

**Post Toyota: A People-Centric Strategy for Ireland**

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Enterprise Research Centre 30<sup>th</sup> March 2010

# **The 3<sup>rd</sup> Way**

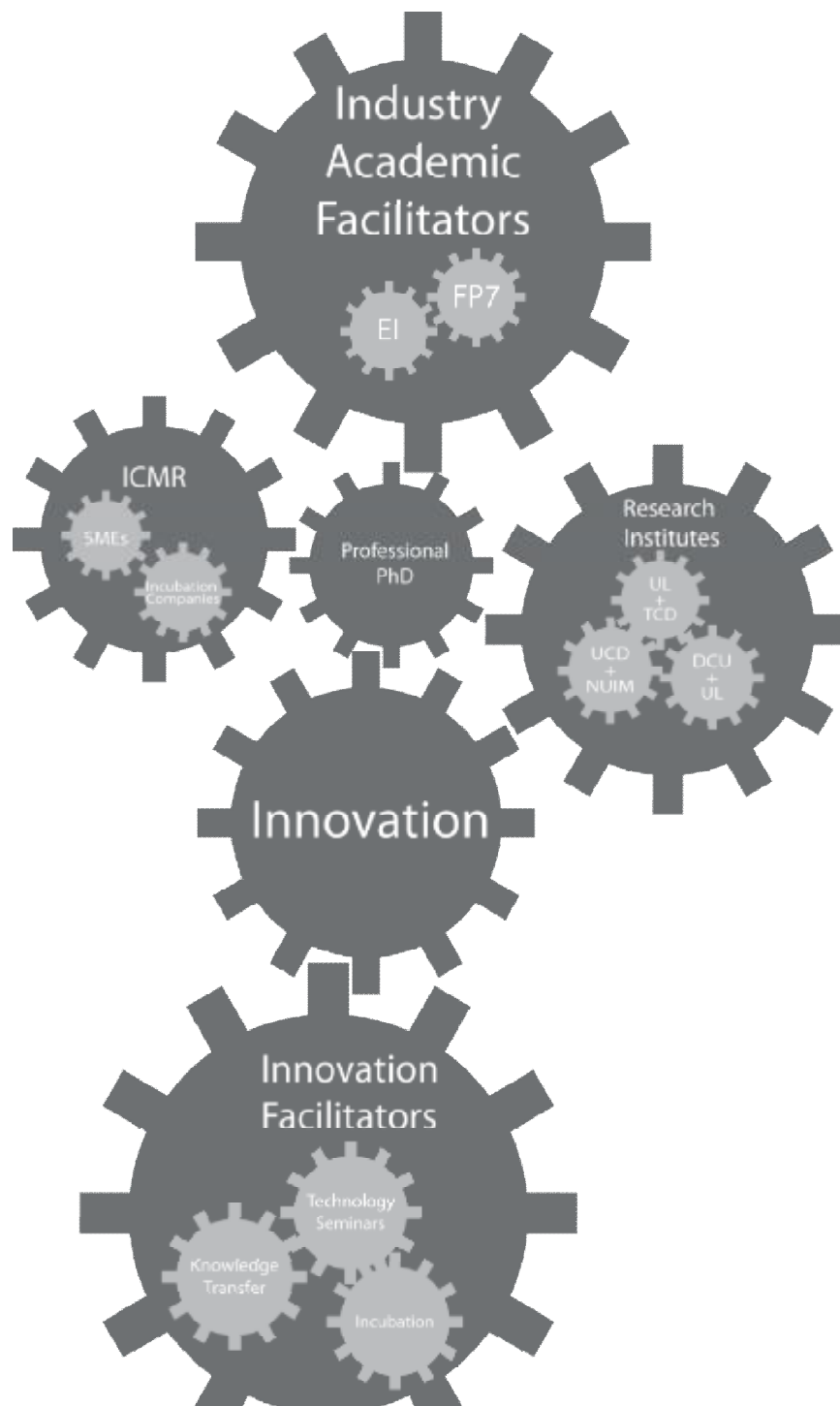
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# Ensuring Competitiveness in the 21<sup>st</sup> century

- engage collaboratively with key stakeholders
  - industry-industry & university-industry
- sophisticated, innovative learning interventions
- customised training programmes
- focused & progressive industrially relevant educational programmes
- top quality research outputs & new start-ups.



