

On Surveys for Research

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1 On Survey

A topic survey¹ is the very first step in a research work, especially when the statement of hypothesis has yet to be defined. If the topic is new to you, the survey is a process for you to self-learn the body of knowledge of the topic. In contrast to learn a new topic in school, survey is a self-learning process without the help of a teacher. It is a step to validate a person if he/she is able to self-learn.

1.1 The Process

Figure 1 shows three rounds of search-read-report process. Definitely, in reality, the number of rounds can be more than three. In each round, papers and books which are related to a topic are searched over the Internet². Then, you need to read the contents of those materials to understand the concepts and ideas presented. Once the materials have been read, you must ensure that you understand everything in them. Finally, you need to write a comprehensive report on the materials understood. One should note that the time spent on one round of survey can be in term of days, weeks, months or even years, which is dependent on the learning ability of a person.

1.2 Duration

Every survey could be a life-long process, as shown in Figure 1b, if you really want to survey everything about a topic. There is no method to estimate how much time you can complete a survey. It is all depended on how much you want to know about the topic.

1.3 End Results

In each round of survey, essential knowledge delineated in the materials have to be understand. If possible, potential research problems (equi. statements of hypotheses or arguments/ideas) to be validated should be figured out. To understand a topic with potential research problems for further investigation are the end results of a survey.

¹One should not confuse a topic survey to a market survey.

²**Question:** In each round of search-and-read, how many papers to be collected and read?

1.3.1 Textbook with comprehensive survey

If you have understand everything of a topic, a survey report or a textbook which covers all those knowledge can be complied and the report can thus be used for teaching or self-learning.

1.3.2 Literature survey in a paper

If a survey is aimed at discovering potential research problems, the information and knowledge obtained in the survey can end up become the contents curated in the *literature survey* section of a future paper disseminating the work and result of any one of these research problems.

1.4 Yet Another Analysis

For a survey aiming at potential research problems discovery, the survey report should cover contents regarding the following issues.

1. Evolution of the concepts advocated and results revealed in the topic.
2. Limitations of the concepts advocated and results revealed in the topic.
3. Potential research problems and the statements of hypotheses included.
4. For each potential research problem and its associated hypotheses, logical arguments have to be delineated to explain (equi. prove) (i) the problem is a new problem, (ii) the significance of the problem and (iii) the contribution(s) of the anticipated results is(are) valuable.

The last step requires logical analysis on those arguments and results presented in the text materials read. Therefore, a survey aiming at potential research problems discovery is yet another analysis report. If you cannot ensure the novelty of the problem, your contribution is none. You could simply repeat (equivalently copy) someone else work.

1.5 Hypothesis Validation after Survey

Once the potential research problems have been discovered and the associated hypotheses are stated in a survey, hypothesis validation will be a follow-up and it could be done right after a survey or in the future. Validation of the hypotheses/arugments/ideas bringing out from a survey could be a life-long project.

1.5.1 Research method

To validate a hypothesis, a research method has to be designed. After the works following the research method have completed, the results obtained can then validate the correctness of the hypotheses.

Philosophically, a potential research problem must be a new problem. Likely, there is no any existing research method suitable for the hypothesis validation. New research method has to be designed. So, arguing the reason why the new research method is appropriate is yet another logical analytical work to be presented in a paper.

1.5.2 Correctness proof

The ultimate goal of a research must be proving that all statements of hypotheses are correct. If only partial correctness, the research is definitely not completed. In this regard, next round of survey and an additional round of validation are inevitable.

2 Use of AI

Today, many people apply the LLM-powered AI tools for survey. Typically, the DeepSeek, the Google Gemini, the OpenAI ChatGPT, the Meta Llama and the Xai Grok are commonly used. Many researchers have found benefit by using these tools. However, no everyone can be beneficial from these tools.

2.1 Brainless Users

For those users who have seldom used their brains to think, these tools cannot help much. This group of users cannot validate if the contents generated by the AI tools are inaccurate and logically making sense. While a survey report can be generated in a short time, the contents in the report can be full of misinformation and inaccurate data. Nevertheless, the users are unable to discuss with the AI tools to dive in critical and valuable issues in the topic being surveyed.

