**Topic 1**

**Computing Projects**

In this topic we will learn about:

* The difference between class project and research project
* The different types of projects
* People involve in a Final Year Project

**What do you know about projects?**

Figure 1.1. Thinking about projects

Literally, we can define project as an individual or collaborative task that is carefully planned and designed to achieve a particular aim.

OR

"A research project" is a school assignment undertaken by a student or group of students, typically as a long-term task that requires independent research.

Dawson(2005) defined project as:

Figure 1.3. The Meliorist Model of a project

(Adopted from Dawson, 2005)

**Class project vs Final Year Project**

You should be able to differentiate between class project and a Final Year Project. There is a vast difference between class project and a final year project.

Class project

* Class projects are assignments that you were ask to complete as accomplishment to the class requirement. It is specific to the class/ subject. It may involve only one sub-area of the computing sciences discipline. For example if you are studying animation, your class project will focus into the animation; or if you are in an audio class, your class project may only requires you to deal with audio.

FYP

* A Final Year Project is a compulsory in most higher learning of institution for all fields of study.
* On the other hand, a final year project (fyp) may comprise a marriage of various subjects that have been studied throughout the study and also as an endeavour to solve a problem using the computing technology.

Figure 1.2. Illustration of project development vs FYP

* FYP requires student to apply all knowledge that they have acquired as well as venturing into a new self-studied knowledge to solve a certain problem.
* It is a proof of how students had assimilate or comprehend what they have studied so far. It also build the critical mind of the students when need to be innovative in producing the output.
* FYP is a first step towards doing a research at higher level. It teaches the formal step-by-step activities in completing a research project.

**Spectrum of Computing Projects**

Computing projects can come from the very technical bits and bytes, that is the hard sciences; or the applications of computer science to solve a problem as in the soft sciences.

Figure 1.4. Specturm of projects in Computer Science

**Computing Project Types**

* Research based
* Development
* Evaluation
* Industry based
* Problem solving

\*May combine more than one type in a project

**Development**

- Development not only software and hardware systems, but also process models, methods, algorithms, theories, and designs.

**Research based**

**-** Involves a thorough investigation of a particular area, improving your understanding of that area, identifying strengths & weaknesses in the field and acknowledging areas suitable for further development and investigation

**Industry-based**

* Project that involves solving a problem within an organisation.

**Evaluation**

* Invlove some form of evaluation as their main focus.
* Eg. Evaluation of two programming languages

**Problem solving**

* The development of a new technique to solve a problem, such as improving efficiency
* Must involve some evaluation

**Whos who in FYP**

Who are involved in a Final Year Project?

Figure 1.5: Parties involve in FYP

The student

* Is the workforce of the FYP.
* The student will identify the problem, find a solution to the problem and solve the problem

Responsibility of the student

* Discuss with the supervisor for guidance
* Prepare the schedule/ ghantt chart/ mile stone
* Plan the meeting schedule
* Keep a log of the meetings for easy reference
* Respect the supervisor’s opinions and thoughts

Supervisor

* The supervisor guides the student and the subject area.
* The supervisor is knowleable in handling research projects and are able to guide in terms of the dos and don’ts, project scopes and the feasibility of the projects.
* The supervisor will also be able to navigate the student into accomplishing the desired outcome.

Responsibility of the supervisor

* Give guidance concerning the research area, problem statement, scoping the project and conducting literature review, methodology and validation
* Ensure the project is feasibility within the stipulated time
* Allocate time to meet student on a regular basis
* Guide in preparing the written report
* Guide in completing the project
* Guide in doing the final presentation

The Examiner

* Assess the project
* Assess the quality of the project

Responsibility of the examiner

* Ensure the project is according to the standard
* Advice for refinement of the project if necessary
* Assess the student’s writing and presentation skill as well as the critical thinking capability

Figure 1.6. Triangular relationship

Coordinator plays a role to coordinate the FYP process. Coordinating between the examiners and supervisor.

Coordinator will also provide guidance and feedback to the students to assure the quality of the project.

Coordinator will oversee the overall progress of the project and from time to time request students to present their project’s progress to assess and enhance their presentation skill.

**Topic 2**

**Choosing a project**

In this topic we will learn about:

* The requirement for a final year research project
* How to choose a topic
* How to create a proposal

**FYP Requirement**

Final year project is not composing a thesis where student put their arguments and justification in writing. It does not require a thorough validation to proof the argument.

