

Developing Research with QA in Cork Institute of Technology

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Legislative Basis for CIT/IoT Research

- The principal function of a college . . . provide vocational and **technical education and training** for the economic, technological, scientific, commercial, industrial, social and cultural development of the State with particular reference to the region served by the college (RTC Act 1992)
-
- . . . promoting the attainment and maintenance of excellence in learning, teaching and **research** in higher education (IoT Act 2002)
 - to engage in **research**, consultancy and development work and to provide such services in relation to these matters as the governing body of the college considers appropriate (IoT Act 2002)
 - to enter into arrangements with other institutions in or outside the State . . . engaging jointly in programmes of **research**, consultancy and development work in relation to such matters as the governing body of the college considers appropriate (IoT Act 2002)

National Imperative - Strategy for Science Technology and Innovation 2006



- “Ireland by 2013 will be internationally renowned for the excellence of its research, and will be to the forefront in generating and using new knowledge for economic and social progress, within an innovation driven culture.”
- “The next phase of development will see significant increases in i) research capacity, quality and output, ii) investment in 4th level and the public research system, iii) reform in the universities and iv) better management of the research and innovation environments.”

Strategy for Science Technology and Innovation 2006

- “There is also an emerging need for a more structured approach to postgraduate formation to ensure effective development of our researchers, shorter PhD duration and increased completion rates.”

SSTI and the IoT's

- “Build research strength in the IoT's that is of high quality and of relevance in a regional context;”
- “Create flexible processes to direct that expertise to local industry to help it address technology challenges and to access the benefits of new knowledge;”
- “Strengthen the IP management and commercialisation function in the IoT's.”

SSTI was supplemented by the Smart Economy Framework (Dec 2008) which places much greater emphasis on commercialising research.

This should be good for IoT's.

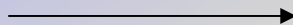
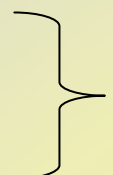
CIT Research – Snapshot

- **Total Staff (Dec 2008):** **1009.66 FTE**
 - Academic Staff (inc. researchers): 681.67
 - Administration (inc. technical): 327.99
- **Total Full Time Students (June 2009):** **6879**
 - UG (Levels 6,7,8): 6633
 - PG (Masters & PhD): 246 → **12 in 1994 !**
- **Total Part Time Students (June 2009):** **2882**
 - UG (Levels 6,7,8): 2742
 - PG (Masters & PhD): 140
- **Total Research Funding (2004- May 2009):** **€53,645,998**

Some (other) output metrics (2004-present)

Peer reviewed Papers:	255	(+6)
Peer-reviewed Conference proceedings:	321	(+11)
Patents:	5	(+3)
No. Innovation Vouchers:	25	(+7)
No. Innovation Partnerships:	7	(+2)
EI Proof of Concept Funding:	11	(+3)
Spin-Out Companies:	0	(+2)

How did we get to this point?

- **Understand the national picture**  Funding agencies
Industry
- **Focus on small number of key areas**
 - Not always a popular thing to do
 - Key management challenge
- **Protect Quality Assurance in:**
 - Research
 - Management
 - Postgraduate education
 - Supervisor Training Strongly Linked

