

Problem Solving (A3) Report

Topic: Reconstruction of UPR course enrollment System

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1. Identify a Problem

PLAN

- Background Context
  - University of Puerto Rico uses an old, non-user friendly and unreliable system for the students to enroll courses.
- Current State
  - Students spends lots of time "just trying to access" the course enrollment system because it crashes. This sometimes led to students not being able to select certain courses and delay the whole process for the University.

2. Set the Target

PLAN

- Design and develop a serverless technology stack in order to handle heavy workloads while at the same time lowering the costs
- New Network Infrastructure →

The diagram illustrates a new network infrastructure setup within an AWS Virtual Private Cloud (VPC). It is divided into two subnets: a Public Subnet and a Private Subnet. The Public Subnet contains a Bastion host, an Internet gateway, and a NAT instance. The Private Subnet contains a Serverless DB instance, a Web app lambda function, and a Backend lambda function. An API Gateway is shown connecting the Internet to the Private Subnet. The entire setup is labeled 'AWS' and 'Virtual Private Cloud'.

3. Analyze the Causes

PLAN

Root cause: It can be hard to migrate from current technology stack them.

Students waste time trying to access the course enrollment system.

Why?

The enrollment system is unable to handle heavy workloads.

Is using 20-year-old technology and approaches.

Why?

It can be hard to migrate from current technology stack them.

Possible causes:

- Employees are not aware of the new technology.
- Employees don't want to do it because it might be hard to migrate technologies.
- Managers are not aware of the positive impact of these technologies; thus, they stick with what they have.

4. Propose & Implement Countermeasures

Proposal: Develop a web application and cloud infrastructure with updated technology. This will allow students to enroll courses from any device that has internet access without using third party software's like PuTTY, Shelly etc. In addition, it will handle heavy workloads while at the same time lowering the maintenance costs.

Cause	Countermeasure	Who?
UPR course enrollment system is; non-user friendly, unstable and unreliable due to the technology stack is using.	Create a user-friendly web application to enroll courses.	Students
	Design a new cloud infrastructure using new technology and cloud computing resources	IT department & University

5. Check/Evaluate

CHECK

Questions to address:

- The system still can't handle heavy workloads?
  - If not, why?
- Are students having trouble understanding the user interface?
  - If not, how can be improved?
- Are the costs the same or more?
  - If not, how we can lower the costs?
- Has the network experience any security breach's?
  - If yes, then review every security measure applied into the network.

6. Act and/or Standardize

ACT

Questions to address:

- How can we ensure the maintenance costs continue to stay as they are or lower them?
  - Evaluate the monthly bills and analyze what resources are doing the most impact.
- How can we ensure we don't get into a similar problem in 5 years?
  - Keep the IT personal up to date with the latest technologies.
- How can we keep improving the user experience?
  - Ask users for feedback.