FYP is merely applying and using the existing techniques and algorithms to solve a real problem in the various domain of the problem.

Figure 2.1. FYP requirement

**Doing a research project**

Doing a research project brings benefit to at least two parties: the researcher (developer/ student) and the user. The researcher (the student) will gain new knowledge through the research work and the user will gain the significant benefit from the new developed product. Thus, it is an important task in daily lives.

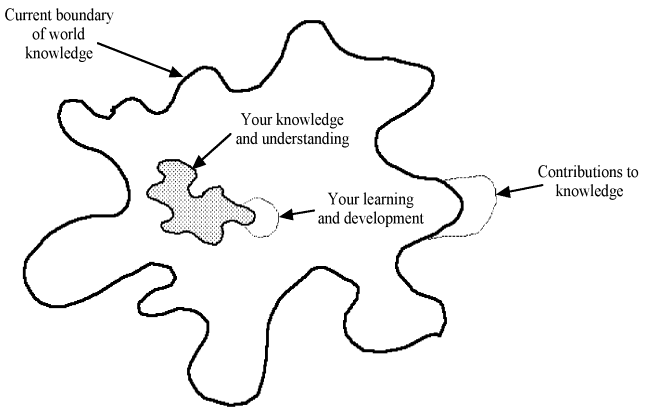


Figure 2.2. Research gain adopted from Dawson(2005)

**Preparation in Choosing the Project**

Computer Science is a vast area ranging from various topics. There are many topics that can become a Final Year Project. However, one thing that students should bear in mind is that FYP has a time constraint. Therefore, the duration and scope is one important factor to choose your topic.

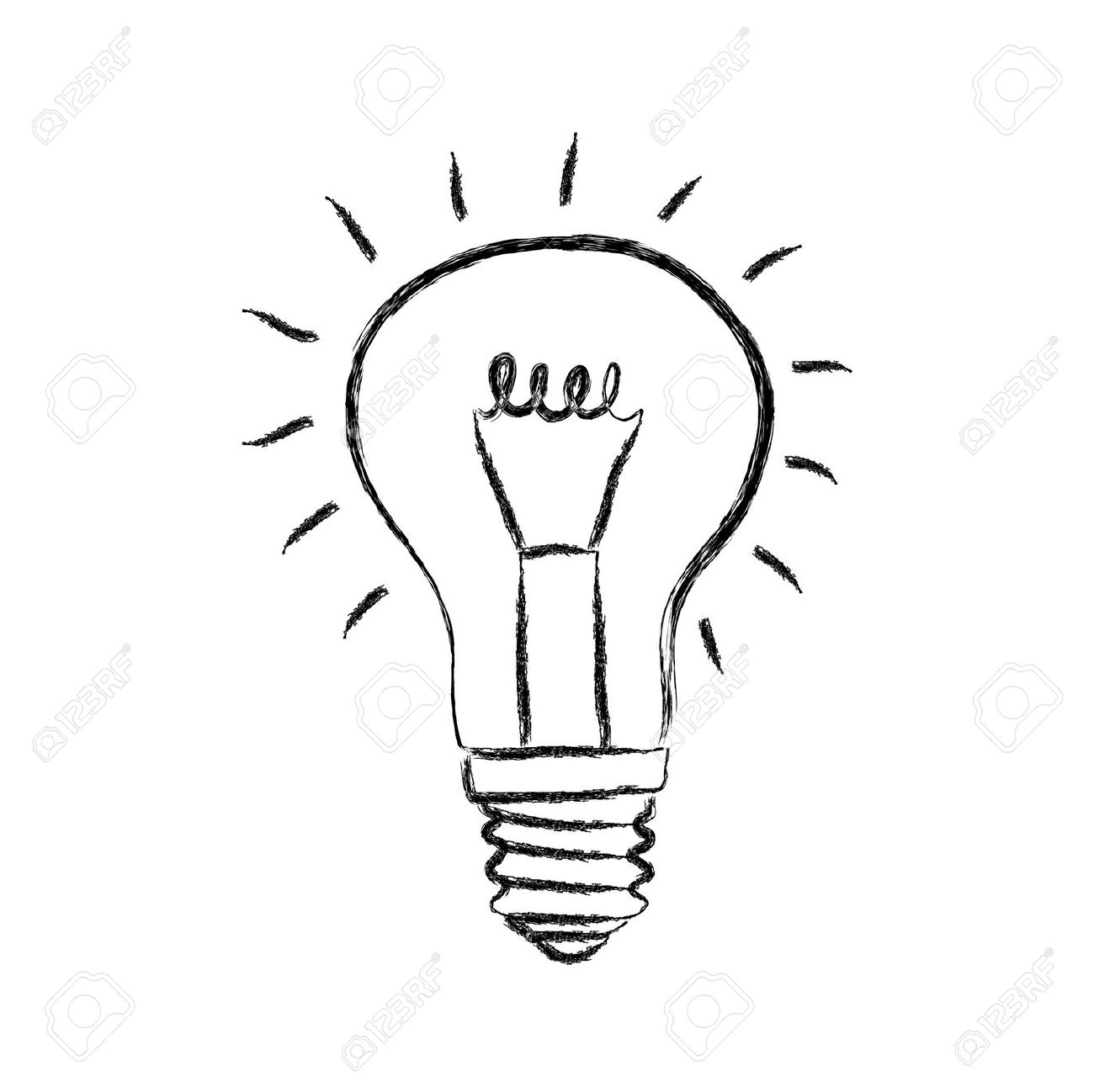
Among considerations when choosing a project:

* You are capable of doing the project within the time frame
* Project that interests you
* Project that has an objective outcome
* Suitable to your degree program (your supervisor and coordinator will be able to guide you)
* The project has sufficient scope
* The project has enough accessible resources (data, expert, etc.)
* The project is feasible

**How to find a topic?**

Below are some guidelines:

* Your own idea and interest
* From the lecturer
* Get the real project from the industry
* Past projects (dig from the library)
* Brainstorming with friends and lecturers
* Look around and try to see the problems that needs a computing solution.



\*Tips: Preferably, find a supervisor who is the expert in the subject area

**Steps to prepare a proposal**

Preparing a proposal is stating your intention on doing a project. It must be done in a structured manner to avoid a misconstrued among people reading or assessing it. A proposal must be very clear so that it is obvious about what project you are going to do, how you are going to do it, and what is the outcome or results of the project.

Figure 2.3. Steps to prepare a proposal

1. **First thing’s first: Choose a subject area**

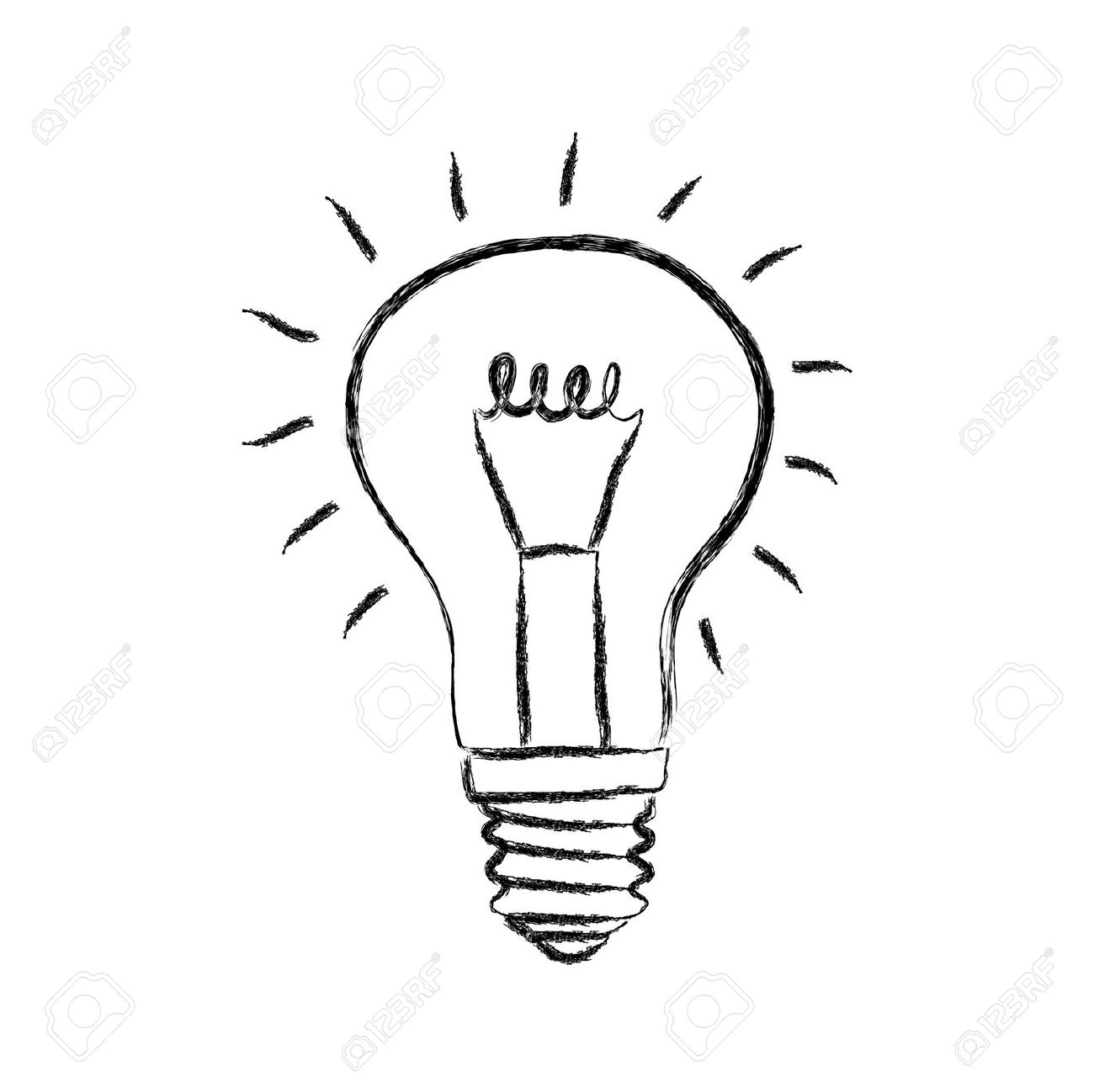
Choose an area within Computer Science that you want to work. The area can be:

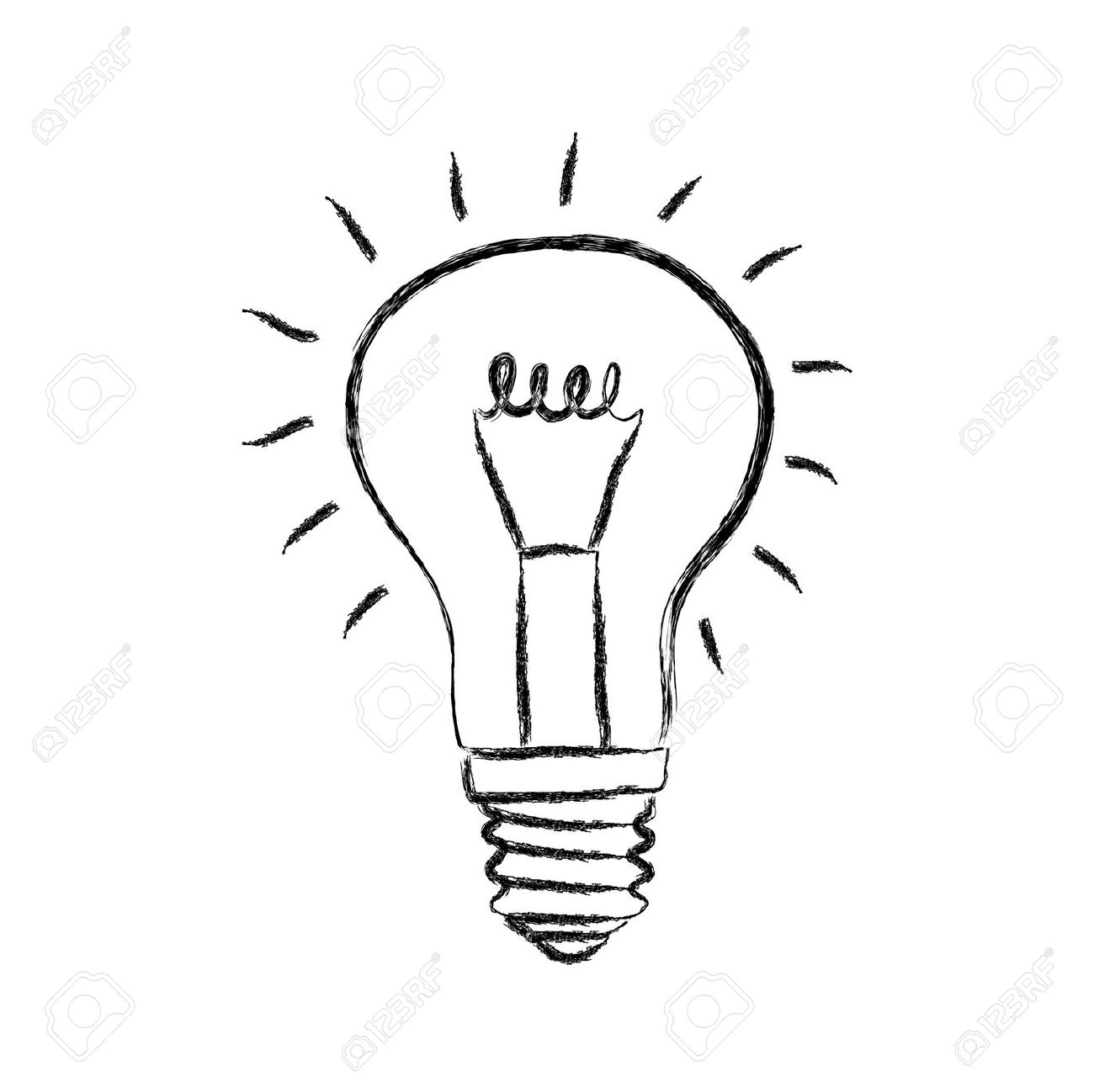
* Mobile application
* Software Engineering
* Image processing
* Augmented Reality
* Human computer Interaction
* Graphics
* Gamifications
* Database
* Bioinformatics

