

BANFF, CANADA September 7–11, 2014

The International School on Research Impact Assessment

Review of Theory and Frameworks

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September 8, 2014

Hosted by:



In partnership with:



Learning outcomes

- To recognize different approaches to organizing information and its relevance to RIA
- To review various research impact assessment frameworks that have been developed by others
- To assess the different characteristics and the strengths and weaknesses of different frameworks
- To provide the wear with all to develop bespoke, fit for purpose, frameworks for specific impact assessments



Outline

1. The art of conceptualization & organising information
2. Review of research Impact assessment frameworks
3. Characteristics of different frameworks



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Approaches to organising information

- By time
- By structure
- By rank
- By deductive reasoning



By time: Chronology

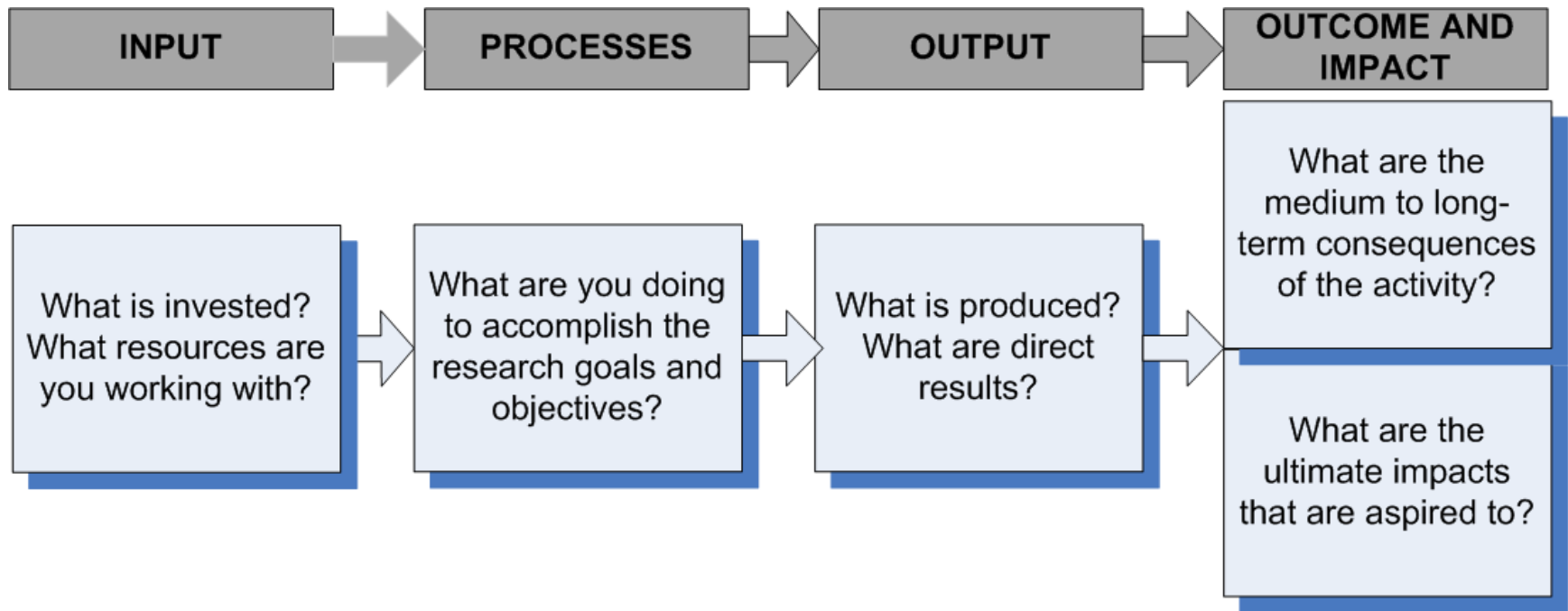


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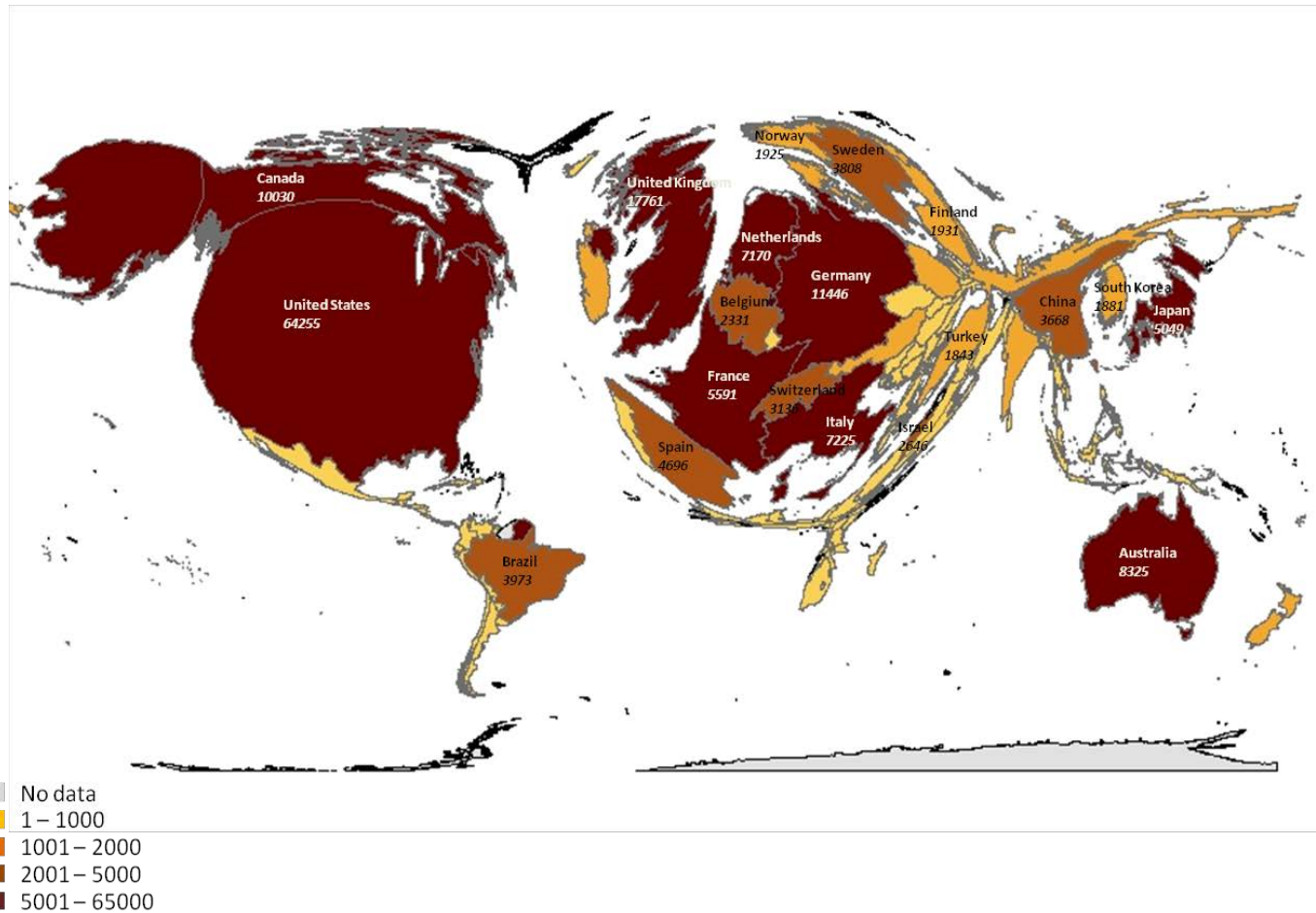
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By time: Cause-effect



