



OAI4 workshop on innovations in scholarly communication
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Making the innovation case in Open Access scholarly communication



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Talk outline

- Background
 - Background to study
 - Personal background
- The talk proper
 - OA for dev countries
 - National info/science/innovation policy
 - S&T policy trajectory
 - defining innovation
 - Innovation theory
 - National System of Innovation approach
 - Underpinning economic theory
- South Africa
- Argument summary
 - To conclude

Background/s to this talk

Background [1]

- Masters in Information and Knowledge Management thesis study
- Aim
 - See if case can be made for mandating OA through NIP, linked to innovation theory (especially NSI approach)
- Why
 - Uptake of OA in SA seemed (frustratingly) slow – assumption/s needed testing
 - SA science publication rate is losing ground internationally (Pouris, 2003)
 - Marked ↓ in publication rate especially among jnr scholars/researchers (Boshoff & Mouton, 2003)

Background [2]

- Publication rate + no. of patents p.a. \Rightarrow rate of knowledge diffusion (& generation?)
- OA form of explicit intervention w.r.t. k-diffusion
- Decline in publication rate \Rightarrow structural problem in SA's NSI (Boshoff & Mouton, 2003)
- Study parts
 - Theoretical framework
 - Empirical studies (questionnaire-based survey + structured record reviews)

Scholarly experiences

- 1999/2000: explored possibility of taking print journal online for Linguistic Society of SA
- 2002: established Information Infrastructure Initiative as web hosting platform for scholars / academics
- 1998–present: We have SAPSE – can't go OA(?)

Background [3]

- Research questions
 - Q1: Since Open Access scholarly communication finds expression through four core activities, do authors and researchers in South Africa engage in these four core activities, and hence engage in Open Access scholarly communication?;
 - Q2: Does Open Access scholarly communication in South Africa require facilitation through national information policy instruments?;
 - Q3: Would such national information policy instruments have consequences for a national system of innovation?

Thesis excerpt: Discussion & conclusions

- It will be shown that,
 - in a world of the rise of the entrepreneurial university,
 - openness of scholarly systems needs to be mandated as openness will not happen of its own accord.
 - Such mandating in South Africa, together with Open Access developments abroad, will increase the amount of reliable research information available to researchers, globally and in South Africa.
 - At the same time, South African research will gain greater exposure.
 - Such stimulation of the core component of a national system of innovation may
 - go some way to alleviate the declining global competitiveness of South African scholarship.
 - Policy recommendation: The argument which permeates this thesis, as elaborated upon in the preceding chapters and revisited below, suggests that minimal amendment of current legislation will constitute mandating Open Access in South Africa.

Theoretical framework

- OA
 - what it is
 - International; trans-national; national initiatives abroad (esp. those which are gov or science council driven); initiatives with a developing country focus
 - Scholarly comm in developing countries (Africa)
 - Scholarly comm in SA
- NIP
 - Definition(s)
 - In SA
- NSI
 - Definition
 - In SA

The talk proper

Open Access defined*

- free or low-barrier diffusion of scholarly research
- finds expression through:
 1. publication in Open Access journals;
 2. making research available in an institutional or disciplinary (a.k.a. subject-based) archive;
 3. making research available via departmental or personal homepages;
 4. making the research output of postgraduates available (ETDs).

note:

1 = research publication = journal reform school

2 to 4 = research dissemination = self-archiving school

* defined for developing countries

National Information(?) Policy[1]

- **Information policy** – “...the set of all public laws, regulations, and policies that encourage, discourage, or regulate the creation, use, storage, and communication of information.” (Weingarten, 1996)
- I use the term ‘information policy’ to designate public policy which incorporates information-, science and technology-, as well as innovation policy, noting Rowlands’ (1996:14) observation that these **terms are often used synonymously**.
- **National** information policy refers to those **policies instituted by the State** rather than firms or organisations.

