ACUTE360.COM
DOING R&D THE RIGHT WAY

Planning & Management of R&D Projects

AGENDA

- **Objectives**
- **Lesson 1:**
  - 1.1 Definition of R&D
  - 1.2 Defintion of SR&ED (CRA)
  - 1.3 SR&ED tax credits
  - 1.4 R&D symptoms & problems
- **Lesson 2:**
  - 2.1 Definition of a project
  - 2.2 The 5 process groups of the project management
  - 2.3 Planning a project
- **Lesson 3:**
  - 3.1 Project management methodologies
  - 3.2 Cascade method
  - 3.3 Agile/Scrum method
  - 3.4 Scientific/Iterative method
  - 3.5 Iterative/Software method
  - 3.6, 3.7, 3.8: Task Trees
- **Lesson 4:**
  - 4.1 R&D project management tools
  - 4.2 Acute360
  - 4.3 Acute360 iterative hierarchy
  - 4.3 Acute360 task tree
  - 4.5 Acute360 features
- **Conclusions & References**

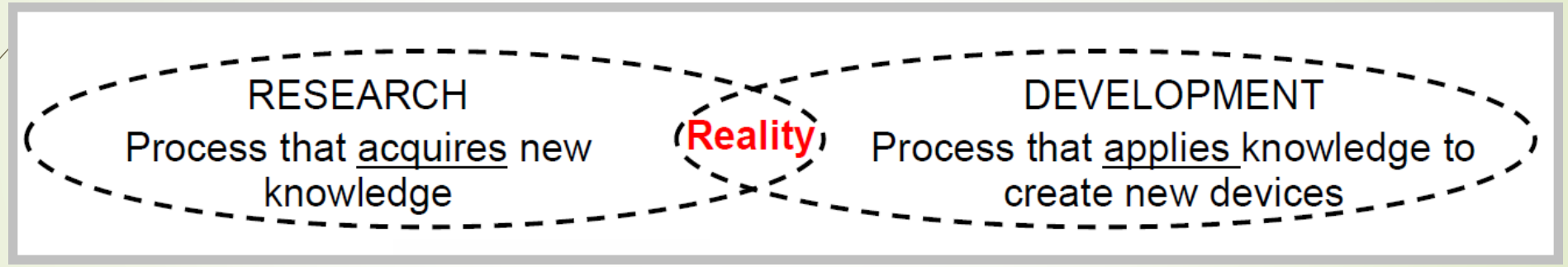
Objectives of this presentation

- To provide insight on how to manage an R&D project and do R&D the right way from start to finish to ensure that project goals are met faster and with less hassle.

- To inform on how to properly document R&D projects so-as-to eliminate uncertainties and gain a high degree of confidence and autonomy in claiming SR&ED tax credits.

1.1 Definition of R&D

- R&D: Research & Developement



1.2 SR&ED (Scientific Research & Experimental Development)

- In the definition of SR&ED, the WTO (World Trade Organisation) and the CRA (Canada Revenue Agency) describes that SR&ED is undertaken: for the advancement of scientific knowledge, or for the purpose of achieving technological advancement aimed at creating new, or improving existing, materials, devices, products, or processes including incremental improvements.

- SR&ED must seek a scientific or technological advancement to be SR&ED and be eligible for a SR&ED tax credit.

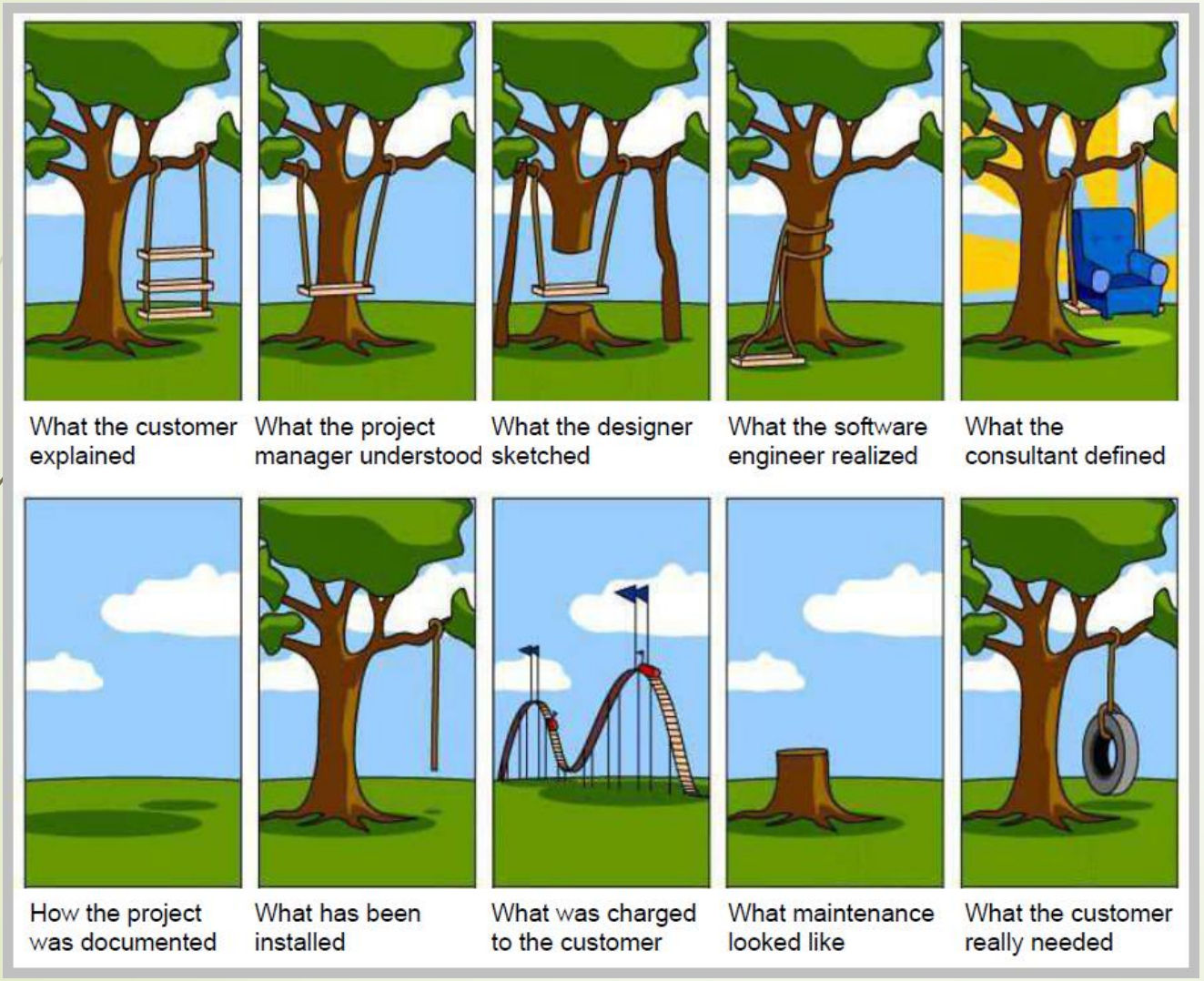
- Work for the advancement of scientific knowledge or for the purpose of technological advancement implies an attempt to resolve what is called scientific uncertainty or technological uncertainty. Basically, the advancement is the targeted outcome of the SR&ED work while the uncertainty is the impetus for the SR&ED work. Therefore, an attempt to achieve advancement is an attempt to resolve uncertainty.