By structure: Geography

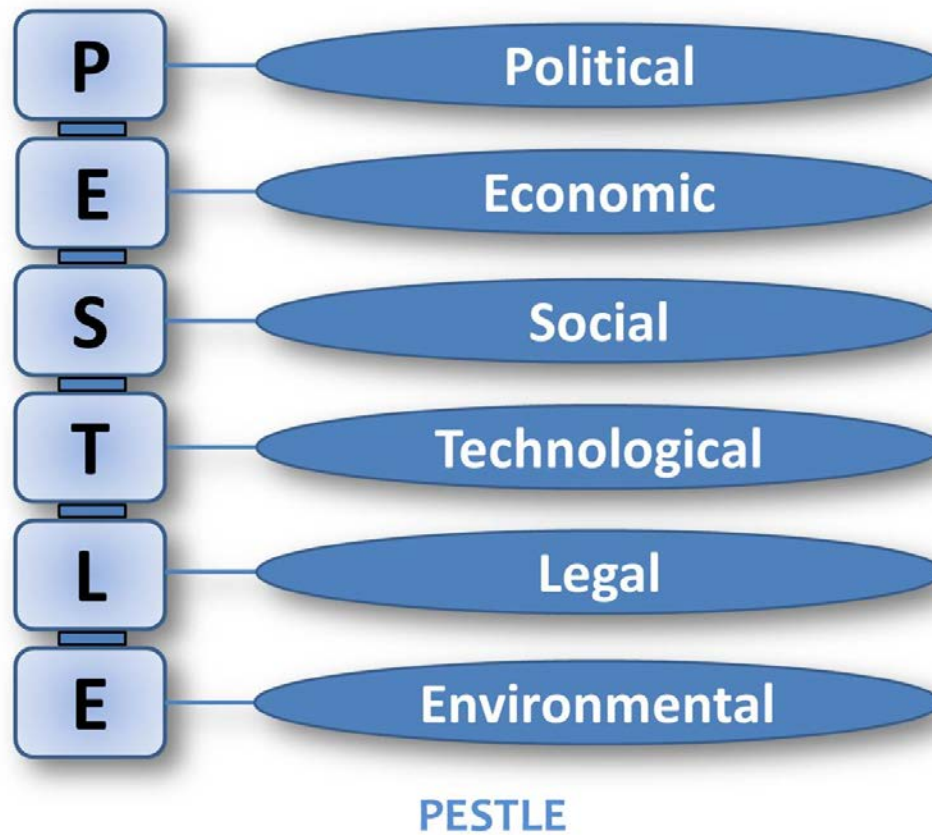


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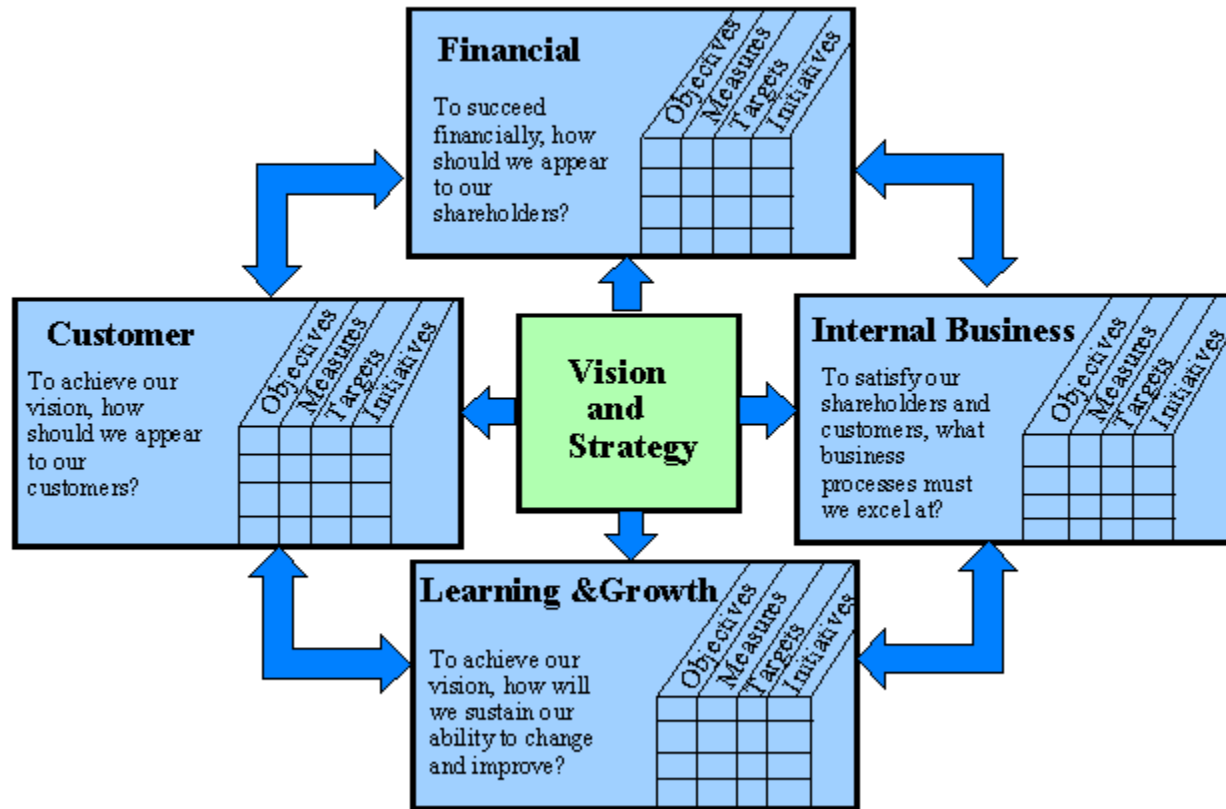


