LEARNING UNIT 03

INFORMATION TECHNOLOGY SERVICE MANAGEMENT (ITSM):

DEVOPS

3.1 INTRODUCTION

This learning unit introduces you to Information Technology Service Management's (ITSM's) DevOps based on the prescribed textbook, which is Kaiser, A.K. (2018). *Reinventing ITIL® in the Age of DevOps: Innovative Techniques to Make Processes Agile and Relevant*. New York: Apress. This book is freely available online from Unisa's e-library – Safari Books Online (O'Reilly) database at https://learning.oreilly.com/library/view/reinventing-itil-in/9781484239766/.

This learning unit introduces DevOps and explains what DevOps is, how and why it came about, the problems it addresses and its principles. It details how DevOps relates to IT services, software development (Dev) and IT operations (Ops) and the benefits of DevOps are exposed with examples. In addition, DevOps is explained in relation to Agile and Lean and directly addresses the typical and long-standing conflicts between IT software development and IT operations teams. The third learning unit highlights that the main objectives of ITIL® and DevOps are essentially the same, to deliver value to the business.

TAKE NOTE

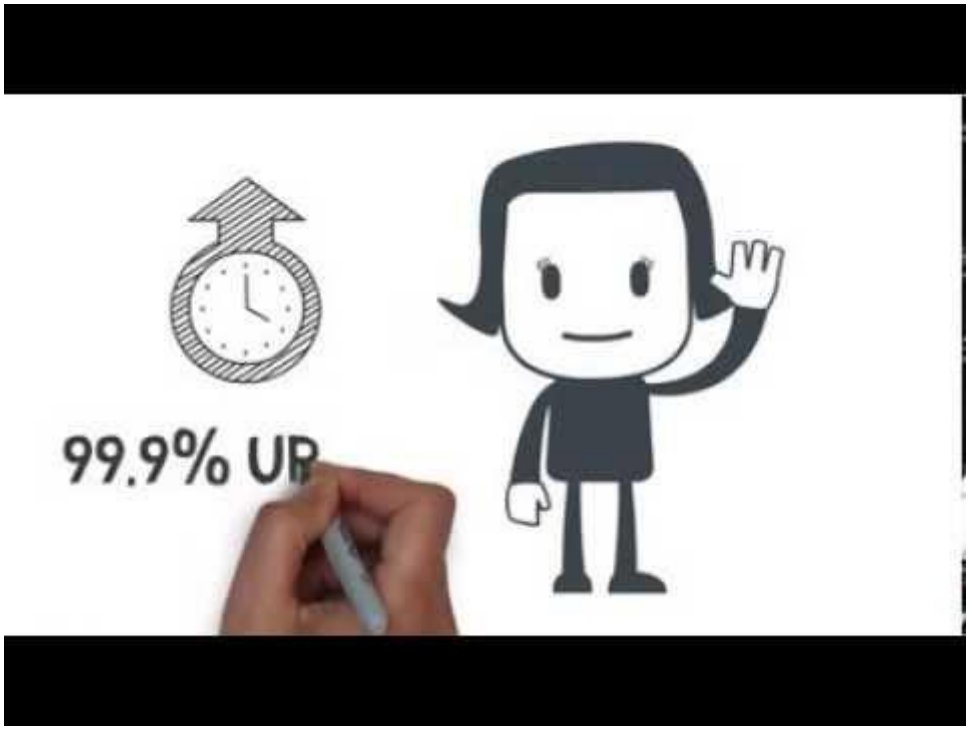
Although Kaiser (2018) refers to the previous ITIL® version 3 structure and ITIL® is now on ITIL® version 4, this module focuses on those relevant aspects of ITL® 3 that remain in ITIL® 4 as practices and require careful integration to be effective. In addition, many organisations that you interact with may still have many aspects of ITIL® 3 embedded; therefore, you must understand how DevOps can be integrated with both ITL® 3 and ITIL® 4 processes and practices. Furthermore, ITIL® 4 states that it can be integrated with DevOps and Kaiser (2018) provides important knowledge about how to practically do this.

Watch this YouTube video:

Use the following link to watch a video explaining DevOps in simple terms: https://www.youtube.com/watch?v=_I94-tJlovg (7:06)

Purpose of the video:

The video explains DevOps in simple terms.