National Information(?) Policy [2]

- **Science policy** will be linked to policies in all other fields of knowledge (Caraça, 2000)
- **Innovation policy** – “concerned with stimulating, guiding, and monitoring knowledge-based activities within a political jurisdiction – typically, a nation, or a region.” (De la Mothe, 2003)
- Adequate policy needed to bolster SA’s scientific output (Pouris, 2003)
- Policy needed to create/maintain physical and knowledge infrastructures – “storage, access, availability, dissemination” neglected part of S&T policy, yet basic scientific results – stored in libraries or univ. Depts. – key to innovation (Smith, 1997)

National Information(?) Policy

[3]

- Foray (1997) – k distribution and openness critical characteristic of any NSI
- David (2003) – openness needs to be mandated
- Davis & Carden (1998) – In developing countries universities are usually the most politically sensitive S&T actors

Models of technological change, science and technology policy paradigms
(after Biegelbauer, 2003)

Time	Leading model	S&T policy paradigm
50's - 60's	Linear model	Science push: S&T as motor of progress and military strength
70's - 80's	Linear model	Demand pull: S&T as problem solver targeting societal and economic problems
90's	Complex holistic model (incl. Feed-backs and loops)	Innovation process: S&T as a source of strategic opportunity, particularly for national and regional economies (both in the short and long term)

Innovation theory (defining “innovation”)

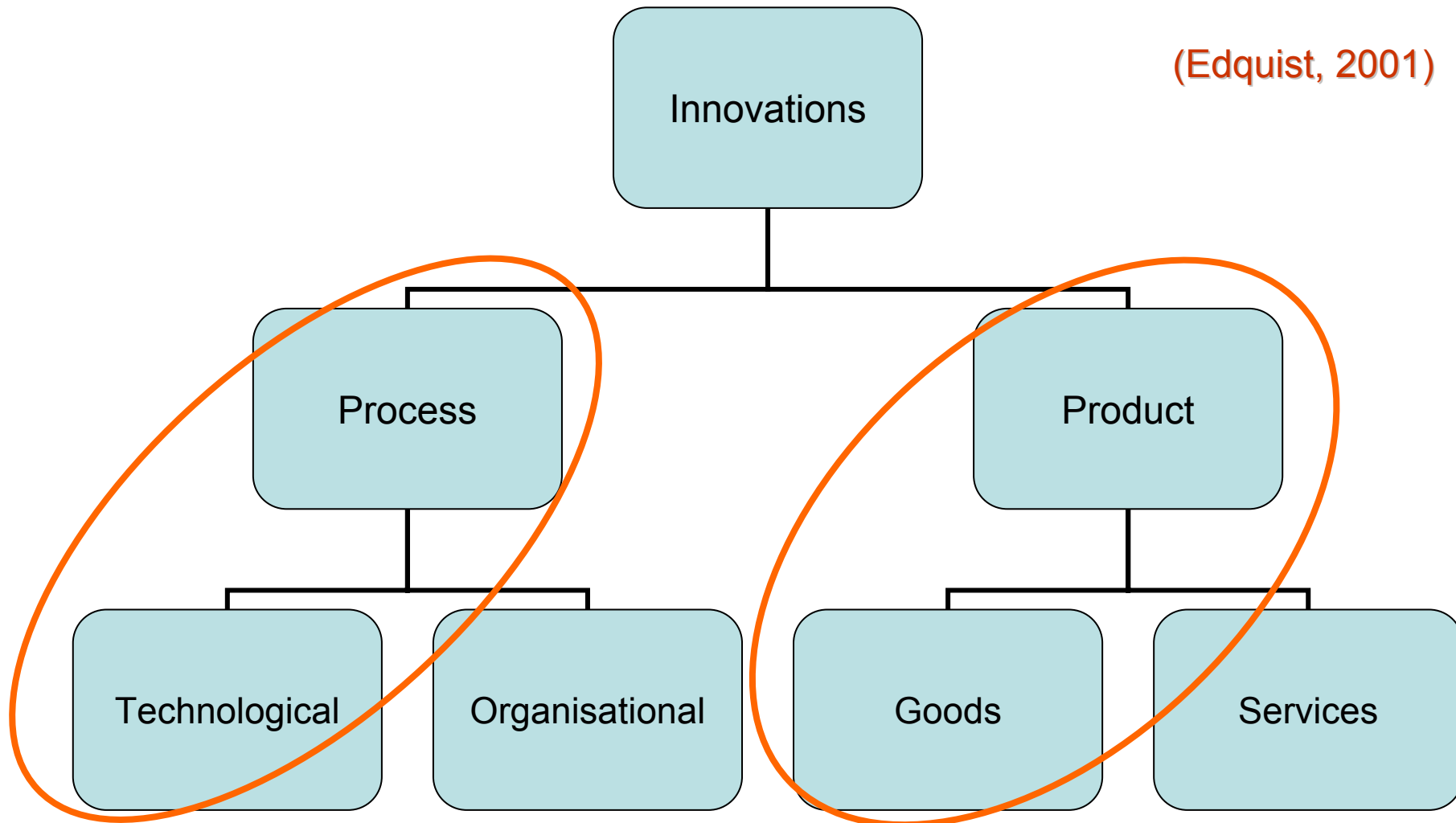
- Innovation – technology–centric conceptions usually
- Invention vs. Innovation
- Product vs. Process
- Linear vs. Evolutionary
- Closed vs. Open systems