By structure: PESTLE



By structure: Function

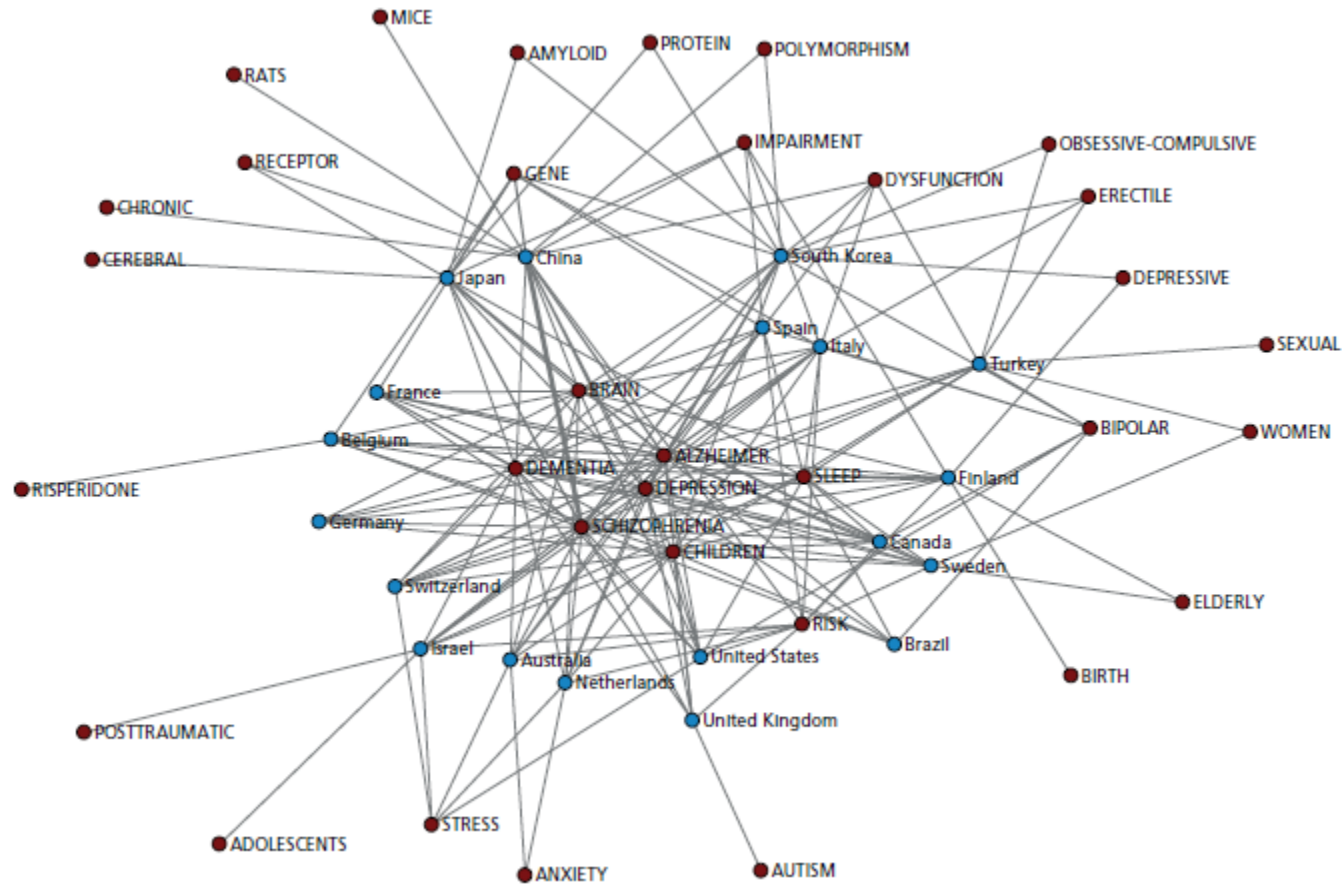
Balanced Scorecard Framework*



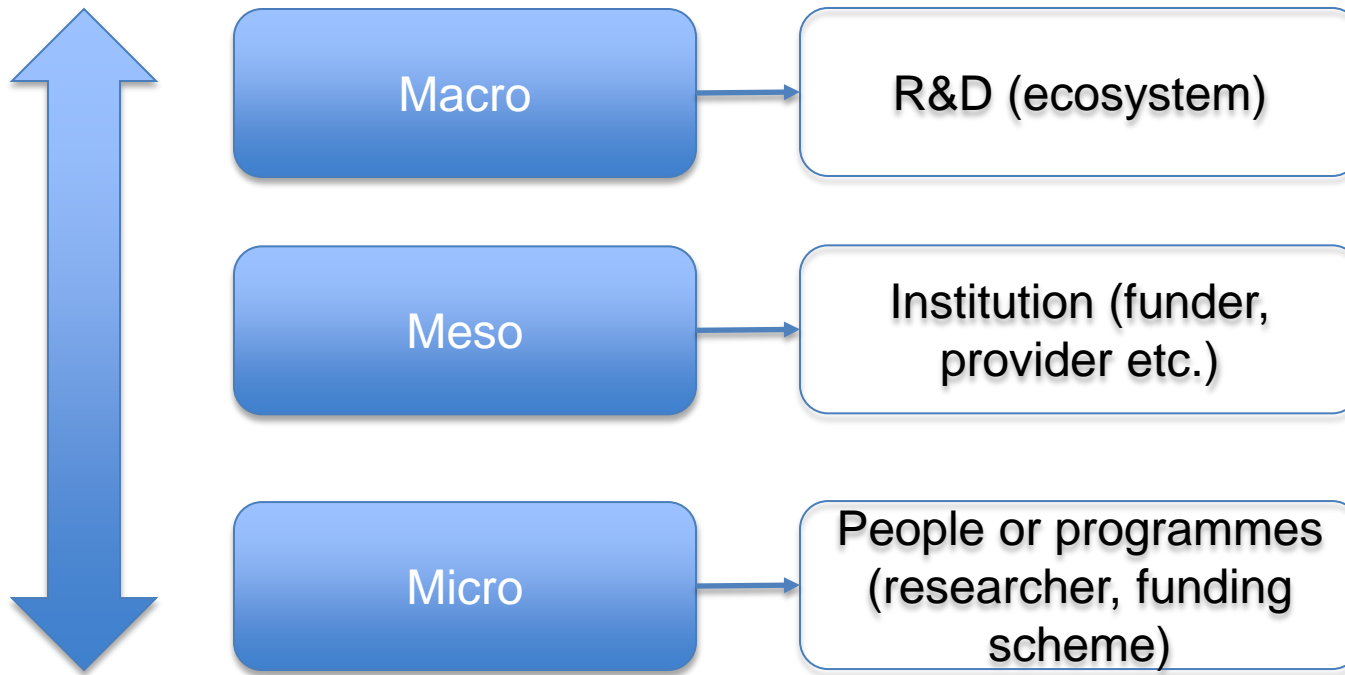
* Adapted from Kaplan & Norton 1996. *The Balanced Scorecard*. Harvard Business School Press: 9. Original from HBR Jan/Feb 1996, p. 76.