UNIVERSITY of LIMERICK  
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## Seeking to enable the 21st century workforce

- McGaw Report on equipping students with 21<sup>st</sup> century competencies; Melbourne Australia
- Back to the Rough Ground; Joseph Dunne

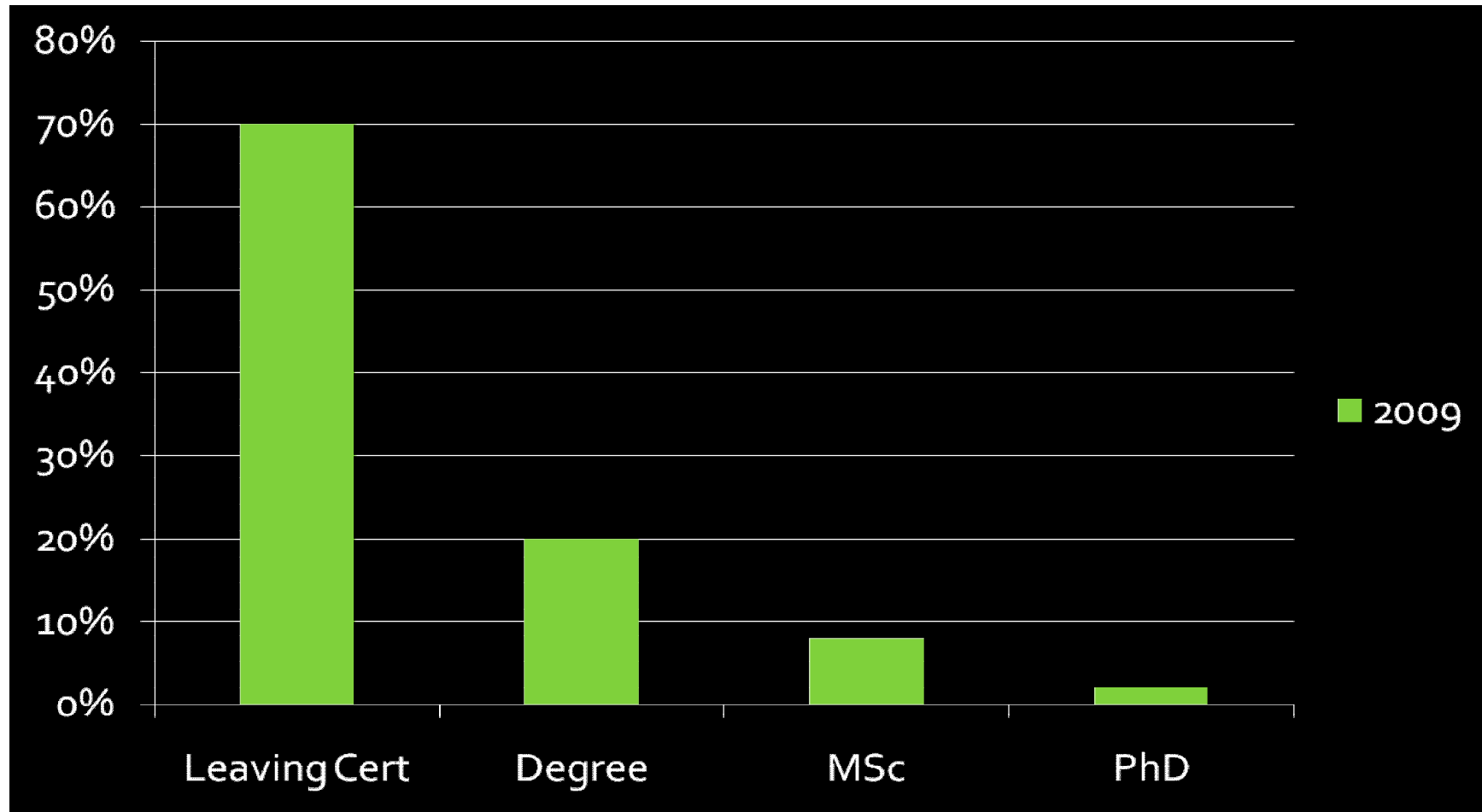
# Important issues

- 1) Capability : Learning , Competency :people
- 2) Capacity : Technology , Innovation: Jobs
- 3) Productive Citizen: Generates Wealth
  - Distributive Citizen : Translates Wealth