… and there are many other growing number of areas that you can embark for your research project

The research area can also be the overlapping of one or more areas.

The research area can be the area that you like or as suggested by your supervisor.

Remember ! Doing research project does not confine you into doing things that you are already familiar with. Doing a research project is a knowledge compilation of what you have studied over the semesters of your Bachelor program plus the extended knowledge that you will discover when doing the project.

Do not be intimidated by areas/ topic suggested by your supervisor because the supervisor will know what is good for you and what is feasible to be completed within the two semesters time frame given to you.

1. **Determine the problem**

Once you know the research area that you are going to work in, next, think of a problem that exist in the area.

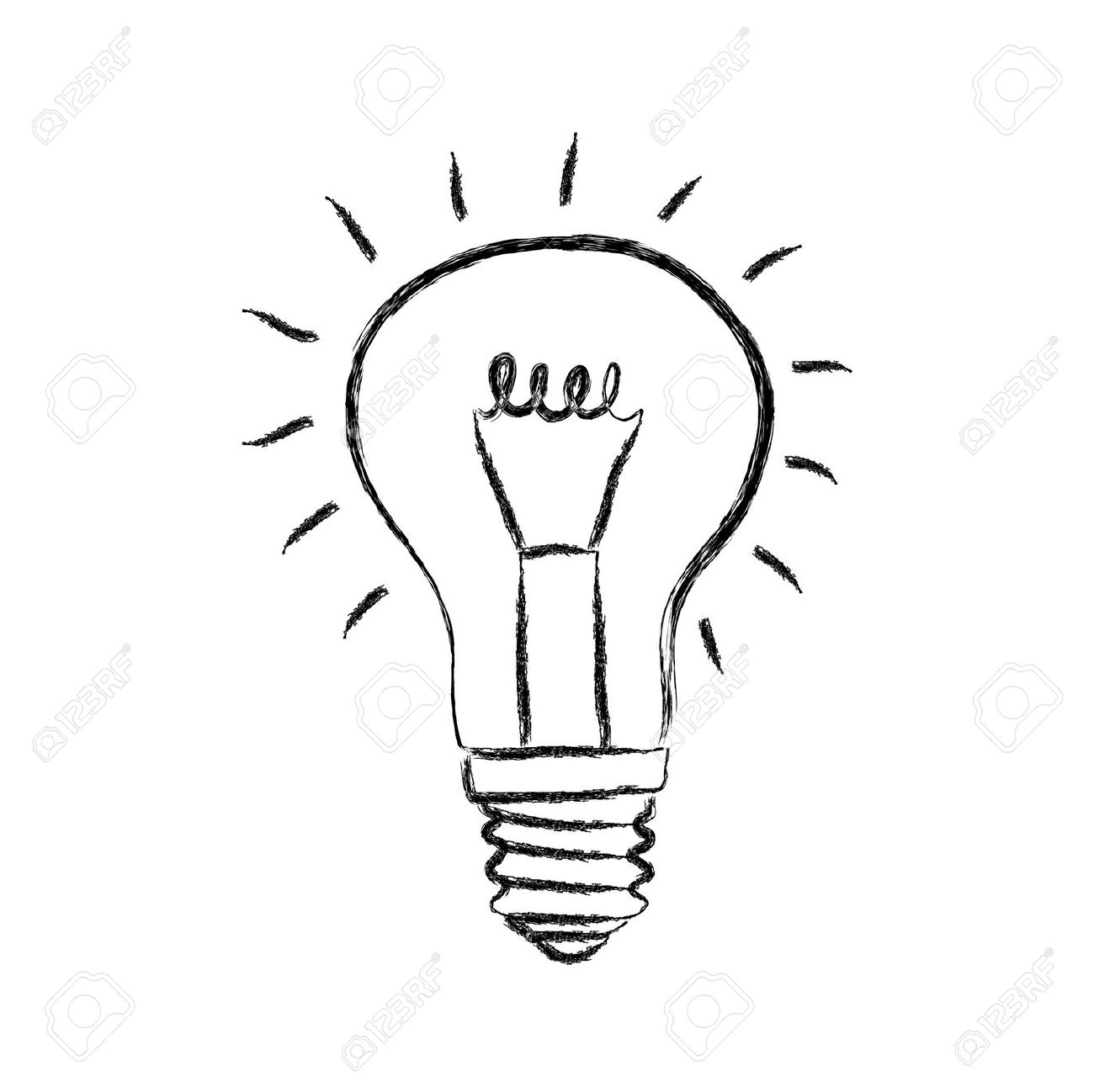
Research project is **based on a problem**. Doing a research project is a process to apply your fundamental knowledge together with the expanded knowledge that you will soon learn in solving a problem.

Figure 2.4. FYP as a process

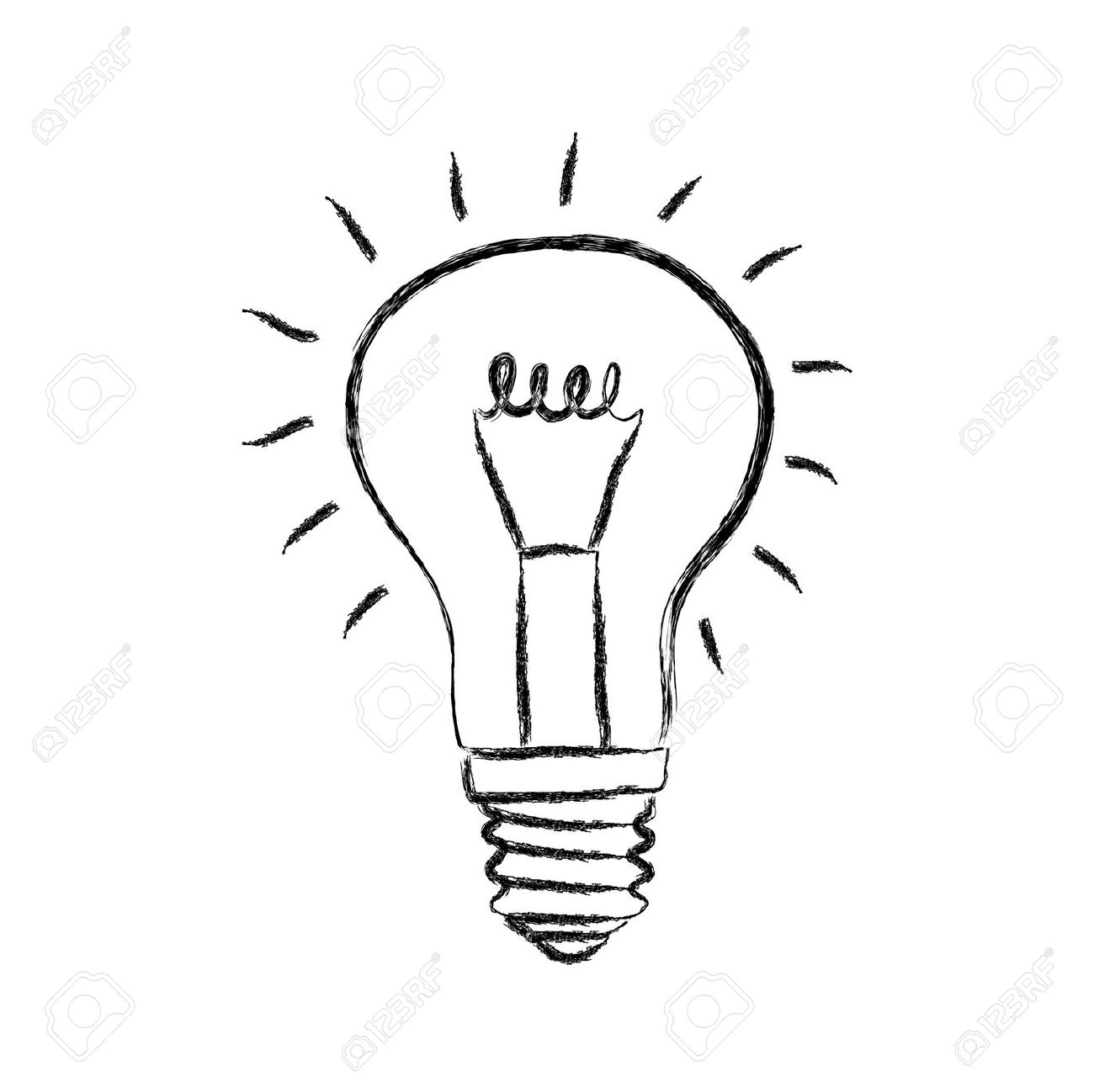
Do not begin a project by thinking about the outcome you expect to produce. But, begin with thinking about the problem, then only focus on the solution and outcome (results).