Schumpeter

- Invention – new concept generation
- Innovation – communication /transfer /diffusion of invention beyond original inventors

Taxonomy of innovations

(Edquist, 2001)



Innovation theory

- Two approaches (Smits, 2002):
 - processes of innovation
 - Micro-level analysis (firms & organisations)
 - systems of innovation
 - Macro-level analysis (sectoral, regional, national, international)

National System of Innovation

- “...the set of organizations, institutions, and linkages for the generation, diffusion, and application of scientific and technological knowledge operating in a specific country.” (Galli and Teubal, 1997: 343)
- Use of the term ‘national system of innovation’ – informs much of the Science and Technology policy dialogue in South Africa (and Africa: NEPAD and AU).

Economic growth

- Accepted determinants of economic growth
 - Growth of knowledge
 - Population demographics
 - State of the arts
 - Available resources
 - Rate of capitalisation
- Growth of k – the most significant source of long-term economic growth
(Alcorn, 1997: 80, Conceição et al, 2000: 11)

National Innovation Systems approach

- Acknowledges
 - Role of national policy
(Furman et al, 2002: 903)
 - Active role played by government
(Furman et al, 2002: 903)
 - Greater role of/for government in
fostering innovation
(Archibugi and Michie, 1997: 134)

Innovation theory timeline

- List (1841) – role of knowledge accumulation (cf. Capital accumulation)
- Solow (1956) – exogenous growth model
- Romer (1986) – ideas–driven endogenous growth theory (new ideas production function)
- Nelson (1993) – National Innovation Systems
- Etzkowitz and Leydesdorff (1997) – triple–helix model of university, industry, and government relations or linkages

Romer's new ideas prod. fx

$$\dot{A}_t = \delta H_{A,t}^\lambda A_t^\phi$$

- Rate of new ideas production = no. of ideas workers \times stock of ideas available to researchers

(Furman et al 2002:902)