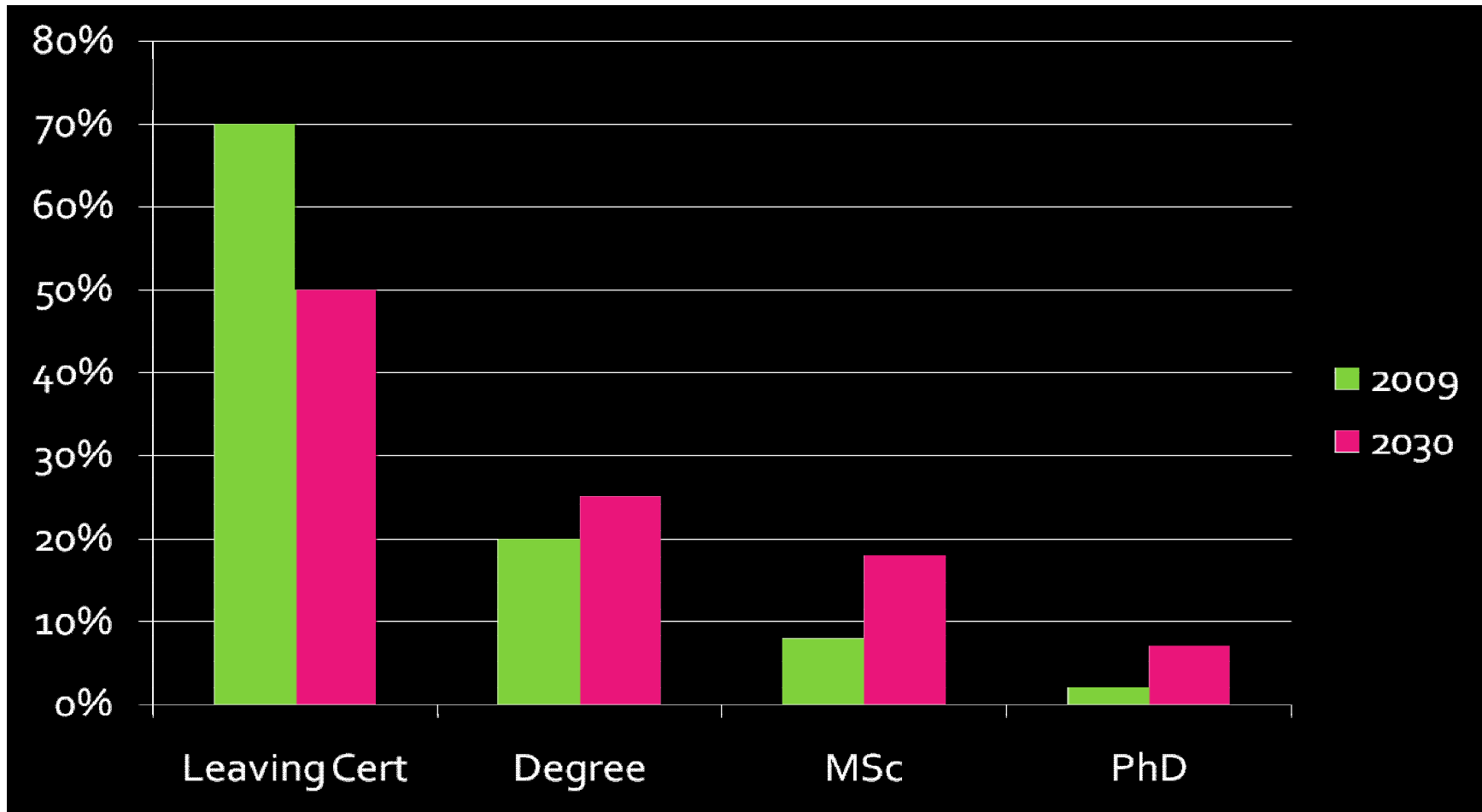
# Capability

- Extending Productive life of the Graduate
- Developing 21<sup>st</sup> Century Skills and Competencies within workforce
- Eight times easier to retain a customer than it is to recruit a new customer

# Workforce Educational Profile; 2009(Eurostat)



