

Conducting a State-of-the-Art Review - A Guide

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In the rapidly evolving world of research and development, conducting a state-of-the-art review is paramount to identify advancements in core technologies and methodologies. The ReaDI-Watch State-of-the-Art Funnel provides a systematic approach to this intricate process.

A Paradigm Shift in New Knowledge Creation

The world of "Knowledge", and "Knowledge Creation" is in complete transformation. AI is completely disruptive. New issues and challenges are emerging around ownership of "Knowledge and IP" and "New Knowledge" created through R&D - this makes it more challenging for companies to claim that their R&D work is owned by them!

Dealing with "Tacit Knowledge"

In companies, all too often, knowledge is "Tacit" - stored in the minds of strong team members. Part of ReaDI-Watch's mission is to bring this tacit knowledge out to the team, for many reasons - not least to support that the R&D work the business is undertaking is qualifying!

A State of the Art Review is required for R&D Tax Credits!

By way of example, see below the requirements across different countries, to ensure that a State of the Art Review is needed to conduct qualifying R&D.

State of the Art : International Guidelines

Ireland

Records required to be maintained to satisfy the science test:

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(e) Evidence that the scientific or technological advance(s) sought had not already been achieved and that the scientific and/ or technological uncertainties that the company was seeking to overcome were not already resolved or that such resolution would not be available to a competent professional working in the field, for example, evidence that a comprehensive literature review to determine the current status of scientific or technological knowledge in the area had been conducted prior to commencing the project.

Canada

Consideration must be given to the scientific or technological knowledge base and the business environment of the individual company...It is expected that any company making a claim for SR&ED will have or will access the expertise necessary to carry out that work. The resources within the company include:

- technical knowledge, education, training, and experience of its personnel; and
- its technical capabilities typified by its current products, techniques, practices, and methodologies (for example, trade secrets and intellectual property).

Publicly available sources generally include scientific papers, journals, textbooks, and internet-based information sources as well as expertise accessible to the company (for example, through recruiting employees or hiring consultants or contractors). The company is expected to have information that is common knowledge at the time the work is performed. Common knowledge is knowledge available to professionals familiar with the specific areas of science or technology in question.

Australia

Supporting R&D activities are activities that are not part of the experimental activities, but directly support them.

Supporting R&D Activity: Literature and knowledge review

Activities which do not form part of the experimental activities may be eligible as supporting R&D activities. As in the BioMine example, companies may register supporting R&D activities that are directly related to a core R&D activity. 'Directly related' requires an activity to have a direct, close and relatively immediate link, association, connection or relationship with one or more core R&D activities

United Kingdom

Show that a professional in the field could not work this out. You should explain why a professional could not easily work out your advance. You can do this by showing that other attempts to find a solution had failed. You can also show that the people working on your project are professionals in that field and get them to explain the uncertainties involved....

...The R&D activity starts when you begin working to resolve the uncertainty. You'll need to identify the technical issues that need to be resolved, and make sure there is not an existing solution that has already been worked out.

...If a particular advance in science or technology has already been made or attempted but details are not readily available (for example, if it is a trade secret), work to achieve such an advance can still be an advance in science or technology.

