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The Way Ahead

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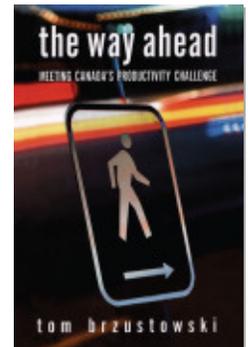
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Glossary

Basic research: research whose goal is only discovery, or seeking the answers to important unanswered questions about nature, about humans, and about humans in nature; basic research is generally organized as a program of investigation which can change as discoveries are made along the way.

Commercialization: the process of bringing a product (good or service) to market to create wealth

Creativity: the ability to look at something that others have been looking at and to see something new, and then to make that new perception apparent to others—creativity is expressed in the arts and letters, in design, in research ...

Design: the creative process of solving the problem of meeting a specified human need under a set of constraints, such as a limit on cost, compatibility with existing systems, safety regulations, ergonomic requirements, etc. The output of design is a proposed realization of an artifact or system, its functioning, its structure, and its physical form. Its quality is measured by its functionality in meeting the need, and by attributes such as reliability, convenience in use, and esthetic appeal.

Development: the activities required to turn an idea or an invention into a product ready to be sold and used; design and testing are always involved.

Engineering: the professional activity of creating artifacts and systems to meet people's material needs, with **design** as the

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central process, **scientific knowledge** and **economic** considerations as its essential inputs, and public safety as its overriding responsibility.

Innovation: a generic term describing the two-part process of **having an idea** and **putting it into action**, or the result of that process. In our context, it's the process of creating a new product and bringing it to market. In that case, the idea takes the form of an **invention** and putting it into action is **commercialization**.

i.e., **innovation = invention + commercialization**

Invention: an idea conceived to meet a need together with the practical means by which it can be implemented.

Project research: research done to help solve a specified practical problem, often encountered in industry, that cannot be solved with existing knowledge; the research is organized as a project, with a schedule, a budget, a management structure, progress reports, etc.

R&D: the acronym for research and development, two closely related but very different activities; a label that aggregates them, often used in statistical reports and in policy documents.

Research: the process of learning what is not yet known by anyone, anywhere.

Science: the social system for creating new knowledge that involves three sequential and interrelated activities: **research** conducted according to the scientific method, **debate** to determine which results of research should be accepted as fact, and finally **predictions** based on facts. **Science** can also be used to denote the accumulation of scientific facts in a certain field.

Technology: the set of materials, tools and procedures that **predictably and reproducibly** combine to produce a specified desired effect in the material environment.