

Benchmarking Research

Benchmarking was defined in 1976 as the study of a competitor's product or business practices in order to improve the performance of one's own company.

Here we define **"benchmarking research"** as **a process for rapidly learning the essence of a desired field of knowledge with an interest in finding its leading edge.**

The purpose of benchmarking should be to get overall background of an area of knowledge, plus knowledge of the state of the art and who is advancing it, and what principles drive this problem. Benchmarking may be performed at the System Level, where complete systems similar to the given product would be evaluated. The process may also be applied at the Functional Level, where individual critical functions would be evaluated.

It should follow several trajectories:

1. Principles:

Textbooks (authors) Find textbooks related to the area, and find where and what the authors are publishing now.

Patents (authors, claims, drawings): Patents require the authors to describe their inventions, and have drawings that explain how they work. See cobrain.com

Formulas: Find formulas that describe basic relationships.

Rate of getting x vs. giving up y: Especially helpful are equations that define tradeoffs between cost and performance. Plot the relationships among the metrics to gain insight into underlying relationships. Seek out physical, political, social, emotional constraints that set limits among the variables describing the area.

2. Research:

Universities (locations, profs, students, theses) Use universities to find people working in given areas who see value in telling you what they know.

Companies (people) Use companies that provide information to their customers and suppliers.

Prof & Tech Conferences (people, proceedings) See conferences and proceedings that include experts in the given area.

Trade Shows (people) Walk the booths full of knowledgeable people.

3. Library:

Books: Use keywords to search for references.

DELICAT: Learn to use the UD online catalog.

Library of Congress: Online source for nearly all published work, and only 100 miles away if you need to go there.

Reference Librarian: The secret weapon is a reference librarian who wants to help you find what you need.

Keywords: Use this powerful tool for searching databases, especially many that have a specific keyword dictionary.

4. Journals:

Scientific (research issues, leading edge) Find the scientific journals used by researchers and practitioners in the field.

Engineering (application issues) Find journals, newsletters or magazines following engineering applications.

Trade (reviews, ads, yr books, directories) Many professional societies have associated trade magazines that review current issues, have ads by companies practicing in the field, and publish directories or yearbooks for finding companies.

Quality: Publications about quality might include case studies about products of interest.

5. People:

Faculty: Find faculty who are researching given areas.

Staff: Find staff working in given areas.

Alumni: Find alumni of programs specializing in the given area.

Local Industry: Find people working in the given area.

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6. Applications:

Practitioners: Find companies and people who invented and use developments in the field.

Competitors: Find all companies who compete, and see how they position themselves regarding the possible tradeoffs.

Ads: Read ads to find common metrics and target values.

Target Values: Find values representing best practices or physical limits.

7. Regulators:

International: Find UN, ISO, etc.

National: Find Federal Laws, SEC, OSHA, EPA, ADA, etc.

State: Find DNREC, State laws, etc.

Local: County/City Laws, etc.

Professional (ASME, SAE, ASTM Test Requirements) Find common practices and target values. Often handbooks describe common expectations for scatter statistics.

8. Web:

Google Use google.com, the best search engine.

Cobrain Use for web and patent searches for active sentence fragments constructed from verb-noun combinations.

Library Networked Databases: Learn to use these online tools.

Benchmarking Institute: See case studies of related industries.

Community of Science: Search for people active in specified areas.

Thomas Register: Search for companies making or selling given products.

Email: Use to contact people who might answer your carefully posed questions.

Proper use of these tools for benchmarking should constitute a measurable skill for the important task of lifelong learning. Every new project requires the updating of information to ensure that the project takes advantage of the latest developments in the technologies related to or enabling it.

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Patents (authors, claims, dwgs)
Formulas
Rate of getting x vs. giving up y

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Faculty
Staff
Alumni
Local Industry

Applications:

Practitioners
Competitors
Ads
Target Values

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International (ISO, etc.)
National (EPA, OSHA, ADA, SEC, etc.)
State (DNREC, etc.)
Local (County/City Laws, etc.)
Professional (ASME, SAE, ASTM)

Web:

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