3.2 DEVOPS

DevOps came about to solve significant problems that exist in the IT world. DevOps addresses the problems of slow development cycles, incomplete and unknown upfront requirement specifications, lack of agility, low productivity, inferior quality and inadequate cooperation between developers and operations. DevOps is evolution in practice. DevOps delivers better quality software faster than other Agile development methods and practices.

DevOps is not a set of rules and regulations or a series of sequential steps that must be followed. DevOps is about bringing together the software development team (Dev) and the IT operations team (Ops) to make a single DevOps team. However, there is far more to DevOps. The single DevOps team adopts a new common culture of shared responsibility and accountability, where

mistakes are expected, accommodated and effectively resolved through innovative processes, technology and extensive development and operations automation.

A DevOps team exists from the time their software service begins (requirements gathering) and only disbands once the software is retired. The advantage of DevOps includes outages reduced owing to software deployment, reduced downtime owing to software deployments, automatic failovers whenever hosts go down and reduced architecture complexity.

DevOps is guided by the following set of principles (represented with the acronym CALMS): **C**ulture, **A**utomation, **L**ean, **M**easurement and **S**haring.

Watch this YouTube video:

Use the following link to watch a video exposing how DevOps is implemented in real-life in Netflix: https://www.youtube.com/watch?v=UTKIT6STSVM (29:32)

Purpose of the video:

The video provides a real-life exemplar of DevOps in action. Remember that DevOps is not a prescriptive set of rules, but rather a culture.

ACTIVITY 3.1: DEVOPS

Instructions:

- Go to the **Discussions** tool on the module's myUnisa website.
- Go to the Forum for Learning Unit 03: Specific Questions and Discussions.
- Open the discussion topic: Activity 3.1: DevOps.
- Provide your insight on the questions/tasks that are outlined below. Type your answer to each question in the discussion forum post using 300 words or less.

Purpose:

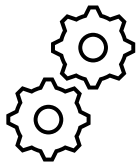
To provide an opportunity for you to apply your knowledge of DevOps in a real-life scenario.

Task:

Study chapter 1 of the textbook (Kaiser, 2018).

Provide explanatory responses to the following:

a) Describe the IT culture in an organisation that you are familiar with (do not use actual names).
b) What problems have you observed as a result of that culture?
c) How do you think the IT in the organisation could be improved by adopting a DevOps culture?



3.3 ELEMENTS OF DEVOPS

The three important elements of any DevOps culture are people, process and technology. People are the essence of DevOps because without people there would be no one to turn on the technology. Today, even artificial intelligence cannot compete with people's creative thinking capacity to develop new solutions and apply creative thinking. People are the culture in DevOps. A typical DevOps team may comprise a product owner (PO), a scrum master (SM), developers (DEVs), testers (TESTs), an architect (ARC), a database administrator (DBA), application support (AS), a system administrator (SYS), a service manager (SMG) and IT security (SEC).

Process is vital because it provides the foundation for automation. The processes come first and then the tools to automate those processes, not vice versa. Important DevOps processes include continuous integration, continuous delivery and continuous deployment. Continuous integration refers to several developers working on the same piece of code at the same time, cooperating, discussing and sorting out any coding conflicts as they arise. Continuous delivery refers to

binaries that have qualified (successful tests) to be released into the production environment. Continuous deployment automates continuous delivery into the production environment.

Technology is the third element of DevOps and enables the critical automation for the massive efficiency gains in DevOps and include tools for source code repositories, hosting services, orchestrators, deployment and environment provisioning and testing.

Watch this YouTube video:

Use the following link to watch a video explaining a DevOps team structure: https://www.youtube.com/watch?v=UyGGYVTQAh8 (7:45)

Purpose of the video:

This video provides an overview of a DevOps team.

ACTIVITY 3.2: ELEMENTS OF DEVOPS

Instructions:

- Go to the **Discussions** tool on the module's myUnisa website.
- Go to the Forum for Learning Unit 03: Specific Questions and Discussions.
- Open the discussion topic: Activity 3.2: Elements of DevOps.

- Provide your insight on the questions/tasks that are outlined below. Please type your answer to each question into the discussion forum post using 300 words or less.

Purpose:

To provide an opportunity for you to practically think about DevOps.

Task:

Study chapter 1 of the textbook (Kaiser, 2018).

