EIS Technical Solution Design

WELCOME CAPSTONE PROJECT STUDENTS!

I. INTRODUCTION:

We will begin this module by developing a motivation for learning about Technical Solution Design. The purpose of Technical Solution (TS) is to design, develop, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product-related lifecycle processes either singly or in combination as appropriate.

II. OBJECTIVES:

At the end of this module, you should be able to:

1. Identify what Technical Solution Design is.
2. Learn the concept of Project Information and Executive Summary.
3. Determine the Requirements Definition.
4. Identify what Solution Description is.
5. Learn the concept of Process Flow, System Architecture, and Solution Details.
6. Determine the Security Assessment and Testing Strategy.

III. PRELIMINARY ACTIVITIES:

Before you proceed to the main lesson, test yourself in this activity.

What is Technical Solution Design?

_____

_____

_____

_____

GREAT!!!
You may now proceed to the main lesson.

Based on the preliminary activities, what did you notice about it?
_____
CONGRATULATIONS!
You may now proceed to the lesson.

IV. DEVELOPMENT OF THE LESSON

Course Materials:

Technical Solution Design

The purpose of Technical Solution (TS) is to design, develop, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product-related lifecycle processes either singly or in combination as appropriate.

The Technical Solution process area is applicable at any level of the product architecture and to every product, product component, and product-related lifecycle process. Throughout these areas, where we use the terms product and product component, their intended meanings also encompass services and their components.

The process area focuses on the following:

· Evaluating and selecting solutions (sometimes referred to as "design approaches," "design concepts," or "preliminary designs") that potentially satisfy an appropriate set of allocated requirements

· Developing detailed designs for the selected solutions (detailed in the context of containing all the information needed to manufacture, code, or otherwise implement the design as a product or product component)

· Implementing the designs as a product or product component

Typically, these activities interactively support each other. Some level of design, at times fairly detailed, may be needed to select solutions. Prototypes or pilots may be used as a means of gaining sufficient knowledge to develop a technical data package or a complete set of requirements.

Technical Solution specific practices apply not only to the product and product components but also to product-related lifecycle processes. The product-related lifecycle processes are developed in concert with the product or product component. Such development may include selecting and adapting existing processes (including standard processes) for use as well as developing new processes.

Processes associated with the Technical Solution process area receive the product and product component requirements from the requirements management processes. The requirements management processes place the requirements, which originate in requirements development processes, under appropriate configuration management and maintain their traceability to previous requirements.

For a maintenance or sustainment project, the requirements in need of maintenance actions or redesign may be driven by user needs or latent defects in the product components. New requirements may arise from changes in the operating environment. Such requirements can be uncovered during verification of the product(s) where actual performance can be compared against the specified performance and unacceptable degradation can be identified. Processes associated with the Technical Solution process area should be used to perform the maintenance or sustainment design efforts.

Project Information

On a building construction project, the '**project information**' is all the information, in whatever format, that is used to create, communicate and realize the project from its inception.

Given the potentially large number of people that may be involved in such projects, including clients, consultants, contractors, subcontractors, and other stakeholders, the amount of information created can be enormous and may include letters, sketches, drawings, schedules, bills of quantities, specifications, contracts, models and so on. This includes information that, whilst it may have been superseded, nevertheless contributed to the overall realization of the project and so is typically retained for record purposes.

Example:

NAME	ClickIT
DESCRIPTION	Develop a system that will help university staff to monitor and solve the reported concern or issue inside the campus immediately.
BUSINESS SPONSOR	Rose Anne Tanjante
OBJECTIVE	To optimize the business services of report and monitoring with rewards system by developing a web application and a mobile application to provide a systematic and improved approach in solving and monitoring of reported issues and concerns.

Executive Summary

An executive summary is a brief introduction and summary of your business plan. It should describe your business, the problem that it solves, your target market, and financial highlights.

A good executive summary grabs your reader's attention and lets them know what it is you do and why they should read the rest of your business plan or proposal. It's not unusual for investors to make an initial decision just based on reading an executive summary, so it's important to get it right. We'll show you how to write an executive summary that sets your business plan apart from the rest.