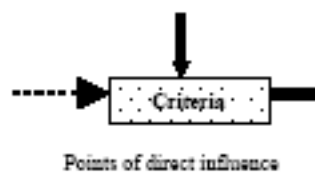
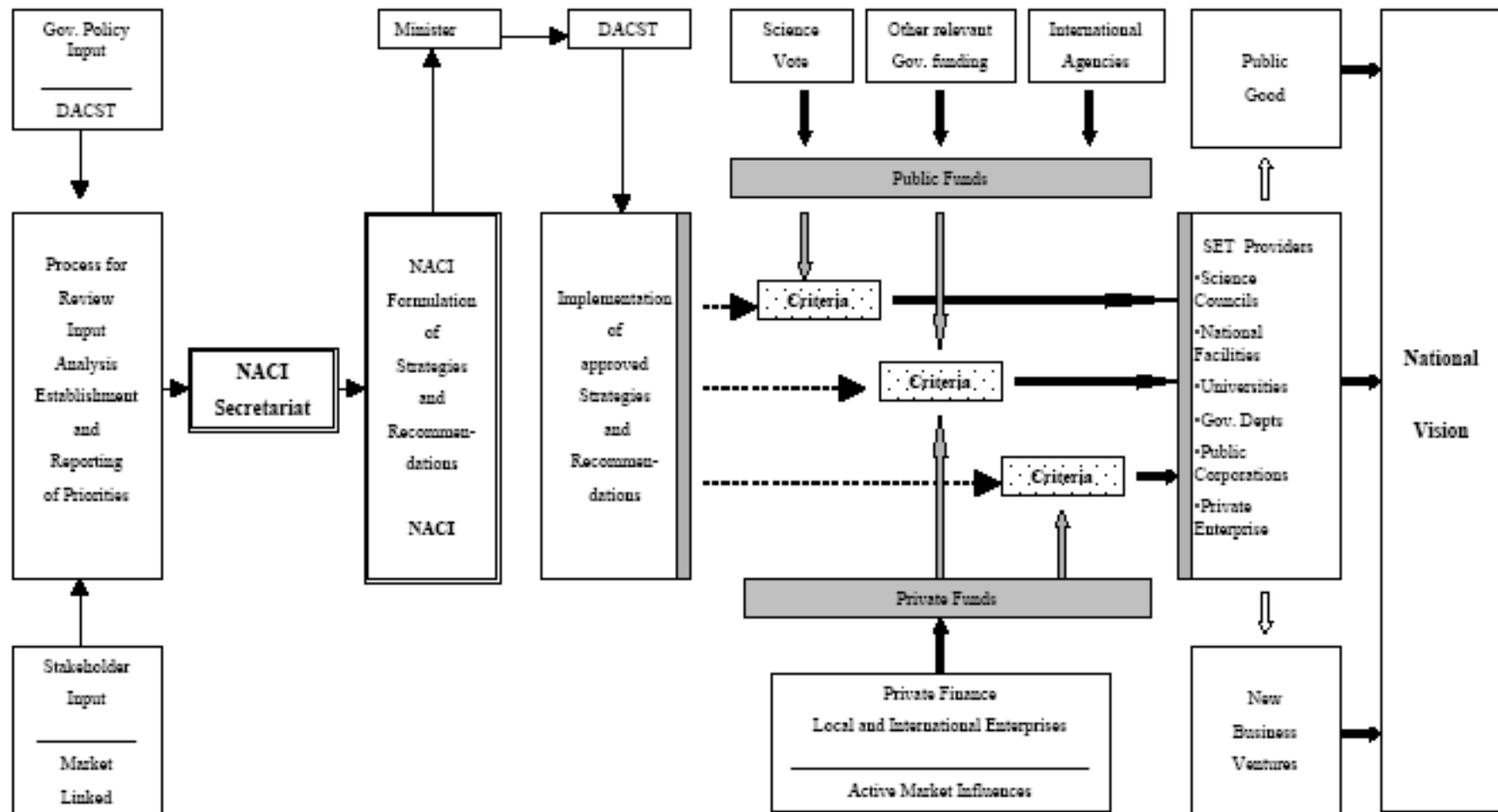
South Africa

South African sc activity

- 0.5% of world publications; 50% of African publications; 0.1% of world patents; 98% of African patents (USPTO) (Ojo!)
- Growth in absolute no. of publications, but declining rate of publication when compared globally
- Government subsidised scholarly publication system (akin to Australia, Spain) (“legacy system”)
- Four OA journals, two gov. accredited (DOAJ)
- Thus far 7 IRs (5 OA)
- 1 (of 8) science council (HSRC) has adopted OA publication model
- To date high-level gov. OA endorsement of access to data (fulltext seemingly not high on agenda) (OECD – Jan 2004; SA NRF & CODATA – Sept 2005)
- Nov 2004 – SIVULILE group formed to take OA forward in southern Africa (IR workshop – May 2005)

