

Life cycles of Automation
systems

**IN EXPERIMENTAL
FACILITIES**

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CONTENT



- Presentation

- Task

-Related Information

-Ideas on how to achieve the
objective

-Create planning/ scheduling and
decomposition of work

-Ideas how to split tasks among
other participants



Who I am?

Academically, I would like to study a master's degree focused on particle physics, high energies or space science.

Im Oscar Vázquez, im Mexican 🇲🇪, i am 22 years old, I studied physics at the UNAM science faculty, I already finished my credits, just working on my thesis to have my degree.



TASK

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1.

- Define the project objective: Design automation processes for colliders, focusing on DCS life cycle improvement with insights from ALICE and ATLAS experiments.



2.

- Define Automation Systems: Automated systems involve the use of control technologies to operate processes without direct human intervention.

3.

- Develop a detailed project plan with milestones for each stage of the life cycle, adapting it to our context, budget, regulations, infrastructure and personnel.

Related information

Automated

Use of control systems and technologies to operate and control various processes without direct human intervention.



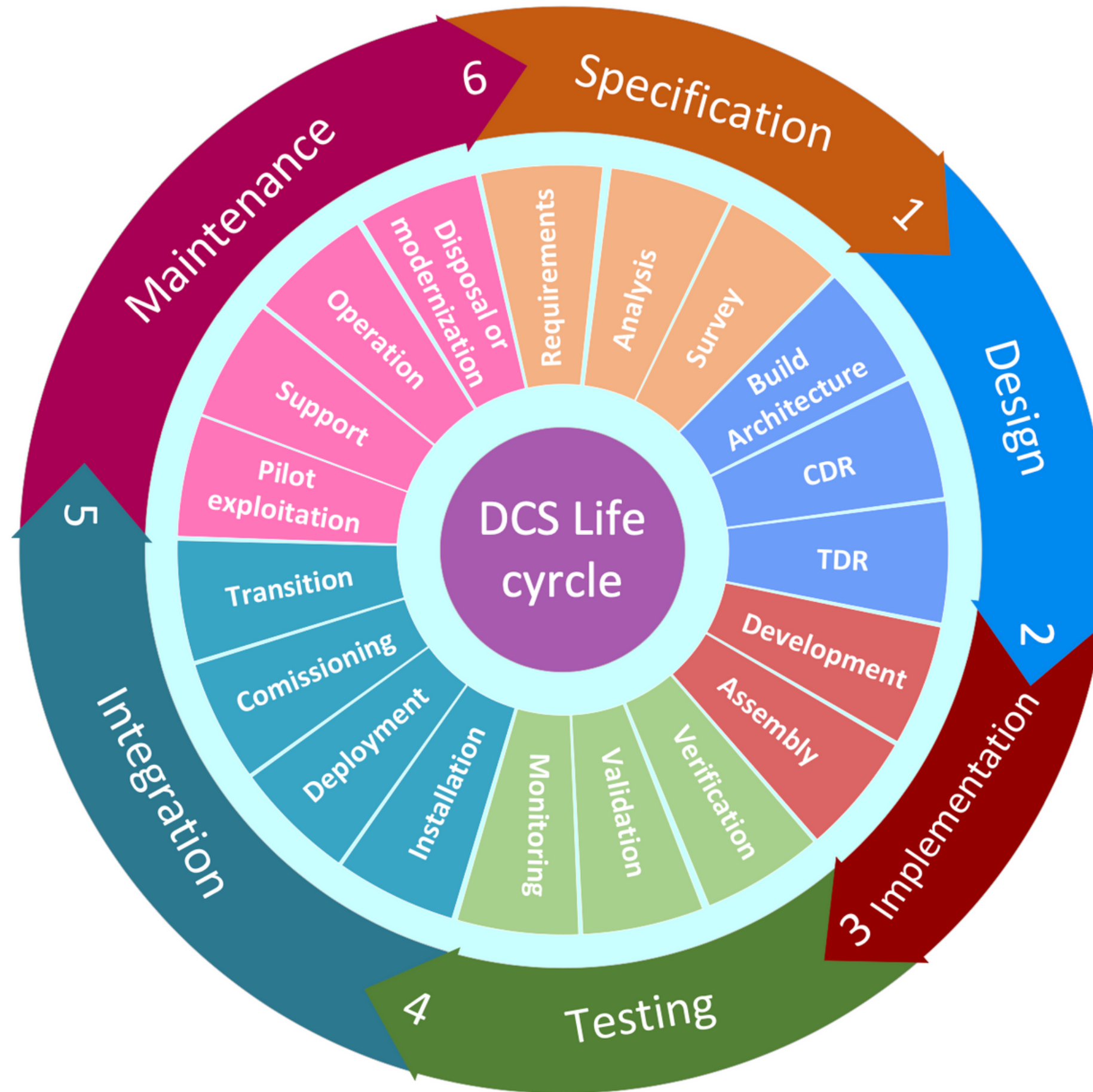
Systems

Components:

1. Particle Acceleration and Control.
2. Beam Steering and Focusing.
3. Data Acquisition and Monitoring.
4. Safety Systems.
5. Remote Operation.
6. Calibration and Alignment.
7. Experiment Control

Life cycle of automated systems

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TDR and CDR refer to two important reports that play crucial roles in the planning, design, and execution of particle physics experiments. These reports provide detailed information about the technical aspects of the experiment, guiding the project through different stages of development.



Conceptual design report

The Conceptual Design Report outlines the conceptual framework, scientific goals, and initial design considerations for a proposed experimental project.

technical design report.

- The Technical Design Report serves as a comprehensive documentation of the technical specifications and design details of a proposed experimental project.

What design stages van they be?

DESIGN CDR AND TDR

CDR

1. DEFINE THE PROJECT SCOPE AND OBJECTIVES.
2. OUTLINE THE EXPERIMENTAL APPROACH.
3. PRELIMINARY DESIGN CONSIDERATIONS.
4. RESOURCE REQUIREMENTS.
5. COLLABORATIONS AND PARTNERSHIPS.

TDR

1. INTRODUCTION AND PROJECT OVERVIEW.
2. DETAILED TECHNICAL SPECIFICATIONS.
3. PERFORMANCE EXPECTATIONS.
4. DATA ACQUISITION AND ANALYSIS.
5. SAFETY CONSIDERATIONS AND RISK ASSESSMENTS.
6. BUDGET AND FUNDING.
7. COMPLIANCE WITH INTERNATIONAL STANDARDS.



International Standards

Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems:

take care of the processes carried out in the experimental stage to avoid risks and how to act if they happen

IEC
61508

ISO
9001

Quality Management

Ensure the quality of components, procedures, techniques, design, execution, safety and handling

Occupational Health and Safety Management Systems:

Regular safety training for personnel working on the experiments, conducting risk assessments in experimental areas, and maintaining thorough records of safety incidents and corrective actions.

ISO
45001

ISO
14001

Environmental Management

Minimize the environmental impact. How to repair damage to the environment

TEAMWORK

3. Those in charge of architecture development and how it would be applied to our context.



Integration



computer systems



1. Those in charge of computer systems, how ALICE and Atlas work, in terms of operation and improvement of automation processes.

physical processes



Those in charge of the physical processes involved, what experiment is being carried out, what is expected to be obtained and analyze the data results.