How long should an executive summary be?
The general rule of thumb is that executive summaries should be as short as possible. Your audience has limited time and attention and they want to get the details of your business plan as quickly as possible.

Example:

To accommodate and monitor the reported concerns and issues, ClickIT was proposed to adapt a generic business process to validate, verify, monitor and solve the report. This proposed project will provide an efficient way to handle and manage every reported issues and incidents being encountered inside the university.

The proponent sees this as a chance to improve the business transactions and strategies of Report and Monitoring of concerns and issues in Quezon City Polytechnic University using the said application, and intends to create a solution to cater these concerns and interests.

Requirements Definition

Requirements Definition is an art, and a science. It requires analysts to work very closely with customers and to draw on their communication and technical skills to surface underlying business needs that might be addressed by a system solution. One of the major pitfalls is to "leap to a solution" with an inadequate understanding of the operating problems and fundamental needs of the customer. Requirements analysis is also by nature an explorative and iterative process. Frequently, customers cannot adequately state what they really need until they see what they have asked for in previous requirements iterations with an IT team. As stated earlier in the introduction to this handbook, an iterative project approach may need to be

used in which repeated sequences of Requirements Definition, System Design and System Build phases will progressively define and build the solution in iterative or spiral approach.

Example:

Req No.	Business Requirement	User Story	Acceptance Criteria	Remarks
U-1	As a Middleman, I should be able to check the sent report if it is valid.	Web App	• Viewing of attached report details. • Concerns and issues are filtered by category	
U-2	As a Middleman, I want to be able to send the validated report either to OSAS Head or to the Guidance Head or both.	Web App	• Reports should be sent either to OSAS Head and Guidance Head or both • Viewing of reported concerns and issues details	
U-3	As an Administrative Staff, I want to be able to send the validated report either to OSAS Head or to the Guidance Head or both.	Web App	• Reports should be sent to Maintenance Staff • Viewing of reported concerns and issues details	
U-4	As a Clicker, I should be able to send a report in a picture or video format.	Mobile App	• User can send a report in a picture or a video format • Mobile app user navigation	
U-5	As a Clicker, I should be able to send a report anonymously.	Mobile App	• User is able to send a report anonymously • Mobile app user navigation	
U-6	As an OSAS Head, I must be able to see the list of reported concerns and issues by category.	Web App	• Reports is categorizing as: Environment issue and Student issue • Dashboard contains the total number of reported concerns and issues by: solve, unsolved, and pending	
U-7	As a Guidance Head, I must be able to see the list of reported concerns and issues by category.	Web App	• Reports is categorizing as: Environment issue and Student issue • Dashboard contains the total number of reported concerns and issues by: solve, unsolved, and pending	
U-8	As an Admin, I want to manage the users of the system.	Environment Setup and configuration	• User Management	
U-9	As an OSAS Head, I want to manage the monitoring of reported concerns and issues.	Web App	• Monitoring of reported concerns and issues history • Reports are filtered by: solved, unsolved and pending • User is able to view all concerns and issues details • User can change the initial remarks and status of reported concerns and issues • Printable is generated after filtering	

| U-10	As a Guidance Head, I want to manage the monitoring of reported concerns and issues.	Web App	• Monitoring of reported concerns and issues history • Reports are filtered by: solved, unsolved and pending • User is able to view all concerns and issues details • User can change the initial remarks and status of reported concerns and issues • Printable is generated after filtering	
U-11	As a Middleman, I should be able to identify the incident by category.	Web App	• Reports is categorized as: Environment issue and Student issue	
U-12	As an Administrative Staff, I should be able to identify the incident by category.	Web App	• Reports is categorized as: Environment issue and Student issue	
U-13	As a Clicker, I'd like to be able to redeem my points from sending such issue and concern being encountered inside the campus.	Mobile App	• View list of reports with equivalent points.	
U-14	As a Clicker, I must be able to notify about my reported concern or issue.	Mobile App	• Viewing of the report's status • Viewing of reported concerns and issues details	
U-15	As an Admin I want to be able to have all source code data used and turnover to internal IT team.	Documentation	• Source code • Accounts/ credentials • System Manuals	
U-16	As an Admin I want to be able to maintain an environment for continuous development.	Web Tool	• Dev, QA, and Prod environment\ • Setup of System Entities	
U-17	As a Maintenance staff, I must be able to provide a solution on the reported environment issue,	Web App	• Monitoring of reported concerns and issues history • Reports are filtered by: solved, unsolved and pending • User is able to view all concerns and issues details • User can change the initial remarks and status of reported concerns and issues	