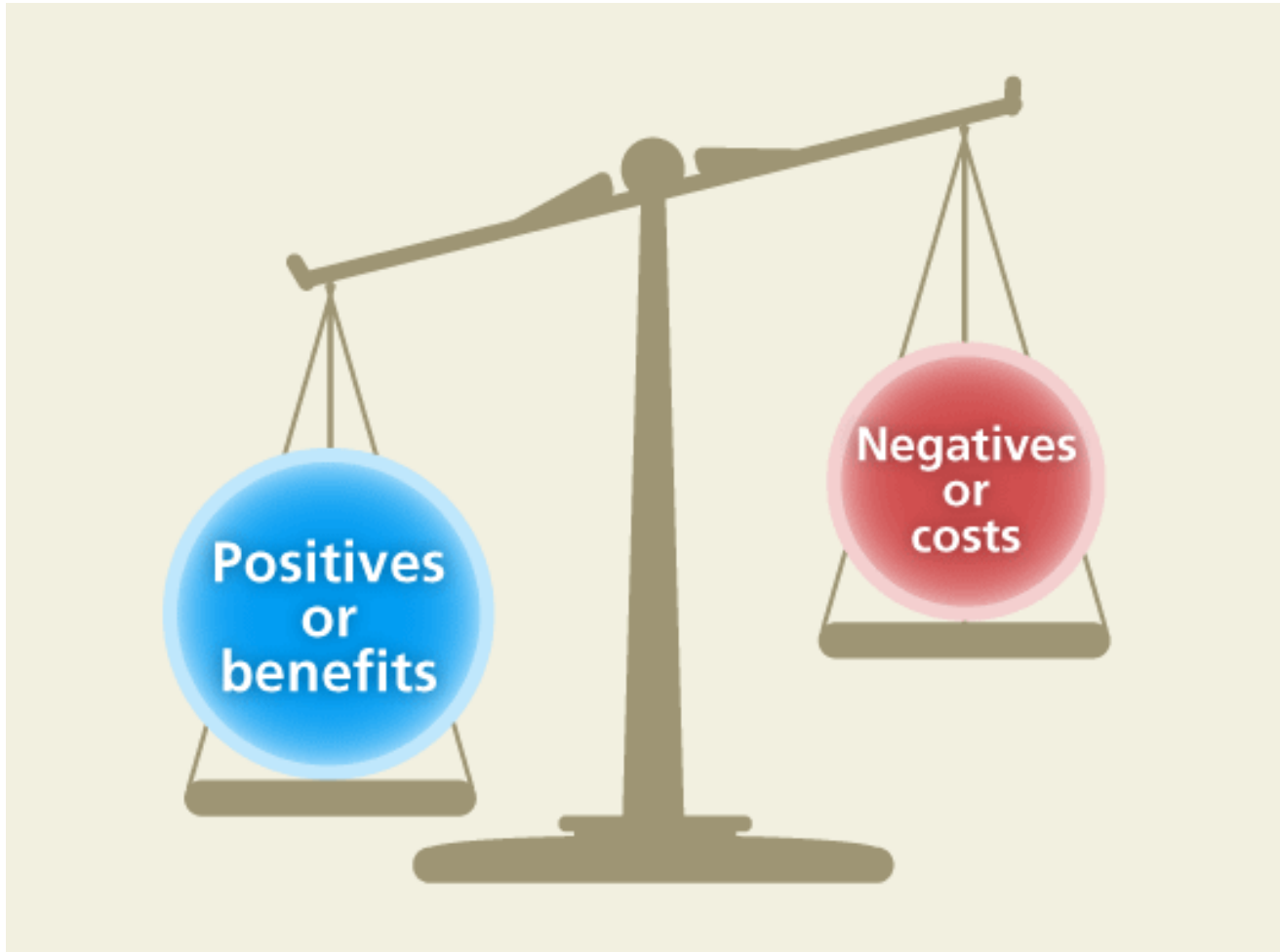
By structure: Interrelationships



By rank: Macro – meso - micro



By deduction: Cost – benefit



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Learning activity

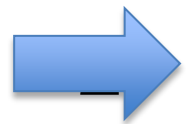


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Outline

1. The art of conceptualization & organising information



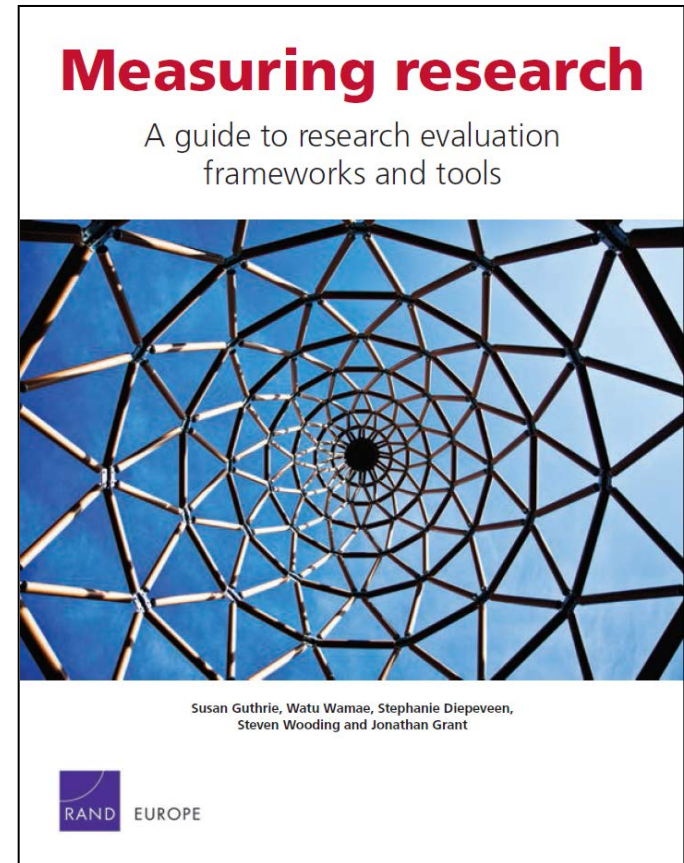
Review of research impact assessment frameworks

3. Characteristics of different frameworks



Aims of the study

- Act as a 'how-to guide' to evaluating research
 - Understand the challenges and trade-offs in evaluating research
 - Provide examples of frameworks and tools used for evaluating research internationally



Report available at: <http://www.rand.org/pubs/monographs/MG1217.html>

Webinar at: <https://www.aamc.org/initiatives/research/348948/randreportrelease.html>

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The approach

- Review of existing frameworks and tools for the evaluation of research
- Analysis of the characteristics of tools and frameworks using a factor analysis approach
- Developed decision tree to aid development of customised research evaluation frameworks



Six frameworks were reviewed ...

 **Research Excellence Framework (REF), UK – assesses performance of UK universities to determine funding allocation**

 **STAR METRICS, US – uses data mining and other low burden methods to account for federal R&D spending**

 **Excellence in Research for Australia (ERA), AU – uses bibliometrics, and other quantitative indicators, to map R&D output**

 **Canadian Academy of Health Science (CAHS), CA – aims to provide consistency and comparability while retaining flexibility**

 **National Institute of Health Research (NIHR) Dashboard, UK – provides performance management information at various levels of aggregation**

 **Productive Interactions, EU – flexible approach to help institutions learn and improve their performance against their own goals**

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... and ten tools

- Bibliometrics
- Surveys
- Logic models
- Case studies
- Economic analysis
- Peer review
- Data mining
- Interviews
- Data visualisation
- Site visits
- Document review