South African NSI

Schematic Representation of the National System of Innovation



Argument summary

SA(OA+NIP+NSI) = ↑econ growth; ↑scientific competitiveness

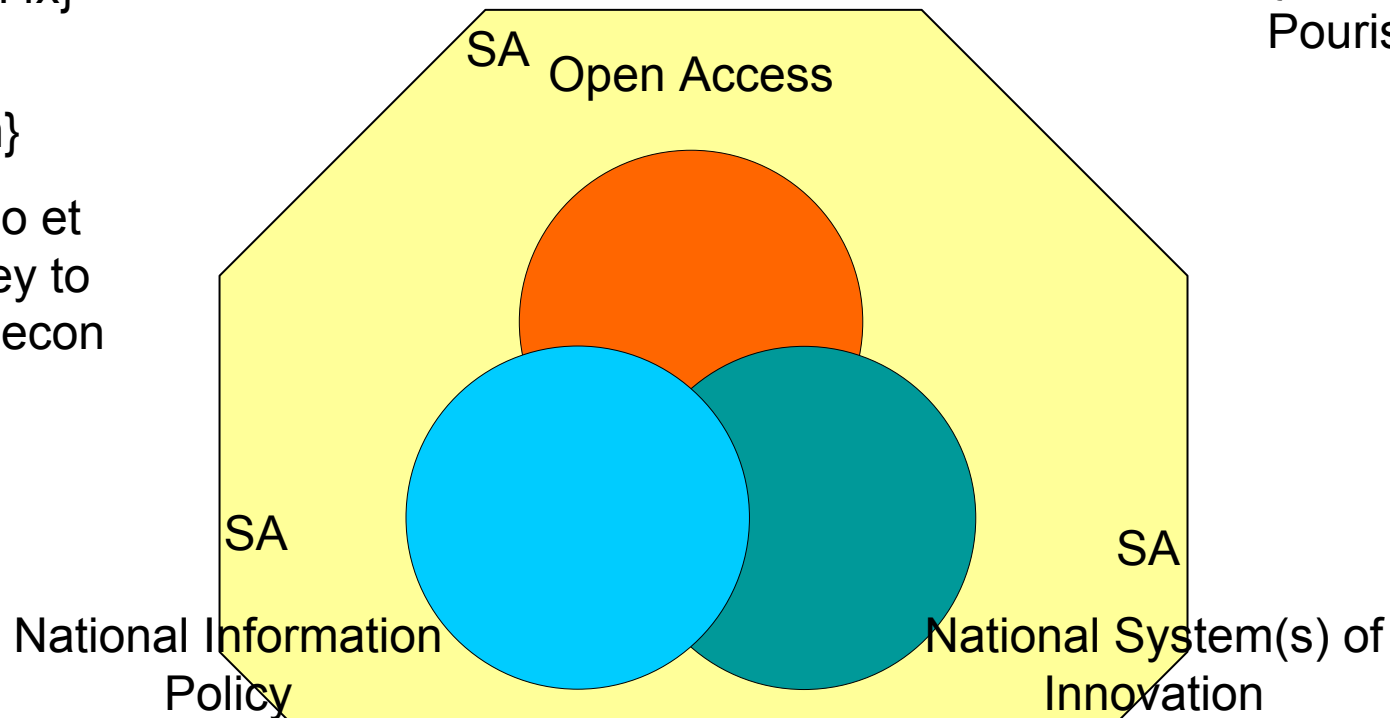


{Romer= k
production fx}

{Solow =
innovation}

{Conceição et
al = k is key to
long-term econ
growth}

{Mouton,
Pouris}



{Weingarten=formal
policies}

{Davis=overlap}

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{Rehman=scope}

{Galli and Teubal}

{Foray} {Smith}

{David}{Arunachalam}



To conclude

- Argument grounded in South African experience
- Not uniquely South African scenario though
- Science and innovation systems are complex yes, and heterogeneous
- Publication output (knowledge diffusion) core component
- Schizophrenia in science and innovation studies scholarly domain (autonomy vs. consultancy)
- Case for OA needs to be made from science/innovation policy space
- OA argument gains (even) greater resonance

acknowledgements



for opportunity to
speak and share findings

Thank you

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