2. **Determination of Information Needs**

**In this Chapter, you will learn:**

1. The importance of learning how to learn.
2. What is the inter-relationships of Information, decision making and problem solving
3. Where literacy falls in terms of thinking style and information literacy.
4. The process of decision making and problem solving.
5. Information/Knowledge Discovery Planning.
Important to note:

Life long self learning is important as it is the one of the most powerful value adding technique that remain yourself as a more competent individual. You should start practicing self-learning by not too dependent on the lecture notes but stretch out beyond the lecture notes and find out more information that are related to the contents of the lectures, through many means such as library visit, surfing on Internet and book stores. The more practice you experience, the more skillful you are in self-learning.

- The 23 slides of transparencies under the 2nd week topic- Determination of Information Needs are in fact quite self-comprehensive.

- This session covers the introduction of deciding the need of Information types and scope to work out a research topic or subject. Information Literacy is how we can find the knowledge that has been created by others relating to any subject that we are interested in. It is an essential part of the learning process that gives us mastery of our lives and power to understanding existing knowledge and/or creates new knowledge.

- Our Tutorial Exercise 1: How to define a Research Topic gives you a very good learning experience and knowledge of how information is organized, selecting a research topic, finding information and how to define and focus your topic. This tutorial exercise could stimulate students’ analytical thinking via accomplishing this exercise through discussion with session teacher during the tutorial session in the week 2. It also provides a wrap up of the theoretical topics (such as 6 steps of decisions making and problem solving) that have been covered in the lecture.

Decision Making and Problem Solving are Information/Knowledge based processes

- Source of knowledge range from untested opinion to highly systematic styles of thinking.
- Researchers have always pursued the discovery of what constitute in a certain subject of knowledge. *(We all want to learn new knowledge, when we search for it, we are also researchers…)*
The Inter-relationship of Information, decision and problem

This could well be perceived by the following statement:

“In the process of knowledge discovery, researchers discriminate among available information sources; identify high quality and high value sources of information that will produce the best results for a given situation, to make decision facing management in a given problem.”

A practice of self digging of information:

“Knowledge is of two kinds.
We know a subject ourselves or we known where we can find information upon it.”
- Samuel Johnson (1709-1784)

Samuel Johnson was a very famous writer in 17century, his achievement is claimed to be next to William Shakespeare, the most quoted of English writer. If you want to know more about him, simplify search via any one of the searching engines such as Google, Yahoo, Excite, Ask Jeeves and much more, by using the keywords such as their name or click to the following one of the many related URL (Uniform resource locator), which points to the address of a specific resource on the Web.

http://www.lichfield.gov.uk/sjmuseum/lcc-sj-history.html

“The formulation of a problem is far more important than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle require creative imagination and marks real advance in science.”
- Albert Einstein (1879-1955)

Similarly, if you want to know more about the Father of Science, Albert Einstein, simplify search via any one of the searching engines by using the keywords such as his name or click to the following URL:

http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Einstein.html
There are many styles of thinking; figure on slide 5 could broadly discuss the different perspective of thinking style by four dimensions (idealism, empiricism, Rationalism and Existentialism). We could see where the Literary style of thinking position itself in terms of these measures.

**Some elaborative note on slide 5:**

- **The horizontal axes** range from a highly **idealistic interpretation** on one end to **empiricism** on the other.
- Empiricism: to denote observations and propositions based on sensory experience and/or derive from such experience by methods of inductive logic, including mathematics and statistics.
- Empiricists attempt to describe, explain and make predictions by relying on information gained through observation. E.g. A regular field observation with counting meter to measure passenger traffic flow at a particular MTR station at different time intervals to give idea/data input on how frequent or how to adjust/revise the MTR schedule at difference time zone in a day.
- **Empiricism** concern the design of procedures to collect factual information about hypothesized relationships that can be used to decide if a particular understanding of a problem and its possible solution are correct.
- **Idealism** is highly interpretative ideas. E.g. A good student should never miss a class without good reason. It is a belief with unquestionable moral/ethical support.
- The **vertical axis** is used to represent knowledge obtained through inductive, empirical approaches or through theoretical means that are based in deductive reasoning. At one end is the **Rationalism**, where reasoning or judgment from known knowledge is a primary source of knowledge. E.g. medical knowledge to cure a patient. At the other end is the **Existentialism**, where idea and opinion are informal with no test and proof of its value. E.g. If you swallow an apple seed, then you will have an apple tree grow on your head.
- **Literary Style** – This problem solving approach occupies a viewpoint toward the center of the graph. The literary style of thinking is used in many classic case studies in the social sciences. Case studies play a prominent role in the development of business knowledge. However, it is difficult to generalize from individual case studies, hence; the literacy style of thought restricts our ability to derive generally applicable knowledge.
- **Literary style of thinking** derives much from literatures search, literatures studies and literary criticism. **Information Literacy** is the ability to acquire, read and write information relating to a targeted subject of interest or problem domain. **They are very much interrelated.**
• The introduction of Internet and www have speeded up the process of information searching and enhanced the literary style of thinking, in our context of Bus110, **Information Literacy** concern research skill which involves finding information and data on the Internet, defining information needs and develops a viable research topic (or any topic of interest).

