



Building Collaborative Networks for Innovation

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Academic Entrepreneurship: Roles and Activities of Principal Investigators of Publicly Funded Research

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Academic Entrepreneurship: Roles and Activities of Principal Investigators of Publicly Funded Research

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www.dit.ie/pistudy

Overview

- Benefits, Characteristics, Distinctions of Publicly Funded Research
- Defining Principal Investigator Roles and Responsibilities
- Our Research Focus and Informing Themes
- Our Research Strategy
- Some Preliminary Insights
 - Rationale, Roles and Activities, Challenge, Frustrations, Technology Transfer and Supports
- Concluding Thoughts

Benefits of Public Research

- Benefits of Public Research (Martin, 1996)
 - Increasing the stock of useful knowledge; Training skilled graduates; Creating new scientific instrumentation and methodologies; Forming networks and stimulating social interaction; Increasing the capacity for scientific and technological problem-solving; Creating new firms.
- Social Benefits
 - Food safety and environmental research (Rubenstein, 2003)
 - Small firms that cannot afford large R&D lab (Beise and Stahl, 1999)

BUT

- Commercialisation Demand
 - ‘the movement of know-how, technical knowledge or technology from one organisation to another’ (Roessner, 2001).



Characteristics of Publicly Funded Research

- Public research is owned and financed by government (Perry and Rainey, 1988).
- Content and transparency of objectives (Rainey *et al.*, 1976; Ring and Perry, 1985),
- Resource utilisation efficiency (Whorton and Worthley, 1981)
- Pricing methods, performance evaluation (Banfield, 1975)
- Responsiveness to interest group demands (Quinn, 1980)
- Member attitudes and motivating factors (Newman and Wallender, 1978)
- Culture of the organisation (Whorton and Worthley, 1981)



Distinctions between Public & Private Researchers

- Public researchers are primarily driven by the desire to expand knowledge frontiers, and to make this knowledge publicly available through scientific publication and other dissemination distribution channels.
- Private counterparts are influenced by profit motivations, which means that any new, commercially applicable knowledge that the firm develops is kept confidential for competitive reasons (Drejer and Jorgensen, 2004)



Our Interest:

Role of Principal Investigators

- The PI is responsible for all actions required to manage and complete the scientific and programmatic aspects of the sponsored project and also initiate programmatic changes.
- This involves:
 - *Managing a research team* from different disciplines and institutions.
 - *Recruitment and selection, assignment, project management, IPR management, financial and budgetary planning.*
 - *Managing multiple stakeholders*, all with different expectations and driven by different logics.
 - Stakeholders include research team members (incl. doctoral research students), public research centre partners, industry, the PI's academic institution, department and TTO, the funding agency, technology recipients, government, and the public.
 - *Doing research!*

A Principal Investigator is expected to be...

- A superior domain expertise
- A leader
- A strategist
- A people manager
- A stakeholder manager
- A technology transfer agent
- A politician
- An administrator
- A market maker
- A project manager
- In essence... is a CEO of a temporary organisation?



Principal Investigator: Definitions and Responsibilities

- Definitions of the role of principal investigators tend to be set by funding agencies and public research institutions and their focus is mainly on administrative responsibilities.
- Public funding: PI is the person charged with direct responsibility for completion of a funded project, directing the research and reporting directly to the funding agency.
- National Institute of Health in the United States *“the individual(s) judged by the applicant organisation to have the appropriate level of authority and responsibility to direct the project or program supported by the grant”*
- Science Foundation Ireland (SFI) *identifies the principal investigator as the Lead Applicant and responsible for the scientific and technical direction of the research programme and the submission of reports to the funding agency has primary fiduciary responsibility and accountability for carrying out the research within the funding limits awarded and in accordance with the terms and conditions of the funding agency. They also serve as the primary point of contact for SFI on the award.*

Principal Investigator: Definitions and Responsibilities

- Stanford University's research policy states that the "***principal investigator has absolute responsibility for the overall conduct of a sponsored project, including all technical, programmatic, financial, compliance and administrative aspects***
The principal investigator is responsible for controlling the technical direction and academic quality of the project, and will ensure that a sponsored project is carried out in compliance with the terms, conditions, and policies of the Sponsor and the University".
- Dartmouth College's research policy explains that "***the ultimate responsibility for the management of the sponsored research award rests with the principal investigator***" :
 - executing the project using sound management techniques;
 - carrying out the project's financial plan;
 - reporting project progress to the sponsor;
 - maintaining an accurate record of project related expenses;
 - complying with institution policies and procedures related to project management and personnel practices; complying with all applicable sponsor terms and conditions