1.3 SR&ED Tax Credits

- **To be eligible for an SR&ED tax credit, you must answer the following five questions:**
  1. Was there a scientific or a technological uncertainty?
  2. Did the effort involve formulating hypotheses specifically aimed at reducing or eliminating that uncertainty?
  3. Was the overall approach adopted consistent with a systematic investigation or search, including formulating and testing the hypotheses by means of experiment or analysis?
  4. Was the overall approach undertaken for the purpose of achieving a scientific or a **technological advancement***?
  5. Was a record of the hypotheses tested and the results kept as the work progressed?

***Scientific or technological advancement is the generation of information or the discovery of knowledge that advances the understanding of scientific relations or technology.**

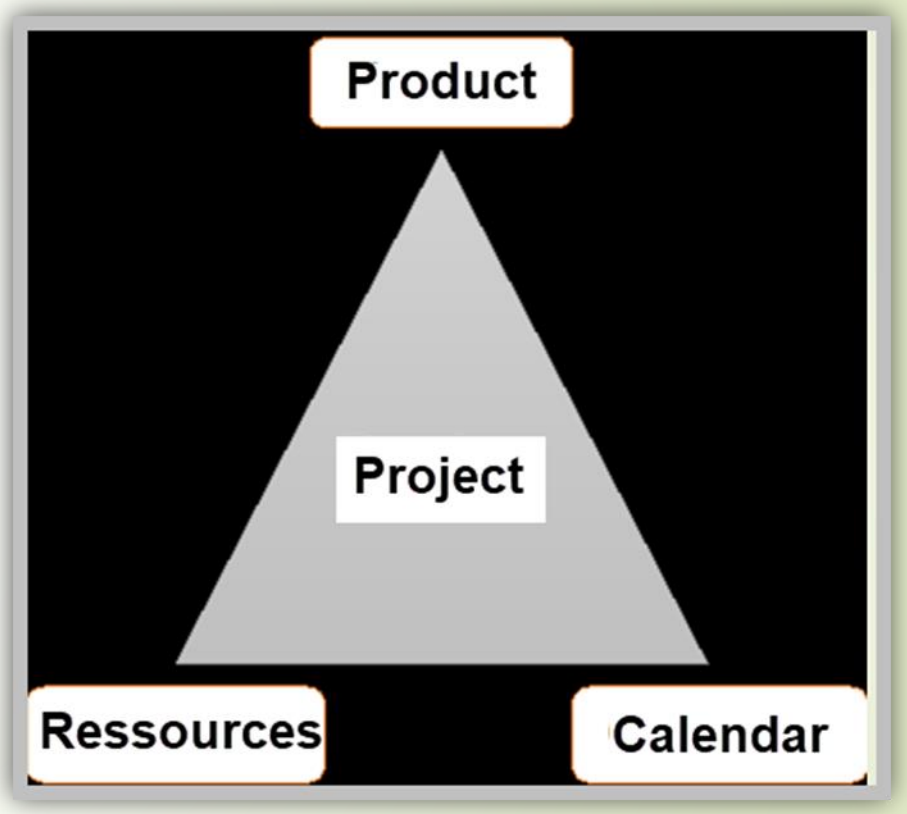
1.4 R&D Symptoms & Problems



- R&D projects are often undertaken without adequate understanding of the right way to do R&D and of the proper and correct management tools that can adapt to the changing requirements and environment of an R&D project.
- Documentation and data collection (capturing all of the R&D acquired knowledge and metrics) are sporadic or non-existent.
- Preconceived ideas are formed before adequate evidence is available and are considered as rigorous solutions.
- Attempts at resolving the project's technical obstacles are often done by trial and error.
- Measuring the R&D team's efficiency and predicting the project costs & success is practically non-existent.