Problems can be obtained from readings, from your own experience, or other’s experience. It can also be an improvement to a previous project. When doing improvement to a previous project, make sure your new project gives a better output (result) and significance.

Problems can also be industrial-based. Your project will be very significant if it is able to solve the real problem as prescribed by the industry. For an industrial-based problem, go to the industry, ask what their problems are, the problem must be computing related, assess the problem with your supervisor and find a solution to the problem.



\*Tips: Your project must start with a problem to solve



\*Tips: Do not be afraid to take up a project that you are not familiar with.

This is a venue for you to learn about new things.

1. **Read previous works**

One way to find a solution to a problem is through reading previous works. Read how others had solve similar problems. This is called doing the **literature review**. Doing literature review will give a better insight about the problem that you are focusing. Also gives ideas how to solve the problem.

When reading previous work, make sure you know your sources. The source of your reading material will be an important proof that you have done a thorough reading about the area that you are studying.

You also need to read previous work when you need to learn about techniques , theories or algorithm to be used in your project.

Keep the list of your read materials organized. You will need it later when preparing a complete proposal and writing a report.

Read, read and read. Continue reading until you really understand the problem. Continue reading until you are determined how to solve the problem.

How to solve the problem may include :

* Applying techniques, approach, algorithm to used
* steps or activities involved when solving the problem; for the activities, you may adopt any existing project methodology that is available

1. **Identify Objectives**

Objectives are the measurable statement of outcome that you wish to accomplish at the end of the project.

Objectives will set the key output of your project.

Objectives will consist of steps that you are going to take to accomplish your project.

Only use the measurable verb as your objectives.

The success or failure of your project is measured through the accomplishment of the objectives.

You must know to what extend your project will be. You need to scope the breadth and depth of your project. Discuss with your supervisor about the scope of the project.

Think also about the significant of your project.

* Who will benefit from the project?
* How your project can help user?

When the objectives are determined, you are ready to prepare a proposal.