Solution Description

Defining the solution at the highest level of abstraction is akin to problem solving. I have used parts of the problem-solving model to get this high-level solution definition for years. It works and it is discussed here.
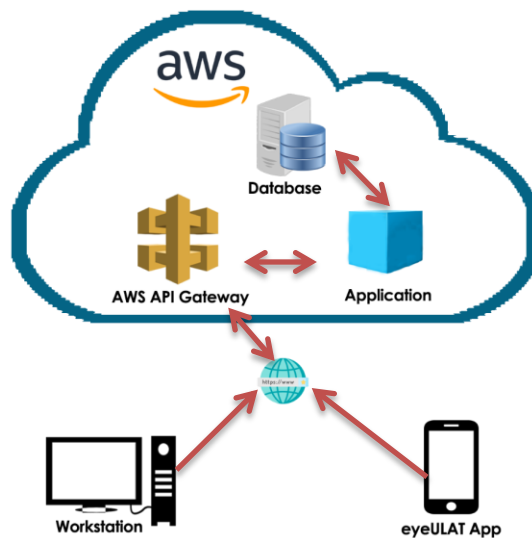
Example:

A. **Logical Architecture**

Architecture Level 2-3 diagram, showing affected/used components and interfaces
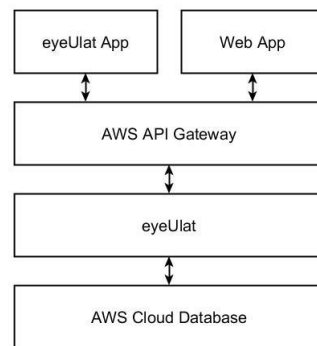
B. **High Level Architecture**

A representation of HL architecture used here to show how the systems will interconnect.

Process Flow

It is a method of visually documenting the stages involved in performing a certain business procedure. A type of process flow popular among business managers might take the form of flow charts that show inputs or information requests, followed by each of the steps required to create deliverable outputs such as products or services from the inputs.
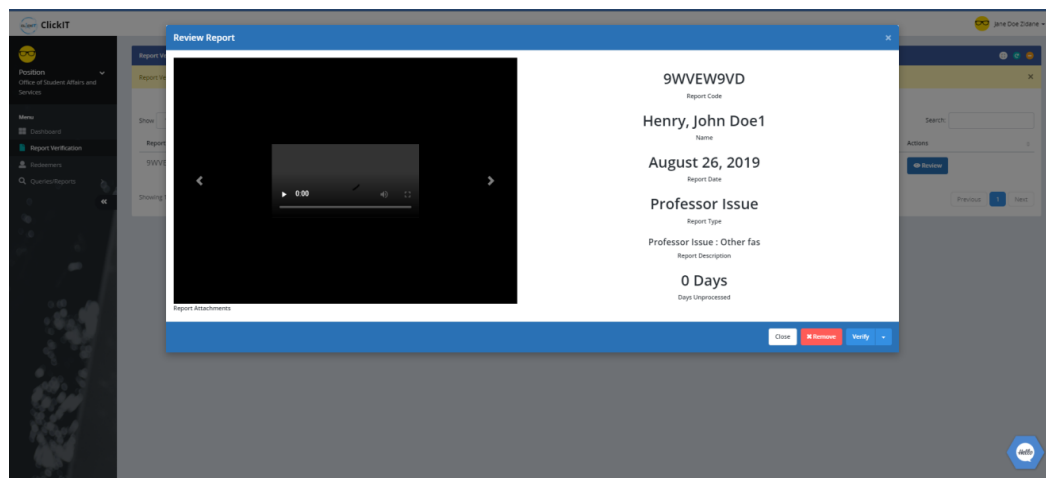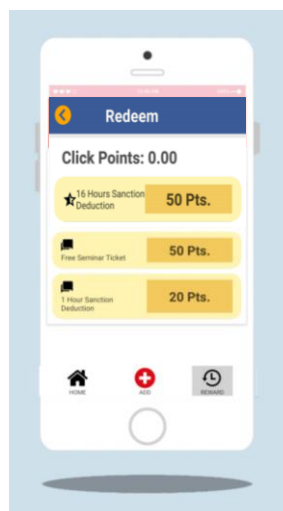
Example:

Sending Reports
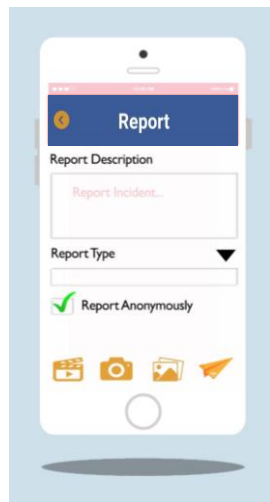
Monitor the Reported Issues


Redeeming Rewards

System Architecture

The purpose of system architecture activities is to define a comprehensive solution based on principles, concepts, and properties logically related to and consistent with each other. The solution architecture has features, properties, and characteristics that satisfy, as far as possible, the problem or opportunity expressed by a set of system requirements (traceable to mission/business and stakeholder requirements) and life cycle concepts (e.g., operational, support) and which are implementable through technologies (e.g., mechanics, electronics, hydraulics, software, services, procedures, human activity).

System Architecture is abstract, conceptualization-oriented, global, and focused to achieve the mission and life cycle concepts of the system. It also focuses on high-level structure in systems and system elements. It addresses the architectural principles, concepts, properties, and characteristics of the system-of-interest. It may also be applied to more than one system, in some cases forming the common structure, pattern, and set of requirements for classes or families of similar or related systems.
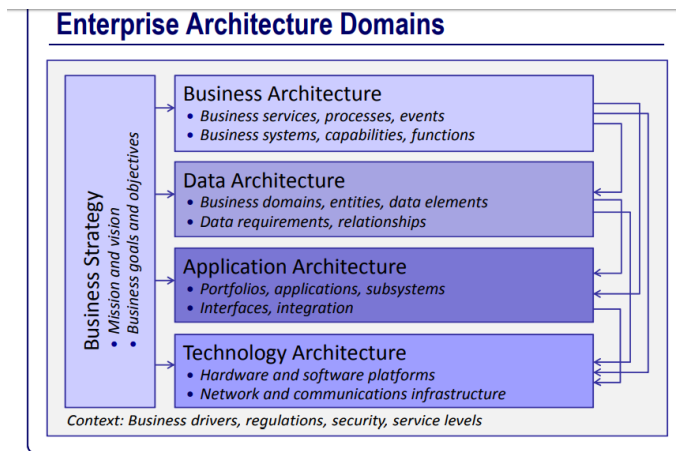
|		Security Architecture	Data Architecture
Business Layer	Business Capabilities Business Processes Ethnograpics	Threats, Vulnerabilities Requirements	Ontologies, Information Models
Application Layer	Application Models Portfolio Management	Application controls	Logical data models
Technology Layer	Infrastructure Technical Standards	Technical controls	Databases, Files, XML, Schemas