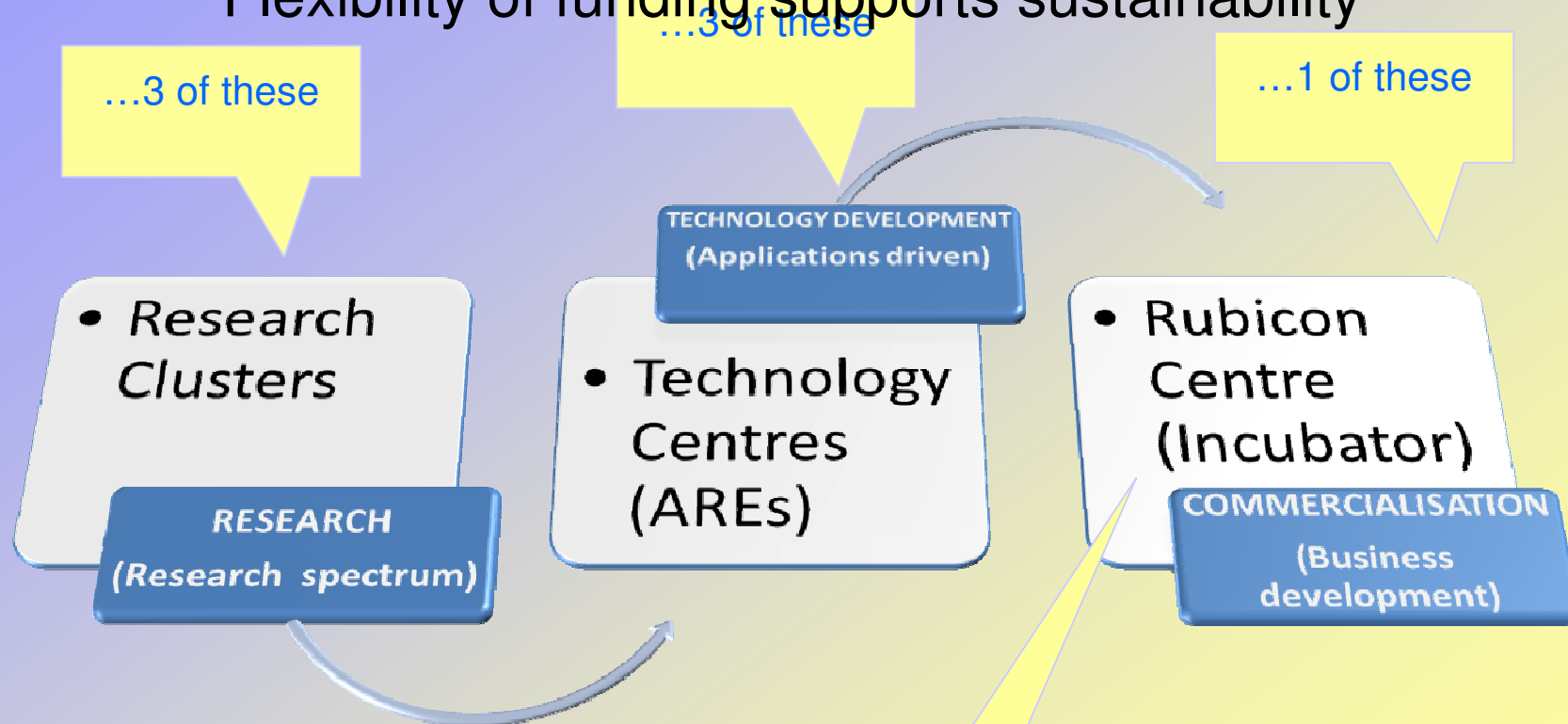
QA gives comfort to funders and collaborators

QA in Research – Strategic Research Clusters

- **Bio- Explore Cluster:** The identification, isolation, expression and engineering of pharmacologically active agents to develop novel infection control agents and improved vaccines and/ or drug delivery platforms.
- **Networked Embedded Systems (NEMBES) Cluster:** From fundamental understanding of embedded systems through to their application in society.
- **Photonics Cluster:** The dynamics of materials and devices constructed using quantum dots and the behaviour of semiconductor lasers under optical feedback and injection; spectroscopy, advanced imaging and optical design to support photonics applications in the industrial sector.
- **New and Emerging Research:** Clean Energy Technologies; business and humanities; creative arts.