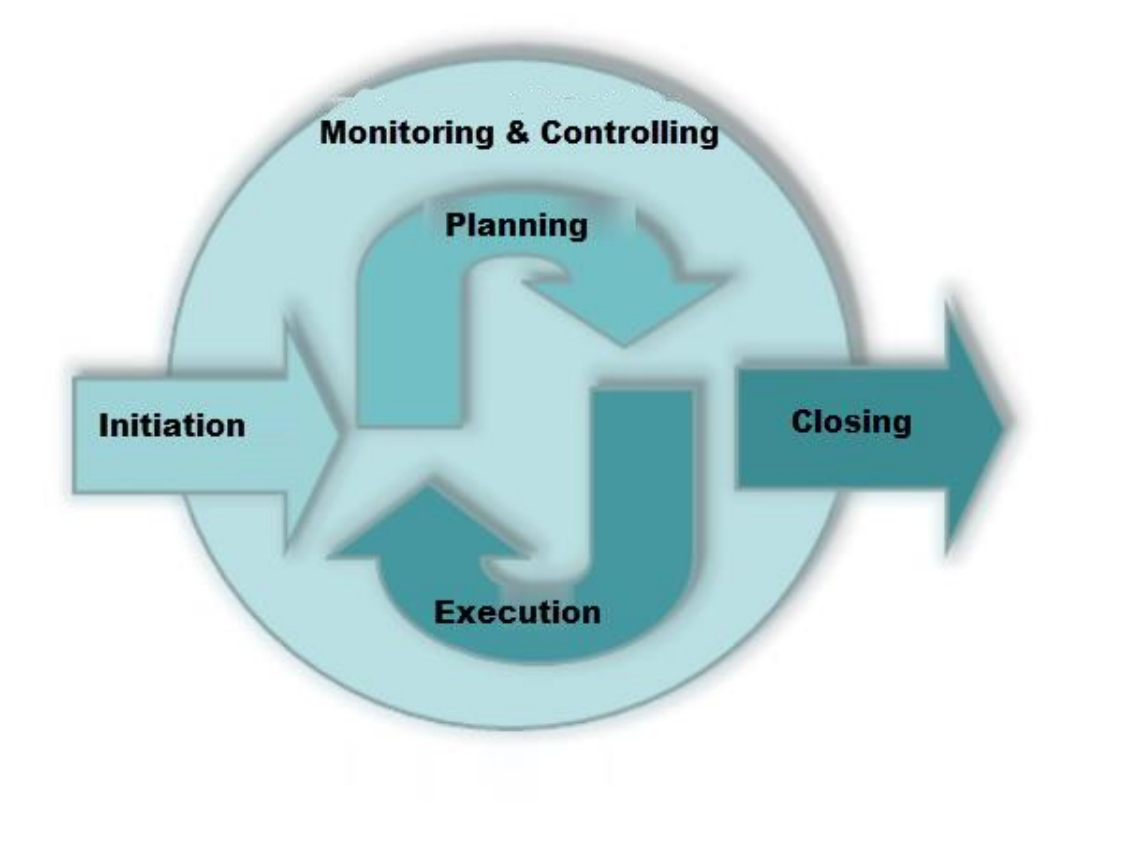
2.1 Definition of a project

- A project is a temporary effort undertaken to create a unique product, service or result.
- A project is temporary in that it has a time-defined start and end, and therefore a defined scope and resources.
- And a project is unique in that it is not a routine operation, but a specific set of operations designed to achieve a goal.



2.2 The 5 process groups of project management

- Initiation
- Planning
- Execution
- Monitoring & Controlling (management)
- Closing



2.3 Planning a project

- Project planning refers to everything you do to successfully set up your project. This is the process you go through to establish the steps necessary to define your project's goals, clarify the scope of what needs to be done, and develop the to-do list.
  - Appoint a project manager with clearly defined authority.
  - Write a description of the context (analysis), objectives and deliverables of the project.
  - Establish the methodology (project management process).
  - Develop a preliminary list of tasks and activities to achieve the goals.
  - Plan the execution of project tasks and activities.
  - Determine the resources needed to complete the project.
  - Master the management of the project.

3.1 Project management methodologies

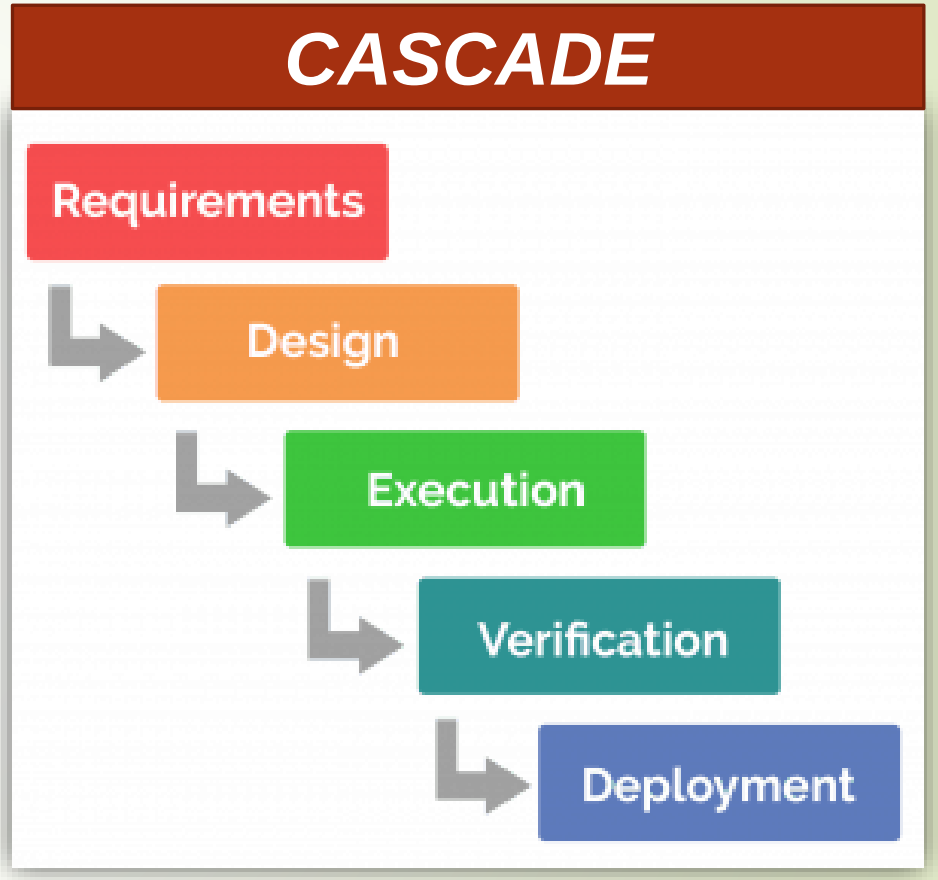
- Project management methodologies help you accomplish every step of your project, from planning to implementation, for efficiency and profitability.