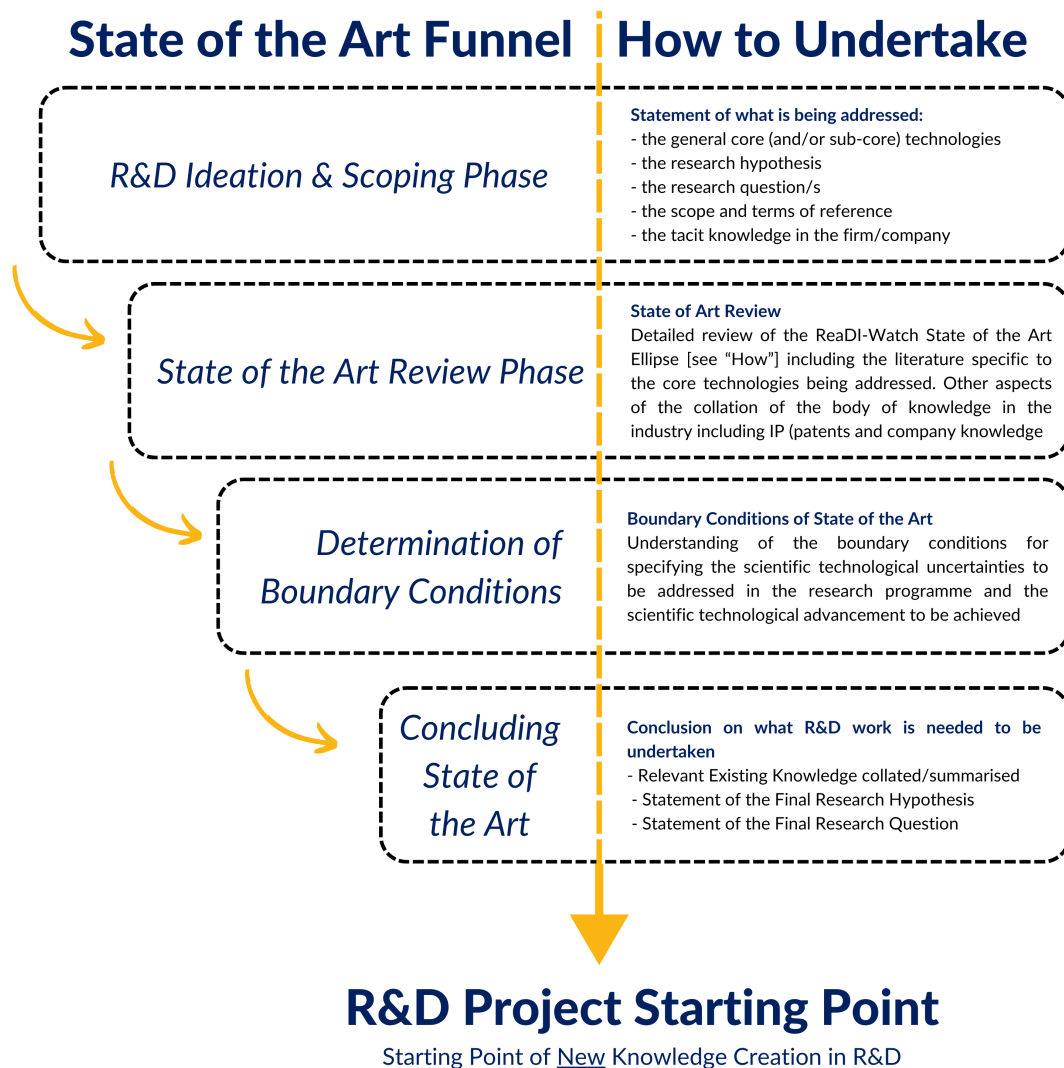
[Irish Revenue Guidelines, Canadian SRED Guidelines, Australian Business R&D Tax Incentive, UK R&D Tax Reliefs]

Different countries' guidance on R&D Tax Credits - demonstrating that a state of the art review is necessary for qualifying R&D

State of the Art Funnel Approach

State of the Art refers to the frontier of publicly available knowledge in science and technology. To determine if a project meets the requirements for qualifying R&D, you must determine if the project advances beyond the known State of The Art in the particular field of research of the project.

As seen in the image below, ReaDI-Watch approach the State of the Art in a "Funnel" approach. Using the funnel approach, the State of the Art is broken out into several phases, each getting closer and tighter in scope to addressing what R&D work needs to be undertaken in order to create new knowledge in the field of science of technology.



ReaDI-Watch's "State of the Art Funnel" Approach

On ReaDI-Watch platform, you can use the State of the Art toolkit to follow the above process. For more detailed guidance and examples (ReaDI-Watch customers only), see [here](#).

Converting a Customer Challenge into a Research Hypothesis

It can be very challenging, when faced with a customer challenge, to understand the challenge as a "Research hypothesis". Engineers are solution focused, and solve problems when working in industry! However, instead of thinking about the customer challenge and solution specifically, in order to conduct a robust state of the art review, consider the "Research hypothesis" as a core technology hypothesis, rather than a focused customer solution:

[Classifying & Managing R&D in Companies using the Core Technologies Framework](#)

See an example here: [Grant Engineering - Innovation and Excellence in Heating Solutions](#)