# Workforce Educational Profile; (Future Skills Forfas)



# Transformation Type I; Radical

Characterised by exiting completely from market  
...Howmedica

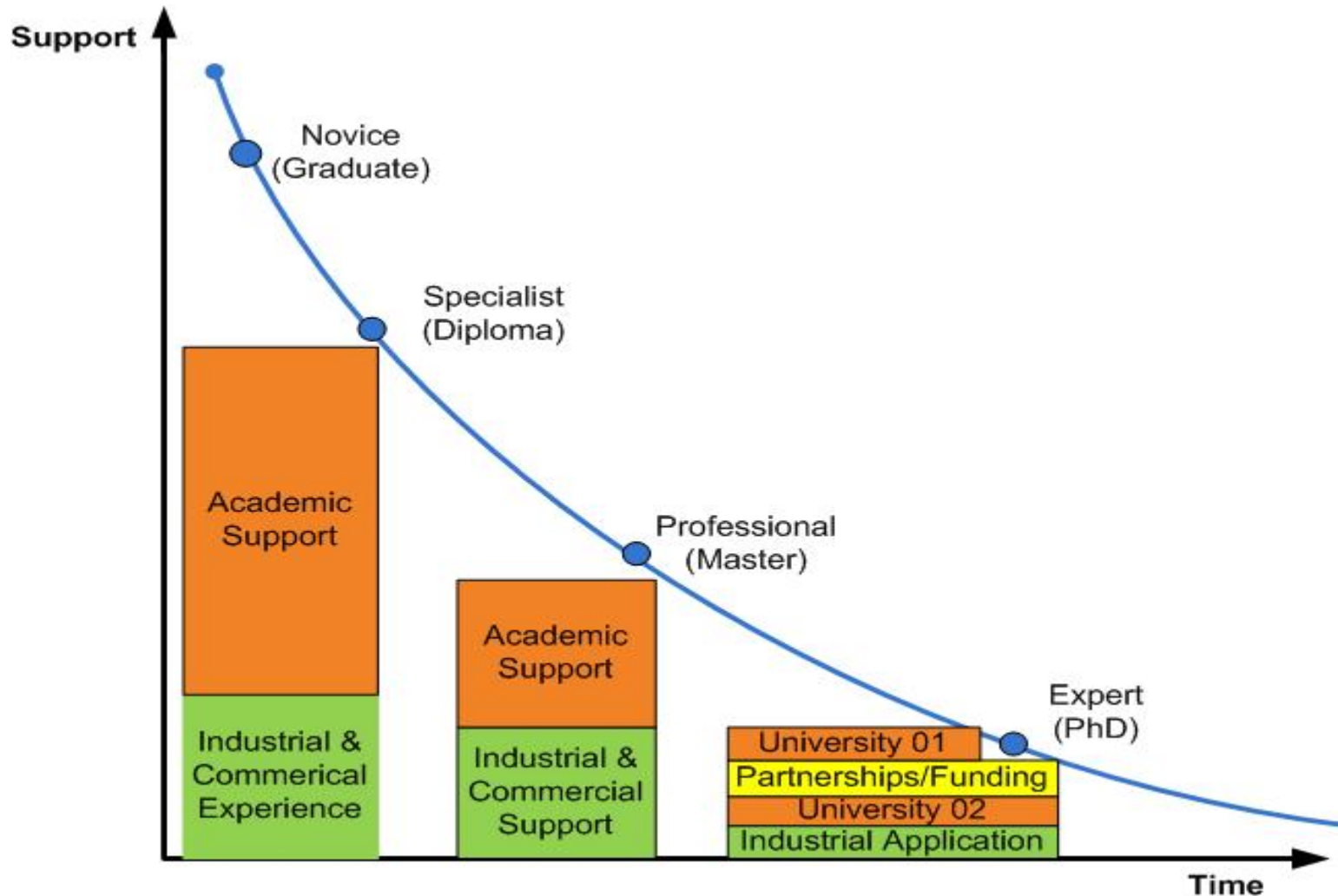
Refocusing on future market growth: emphasis on  
technology and knowledge capital (PhDs)  
Green Field