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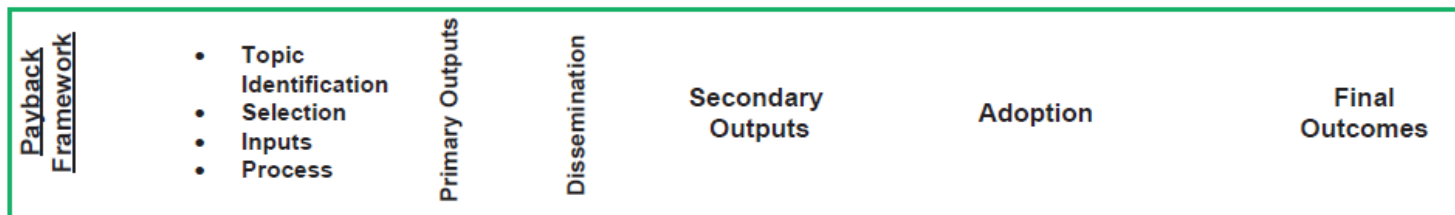
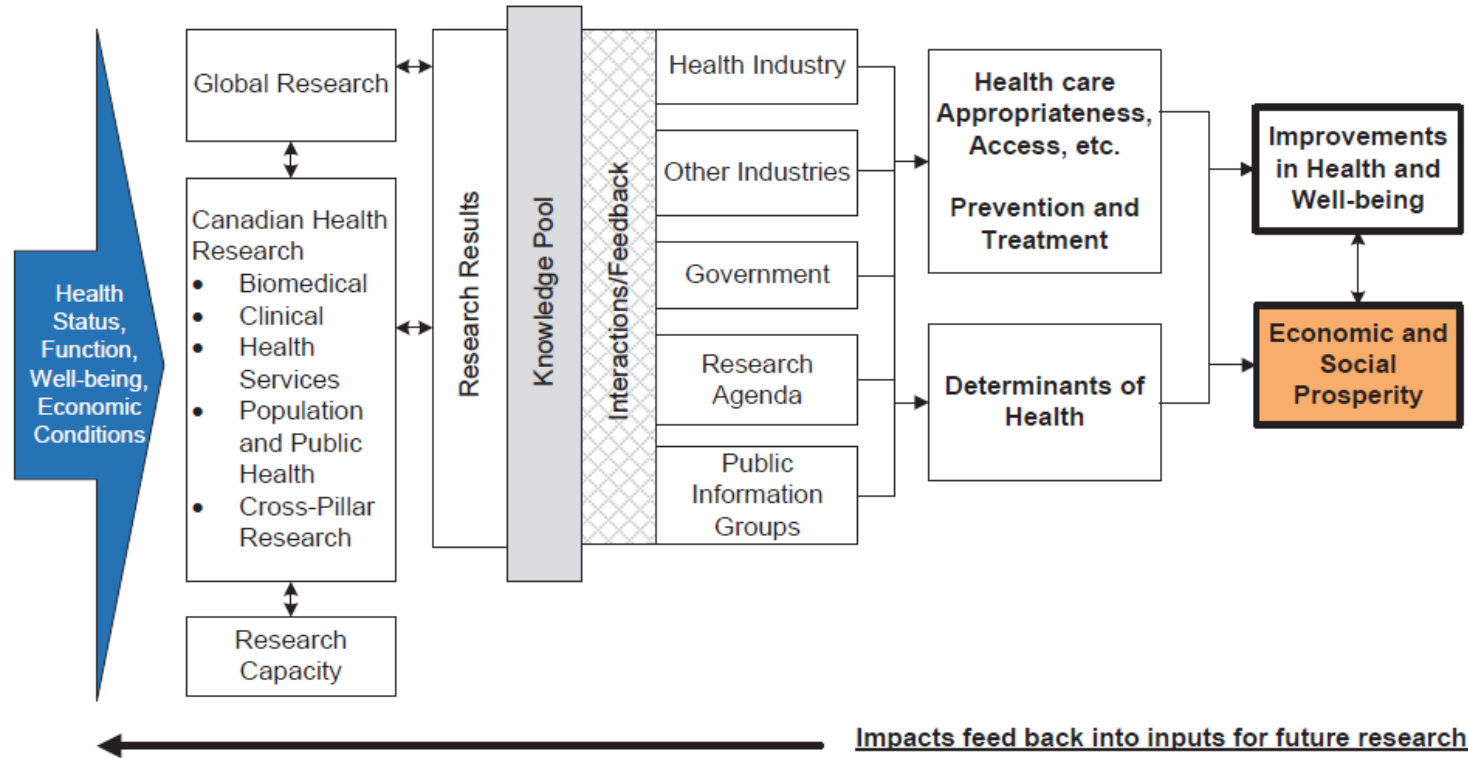
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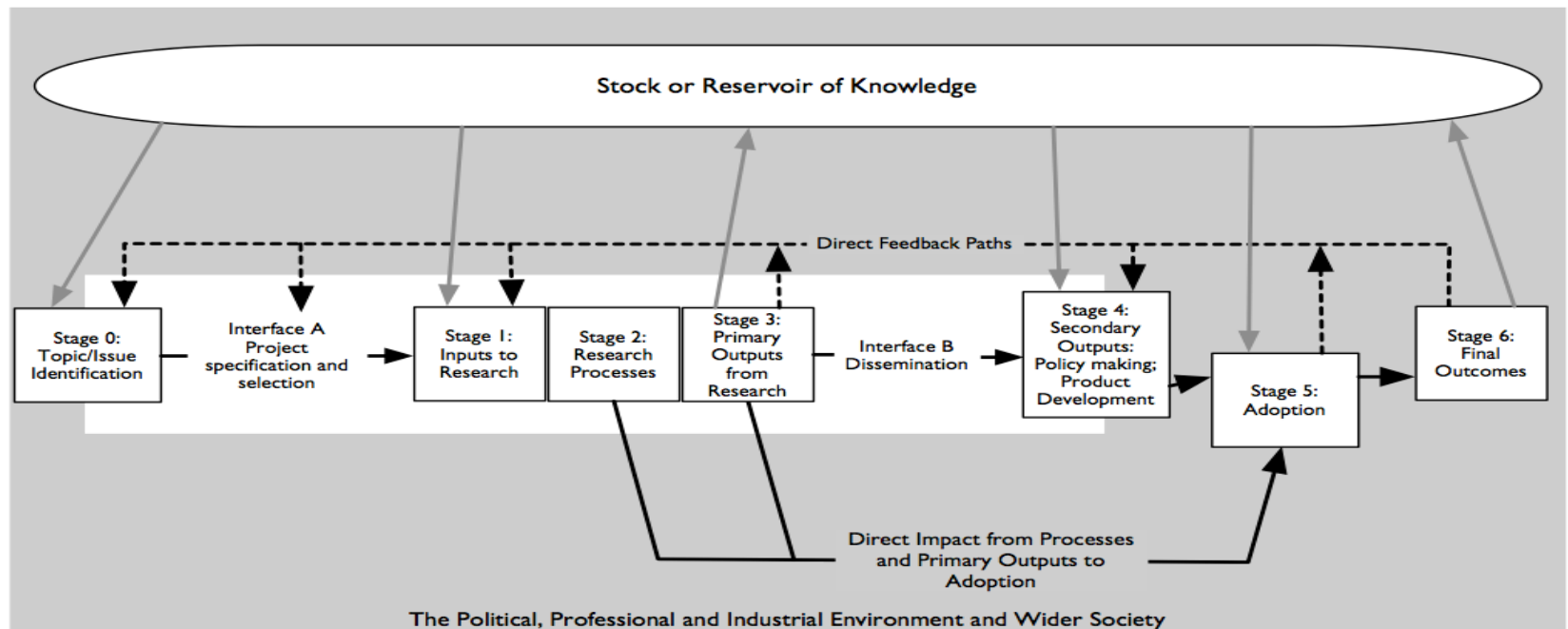
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Canadian Academy of Health (CAHS)

Initiation and Diffusion of Health Research Impacts



The Payback framework



Adapted from Hanney S, Gonzalez-Block M, Buxton M and Kogan M, The Utilisation of health research in policy-making: concepts, examples and methods of assessment. *Health Research Policy Systems* 2003, 1:2

Buxton, M., and S. Hanney. "How can payback from health services research be assessed?" *Journal of Health Services Research and Policy* 1 (1996): 35–43.