- **Following are four methodologies:**
  - **Cascade**
  - **Agile/Scrum**
  - **Scientific/Iterative**
  - **Software/Iterative**

3.2 Cascade method

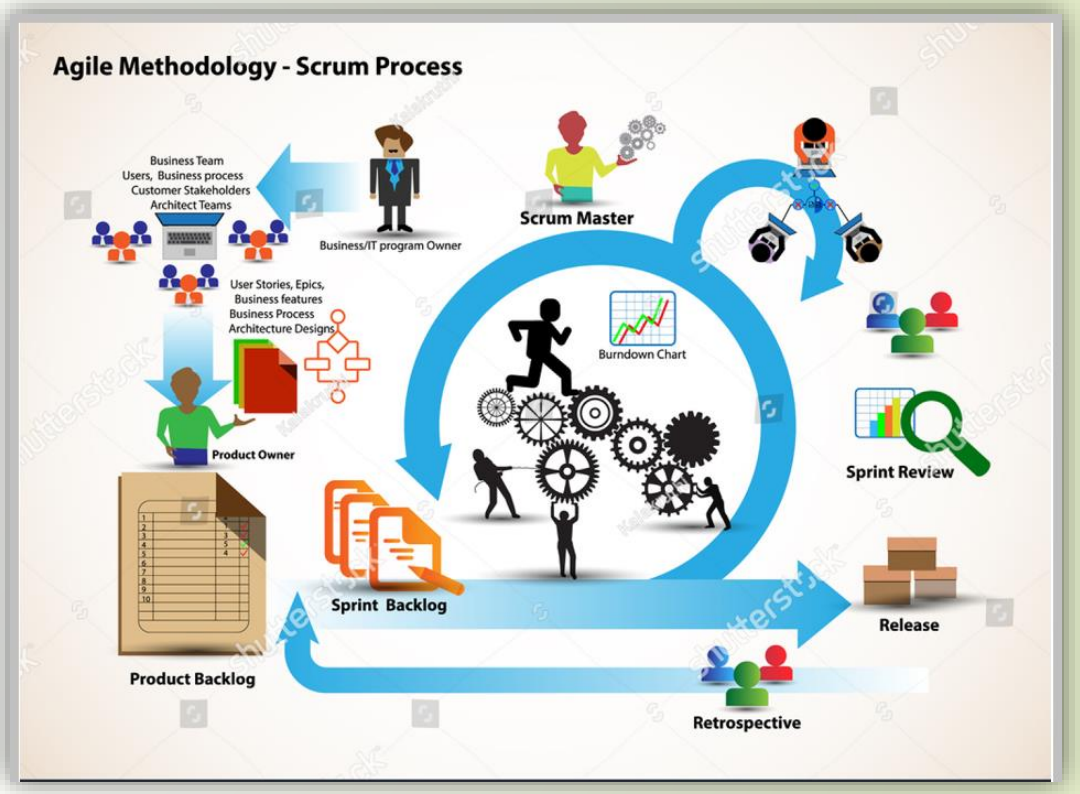
- As the name suggests, the waterfall approach follows the logic of a waterfall. Once the water has rolled down the side of the mountain, it can no longer rise, but only continue its way.

- Thus, **as soon as a stage of the project is completed, the team moves on to the next stage; there is no (or little) going back**. The idea is to move forward naturally, step by step, until reaching the final goal by following a clear and precise direction.



3.3 Agile/scrum method

- Agile/scrum project management is a sprint/iteration approach to project management for software development.
- Agile focuses on fixed length sprint/iterations (mini waterfall) to lead to rapid delivery of part of the software.



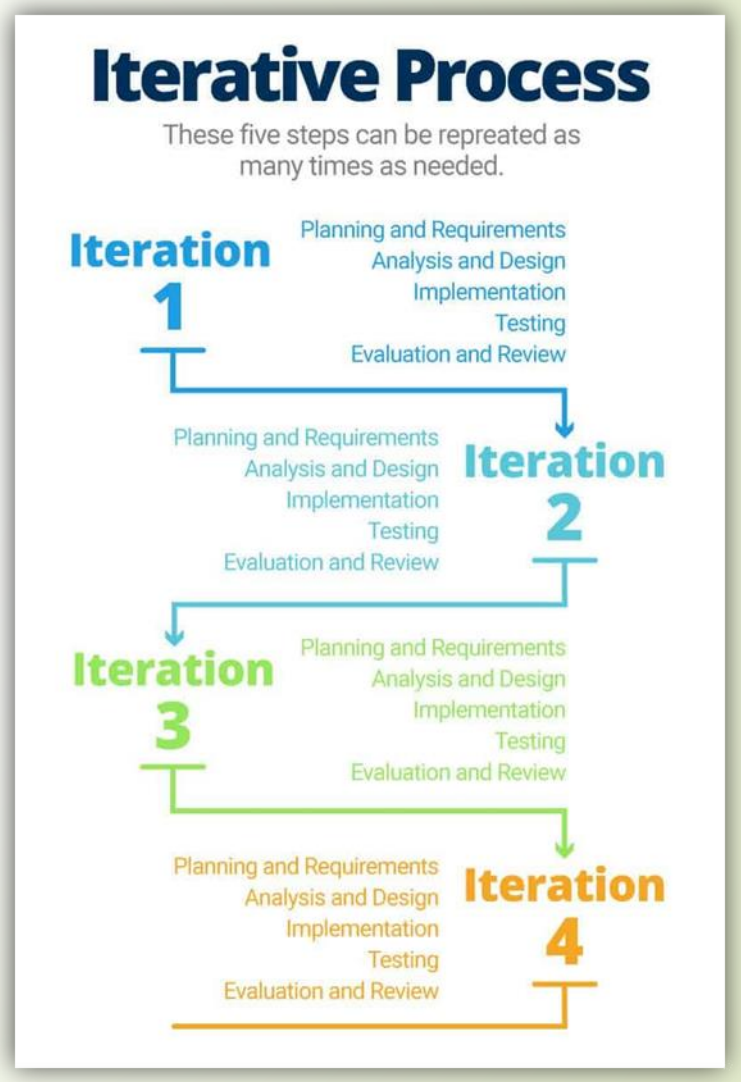
3.4 Scientific/Iterative Method

The Scientific Method

The iteration of four recursive phases for the planning, conduct, and stepwise refinement of a research or development task