Transformation Type II;  
Incremental Transformation  
Strong Emphasis on Existing Workforce

Infinion.....

Transforming existing workforce plus recruitment  
Focusing on up-skilling

# How can we “Future proof” our workforce?





# **Implications this has for Lean Systems**

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## Toyota System for Lean Manufacturing

- Toyota System
  - Focus on manufacturing & engineering systems
- We need a Toyota System for People
  - People systems approach to lean manufacturing
  - 3 elements to the People Systems
    - **Competences** required for Tasks
    - Lean Design of **Training** to enable these Competences
    - Assessment of **Learning** for Individual & Organisational Benefit

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# Competences

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# Task Competences

- q 3 Competence Types
- q Skill based level- psychomotor performance- smooth, automated & highly integrated patterns of behaviour with much control or attention
  - q Psychomotor domain of learning- muscular & motor skills but not interpretation
- q Rule based level- conscious control of the sequence of activities leading to performance through stored rules or procedures derived from previous performance or instruction
  - q Level 1 cognitive typology of learning (Bloom, 1976)
- q Knowledge based level
  - q Understanding, application, synthesis, evaluation- new models

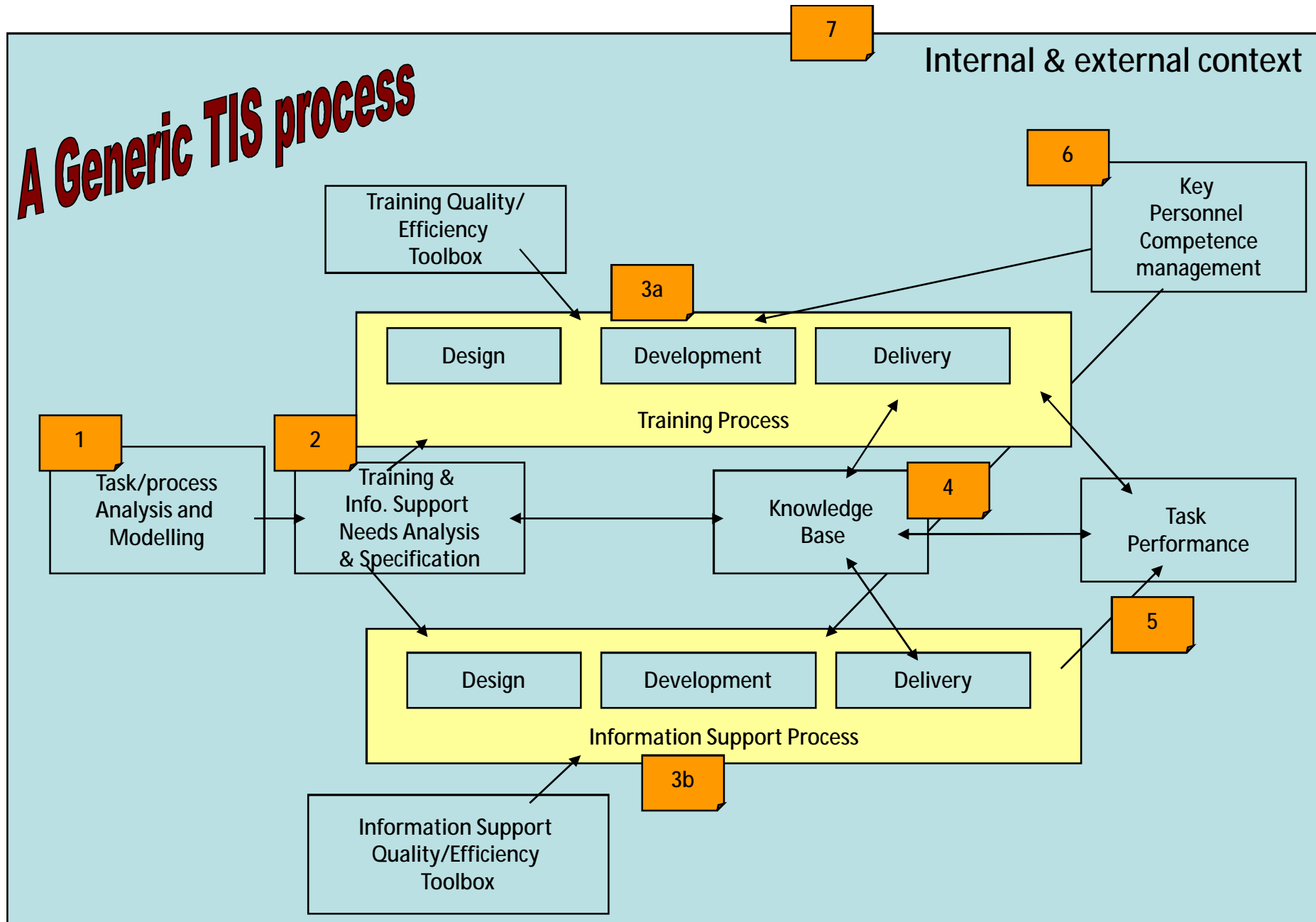
## How Task Competences Influence Learning & Training Design