SRC's and the Innovation Ecosystem

Flexibility of funding supports sustainability



SRC's are increasingly multidisciplinary
2nd largest in Ireland

Importance of Strategic Focus to QA

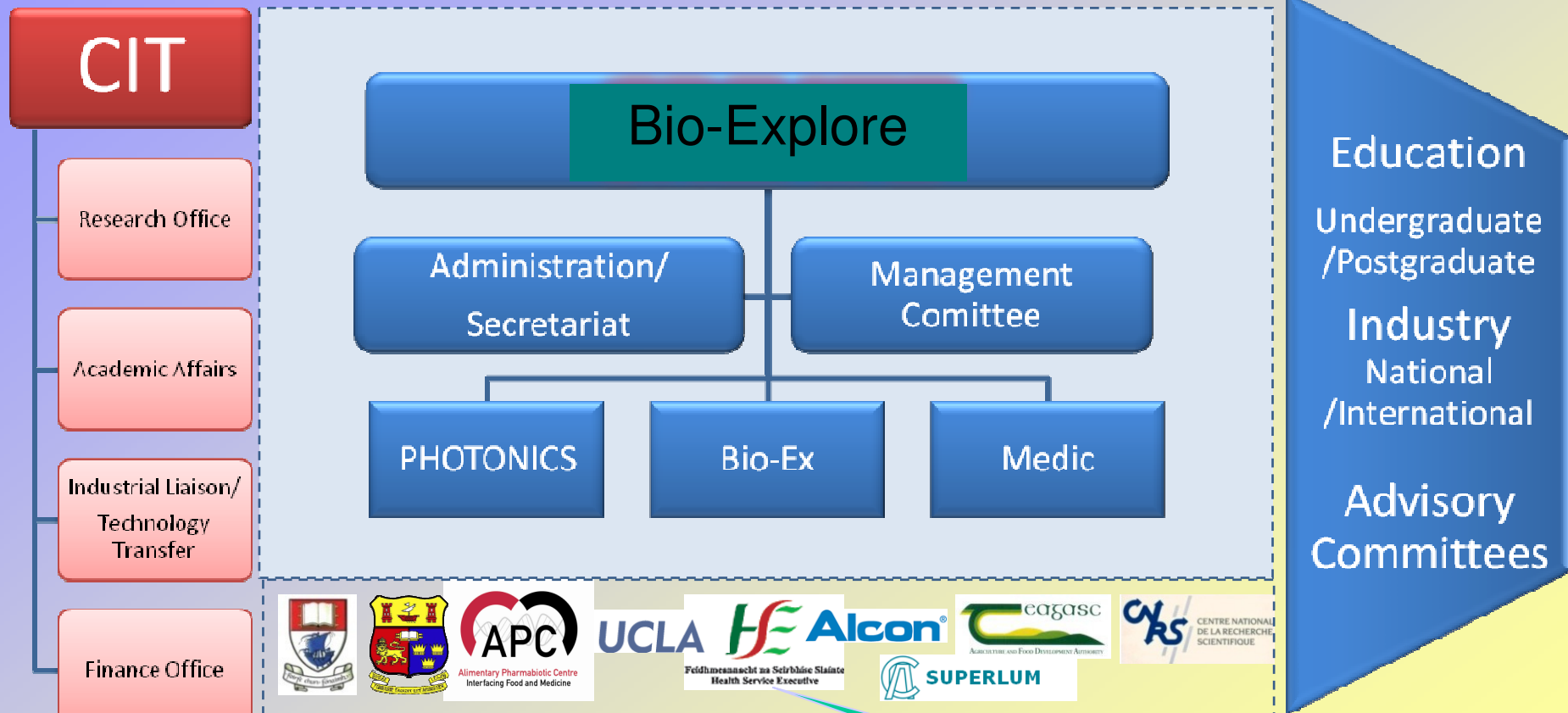
- Strategic Focusing allows one to over time :
 - **Build high-quality physical infrastructure**
 - **Develop expert supportive teams**
 - PI's, postdocs, contract researchers, visiting researchers, and industry personnel
 - **Establish a reputation**
 - Track record is critical to sustainability
 - **Have real impact at undergraduate level**

How big do you want your research to go?

Research2014 Metrics		2009	2014
Number of PhD's		47	90
Number of Research Master's		73	80
Postdocs		11	30
Ongoing Funded Collaborations	International	9	25
	Industry	23	50
Research Space		3000m ²	4500 m ²
Publications / year		45/year	100/year
Patents / licenses		2 / 5 cumul.	12 / 50 cumul.
Income / year	SFI	SFI (€1.5M)	SFI (€3M)
	EU	EU (€1.5M)	EU (€4M)
	EI	EI (€2M)	EI (€3.5M)
	International	(€1M)	(€3M)
Staff actively engaged in R&D		51	110

