DIEM - University of salerno
Master's degree in Computer Engineering
Situation Awareness

Report
Project 3: E-learning

Lecturers:
Giuseppe D'Aniello,
Matteo Gaeta

Group 6 Members:

Surname	**Name**	**Number**	**E-mail**
Galasso	Gianluca	622702000	g.galasso33@studenti.unisa.it
Iovaro	Damiana	622702017	d.iovaro@studenti.unisa.it
Murati	Camilla	622702126	c.murati@studenti.unisa.it
Sellitto	Marco	622702105	m.sellitto13@studenti.unisa.it

2023/2024

Contents

Chapter 1

Introduction

The objective of this project is to implement a comprehensive e-learning system designed to assist users in tailoring their learning pathways and enhancing their skill sets. Developed with a strong emphasis on situational awareness, this project is structured into two primary components: the first involves *Goal-Driven Task Analysis* (GDTA), and the second focuses on the implementation of an integrated dashboard.

This system is meticulously crafted with a **User-Centric Approach**, ensuring that users can effectively monitor their competencies and track their learning progress. In developing the GDTA, we delineated operational concepts through detailed personas and scenario analysis, ensuring that the system is attuned to the diverse needs and contexts of its users.

For the dashboard implementation, we leveraged *ElasticSearch* as the underlying database and *Kibana* as the visualization tool. The data presented on the dashboard were specifically curated for this project and are stored in multiple .csv files.

Initially, our goal was to conduct a comprehensive data analysis using an extensive dataset found online. However, we faced significant challenges in locating suitable data that aligned perfectly with our needs. Consequently, we chose to create our own .csv files containing the essential data required to populate our dashboard.

This decision granted us full control over the data, enabling precise customization according to the specific requirements of our project. By curating our own dataset, we ensured the accuracy and relevance of the information presented, thereby facilitating a more insightful and effective implementation of our e-learning system.

Chapter 2

Data Analysis

Chapter 3

Operational Concept

We questioned which requirement could be critical for a Situational Awareness System. This phase involved identifying and understanding the essential needs that the system must fulfill to be effective and user-friendly.

To achieve this, we conducted a detailed analysis of the *Operational Concept*, which involved the development of detailed personas and scenario analysis.

The Operational Concept is a critical phase in the design of complex systems, translating system requirements into actionable plans. It provides a comprehensive understanding of the system's operational environment, including the roles and responsibilities of the users, the tasks they perform, and the context in which they operate.

Since we are developing an e-learning dashboard intended for users who may access it from various locations, we have not defined specific environmental constriants. The flexibility of online learning environments means that users could be utilizing the system in diverse settings, such as homes, offices, or public spaces, each with varying levels of connectivity and hardware capabilities. Additionally, given the global reach of e-learning platforms, environmental conditions can differ widely among users, making it impractical to impose rigid environmental constraints.

3.1 Scenario

The company requires all employees to pursue upskilling or reskilling opportunities based on their previous studies and work experiences. Marta and Matteo are two employees whose skills and knowledge will be monitored to ensure they can effectively contribute to projects in the Offensive Cybersecurity field. The company's e-learning platform provides courses that enable employees to obtain the *OSCP* (Offensive Security Certified Professional) certification.

The platform is accessible both on-site at the company and remotely, offering flexible learning options that accommodate diverse schedules. Each employee receives a personalized dashboard where they can track their progress and access a wide range of educational resources, including video courses (concept pills), slide decks, and practical exercises. At the end of each module, employees can take assessments to reinforce their understanding and ensure they meet the learning objectives.

Additionally, the platform includes analytics and trend reports that help employees understand their learning journey, estimate the time required for course completion, and measure their engagement levels. The course design features a tailored approach, continuously monitoring each employee's performance and adapting to their specific learning needs. This customization

enhances the overall learning experience, ensuring employees are well-prepared for the OSCP certification.

3.2 Supported Figure: Matteo

Matteo is a student from the University of Salerno, with a bachelor's degree in Computer Engineering. His passion for cybersecurity has led him to specialize in this field, acquiring basic skills ranging from understanding the fundamentals of cybersecurity to networking and network protocols, from vulnerability analysis to familiarity with essential security tools. Now, Matteo faces a new challenge: a project in collaboration with Marta concerning Offensive Cybersecurity. However, to best address this task, Matteo needs to broaden his skills and knowledge.

Characteristic	**Description**
Age Range	20-25
Gender	Male
Culture	Italian
Education	Bachelor's degree in Computer Engineering
Language	Italian, English (proficient for technical literature)
Frequency of Use	Several times a week
Experience	Familiar with basic cybersecurity tools and platforms, intermediate programming skills
Personality	Curious, analytical, detail-oriented, enjoys problem-solving, goal-oriented, collaborative
Acquired Skills	Fundamentals of cybersecurity, networking, vulnerability analysis, basic scripting/programming, offensive cybersecurity
Learning Style	Visual and hands-on learner

3.3 Supported Figure: Marta

Marta is a student from the University of Naples Federico II. She completed a bachelor's degree in Computer Engineering and has now specialized in machine learning, acquiring basic skills in the field of artificial intelligence, including the structure and applications of neural networks and deep neural networks, their applications in robotics, and autonomous driving. Marta wants to collaborate with Matteo on a new project in the field of Offensive Cybersecurity. Since Marta has followed a different academic path from Matteo's, which does not involve cybersecurity, she needs to upskill her competencies.

Characteristic	**Description**
Age Range	20-25
Gender	Female
Culture	Italian
Education	Bachelor's degree in Computer Engineering, specializing in Machine Learning
Language	Italian, English (proficient for technical literature)
Frequency of Use	A few times a week
Experience	Skilled in AI and Machine Learning platforms, novice in cybersecurity
Personality	Innovative, inquisitive, enjoys learning new skills, collaborative, adaptable
Acquired Skills	Basics of AI, neural networks, deep learning, robotics, autonomous driving, basic programming, willingness to learn cybersecurity
Learning Style	Visual and auditory learner, prefers structured guidance

Chapter 4

Goal-Directed Task Analysis

Chapter 5

Dashboard

Chapter 6

Conclusions

Contents

List of Figures

List of Tables