Our Objective and Research Gap

- Overall Research Objective
 - *To identify the determinants of principal investigator effectiveness in the delivery of public research.*
- Micro perspective
 - Research on research management dominated by macro perspective
 - Need for increased concentration at an individual level rather than institutional or systems levels



Our Informing Thematic Agenda

- *Role of the PI*
 - Role identity, professional competencies, influences on the management approaches
- *Determining and Managing Collaborations*
 - Determining factors that influence PI choice; harnesses and managing partner contributions.
- *Stakeholder Management* (Freeman, 1984; Mitchell et al, 1997; Frooman, 1999)
 - Prioritisation of stakeholders; institutional supports; managing of funding agencies expectations and influencing and shaping funding calls
- *Technology Transfer* (OECD 2003; Sanchez and Tejedor 1995; Lambert, 2003; Scott, 2001)
 - Institutional and cultural barriers and performance and delivery incentives
- *Management Skills and Acumen* (Kuratko, 2005; Gratton, 1987 and Bloom, 2005)
 - Evolvement of managerial skills via public research funding
- *PIs as Market Shapers*



Research Strategy

- Quantitative Phase (Ongoing)
 - Survey of total population
 - 1,400 Principal Investigators in the Irish System

- Qualitative Phase (Ongoing)
 - 30 PIs plus across the Irish Research System – HEIs and PRO

Some Preliminary Findings

Qualitative Phase

Rationale

Roles and Activities

Challenges

Frustrations

Technology Transfer

Supports



Rationale: Becoming a PI

- Dependences
- Control of Project
- Passion
- Pressure
- Career Advancement
 - Recognition
 - Working with leading players
 - Promotion
 - Status and Credibility
 - Autonomy

‘self motivations’

‘better control over the direction of the project’

‘working with a work leader in the area represented a huge opportunity’

‘as a PI I am driven to make a difference ... being a PI also provides you with a unique opportunity to do what you want’



Roles and Activities

‘the PI is much more of a managerial role, you are running it...’

‘My key task on a daily basis would include that the science is carried out in the individual project tasks.’

‘I must get them to integrate and to work together. I must chair and coordinate working meetings.’

‘Being a good listener and getting people involved and letting them air their views is crucial’

- Direction and Supervision
- Administration
- Co-ordination and Alignment
 - Managing diversity and maintaining project focus
- Motivating and Driving Others
 - Research Officers
 - Maintaining project momentum



Challenges

- Portfolio Management
- Managing Diversity
- Changing Landscape and Project Adaptability
 - Market Changes
 - Policy Decision
- Stakeholder Pressures
 - Budgetary Issues
 - Changing Circumstance for Partners
 - ‘Big Brother’ Syndrome – regulators, funders and other stakeholders

‘structural aspects of being a PI. It is very challenging to meet expectations and being able to juggle all of these projects.’

‘While the agency still want to give out money to have a record of achievement and the universities want you to bring in money, the dynamic has shifted for PIs with both sides now increasingly pushing in on the PI at the same time.’

‘stakeholders were always putting us under the grill asking what we produce, how did you do it, how relevant was it, etc.’



Principal Investigator Frustrations

- Administration
 - Time consuming
 - Recruitment procedures
 - IT
 - Dependency on Admin. Services
 - Spending
- Inflexible Organisational Environment
 - Lack of skills
 - Lack of support
 - Staff appraisal and rewards
 - Uncertain career paths for researchers

'the killing thing is that admin and its is only going to get worse'

'you are utterly dependent on admin such as the finance area and this can be frustrating'

'rewarding people, it is more or less accepted that you cannot do very much'

'I struggle with how I can create employment for my team for a number of years, and not have them constantly looking over their shoulder.'



