

**COMPETENCY 1
FOR INFORMATION SYSTEMS
ENGINEERS**

Managing and coordinating a software project

Workplace situations

Development trajectories

Specifications

Gather and analyze project needs, requirements, and limitations.

Write specifications.

Develop and evaluate a prototype.

Coordination of a software project

Choose a technical solution (architecture, development technology).

Determine delivery policy (open source, license, royalties).

Evaluate the results.

Implementation of support tools

Choose the appropriate tools for each stage in the development lifecycle.

Choose versioning management and configuration tools.

Integrate these tools into the project environment.

**Creation of a collaborative workspace,
coordination of a development team**

Plan meetings and interaction between team members.

Manage men and women in a multicultural context.

Actively facilitate creativity and the circulation of information.

**COMPETENCY 2
FOR INFORMATION SYSTEMS
ENGINEERS**

**Designing, developing, and integrating
software bricks**

Workplace situations

Development trajectories

**Specifications for the architecture of the
system and its components**

- Analyze the system's functional and non-functional specifications.
- Organize and structure the modules.
- Determine the interfaces and protocols between components.

**Adjustments and upgrades
to an existing system**

- Analyze the existing system.
- Determine which components to modify and add.
- Evaluate the cost and risks associated with porting.

**Porting of an application from one platform
to another**

- Assess the complexity of porting.
- Assess alternative technical platforms and dependencies.
- Assess the impact of the change.

Integration of existing systems

- Discover and rediscover the systems interfaces to integrate.
- Develop uniform facades for the systems to integrate.

**COMPETENCY 3
FOR INFORMATION SYSTEMS
ENGINEERS**

Automating information processing

Workplace situations

Development trajectories

Application design

Analyze the customer's needs.

Describe the features of an information system.

Recommend an algorithm.

Design and development

Study the feasibility and effectiveness of the solution (complexity of the algorithm).

Develop a prototype.

Experiment (model inputs; simulate and measure performance).

Systems integration

Check that the solution responds to the need.

Create instances of the solution (configuration).

Evaluate performance.

**COMPETENCY 4
FOR INFORMATION SYSTEMS
ENGINEERS**

Administering IT infrastructure

Workplace situations

Development trajectories

Implementation of an infrastructure

- Draw up an implementation plan.
- Track progress on the implementation plan.
- Test and evaluate the infrastructure implemented.

Network updates

- Identify a network's weaknesses.
- Select hardware solutions.
- Create and implement an update plan.

Design of a distributed solution

- Draw up specifications that factor in the unique features of the target domain.
- Select technologies appropriate to the distributed environment.
- Implement development-testing-integration cycles.

Requests for proposals

- Analyze requests for proposals.
- Dimension a solution.
- Write the proposal.

**COMPETENCY 5
FOR INFORMATION SYSTEMS
ENGINEERS**

**Developing smart systems (interactive systems
and complex-data processing systems)**

Workplace situations

Development trajectories

**Creation of a human-machine interface
based on user needs**

Analyze the problem and requirements.

Write specifications.

Develop a prototype and evaluate user-friendliness.

**Implementation of a
content management system**

Analyze needs and initial data.

Choose a technical solution.

Implement and maintain the system.

**Development of or improvements
to a multimedia processing module**

Process image, audio, video, and text.

Transform or analyze signals or symbols.

Evaluate performance.

**Analysis and extraction of
structured information from the web**

Gather a large volume of heterogeneous data.

Filter data to be able to find the information needed.

Organize and summarize information.

**COMPETENCY 6
FOR INFORMATION SYSTEMS
ENGINEERS**

Practicing continuous innovation

Workplace situations

Development trajectories

Needs forecasting (market creation)

- Summarize economic, technical, legal, and societal information.
- Participate in innovation think tanks and trade shows.
- Monitor the emergence of new technologies and new markets.

Business creation (business plan)

- Identify or create a need.
- Interact with public- and private-sector research organizations.
- Recommend an innovative solution.
- Leverage an emerging technology.

Consolidation of a consulting, audit, and training business for the long term

- Acquire new competencies through continuing professional development.
- Gather and organize scientific and technical data from a wide variety of sources.
- Produce work that demonstrates thinking on an emerging technology.
- Establish a professional network.