Payback categories

- Knowledge production
 - Traditionally more academic focussed, can't be used for impact
 - Can provide useful starting points to trace impact forward
 - Indicators: citation impacts; shares of publication
- Research capacity building
 - Elements which build future research capacity
 - Aids absorption of knowledge by the system
 - Indicators: Research resources; New methodologies; Career development of collaborators (outside academia); Leveraged funding



Payback categories (*cont'd*)

- Informing policy development or practice
 - Looks at impacts in both processes and policy outcomes
 - Policies and practice might change at multiple levels
 - Impacts include change in advice given by professional bodies; changes in professional practice within a sector; changes to training policies or guidelines
 - Indicators: Use of research in guidelines; Media citation analysis; Citations in advocacy guidance; Requests for research to support policy development



Payback categories (*cont'd*)

- Informing product development
 - Identify concrete steps in the commercialisation process
 - Trace proof of concept research through to clinical trials
 - Indicators: Patent citations, patent applications, contributions to website
- Sectoral benefits (health, education, environment, cultural)
 - Identifies ways that sectors and user communities have gained from the research
 - Can include impacts from broader public knowledge creation
 - Indicators: More equitable access to services; Cost-savings within a sector; Health gains; Preservation of cultural heritage



Payback categories (*cont'd*)

- **Socio-economic benefits**
 - Economic benefits from the processes of product, policy, or professional development
 - Economic benefits from a healthier or more enriched society (e.g. increased productivity, lower crime rates, healthier society)
 - Impacts affecting the welfare, profits and revenues of individuals or organisations involved in the research
 - Indicators: improved efficiency or effectiveness of services due to research; commercialisation gains; well-being measures; gains in socio-economic status of communities



Canadian Academy of Health (CAHS)

Origin and rationale:

Draws on well established 'Payback' framework. Aims to improve comparability across a disparate health research system. Covers wide range of impacts

Scope:

Five categories: advancing knowledge; capacity building; informing policies and product development; health and health sector benefits; broader economic benefits

Measurement:

Specific indicators for each category. Logic model has 4 research 'pillars': Biomedical; Clinical; Health services; Social cultural, environmental and population health

Application to date:

Used by public funders; predominantly CIHR (federal funder), but there has also been some uptake by regional organisations (e.g. Alberta Innovates)

Analysis:

Strengths: generalisable within health sector, can handle unexpected outcomes. But understanding needed at funder level - may limit uptake. Early stages hard to assess

Wider applicability:

Breadth, depth and flexibility mean framework should be widely applicable. However, it only provides a guide and needs significant work to tailor to specific circumstances



SWOT analysis for CAHS



Strengths

- Very comprehensive
- Flexible
- Developed through engagement, and has strong buy-in
- Formative
- Looks at process as well as outputs and impacts
- Concept of an indicator library
- Aligned with main funders, framework



Weaknesses

- Resource intensive
- Complicated
- Not easily comparable
- Implementation challenging
- Developed by committee
- Requires participant expertise
- Not ranking – hard to use to allocate funding
- Large burden on participants
- Not multi-disciplinary
- Definitional ambiguity between outputs and outcomes



Opportunities

- Unified but flexible approach
- Potential to build an indicator platform and toolkit
- Built on an internationally recognised framework - opportunity for international uptake and wider comparability



Threats

- No implementing owner
- Slow uptake
- Dependent on CIHR endorsement

National Institute of Health Research Dashboard

El Turabi et al. *Health Research Policy and Systems* 2011, **9**:13
<http://www.health-policy-systems.com/content/9/1/13>



HEALTH RESEARCH POLICY
AND SYSTEMS

RESEARCH

Open Access

A novel performance monitoring framework for health research systems: experiences of the National Institute for Health Research in England

Anas El Turabi^{1,2*}, Michael Hallsworth³, Tom Ling² and Jonathan Grant²



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Disbursement

- % of planned expenditure disbursed

Cost per output

- Cost per publication
- Cost per participant recruited into clinical research
- Cost per trainee

Financial governance

- Expenditure audited and signed off by NIHR

Completion

- % of research projects completed to plan
- £s spent on project extensions

Quality

- Bibliometric data for NIHR programmes, including:
Number of peer reviewed papers; Number of peer reviews

Applications

- % of research proposals achieving milestones set out in proposals
- % of trainees completing research training

- Number of people participating in NIHR trials
- % of NIHR-linked trials within 5% of recruitment plan

Budget

- Average research
- Number of passports active
- Pages accessed NIHR portal

Corporate and risk reporting

- Corporate business metrics not otherwise covered (currently being defined with DH)
- Issues escalated for monitoring by NIHR Senior Management Team

Attention

- Number of parliamentary questions relating to NIHR
- NIHR-related news stories in the national media

Reputation

- NIHR reputation surveys:
 - NHS
 - Academia
 - Industry
 - Patients and public

Impact

- Major research achievements that have the potential to improve health and social care - highlights and milestones

The Dashboard is incorporated into MIS



NIHR Dashboard

Origin and rationale:

Aim is to develop a small but balanced set of indicators to support strategic decision making, monitoring performance on regular ongoing basis

Scope:

Data collected quarterly at programme level on inputs, processes, outputs and outcomes for 3 elements – financial, internal process, and user satisfaction

Measurement:

Programme specific data can be pooled to provide a system level dashboard. 15 indicators selected, matching core aims, collected quarterly

Application to date:

Launched July 2011 NIHR-wide, with data to be provided by the four coordinating centres, analysed and aggregated centrally

Analysis:

Designed to fit strategic objectives, so in that sense likely to be effective. However, only just launched, so detailed analysis premature

Wider applicability:

Should be applicable to other national health research funders. Performance indicators selected can be tailored to assessment needs



SWOT analysis for NIHR

Dashboard



Strengths

- Aligned with institutional goals
- Bespoke
- Formative
- Can be used for monitoring (frequent assessments)
- Wide applicability
- Strong theoretical basis
- Comparable
- Focused and selective set of indicators
- Indicator set is balanced
- Continuous burden (not episodic)



Weaknesses

- High central burden
- Bespoke
- Reliant on information management systems
- High up from burden
- High level of central expertise required
- Not comprehensive if incorrectly used – it only monitors the indicators you select
- Continuous burden (not episodic)
- Not multi-disciplinary



Opportunities

- Flexibility may allow use across multiple institutions
- Useful at many levels



Threats

- Scalability across multiple institutions not demonstrated
- New and not fully implemented

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Broken Link designed by Stephen JB Thomas from The Noun Project

Learning activity




- In small groups, discuss one of the remaining frameworks or a framework you are familiar with
 - UK REF, US Star Metrics, EC Productive Interactions
- Review its characteristics
- Identify its strengths, weaknesses, opportunities and threats
- Fill in the A1 sheet and stick to 'wall'



Outline

1. The art of conceptualization & organising information
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 Characteristics of different frameworks



Key findings of analysis

- There is no silver bullet
- The framework should be designed based on the purpose of the evaluation
- Research evaluation tools typically fall into one of two groups
- There is a range of possible units of aggregation
- There are some perennial challenges to research evaluation that need to be addressed
- Research evaluation approaches need to suit their wider context
- Implementation needs ownership and the right incentives and support



There is no silver bullet

Designing a research evaluation framework requires trade-offs:

- Quantitative approaches tend to produce longitudinal data, do not require judgement or interpretation and are relatively transparent, but they have a high initial burden
- Formative approaches tend to be comprehensive, evaluating across a range of areas, and flexible, but do not produce comparisons between institutions
- Approaches that have a high central burden tend not to be suitable for frequent use
- Approaches that have been more fully implemented tend to have a high level of central ownership
- Frameworks that place a high burden on participants require those participants to have a high level of expertise (or should provide capacity building and training to achieve this)

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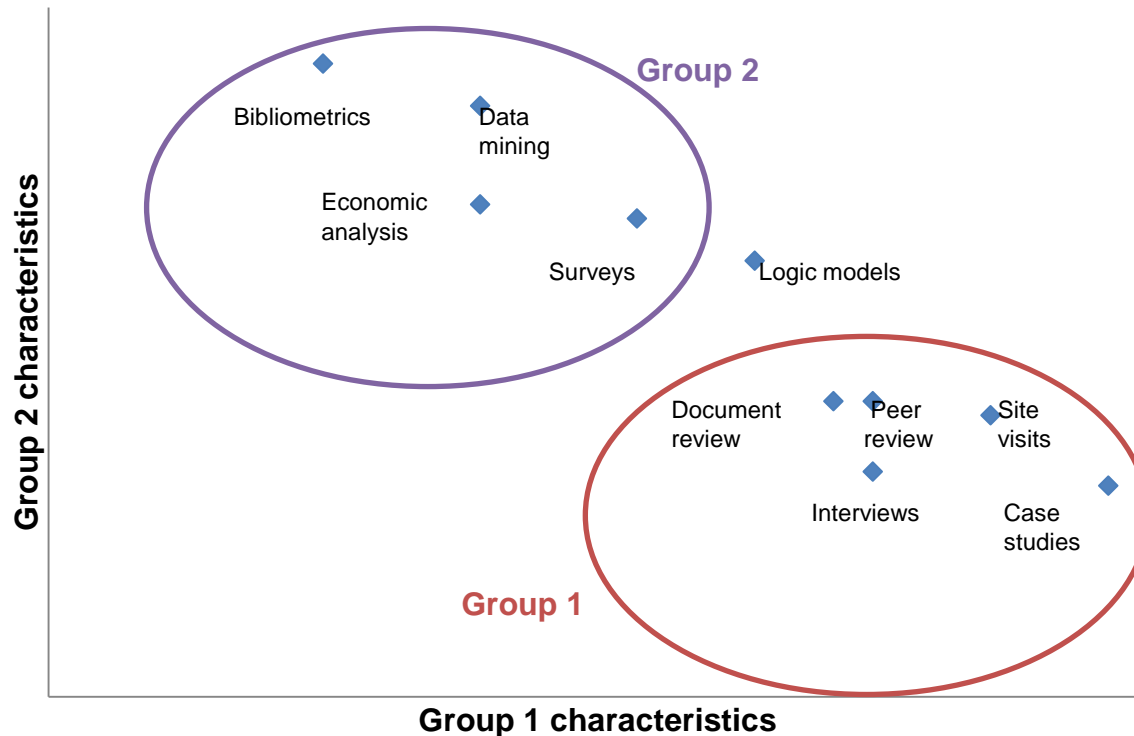


The framework should be designed based on the purpose of the evaluation

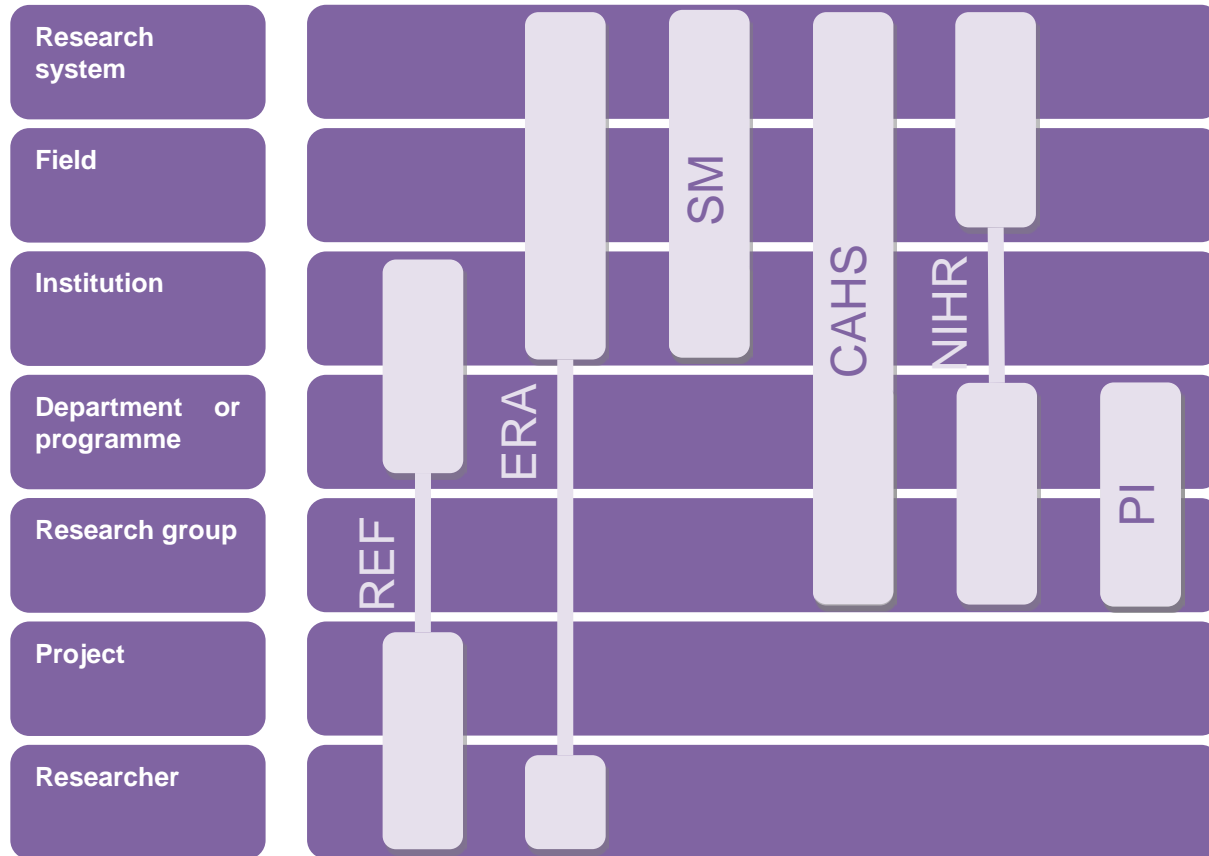
- **Analysis:** What works in research funding?
- **Advocacy:** 'Make the case' for research funding
- **Accountability:** To taxpayer, donors, etc.
- **Allocation:** What to fund (institution, field, people ...)



