# THESIS SUMMARY

The doctoral thesis analyses the integration of cloud computing technologies and agile methodologies for the development of efficient, flexible, and scalable software solutions, with a special focus on the logistics sector and the application of these technologies in the delivery of goods. The first chapter provides a general synthesis of current research in the field of cloud computing and agile development. It highlights the influence and benefits of their integration in business contexts. Data security is addressed by raising awareness of cyberattacks and discussing the classification of vulnerabilities based on severity. Various types of attacks and ways to protect applications and internet networks are described. The paper also examines the financial implications of implementing these technologies, presenting their efficiency and profitability through a case study.

The second chapter describes the features and architecture of a software system designed to optimize goods delivery, starting from the classic traveling salesman problem. It outlines the required input data, the results produced by the algorithm, how IoT devices are used to improve, monitor, and optimize deliveries, and how large volumes of data are managed. The proposed solution incorporates routing algorithms to enable fast deliveries, while adhering to numerous constraints. Additionally, the chapter explains how the system can effectively manage goods inventories. The approach of using cloud hosting as a scalable solution for this system is evaluated together with the cost-benefit analysis of combining cloud computing and agile methodologies in inventory management. Thus, the initial investments required for the cloud infrastructure, the savings achieved by optimizing processes and reducing losses, as well as the cost amortization due to improved logistics performance are detailed.

The following chapter outlines the use of agile methods and specific cloud services to develop a functional prototype. It explains the programming principles underlying the architecture and describes the component modules. The prototype is evaluated through case studies, addressing various challenges, such as vaccine distribution during the Coronavirus pandemic, product delivery optimization in line with the objectives of the European Green Deal and the adaptation of the software system for tracking patient movements in hospitals.

The ultimate goal of the thesis is to enrich the specialized literature by combining the two fields into a practical application framework and to provide both theoretical and practical insights

into their use in resource management and organizational process optimization. The research aims to develop and validate an application framework that combines agile methodologies with cloud computing technologies for adaptive goods inventory management, offering practical examples in areas such as warehousing operations, transportation systems, and hospital flow optimization.