

**FRAMEWORK GUIDELINES FOR THE
PROOF OF CONCEPT METRIC**

Developed by the Proof of Concept Advisory Group in collaboration with the
Science Industry Action Agenda
- a joint initiative of
Science Industry Australia Inc. and the
Department of Industry Tourism and Resources and the
Department of Education, Science and Training

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Background

A strong national innovation system contributes to Australia's sustainable economic, social, cultural and environmental development by providing the means for developing skills, generating the ideas for innovative products, processes, business models and services, and turning them into commercial, social cultural and environmental success.

To meet emerging global challenges and ensure the Australian science industry's sustainable competitive advantage, the Science Industry's strategic plan aims to commercialise more Australian publicly funded research. An impediment to achieving this aim is the relative lack of high quality evidentiary documentation accompanying research at the proof of concept stage that potential investors can use to assess the marketability of the concept more accurately. This was an issue in the Australian Bureau of Statistics (ABS) 2004-05 Survey of Venture Capital in Australia which found that only a small percentage of proposals for venture capital financing were successful – 140 venture capital managers reviewed 10,199 potential investments and conducted further investigation on 1,094 of these, with 176 being sponsored for venture capital. This finding is consistent with the earlier ABS surveys. The Productivity Commission in its draft research report on its review of public support for science and innovation said that establishing the level of evidence likely to be required by potential investors could reduce search and transaction costs and improve the level of analysis of projects (PC pp. 6.35 – 36).

A proof of concept is a body of work that demonstrates the attractiveness of taking an innovative idea into commercial development.

This impediment is often referred to as the innovation gap between researchers and the market. Australia's universities, publicly funded research agencies (PFRAs) and industry readily acknowledge the gap's existence. To bridge the gap and improve the conversion rate of ideas into things that are marketable, the Science Industry identified that universities and PFRAs should be encouraged to improve the quality of documentation accompanying proof of concept work.

An appropriate metric would enable the examination of bodies of work that constituted a proof of concept and the public recognition of having achieved 'proof of concept' status.

A metric is a system of parameters, procedures to conduct such measurement, and procedures for interpreting the assessment. The Department of Education, Science and Training has done significant research into commercialisation metrics. These framework guidelines operationalise a metric for proof of concept.

The formal recognition of proof of concept outputs from universities and PFRAs would encourage the changes in the same way that the bibliographic metric and citations have encouraged researchers to publish their research and consequently improve research quality.

Proof of concept is a measure of research quality and impact. Research quality includes intrinsic merit and academic impact. Academic impact includes peer recognition and the impact of the research on the same or related discipline area. Research impact relates to the successful application of the idea and its recognition by qualified end-users of the idea's economic, social, environmental and/or cultural benefit to them. Industry / community engagement is important for the validation of a proof of concept's quality and impact.

Because of its position at the applied end of the research spectrum, proof of concept is an intermediate measure of the conversion rate of ideas into marketable products, processes, business models and services. It provides more immediate feedback on the marketability of a concept than the downstream results of a successful proof of concept such as:

- ∞ A license for the innovation, or an option to license it;
- ∞ Market based milestones to guide further development;
- ∞ Sale of the technology to an established company;
- ∞ A spin-off company from the research institution; and / or
- ∞ A new high growth start-up company.

To progress the development of a proof of concept metric, the SIAA formed the Proof of Concept Advisory Group to develop a set of *framework* guidelines for a metric. The Advisory Group comprised senior leaders of the Government's peak research institutions Australian Research Council and Australian Vice-Chancellors Committee, along with commercialisation intermediaries and industry – see **Attachment A** to these guidelines for details.

The *framework* guidelines given below are based on guidelines from:

- ∞ Scottish Proof of Concept Program;
- ∞ NHMRC Development Grants Program;
- ∞ ARC Linkage Grants Program;
- ∞ University of Sydney Innovation Challenge; and
- ∞ Monash University medical faculty.

Issues - the metric

Proof of concept is achieved when research is taken to a stage where the risk / reward profile enables the potential users of the idea to consider making an investment to develop the concept further. For this purpose, the proof of concept evidence in the form of a document includes: comparisons of the work to 'gold standards' (i.e. better than the alternatives in the relevant model system); cost / benefit and risk / reward estimates for the commercial use of the idea; the market attractiveness or potential for end-user acceptance; and the potential path(s) to market.

The metric for a proof of concept proposed for universities and PFRAs is based on the evidence outlined above and includes:

- ∞ A clear description of the concept to be proven.
- ∞ A well constructed design for proof of concept testing that yields reproducible results, and addresses the needs of the appropriate investment market.
- ∞ Results of searches and analysis to determine the ownership of intellectual property rights of the technology relevant to the concept, and consequently protectability and freedom to operate.
- ∞ A cost / benefit analysis that provides an initial estimate of the costs to develop the concept versus the likely rewards. The rewards (impact) could include economic, social and environmental benefits, or public goods.
- ∞ Evidence that the market or end-user opportunity for the concept proof is real and demonstrable. Primarily, this could take the form of feedback from potential licensees or investors, letters of support from an industry partner (private or public sector), an executed transaction such as a licence agreement, or an option to licence. A secondary alternative could be a substantial review of the market and industry needs, and challenges where the proven concept may be applied.