Example: Data Architecture
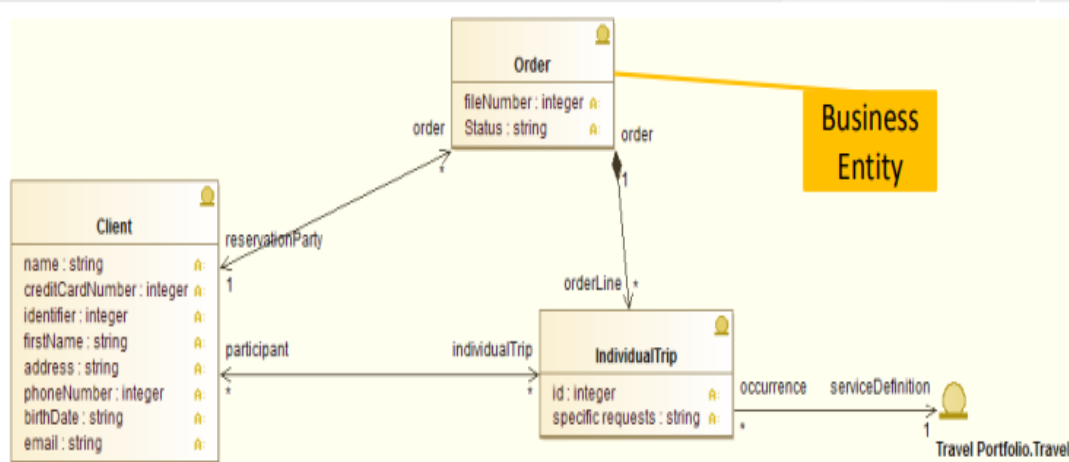
Example: Technology Architecture
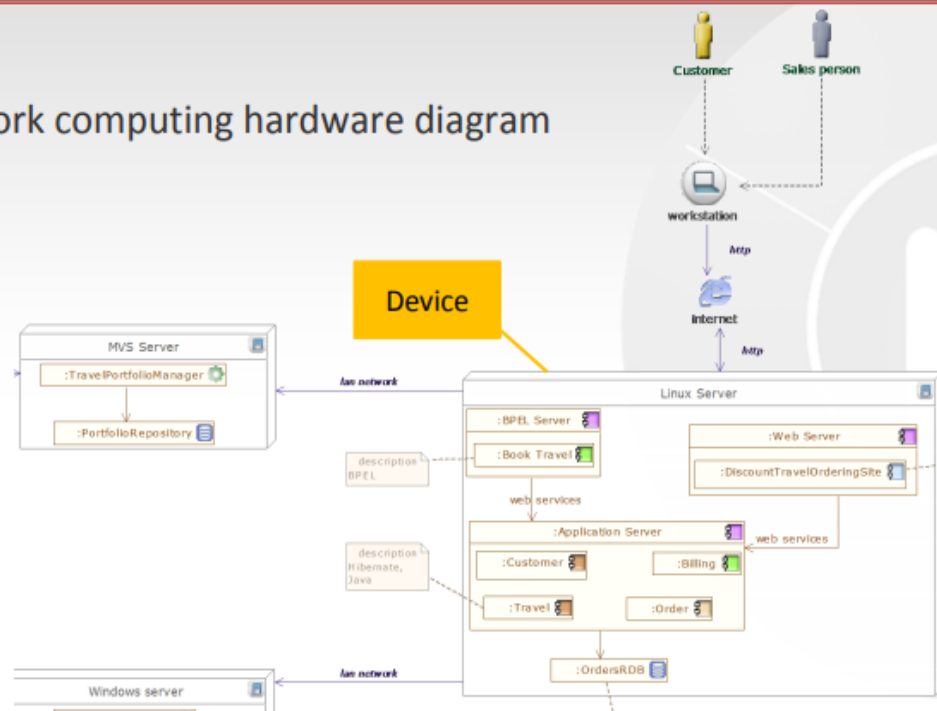
Solution Details

A **solution** is an implementation of people, processes, information and technologies in a distinct system to support a set of business or technical capabilities that solve one or more business problems.

Example:

#	API	Source	Target	Interface Type	Interface Description	New/Reuse /Enhance
1	Enroll as user	App/Web	API Gateway	Request	Process Request	Reuse
2	Validate user	App	Sendit! server	Response	SOAP/REST	Reuse
3	Log In	App/Web	API Gateway	Internal	Process request	Reuse
4	Facilities/Asset Validation	App/Web	Sendit! server	Request	Process request	Reuse
5	Employee/Faculty Validation	App/Web	Sendit! Server	Response	SOAP/REST	Reuse
6	Student Organization Validation	App/Web	Sendit! Server	Request	Process Request	Reuse
6	OSAS Validatoon	App/Web	API Gateway	Schedule	Cron job	Reuse

Security Assessment

Information Technology Security Assessment (IT Security Assessment) is an explicit study to locate IT security vulnerabilities and risks.

