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<b>Title of Assignment:</b> Assignment 8: Study and explore – case study with DevOps and site reliability engineering.			
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**Aim:** Study and explore – case study with DevOps and site reliability engineering.

**Problem Statement:** Study and explore – case study with DevOps and site reliability engineering.

### Background Information:

#### Site Reliability Engineering (SRE)

Site Reliability Engineering or SRE is an exceptional, software-first approach to Information Technology operations supported by a group of analogous practices. The main focus of SRE is system reliability, which is considered the most basic feature of any product. Once the system is reliable enough then SRE starts to adding new features or producing new products. It also puts efforts for close attention on tracking results, making appreciable performance improvements, and automating operational tasks.

## DevOps

The term DevOps is Development and Operations which was invented in 2009 by Patrick Debois. Nothing but a set of practices in between development and operations in the entire service life cycle. Its principles are the same as those of SRE:

- Application in engineering practices to operations tasks, evaluating results, and belief in automation instead of manual work. But its focus is much larger.
- It appeared in the first place as a culture and mindset that didn't specify how particularly to implement its ideas.
- It's often seen as an inference of main SRE methods so that they can be used by a larger range of organizations.

### Case Study:



Etsy, Inc. is an American e-commerce company focused on handmade or vintage items and craft supplies. With almost 4.4 million sellers and 81.9 million buyers, Etsy enables eCommerce on an enormous scale for various arts and crafts communities internationally. Etsy had adopted DevOps best practices quite early, in 2009, and has been living and breathing the methodology ever since.

The great Etsy cultural shift - Etsy focused on building a culture where teams could collaborate and synchronize in real-time for all their tasks. However, such cultural shifts can be challenging because every business has unique market requirements, resource constraints, and willingness to change.

### **Continuous integration and continuous delivery (CI/CD) -**

Etsy's DevOps teams found a quick and friction-free way to deploy code. The solution involved the implementation of a continuous delivery pipeline. At Etsy, continuous integration is the essential process of integrating new code with a

“master” branch frequently throughout the day. Here, CI systems were usually allowed to automatically run a series of tests upon merging the latest changes to ensure that the integrations were successful.

### **Try -**

Etsy came up with Try, a library that allows developers to test their changes in Jenkins without having to commit to trunk. This tool is central to Etsy’s continuous integration process. Try is responsible for keeping the trunk clean and deployable while enabling developers to quickly and reliably test their changes. In 2011, after Etsy introduced Try to the team, the number of deploys increased to more than 20 deploys a day and more in the future.

### **Deployinator -**

Etsy’s team created Deployinator – a one-button web-based deployment app to make code deployment as easy and painless as possible. With the help of Deployinator, Etsy just needed one person to push any amount of update in just under two minutes. Before implementing DevOps, it required a minimum of three developer engineers, one operation engineer, and any production engineer on standby. Deployinator did a lot of heavy lifting for Etsy and is truly at the core of the company’s development and deployment model

### **Automated testing -**

Continuous deployment allows Etsy to test various scenarios continuously. After investigating a few methods, including O’Brien-Fleming, Pocock, and sequential testing, Etsy ultimately settled on the latter. And so, using the difference in successful observations, the team looked at the raw difference between the old version and the new. This method worked well for detecting small changes quickly.

### **Continuous monitoring -**

Etsy spends a lot of time gathering metrics for all its processes. The development team conducted at least 14000 tests per day. Also, tracking each deployment allowed them to detect any bugs they could have missed quickly. Monitoring is how Etsy’s team builds confidence in their CI/CD processes. The company used various monitoring tools like Nagios, StatsD, Graphite, and Ganglia to correlate issues that arise across its architecture.

### **How has DevOps at Etsy evolved over the years? -**

With the evolution of technology, Etsy has reevaluated its decisions. For instance, Etsy has been using Google Cloud Platform (GCP) as their cloud provider since 2018 after years of hosting their services on self-managed data centers. After that, Etsy started using Jenkins to securely deploy Kubernetes-based authentication tokens and container orchestration. The development team also built an entirely new tool called Switchboard to resolve several Etsy-specific problems like having no load balancer or API endpoints, etc.

### **Outcomes:**

- Etsy began with an honest assessment and identified where the code-base and team stand regarding deployments and where they wanted to take it from there.
- Etsy kept it simple at the start. Prepared small chunks of code.
- Etsy kept their deployment small and often. This enabled people to focus on the quality of their code instead of the reliability/stability of the deployment platform.
- Etsy automated everything they can to foster greater accuracy, reliability, consistency, and speed.
- Etsy evaluated their business, development, and deployment culture, respectively. Visualizations helped them make informed business decisions.
- They encouraged value-based learning and collaboration between teams to bring about transformational change within their organization.

### **GitHub Repo Link:**

<https://github.com/Vidhyapati/CCA-Assignments>

### **Conclusion:**

As DevOps processes grow, there is new increasing demand for professionals with expertise in Key practices and tools. DevOps is not open up new opportunities for Operations personnel but also provides them with a logical career succession.