**Decision Making and Problem Solving**

• Some recommended readings could be retrieving from the following sites.

http://unce.unr.edu/publication/FS93/FS9395.html
http://ohioline.osu.edu/hyg-fact/5000/5301.html
http://www.ri.net/RITTI_Fellows/Barton/infolit.html

And much more…. (Again, go beyond the given 3 sites and try to search more related information from Internet using various search engines.)

**Six Steps to Decision Making and Problem Solving**

1. **Identify and Define the Problem.**
   Discover Management Dilemma - This may be a problem or an opportunity.
   E.g. Declining sales, increasing employee turnover

   - Management Dilemma is a symptom of an actual problem.
   - Choosing one dilemma (problem statement) to focus and direct resources on a path to provide critical decision making information (knowledge) concern knowledge discovery strategy.

2. **List Possible Options/Alternatives**

   **Define Management Questions**
   - Researchers/Managers must move from management dilemma to management questions to proceed with the Information / Knowledge Discovery Plan.
   - Using collected exploratory information put the dilemma or the correction of the symptom in question form.
   - The definition of the management question set the research task.
   E.g. What should be done to increase sales? What should be done to reduce employee turnover?
Define Research Questions

- Translate the list of management questions into research questions.
- Several research questions may be formulated at this stage. Each question is an alternative action that management might take to solve the management dilemma.

E.g. Should the product be re-design? Should we adjust the selling price? Should we upgrade the staff remuneration package? Should we reorganize the company? Etc…..

List Possible Options/Alternatives

Many ways… (all involve facts findings and information collection)
- Exploration: review published sources and information gatekeepers to understand the true management dilemma (not just its symptoms), clarify the possible management actions that might be taken to solve the problem.
- use brainstorming technique, interviews with information gatekeepers/ experts and other qualitative research techniques.

3. Evaluate the Options

- Evaluate the question list with the entire possible alternative proposals according to the company’s needs and priorities.

Evaluate the Option

- Several research questions/topics or options may be formulated at this stage. Each option is an alternative action that management might take to solve the issue.
- The most plausible action or the one that offers the greatest gain using the fewest resources is researched/studied first.

Some True or False questions to ask in evaluating the option (research question):
- A research question should be fact-oriented, information gathering question.
- A research question/statement is the hypothesis of choice that best states the objective of the problem study, which fits the need to resolve the management dilemma.
- A research question identified the information needs to answer it, if the question is answered (result satisfied), the searching/research process is completed, if not, fine tune the original research question and search again.
4. **Choose One Option**

- Choosing incorrectly will direct valuable resources (time, manpower, money and equipment) on a path that may not provide critical decision-making information.
- It is important that the solution to the chosen option/topic (Or problem to solve), does not create another immediate problems.

5. **Make a Plan and Do it.**

- Once the option/research question(s) has been selected, researcher should transform the selected option/ research question into more specific set of investigative questions.
- Investigative questions reveal the specific piece of information the researcher need to known to answer the research question, to satisfactorily arrive at a conclusion about the research topic.

**Steps to follow in formulating investigation plan for information/knowledge discovery:**

- Review the research questions and break each of them into specific second and third level questions.
  
  E.g. What are the customers’ preferences? What is the market trend? What are the consumers Index?

- Determine Information needs: what evidence must be collected to answer the various questions and hypothesis (if used).

- Set the scope of the research topic or option. This will establish a boundary to separate contiguous problems from the primary object.

- Determine the primary data collection method: examine the investigation question for they guide the development of the research design and are the foundation for creating the research data collection instrument.
  
  E.g. Survey, Interview, Observation, Surfing on the Internet, Library search and etc. etc.

**Do it /Action:**

Once the Investigation Plan is developed, search for the required evidence / information according to the needs of the research question(s) selected for a specific problem domain identified.
6. Evaluate the Problem and Solution

This is the most neglected step in decision making, yet it is critical to the learning process.
This step looks at:

- What brought the problem about?
- Can a similar problem be prevented in the future?
- How good the present problem solved?

All these would need – Measurement questions to be designed to evaluate the problem and verify the solution.

Measurement Questions - Two types of measurement questions:

(1) Pre-designed and pre-tested questions: measurement questions that have been formulated by previous researchers and are recorded in literature for others to apply literally or adopt in projects. This provides enhanced validity and can reduce the cost of the project.

(2) Custom-designed questions:

Measurement questions should be custom tailored to the investigative questions. The resources for this task will be the collective insights from all the activities (particularly insights from exploration) in the research process completed.

The custom-designed measurement questions usually will be refined during the pilot testing of the data collection instruments. e.g. In a survey, measurement questions appear on the questionnaire. In an observation study, measurement questions are the observations that researchers must record about each subject studied.

The Information/Knowledge Discovery Plan consist of the above 6 steps plus the step of Reporting the Results (The last step of the Information/Knowledge Discovery Plan).

- Prepare a report and transmit the findings and recommendations to managers for the intended purpose of decision making.

- The researcher adjusts the style, organization of the report (Knowledge representation) according to the target audience, the occasion and the research purpose.
- The results may be communicated via conference, written report, oral presentation or some combination.

Summary

Six strategic steps from general to specific thinking to set the direction to identify and/or discover knowledge for management decision in problem solving:

1. Identify Management Dilemma
2. Define Management Questions
3. Decide Research Questions
4. Design Investigation Questions
5. Design Measurement Questions
6. Findings of results for Management Decision

To get the practice of the above six steps to identify and/or discover knowledge for management decision in problem solving, do the tutorial exercise one.