- Psychomotor learning requires practice e.g. endoscopy procedure
  - How much practice- what's the learning curve?
- Accuracy tasks decay three times more quickly than that of speed tasks
  - e.g. is it procedures not being followed or decay or habits or ???
  - when is refresher training required?
- Rule-based & Knowledge-based tasks e.g. Intel & Pfizer
  - Operators trained on diagnostic heuristics performed less well on novel faults (but equally well on familiar faults) than those who were trained on system components
  - System based knowledge training over-inflated operator confidence.
- When process tasks are more similar; beneficial to increase worker multifunctionality as the negative impact of lost efficiency due to forgetting was small relative to the benefits gained from increased learning & the ability to respond to system variability

# **Training Design**

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# A Generic TIS process



(c) TCD

# Training Design

## Frequency of Training

- Knowledge that cognitive tasks decay faster than physical tasks would suggest more frequent refresher training for those types of tasks to avoid loss of knowledge or perhaps bursts of 'knowledge bites' training to maintain that knowledge

## Training Content

- Providing training on systems and models as well as procedures facilitates greater performance and retention. Compartmentalised knowledge versus systems knowledge
  - How to do?
  - Why to do?
  - Wider context?
  - E.g. Intel & Boston

# Training Design

## Training Delivery

- Taking time to mentally prepare for motor tasks with low and medium levels of cognitive demand improves retention. Mentally preparation for all level of motor task improves performance initially.
- Practicing multiple integrated tasks in tandem improves retention of all three rather than practicing each task in isolation improves retention of those skills.

## Training Environment

- Ensure the training equipment is as similar as possible to the 'real life' equipment for greater retention. Closer conditions for retrieval

## Training Materials

- Natural tasks versus artificial tasks e.g. Boston bracelets

# **The 3<sup>rd</sup> Way**

- **Ireland- Centre of Excellence in a 'People Centric Approach to Lean Philosophy'**
- **Unified Systems Thinking Approach to Learning**
- **Training is Under-valued in Industry & Academia**
- **The 3<sup>rd</sup> Way- its not just Training!**
  - **Industry-Academia Integration**

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**Thank You**  
**Questions & Comments?**

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