Provide explanatory responses to the following:

a) How is software specified, developed, implemented and supported in an organisation that you are familiar with (do not use actual names)?
b) Who are the different teams involved in the different stages?
c) How quickly are new features delivered, how often are there bugs and how quickly are the bugs fixed?
d) How do you think DevOps could help?

3.4 SIMILARITIES AND DIFFERENCES BETWEEN ITIL® AND DEVOPS

Both DevOps and ITIL® focus on and provide value to the customer. ITIL® gives precedence to the customers' perception of value and DevOps incorporates the customer [product owner (PO) team member] into the development team. So, they are both striving to achieve the same outcome, just in very different ways.

Now, let us proceed with some of the important differences between DevOps and ITIL®. The first is the perceived sequential nature of ITIL® and the concurrent nature of DevOps. Although ITIL®4 departs from its very sequential previous versions, the ITIL's® practices, for example, require strategy management to precede portfolio management and service design to precede release management. DevOps is not sequential and provides features at the outset before requirements are fully understood.

Other differences include the batch sizes being much smaller and rapid feedback in DevOps, which reduces risk. DevOps also has cross-functional teams while ITIL® typically has single functional teams.

In addition, service configuration management is understood differently between the two. In ITIL®, it is managing all the service-related data and information while DevOps refers to source code

management. Notably, in DevOps, continuous deployment renders release management irrelevant.

TAKE NOTE

Although Kaiser (2018) refers to the previous ITIL® version 3 structure and ITIL® is now on ITIL® version 4, this module focuses on those relevant aspects of ITL® 3 that remain in ITIL® 4 as practices and require careful integration to be effective. In addition, many organisations that you interact with may still have many aspects of ITIL® 3 embedded; therefore, you must understand how DevOps can be integrated with both ITL® 3 and ITIL® 4 processes and practices. Furthermore, ITIL® 4 states that it can be integrated with DevOps and Kaiser (2018) provides important knowledge about how to practically do this.

Watch this YouTube video:

Use the following link to watch a video discussing how DevOps and ITIL® are complementary: https://www.youtube.com/watch?v=wiSs3gq3GD4 (2:04)

Purpose of the video:

This video briefly discusses how DevOps and ITIL® are complementary.

ACTIVITY 3.3: SIMILARITIES AND DIFFERENCES BETWEEN ITIL® AND DEVOPS

Instructions:

- Go to the **Discussions** tool on the module's myUnisa website.
- Go to the Forum for Learning Unit 03: Specific Questions and Discussions.
- Open the discussion topic: Activity 3.3: Similarities and differences between ITIL® and DevOps.
- Provide your insight on the questions/tasks that are outlined below. Type your answer to each question in the discussion forum post using 300 words or less.

Purpose:

To provide an opportunity for you to reflect on the similarities and differences between ITIL® and DevOps.

Task:

Study chapter 3 of the textbook (Kaiser, 2018).

Provide explanatory responses to the following:

a) In an organisation that you are familiar with (do not use actual names), what element of ITIL® have you observed and what elements of DevOps have you observed?
b) What other elements have you observed that are not ITIL® or DevOps?

3.5 CONCLUSION

This learning unit introduced you to Information Technology Service Management's (ITSM's) DevOps based on the prescribed textbook (Kaiser, 2018).

After reviewing all the topics and completing all the activities, you should be able to create your own summary of the learning unit and use it during your preparation for the examination. In addition, you should now understand DevOps and be able to explain what DevOps is, how and why it came about, the problems it addresses and its principles. You should also be able to apply DevOps in relation to IT services, software development (Dev) and IT operations (Ops), Agile and Lean, including DevOps benefits and how DevOps directly addresses the typical and long-

standing conflicts between IT development and IT operations teams. Furthermore, you should understand that the main objectives of ITIL® and DevOps are essentially the same, to deliver value to the business. We trust that this learning unit significantly improved your understanding of DevOps.

The next learning unit analyses ITIL® and DevOps, compares and contrasts their strengths and weaknesses to demonstrate where and how they can be beneficially integrated and begins the process of integrating ITIL® and DevOps by identifying the ITIL® processes and phases that need to be changed and those that do not need to be changed.

References

Kaiser, A.K. (2018). *Reinventing ITIL® in the Age of DevOps: Innovative Techniques to Make Processes Agile and Relevant*. New York: Apress. https://learning.oreilly.com/library/view/reinventing-itil-in/9781484239766/ (Freely available online from Unisa's e-library – Safari Books Online (O'Reilly) database).