Purpose of Security Assessment

The goal of a security assessment (also known as a security audit, security review, or network assessment), is to ensure that necessary security controls are integrated into the design and implementation of a project. A properly completed security assessment should provide documentation outlining any security gaps between project designs and approved corporate security policies. Management can address security gaps in three ways: Management can decide to cancel the project, allocate the necessary resources to correct the security gaps, or accept the risk based on an informed risk / reward analysis.

Example:

Solution provider must fully comply with Information Security requirements. Security controls should be implemented that insure the validation of input data, internal processing and output data.

***Low – resource utilization is 2hrs

Testing Strategy

A **test strategy** is an outline that describes the testing approach of the software development cycle. The purpose of a test strategy is to provide a rational deduction from organizational, high-level objectives to

actual test activities to meet those objectives from a quality assurance perspective. The creation and documentation of a test strategy should be done in a systematic way to ensure that all objectives are fully covered and understood by all stakeholders. It should also frequently be reviewed, challenged and updated as the organization and the product evolve over time. Furthermore, a test strategy should also aim to align different stakeholders of quality assurance in terms of terminology, test and integration levels, roles and responsibilities, traceability, planning of resources, etc.

Test strategies describe how the product risks of the stakeholders are mitigated at the test-level, which types of testing are to be performed, and which entry and exit criteria apply. They are created based on development design documents. System design documents are primarily used, and occasionally conceptual design documents may be referred to. Design documents describe the functionality of the software to be enabled in the upcoming release. For every stage of development design, a corresponding test strategy should be created to test the new feature sets.

Example:

Testing was being done during each stage in the development. There is one (1) dedicated tester assigned on every sprint. The test cases for each sprint should be developed from the functional specification and use cases. Test Cases are based on the agreement during sprint planning of the Team depending on the timeline of a sprint. If a sprint will take 2 weeks, then it needs to determine how many can one (1) dedicated resource can execute in this timeline.

We had just finished the discussion on EIS Technical Solution Design. Let's move on to the next higher level of activity/ies or exercise/s that demonstrate your potential skills/knowledge of what you have learned.

V. ANALYSIS, APPLICATION AND EXPLORATION

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ACTIVITY 1

Name: _____   Year & Section: _____

Output: Project Information.

Output: Executive Summary.

Output: Scope of Work.

Output: Requirements Definition.

Output: Solution Description.

Output: Process Flow.

Output: System Architecture.

Output: Solution Details.

Output: Testing Strategy.

Finally, let us summarize the lesson of what we had discussed today.

VI. GENERALIZATION

The readings in this section allow us to explore the Technical Solution Design. The purpose of Technical Solution (TS) is to design, develop, and implement solutions to requirements. Solutions, designs, and implementations encompass products, product components, and product-related lifecycle processes either singly or in combination as appropriate.

VIII. REFERENCES

- http://chrguibert.free.fr/cmmi12/cmmi-dev/text/pa-ts.php.
- https://www.designingbuildings.co.uk/wiki/Project_information.
- https://articles.bplans.com/writing-an-executive-summary/.
- https://its.ucsc.edu/drb/sdlc/req-def.html
- https://www.oreilly.com/library/view/effective-software-project/9780764596360/9780764596360_ch04lev1sec1.html.
- http://www.businessdictionary.com/definition/process-flow.html.
- https://www.sebokwiki.org/wiki/System_Architecture.
- https://www.gartner.com/en/information-technology/glossary/solution.
- https://en.wikipedia.org/wiki/Test_strategy.

CONGRATULATIONS on reaching the end of this module!
You may now proceed to the next module.
Don't forget to submit all the exercises, activities and portfolio on _____.
KEEP UP THE GOOD WORK.
Well Done!!!