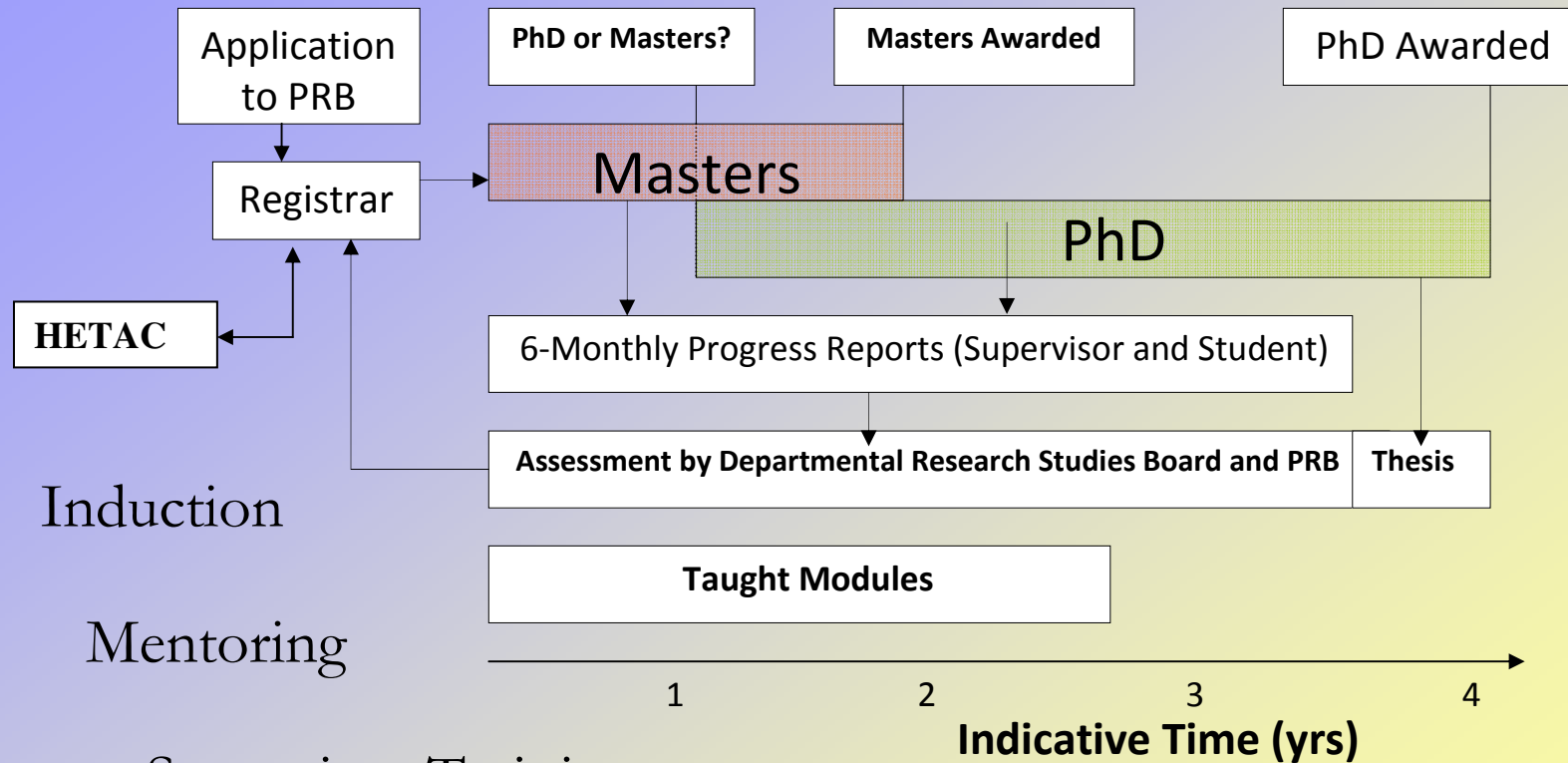
There must be **realistic** metrics if performance is to be assessed but don't be afraid to re-assess in light of external factors

QA in Management – SRC's



Networking and collaboration embedded

QA in Postgraduate Education



Induction

Mentoring

Supervisor Training

Industry Supervisors

Co-supervisors

Mobility

PDP

School of Graduate Studies

QA in Undergraduate Research Education

- Embedding SRC research in undergraduate activities
 - researchers teach at undergraduate level
 - new Bachelor Degrees
 - new Master's programmes
 - placements and work experience
 - writing journal/conference papers
 - encouraging innovation
 - Campus IP policy / Innovation awards
- Closer links to industry
 - TTO



Through the
SRC
Management
Cttee

The Challenge of Multidisciplinary Research

“Science is becoming increasingly interdisciplinary in response to the complex problems within our society”

(but physicists often don't understand biologists)

- global climate change
- world hunger and food production
- energy production and use
- human genetics and health

CIT “endgame” - Integrating Research, Teaching & Learning, Knowledge Transfer

- Building the multidisciplinary innovation campus
- Research Informed Teaching
- Creating Researchers of the Future (3 stage process)
 - (i) Awareness raising
 - (ii) The research experience
 - (iii) Building research capacity
- Strategic alignments (UCC, CUH)
- Strong **partnerships** (not just collaborations)

An Observation

Total Sectoral Funding	
2004	€18.30
2005	€27.00
2006	€26.90
2007	€60.20
2008	€64.30
€196.70	

Increasing staff involvement in research. Dual teaching-research role

	2004	2007
Universities	€243	€346m
IoT's	€ 18	€ 60m

IoT share of research fund has risen from 7% to 17%

Final Comment

Success is a lousy teacher. It seduces smart people into thinking they can't lose.