1. **Writing a Proposal**

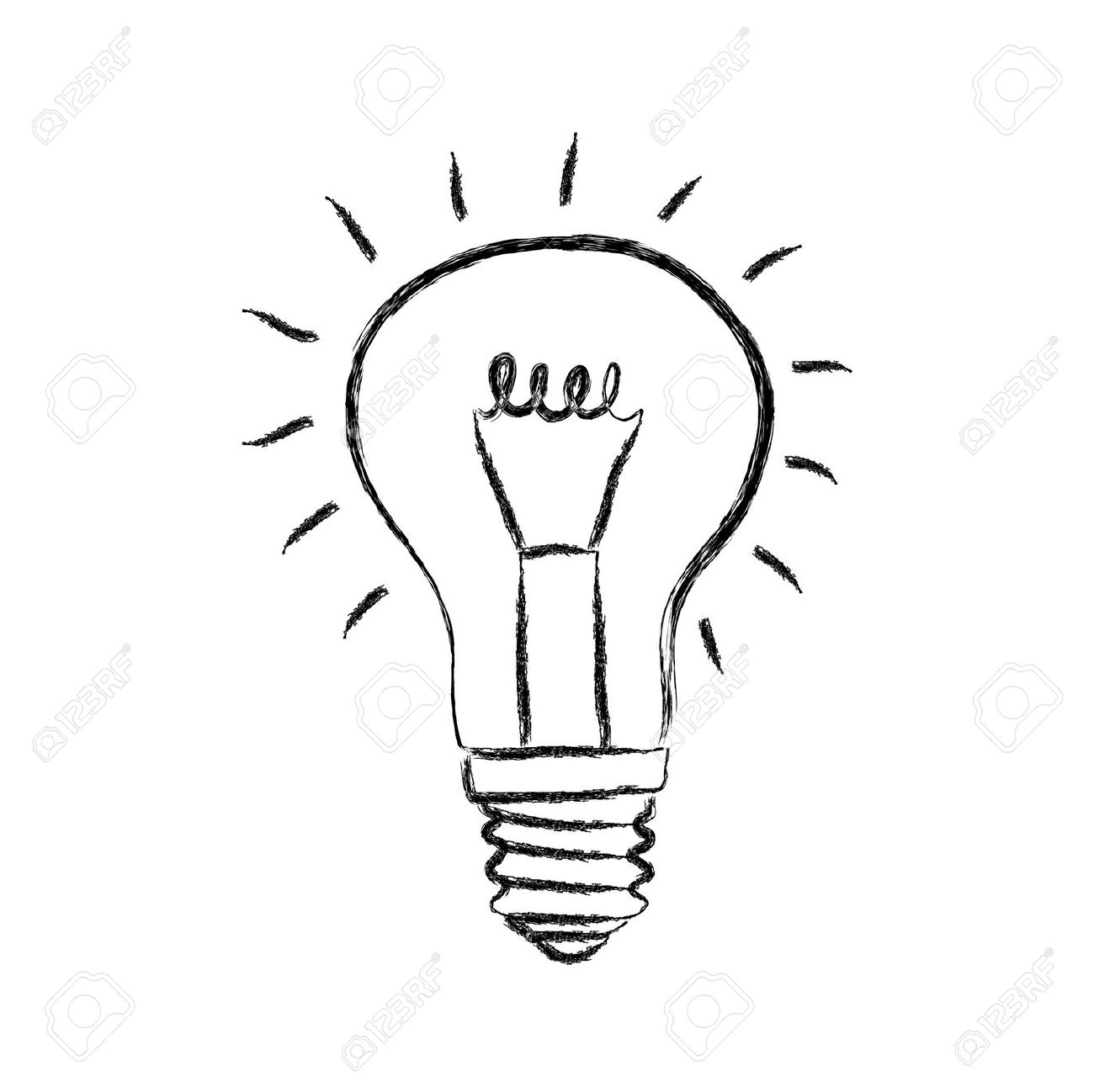
A proposal is a complete document where your research idea is presented.

The proposal will tell the audience/ examiners about:

* Research idea/ background to the problem
* The problem statement
* The objectives
* Scope of the project
* Significant of the project
* Limitation of the project (if any)
* Literature Review
* Research Methodology

Students are normally required to defend their research idea. During the defense, the student will be assessed on :

* how much they know about the project that they are going to do.
* how well they have studied about the project and its solution.
* the depth of knowledge that they have about the project through readings of literature
* how well the plan the activities to be conducted in order to complete the project – research methodology



\*Tips: Student must always remember that this is YOUR project NOT your

supervisor’s. Therefore you must know about the project very well.

*Now you are ready to get into the serious business – PREPARING THE COMPLETE PROPOSAL*