2.2 Brainness Users

For those users who have actively used their brains to think and analyze, these tools can help a lot. This group of users can validate if the contents generated by the AI tools are accurate and logically making sense. While

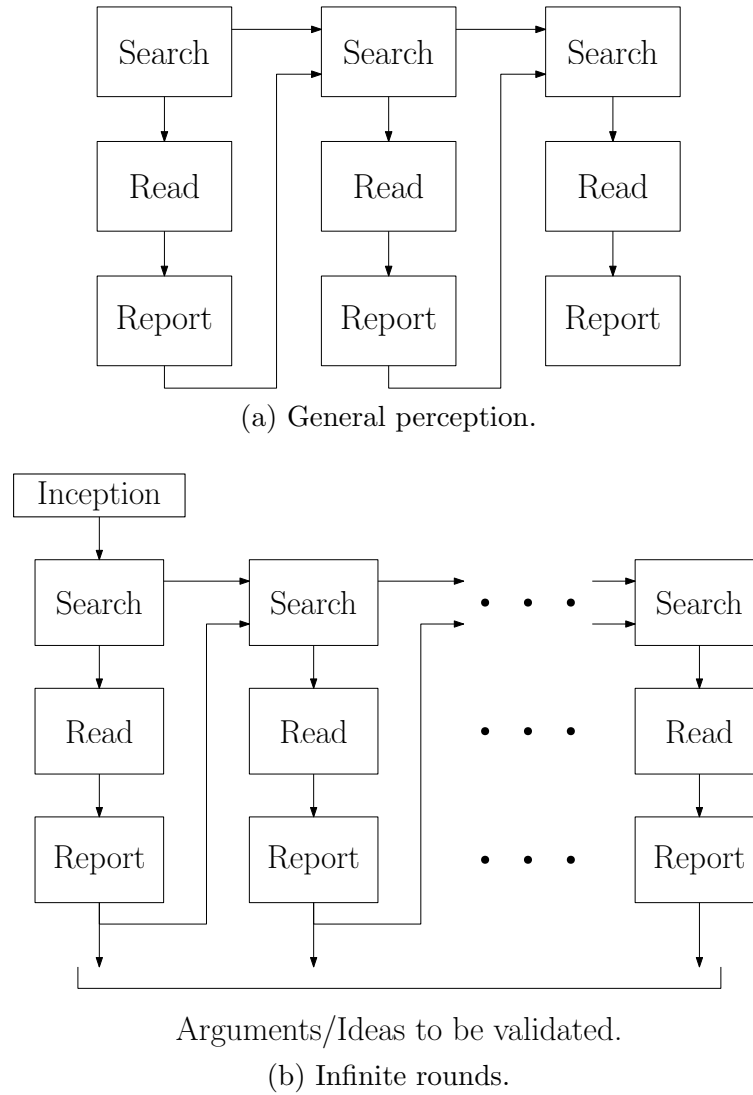


Figure 1: Survey could be a lengthy process. It is a multiple-round process. AI tools could help at the inception stage. They might help at the search and report steps. The report compiled in each round is basically a progress report.

a survey report to be generated might take a longer time, misinformative content and inaccurate data could be largely reduced in the report. Most important, this group of users is able to discuss with the AI tools to dive in critical and valuable issues in the topic being surveyed.

For a brainness user, the AI tools can reduce the time for searching important articles relevant to the topic. However, the time spent on reading and understanding those materials cannot be reduced. The time spent on discussion and exploring potential research problems can definitely be reduced. The time spent on survey report writing can also be reduced.

2.3 Time Spent on Information Validation

It should be stressed that the use of an AI tool in survey might be inefficient. One reason is on the time spent to validate if the contents generated by the AI tools are inaccurate and logically making sense. To do so, the time spent could be equivalent to the time spent for a reviewer to comment on a paper.