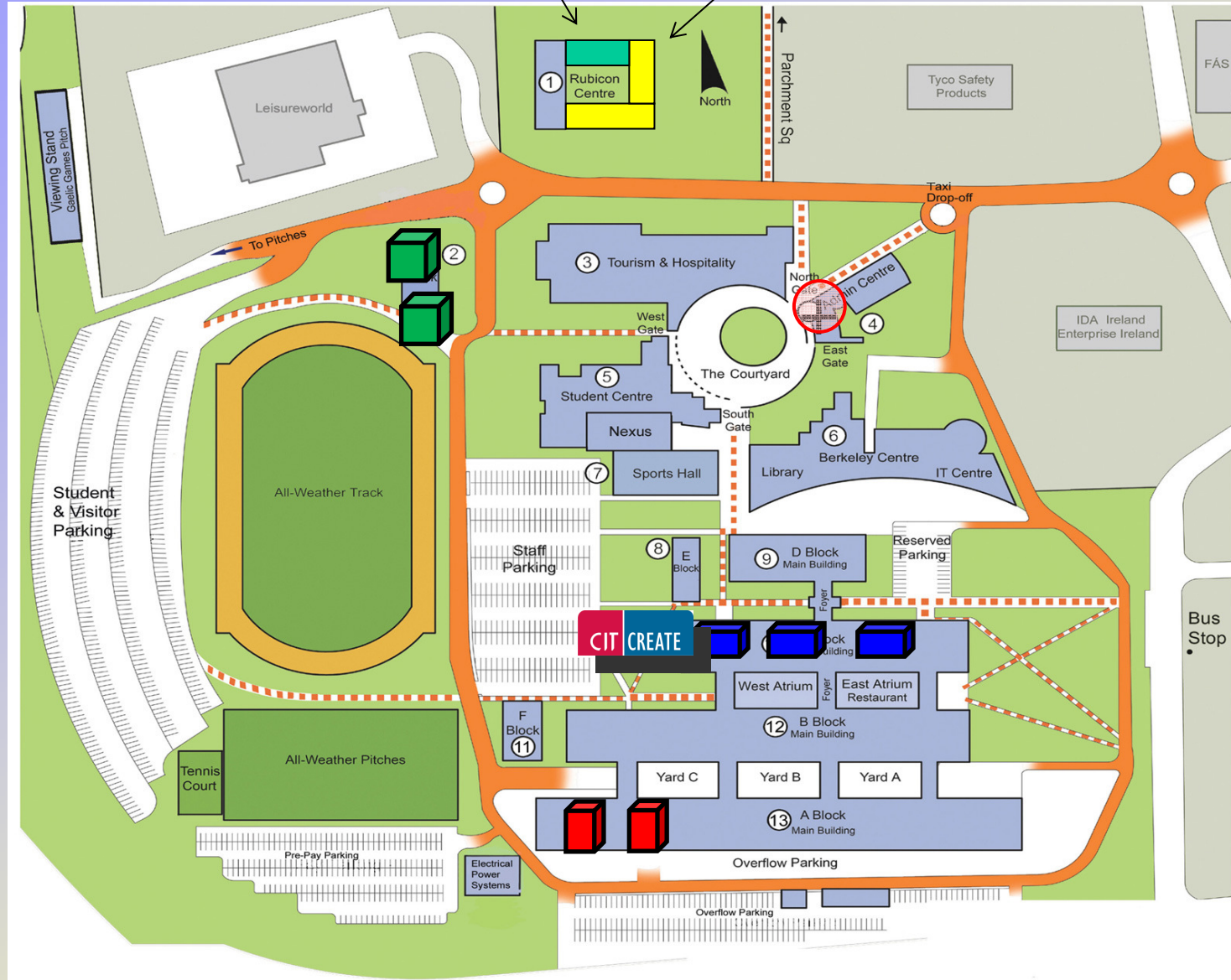
Bill Gates

Thankyou



Rubicon Extension 

NIMBUS (PRTL I V) 



Back

Key Elements of Research2014

- Implementing a framework to deliver subject-specific postgraduate modules in selected areas and for at least two National Graduate Schools;
- Enhancing the research supervision training for supervisors;
- Increasing the bidirectional knowledge transfer activities between CIT and industry;
- Extending the on-campus incubation centre to twice its present size;
- Strengthening strategic linkages with other HEI's

Key Elements of Research2014

- Building on existing strengths
- Significantly expanding the numbers of early-stage researchers;
- Recruiting and retaining high-calibre research-active staff;
- Enhancing the Research Infrastructure (buildings and access-to-knowledge);
- Increasing Collaboration (both inter-institutional and intra-institutional);
- Improving integration of research with teaching and learning;
- Providing all research postgraduates with nationally accredited modules in generic skills training;