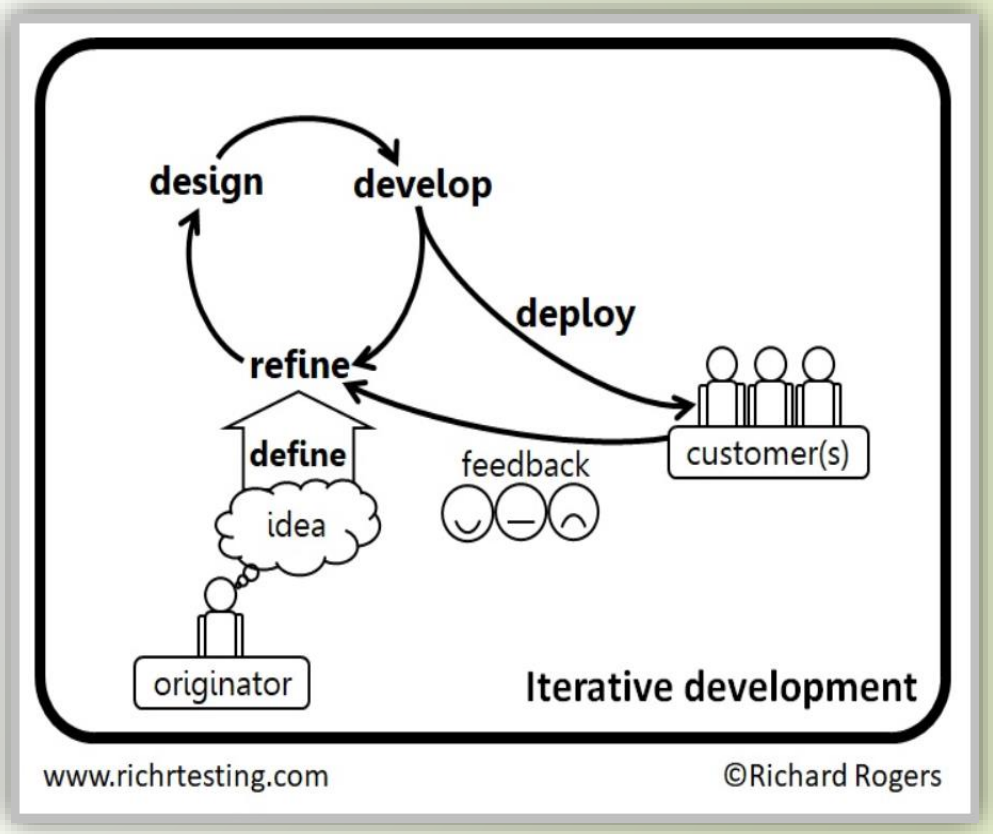
Analysis	Describe Problem Set Performance Criteria Investigate Related Work State Objective
Hypothesis	Specify Solution Set Goals Define Factors Postulate Performance Metrics
Synthesis	Implement Solution Design Experiments Conduct Experiments Reduce Results
Validation	Compute Performance Draw Conclusions Prepare Documentation Solicit Peer Review

Getting it right by Peter Block (Academic Press)



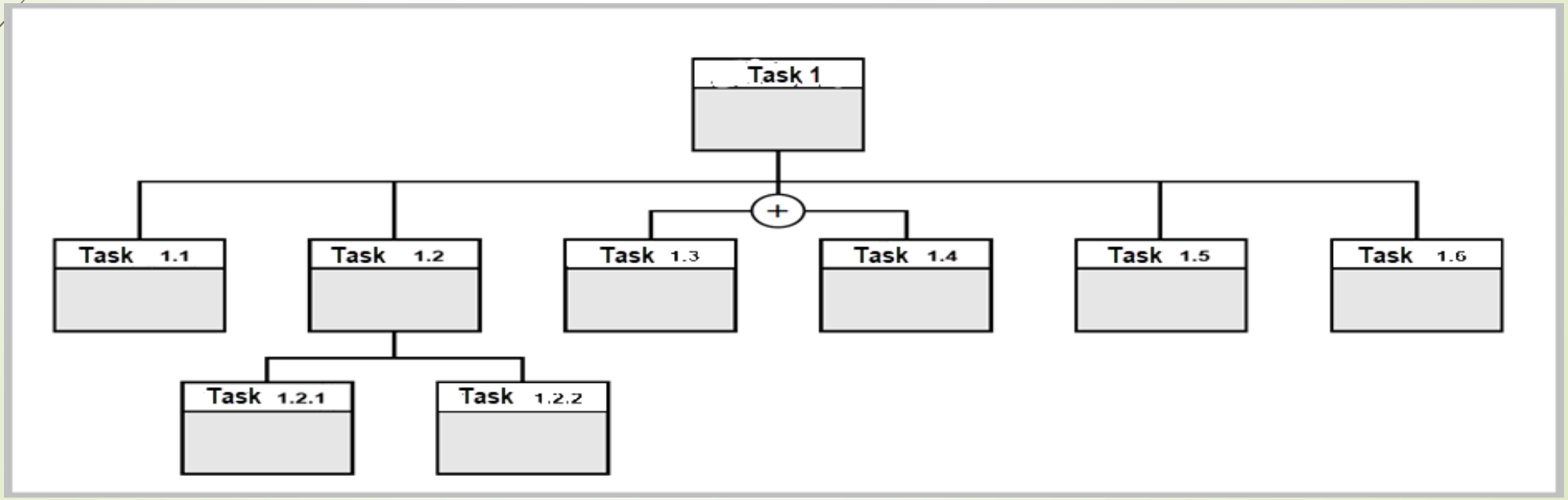
3.5 Iterative/software

- An iterative lifecycle model does not attempt to start with a complete specification of requirements.
- Development begins with the specification and implementation of only part of the software, which can then be revised to identify other requirements. This process is then repeated, producing a new version of the software for each cycle of the model.
- The iterative life cycle model consists of repeating the following 4 phases:
  - A requirements phase (planning), during which software objectives / requirements are gathered and analyzed.
  - A design phase, in which a software solution that meets the requirements is designed.
  - An implementation and testing phase, when the software is coded, integrated and tested.
  - An examination phase, during which the software is evaluated.