Research evaluation tools typically fall into one of two groups



There is a range of possible units of aggregation



There are some perennial challenges to research evaluation



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Research evaluation approaches need to suit their wider context

- Acceptability and credibility
- Differences between countries
- Need to ensure framework does not discriminate

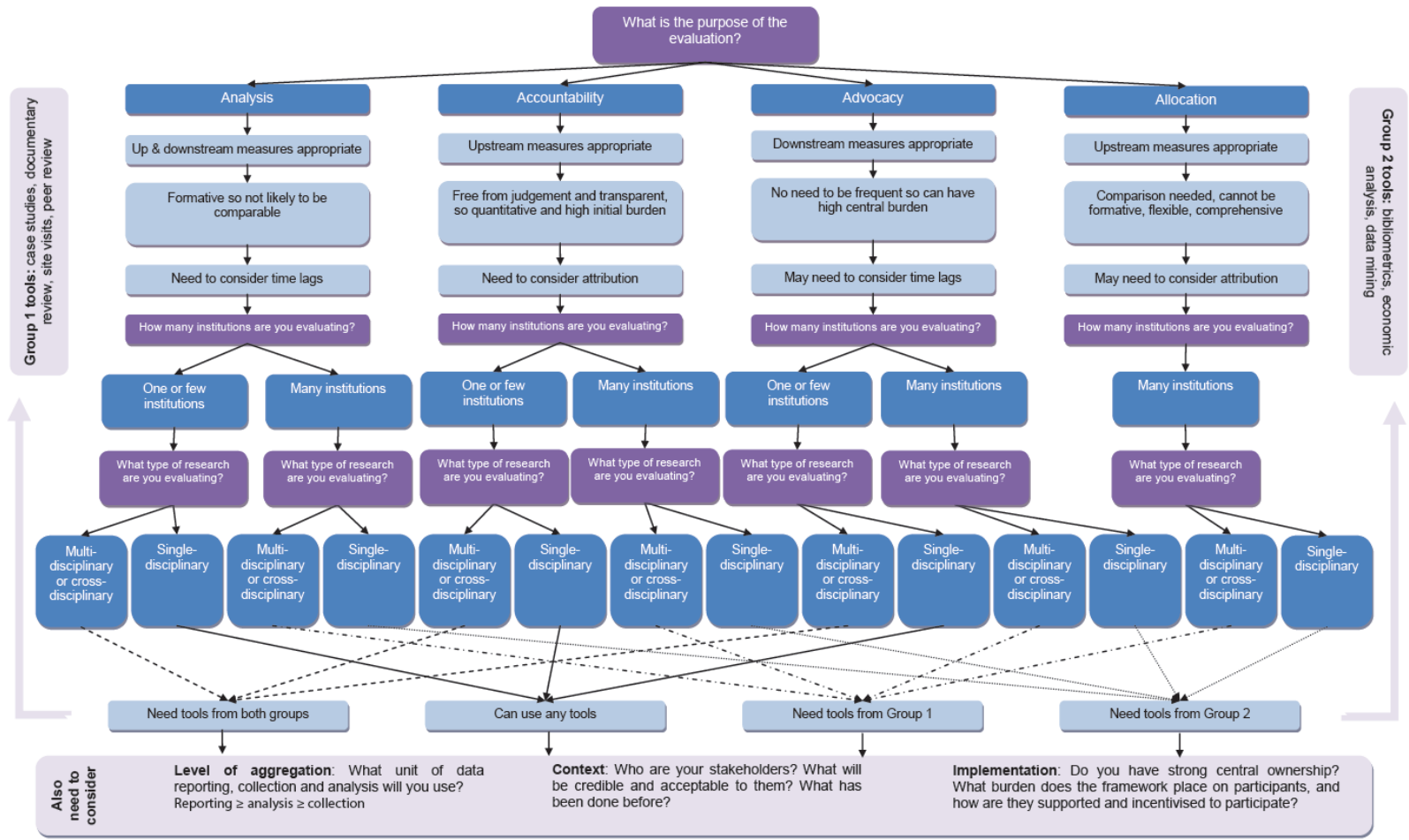


Implementation needs ownership, the right incentives and support

- Where compulsory, the challenge is to obtain support from the academic and wider community
- Where participation is voluntary, incentives need to be in place to promote and sustain uptake
- In both cases, participants need to be given the skills necessary for the process, through simplicity, training or a toolkit
- In all cases, strong central ownership is needed for effective large-scale implementation



A decision tree for developing a research evaluation framework



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A decision research

What is the purpose of the evaluation?

are so not likely comparable

Need to consider time lags

How many institutions

What type of research are you evaluating?

One or few institutions

disciplin

Single-disciplinary

Need tools from both groups

Level of aggregation: V

Allocation

as appropriate

Down

need to consider time lags

May need to con

How many institutions are you evaluating?

How many institutions are you evaluating?

One or few

Many institutions

Many institutions

What type of research are you evaluating?

Multi-disciplinary or cross-disciplinary

Single-disciplinary

Group 2 tools: bibliographic analysis, content analysis

to?

stakeholders? What will be possible to them? What has

Key messages

- Know why you are assessing research impact
 - What is the objective of the research evaluation?
- Use a ‘multi-method, multi-dimensional’ approach
 - Don’t rely on one method (e.g., bibliometrics)



Key messages (*cont'd*)

- (Research) impact assessment is not easy
 - No (research) funder has the answer
- Need to move from advocacy to accountability
 - Need ‘science of science’ to understand what works
 - Need a practical evidence base for science policy
 - Need to ‘walk the talk’



Questions and discussion



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Recommended readings

Morgan Jones, M and Grant J (2013). *Making the Grade. Methodologies for Assessing and Evidencing Research Impact. 7 Essays on Impact.* DESCRIBE Project Report for Jisc. University of Exeter / Dean et al. (eds.) (Exeter, UK : University of Exeter, 2013), p. 25-43.

[http://www.exeter.ac.uk/media/universityofexeter/research/ourresearchexcellence/describeproject/pdfs/2013_06_04_7_Essays_on_Impact_FINAL.pdf]

HEFCE (2011) *Assessment Framework and Guidance on Submissions*, REF 02.2011, Higher Education Funding Council for England, Scottish Funding Council, Higher Education Funding Council for Wales and Department for Employment and Learning, Northern Ireland. [<http://www.ref.ac.uk/>]

ARC (2010) *Excellence in Research for Australia: ERA 2010 Evaluation Guidelines*, Australian Research Council.

[http://www.arc.gov.au/era/era_2012/outcomes_2012.htm]



Recommended readings (*cont'd*)

El Turabi A, Hallsworth M, Ling T and Grant J (2011). A novel performance monitoring framework for health research systems; experiences of the National Institute for Health Research. *Health Research Policy and Systems*. 9:13. [<http://www.health-policy-systems.com/content/9/1/13>]

Guthrie, S, Wamae, W, Diepeveen, S, Wooding, S and Grant, J (2013). *Measuring Research: a guide to research evaluation frameworks and tools*. RAND Europe, Cambridge (MG-1217-AAMC). [<http://www.rand.org/pubs/monographs/MG1217.html>]

Spaapen, J. and Van Drooge, L. (2011) 'Introducing "Productive Interactions" in Social Impact Assessment', *Research Evaluation*, Vol. 20, No. 3, pp. 211–218.

CAHS (2009a) *Making an Impact: A Preferred Framework and Indicators to Measure Returns on Investment in Health Research, Report of the Panel on the Return on Investments in Health Research*, Canadian Academy of Health Sciences. [http://www.cahs-acss.ca/wp-content/uploads/2011/09/ROI_FullReport.pdf]



Thank you!

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