- ∞ A clear description of the strategy for commercial exploitation of the proven concept that is realistic in terms of the market opportunity targeted and its market relevance at the time the product, process, business model or services is anticipated to be available, given the known current state of the market (this would require further specification for each institution and for particular technologies).
- ∞ Results of an analysis of competitors including those in the pipeline, those in commercial use, and those described in the patent literature that makes clear that the concept overcomes the limitations of the alternatives / competitors.

As it might be argued that the above information requirements could be too onerous for a researcher to provide to an assessment body in a university or PFRA for a proof of concept determination, the metric could be based on the above framework.

It is expected that universities and PFRAs would adopt and extend these guidelines to reflect their needs, experience and the nature of the particular research, e.g. biotechnology, engineering and manufacturing, medical, information technology, telecommunications, commerce and the social sciences. Examples of proof of concept reporting are given in **Attachment B** to these guidelines.

The introduction of a proof of concept metric would not require significant changes to governance arrangements at universities and PFRAs to encourage improved documentation of proofs of concept. Rather, the metric codifies and clarifies processes that already exist in universities.

Deliverable

The deliverable is a proof of concept document conforming to the required format and content. This document enables the appointed assessors to validate the inputs, and to compare and prioritise a number of successful proof of concept assessments.

Arrangements would be required to ensure confidentiality of the intellectual property. The university or PFRA commercialisation arm would have the necessary arrangements in place.

To ensure the confidentiality of the intellectual property, the appropriate assessment body would award 'proof of concept' to the applicant whilst not disclosing the full details of the evidence.

Validating the results

To ensure consistency between universities and PFRAs, the assessment system would be self-moderating in the same way that bibliographic metrics became collectively self-moderated by universities a year or so after that system commenced operation. For self-moderation to work, universities and PFRAs would make public the results of their proof of concept assessments. If an assessment body awarded proof of concept to a relatively large number and percentage of projects, and subsequently a relatively small number and percentage of these projects went on to further commercialisation steps, questions would be asked about the quality of that assessment body's assessment process.

Assessment resources

The development and management of proof of concept processes could be a role for university commercialisation arms.

The people best equipped to make the assessment of a proof of concept would be industry / commercial entities who would be potentially interested in investing in the product, process, business model or

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service, and commercialisation intermediaries. However, given the difficulty of forming and running a 'panel of industry experts' to conduct the assessments, an alternative could be an assessment body nominated by the university or PFRA and drawn from its commercial arm and the broader community.

**ATTACHMENT A TO
FRAMEWORK GUIDELINES**

PROOF OF CONCEPT ADVISORY GROUP

Emeritus Professor Chris Fell, AM (Chair)

Dr Andrew Baker, representing Brigitte Smith, Managing Director GBS Venture Partners Limited

Professor Mark Baker, CEO, APAF

Peter Batchelor, Chief Operating Officer, Monash Commercial Pty Ltd

Phil Binns, Managing Director, Varian Australia Inc.

Dr Mark Bradley, CEO, ATP Innovations

Andrew Davis, Group Manager Technology Commercialisation,

representing David Henderson, Managing Director, UniQuest Pty Ltd

Dr Rowan Gilmore, CEO, Australian Institute of Commercialisation

Grant Kearney, CEO, InnovationXchange

Dr Ian Mackinnon, Executive Director, Australian Research Council

Andreas Molt, Assistant Director Policy and Analysis, AVCC

Michael Panaccio, Investment Principal, Starfish Ventures

Greg Redden, Business Strategy Manager, CSIRO

Ian Beckingham, Manager, Department of Industry, Tourism and Resources (Secretary)

**ATTACHMENT B TO
FRAMEWORK GUIDELINES**

EXAMPLES OF PROOF OF CONCEPT REPORTING

**Adelaide Hills Vineyard Contractors – increasing vineyard yields
Australian Institute of Commercialisation TechFast Case Study**

AHVC_140606.pdf

**Advanced Technology Systems Australia – exploring and monitoring below sea level
Australian Institute of Commercialisation TechFast Case Study**

ATSA_140606.pdf

Many other examples of research that could also be considered close to proof of concept are contained in the ‘Big Book of Ideas’ produced for the Commercialisation Expo 2006 held in Melbourne in June.

iPod casts from ATP Innovations can be found at <http://www.indialogue.com.au/>

See March 2006: G2 Microsystems, TIL Ltd

April 2006: Medsaic, Packaged Environmental Solutions

May 2006: Howard Partners

June 2006: CDCS