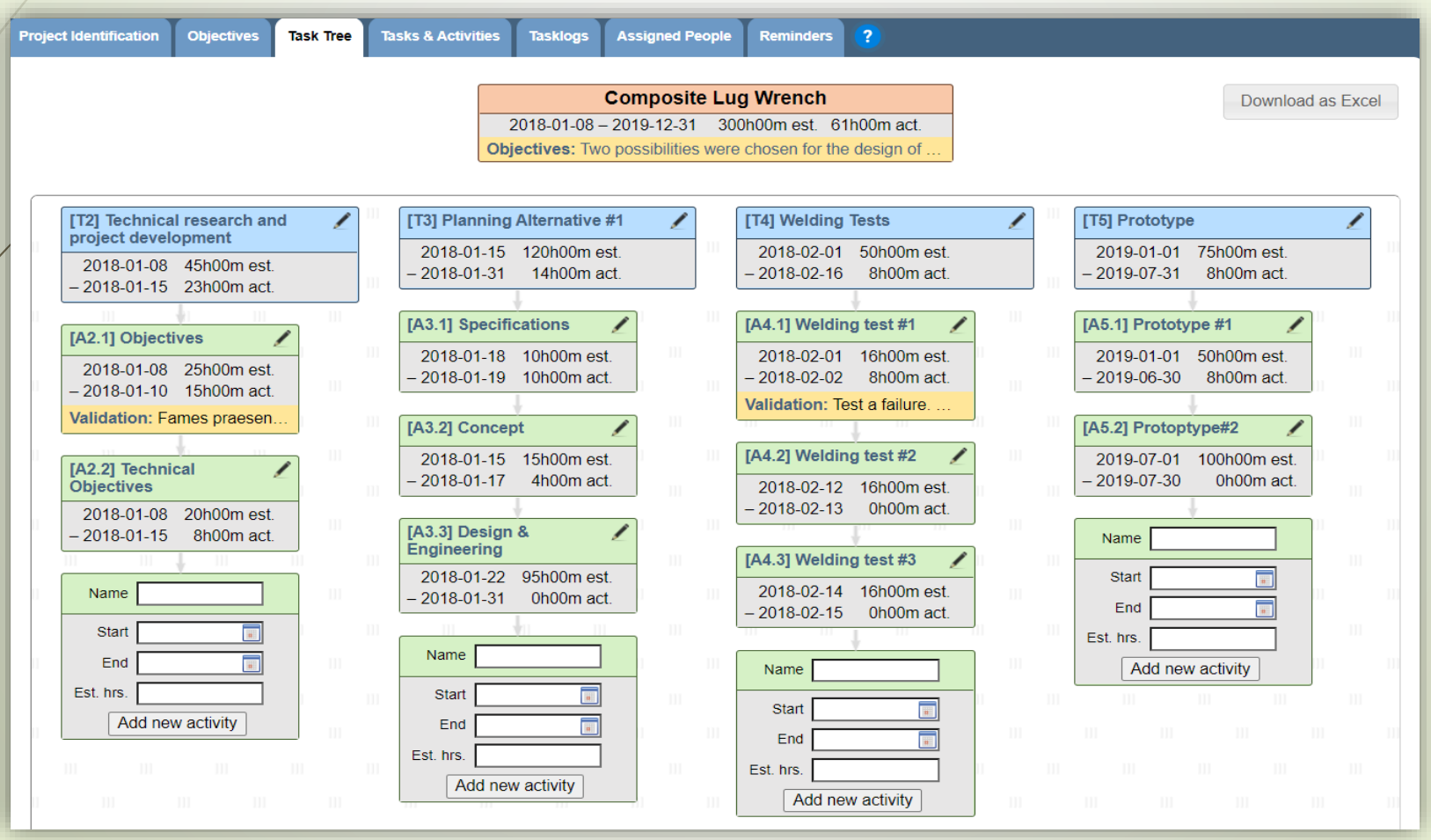
3.6 Task Tree

- Each project has a hierarchy of tasks, each with a single goal. The figure below represents a very simple hierarchy of tasks in the form of a tree, called the project task tree, or simply a task tree.
- Task 1 (project objective) at the first (highest) level invokes six sub-tasks at the second level of the hierarchy (top-down tasks), the objectives of which must be met to achieve the objective of the parent task, the task 1.
- Likewise, task 1.2 at the second level invokes two top-down tasks at the third level, both of which must be met to achieve the parent task's goal (project goal).