If a reviewer is new to the area of a paper, the reviewer will need to spend time to dive in the background knowledge of the paper. Afterward, the reviewer needs to spend time to logically validate the value of the research problem and the contribution of the results presented in the paper. Finally, the reviewer needs to spend time to validate the viability of the research method and the correctness of the results.

3 Exemplar Dialogue with Gemini

The purpose of the following dialogue is to find out further information on the fate of some application system providers (ASPs), like *i2 Technologies* and *Commerce One*, which were shooting-star dot-com. This information could be a reference for us to predict the future of the current LLM-startups.

Turn 1: i2 Technologies

User: In the 1990s, there was a tech startup named i2. This firm eventually bankrupted after the dot-com bubble. I wonder where the technologies developed by i2 went to?

Assistant: The software and technologies developed by **i2 Technologies** are currently owned by the Japanese electronics giant **Panasonic**, where they function as part of its independent subsidiary, **Blue Yonder**.

While i2 Technologies lost over 99% of its stock value after the dot-com bubble burst, the company didn't immediately dissolve; its underlying supply chain management and optimization software underwent a series of corporate acquisitions.

The Journey of i2's Technology

- **2010 – Acquisition by JDA Software:** After surviving the initial 2000 crash, i2 Technologies was officially acquired by rival supply chain management firm **JDA Software** in January 2010 for approximately **\$604 million**. JDA integrated i2's patented manufacturing and discrete supply chain software into its own retail-focused platform.
- **2020 – Rebranding to Blue Yonder:** In February 2020, JDA Software retired its 35-year-old name and completely rebranded itself as **Blue Yonder** to highlight its pivot toward AI-driven, cloud-based digital fulfillment. Consequently, legacy i2 technologies became part of the **Blue Yonder Luminate platform**.
- **2021 to Present – Full Acquisition by Panasonic:** Panasonic, which initially took a minority stake in Blue Yonder, completed a full **\$7.1 billion acquisition** of the company in September 2021.

Today, the core algorithmic and supply chain infrastructure originally pioneered by i2 in the 1990s continues to power automated logistics, demand planning, and warehouse management systems globally under Panasonic's **Blue Yonder** banner.

Turn 2: Commerce One

User: How about the tech startup Commerce One?

Assistant: The software intellectual property and core assets of the B2B tech startup **Commerce One** are currently owned by the UK-based procurement software company **Proactis**.

Similar to i2 Technologies, Commerce One was an absolute titan of the dot-com era, peaking at a massive **\$21.5 billion market capitalization** in 2000 before its business-to-business (B2B) trading marketplaces failed to sustain traction. When the bubble burst, its technology passed through a chain of acquisitions.

The Journey of Commerce One’s Technology

- **2004 – Bankruptcy and Asset Split:** Unable to adapt its software model, Commerce One filed for Chapter 11 bankruptcy in late 2004. Its assets were carved up; the core Supplier Relationship Management (SRM) division and its “Conductor” process-management platform were sold to an investor group consisting of **ComVest Partners** and DCC Ventures.
- **2006 – Acquisition by Perfect Commerce:** In February 2006, the remaining components of Commerce One were officially acquired by **Perfect Commerce** (formerly known as PerfectYard), an enterprise sourcing and procurement provider. Perfect Commerce integrated Commerce One’s marketplace infrastructure into its own automated global network.
- **2017 to Present – Absorption into Proactis:** In July 2017, the UK-based global spend management company **Proactis acquired Perfect Commerce** for roughly \$132 million. As a result, whatever operational DNA remains of Commerce One’s early procurement software is now nested inside Proactis’s broad portfolio of commercial digital solutions.

Its Lasting Technological Legacy

While Commerce One as a company dissolved, it left a massive mark on the architecture of the modern internet. In 1999, Commerce One acquired a startup called Veo Systems. Through that acquisition, Commerce One engineers developed **Schema for Object-Oriented XML (SOX)**.

SOX was a foundational technology that heavily influenced the development of the **W3C XML Schema** and **JAXB** (Java Architecture for XML Binding). These standards became the literal bedrock for how different corporate computing systems automatically format, read, and exchange data across the web today.