Technology Transfer & PI Supports

- PI Involvement in TT Duties
- TT Challenges
 - IP Agreements
 - Acceptance and Legitimacy
 - Ownership of Know how
- Shaping Market

Supports

- Preparation
 - Past work experience
 - Self Taught
- Organistional Supports
 - Formal Training
 - Informal Aids (personal networks internal and external)
 - Services
 - Equipments



Potential Determinants of Principal Investigator Effectiveness

Macro

- Scientific domain
- Innovation system

Meso

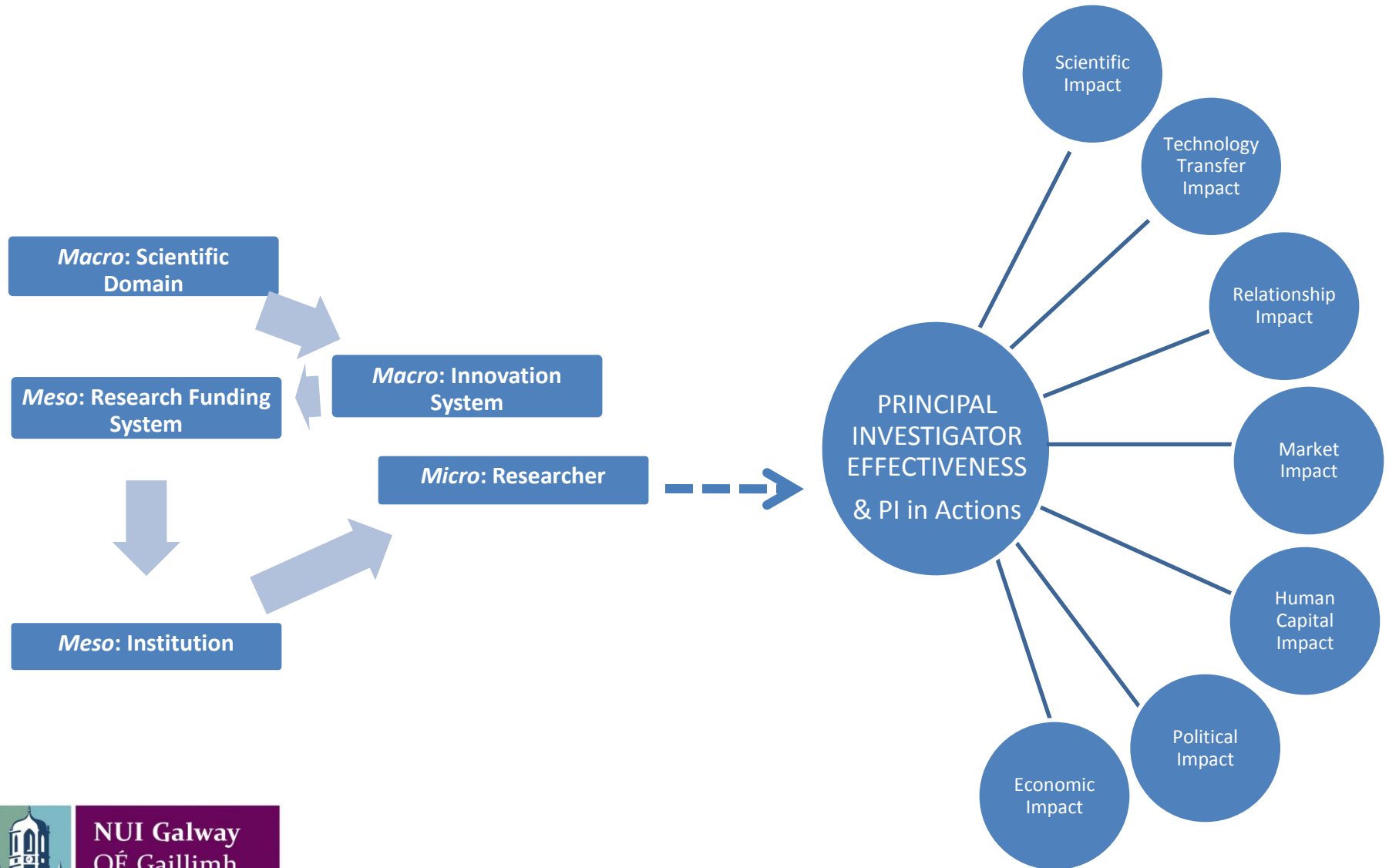
- Institution
- Research funding system

Micro

- Project network
- Researcher



Principal Investigator Effectiveness Framework



Concluding Thoughts

- Not a CEO of a temporary organisation but more akin to small business owner
- Manage scientific, managerial, organisational and technology transfer complexities
- Roles and activities are managerial in nature and focus – require multi-tasking capabilities
- PIs have limited degrees of control and influence with key stakeholders – ‘takers rather makers’
- PIs in project formation are makers but this seems to change over the life of a research project
- Publicly funded PIs are a critical resource in a national research system but a more coherent and deliberate approach needs to be taken for career development and professional enhancement

The reality ‘the pressure is constantly on to bring in the money.’





Thank You

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