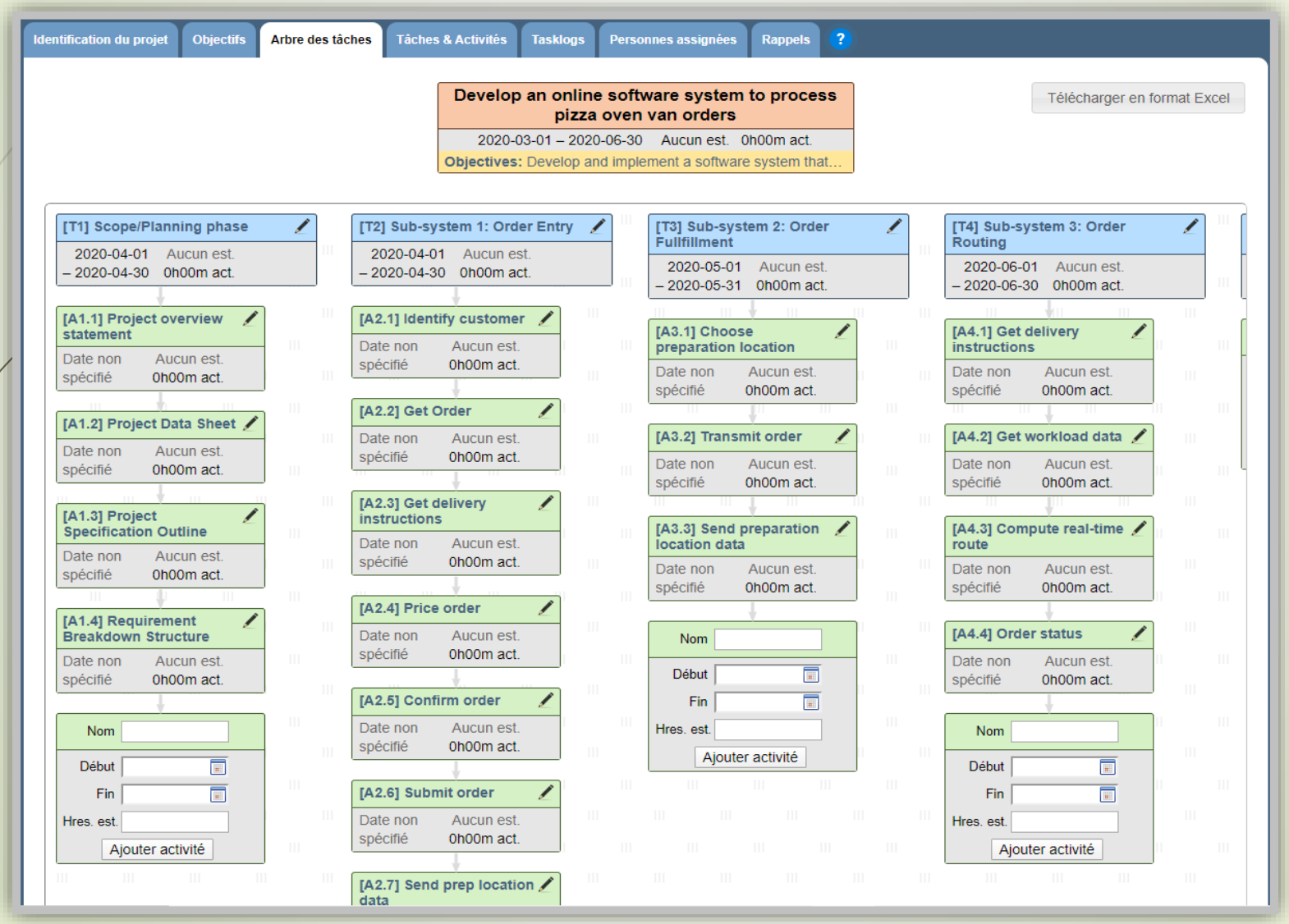


3.7 Task Tree: typical project

Acute360 iterative task tree management hierarchy is comprised of four building blocks:
1. Analysis/Objectives 2. Tasks 3. Activities/Iterations (Hypotheses & Experimentations) 4. Validation.

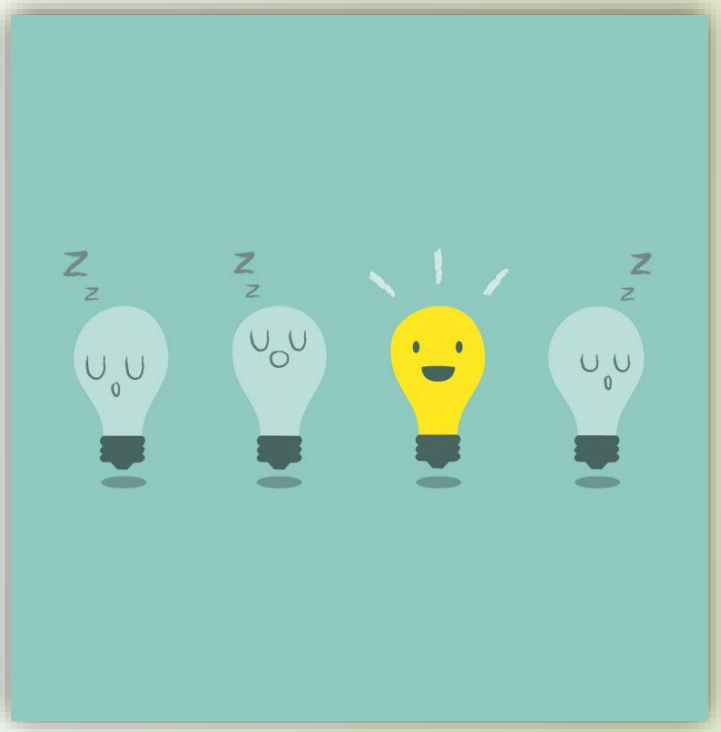


3.8 Task Tree: software project



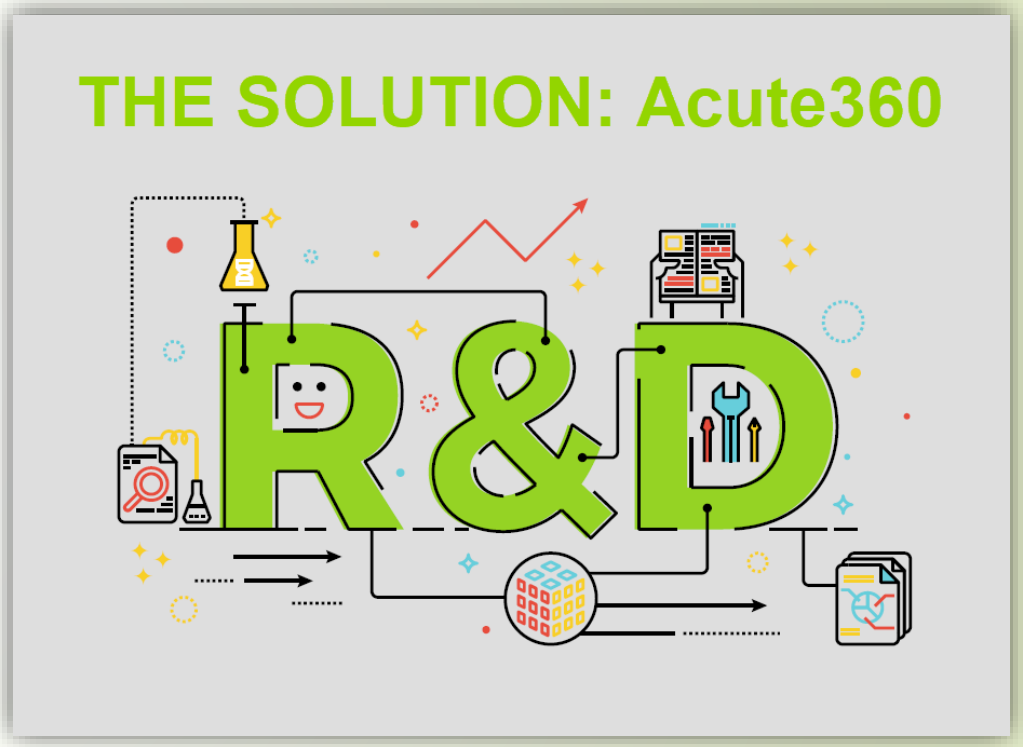
4.1 R&D project management tools

- To carry out an R&D project - setting objectives, organizing actions, planning, etc. - the project manager must use tools to manage, organize and document the project either with:
  - A group of manual or digital tools (Notebook, Excel, Word, etc.) such as:
    - Laboratory's notebook
    - Logbook
    - Timesheets
    - Etc.
  - A comprehensive software for R&D project management.



