Development of Software for Monitoring Computer Performance and Usage

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***Abstract*—This thesis develops software for monitoring computer performance and usage on an internal network. The system, built with C# and SQL Server, collects performance data from networked computers, calculates indicators, and displays the results. The source reports that the product was tested and functioned for the intended monitoring task, but does not give a numerical accuracy or reliability study. Its current scope is limited to local-network computers; running-process monitoring and configurable alerts are absent. The author proposes broader indicators, more flexible alerts, and possible future machine-learning support. The work documents a functional student software prototype and its remaining limits.**

***Index Terms*—software system, monitoring, computer performance, C#, SQL Server**

I. Introduction

The thesis introduces the problem of computer performance monitoring, reviews similar issues, and outlines the objectives, scope, and research methods. It also covers the theoretical foundations of computer performance, including CPU, RAM, hard drives, and GPUs, as well as the UML and C# programming language. The author aims to develop a software system that can monitor the efficiency of computer usage, focusing on internal network monitoring. The system is designed to collect and analyze performance data, calculate key performance indicators, and display relevant information. The research methods include a survey of the current state of the system, proposing solutions, and defining system requirements. The overall architecture and functional analysis of the system are then designed using UML and C# programming [1].

II. Methods

The author conducted a survey of the current state of the system, proposed solutions, and defined system requirements. The overall architecture and functional analysis of the system were then designed using UML and C# programming. The system was developed using C# for the front-end and SQL Server for the back-end. The UML diagrams were used to model the system's structure and behavior, ensuring a clear and organized design. The system requirements included the ability to monitor internal network computers, collect performance data, calculate key performance indicators, and display relevant information. The author also considered the integration of new technologies such as machine learning or artificial intelligence for future development [1].

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III. Results

The report presents a working monitoring application that receives performance data from computers on an internal network. It calculates selected indicators and displays them through the software interface. The author states that the product was tested and found useful for computer-performance monitoring, but does not provide a documented test population or numerical accuracy measure. The implemented system does not yet monitor running processes or let users configure warning thresholds. These limitations are explicitly identified in the source conclusion [1].

IV. Discussion

The implemented functions cover data collection, indicator calculation, and display for computers on the internal network. They demonstrate the intended workflow but do not establish effectiveness for external networks or a large-scale installation. The source proposes process-level monitoring and adjustable alerts to make the system more useful in practice. It also mentions machine learning as a possible future extension, not a capability of the current application. The absence of numerical validation limits claims about monitoring accuracy [1].

V. Conclusion

The thesis delivers a C# and SQL Server application for monitoring computer-performance indicators within a local network. The source reports successful functional testing and describes the resulting collection, calculation, and display workflow. It does not document a test on a specified number of computers or quantify reliability. The author identifies process monitoring and alert configuration as missing functions and suggests expanding the indicators and flexibility of the system. The present contribution is a working prototype with a clearly stated local-network scope [1].

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