts, definitions and relationships. The Rulebook will contain regulatory rules, business governance policies and related rules.

- Financial Industry Regulatory Ontology (FIRO) will enable efficient access to the wide and complex spectrum of regulations. To achieve this, it will rely on formal semantics to capture and represent the knowledge embedded in such regulations.
- The Financial Industry GRC Ontology (FIGO) will provide formal knowledge representations and semantic data models to help federate and integrate GRC data, processes and practices.
- The Financial Industry GRC Process Models (FIGP) will enable the FIRO and FIGO models to, for example, (a) facilitate the efficient and effective consumption of regulations for regulatory change management (RCM) by financial services organizations and/or (b) federate GRC data and create applications to enable Integrated GRC.
- The Financial Industry GRC Maturity Model (FIMM) will provide a normative reference for financial services firms to develop capabilities for GRC. FIMM describes the key practices and adoption factors for various levels of GRC maturity which will enable benchmarking to identify capability improvement strategies and best practices.
- The Financial Industry Risk Assessment (FIRA) will initially codify the fiduciary and non-fiduciary duties which arise in the context of UCITS and non-UCITS type funds and this will, in turn, help codify duties arising from the Bank Secrecy Act and other AML related regulations.

FACILITIES

- Dedicated facility in Cork, Ireland

RESEARCH PARTNERS

- Hosted by UCC
- UCD

INDUSTRY MEMBERS

- Abtran
- Allied Irish Banks
- Apex Fund Services
- BAE Systems Detica
- Bank of Ireland
- Citi
- Qumas
- SAP
- TerraNua
- Verint
- Wolters Kluwer

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