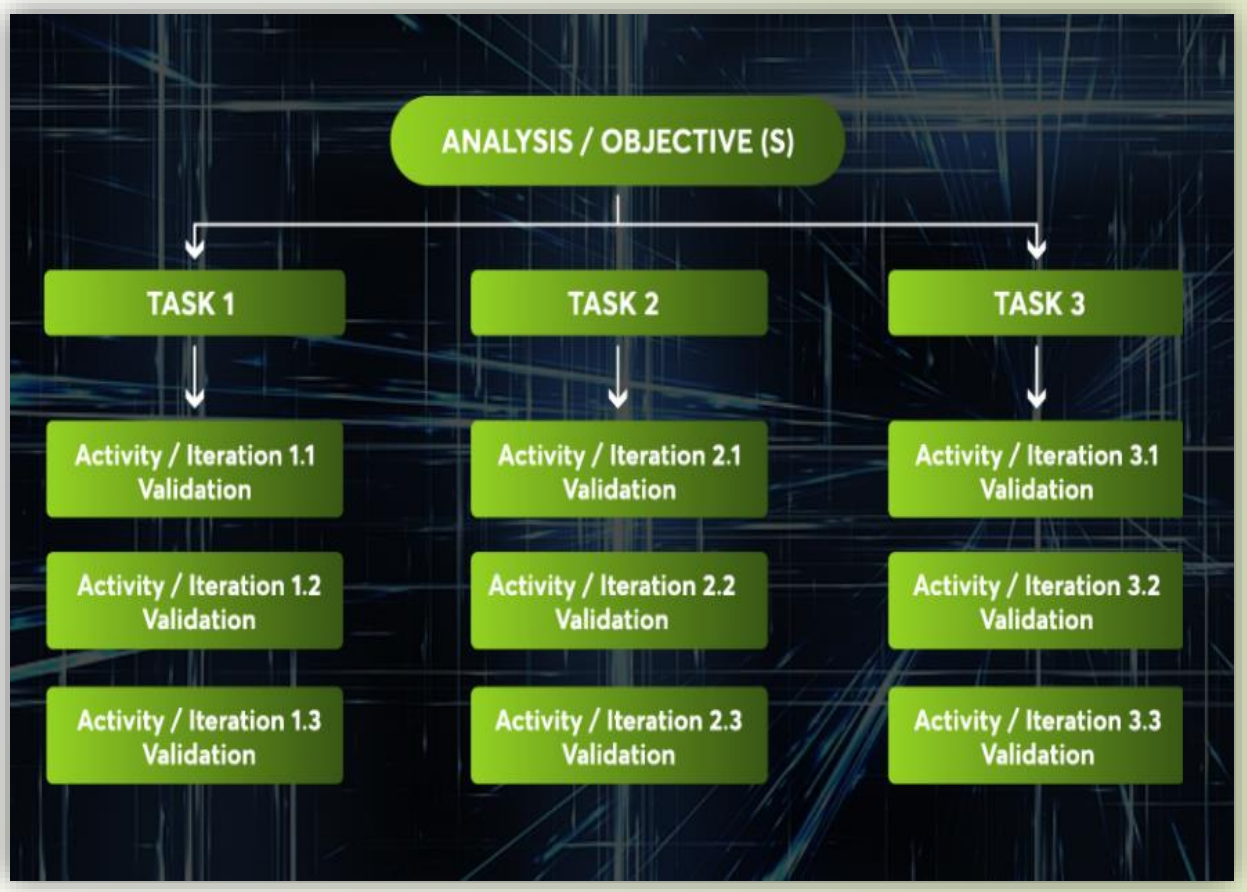
4.2 Acute360 (iterative R&D project management software)

- **Acute360 is a cloud-based R&D project management platform that squarely focuses on managing R&D projects the right way:**
  - Quick Start a project and start managing and documenting the project within minutes.
  - Immediately start logging in time and results via the platform or the mobile app.
  - Easily collect real-time technical and financial data to evaluate a project's performance & manage its success.
  - Effortlessly capture and document all the R&D acquired knowledge and metrics using the mobile app.
  - Easily identify & qualify eligible SR&ED claimable tax credit activities and take out the uncertainties in claiming SR&ED tax credits.



4.3 Acute360 Iterative Hierarchy

- Analysis/Objective: Before defining the objective of the project, you should go through an analysis phase to gain a thorough understanding of the project's problems and then formulate a specific and reasonable project objective.
- Tasks are a decomposition of the project's objectives into more manageable parts or requirements. They are the roadmap that identifies the requirements or problems that needs to be resolved to attain the project's objectives.
- Activities/Iterations are a descendant (subtask) of the Task, and you may add as many Activities/Iterations to a Task as is required to attain a conclusion (success or failure) to the Task's objective. You can create Activities/Iterations to either define work to be performed required to attain the Task's objective or propose a hypothesis along with a solution that will attempt to resolve a scientific or technological uncertainty/obstacle to attain the Task's objective.
- Validation of the Activity/Iteration is a periodic assessment of the success or failure of the work or experimentation undertaken to attain the Task's objective.



4.4 Acute360 Features

For an overview of Acute360 features:

- **Visit the website at www.acute360.com**
- **Take a step-by-step tour of the platform by clicking on the following link: https://devacute360.nickelled.com/welcome**
- **Try a 30-day free trial by clicking on: https://acute360.com/en/free-trial/**

Conclusions (1 of 2)

To do R&D the right way: plan your project and follow these guidelines:

- Appoint a project manager with clearly defined authority.
- Make a positive first impression: give a title to the project. Make it a mini summary of your project.
- Set the start and end date of the project.
- Start with an analysis and a brief description of the background or reasons for the project.
- Be brief, and to the point and write down the goals so that everyone understands what the project will accomplish.
- Identify the limitations and uncertainties of the project by listing the sources that you have researched and consulted (internet, magazines, books, etc.).
- Always set the start and end date for each task and activity (sub-task). Make an estimate of the hours it will take to complete the project, as well as an estimate of the hours it will take to complete each task and activity.

Conclusions (2 of 2)

- Create a Task Tree for a top-down planning of your project. Create Tasks (break-up of the project's objective into smaller more manageable objectives) & write a brief description of each Task's objective.
- Create Activities (sub-tasks) to either define the work to be performed required to attain the Task's objective or to propose a hypothesis along with a solution that will attempt to resolve a scientific or technological uncertainty/obstacle to attain the task's objective.
- Document (photos, reports etc.) and log (brief explanation) the work and results against each Activity on a regular basis.
- Validate and summarize on a regular basis the work and results that have been logged against each activity.
- In an iterative approach to solving a problem, you venture into unfamiliar territory and you must recognize that you are going to have to do many iterations and often restart the work before reaching the solution. Each activity represents an iteration to arrive at the objective of the task.

References

- Peter Bock, Getting It Right, chapters 3 & 9
- Dominic Battré, Ralf Christel, Florian Schoppmann, Organization and management of R&D projects
- Shutterstock