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# Crearea extensiei AZURE „LIVEMON" pentru monitorizarea stării ecosistemului it în timp real pe un singur tablou de bord

## Teză de master

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# REZUMAT

Această lucrare este cercetarea și dezvoltarea unui instrument de tehnologie a informației pentru monitorizarea, detectarea și afișarea stărilor unui sistem informațional în timp real. De asemenea, pune bazele extinderii capabilităților instrumentului final, care poate fi extins în viitor utilizând automatizarea răspunsului la modificări sau evenimente desemnate.

Lucrarea include o parte de cercetare și o parte de dezvoltare. Partea de cercetare oferă analize și cercetări în acest domeniu al tehnologiei informației bazate pe sistemul cloud deschis al serviciilor MICROSOFT AZURE.
Sunt prezentate concluziile privind necesitatea și importanța dezvoltării unui instrument de monitorizare centralizată a ecosistemului IT.

De asemenea, oferă o viziune asupra calității și ușurinței în utilizare a instrumentului. Sunt date exemple de algoritmi de testare care permit previzionarea comportamentului sistemului și a posibilității de a rula acești algoritmi într-un singur loc centralizat.

În cea de-a doua parte a lucrării, sunt prezentate motivele pentru direcția aleasă în dezvoltarea instrumentului și descrierea acestuia. Sunt date exemple de fragmentare a datelor importante în diferite locuri dintr-un ecosistem real și importanța urmăririi lor în timp real și dependența lor unul de celălalt. De asemenea, descrie procesul de lucru și de colectare a informațiilor într-un singur loc, cu capacitatea de a răspunde la evenimentele în curs.

# ABSTRACT

This work is the research and development of an information technology tool for monitoring, detecting and displaying the states of an information system in real time. It also lays the foundation for expanding the capabilities of the final tool, which can be expanded in the future using automation of response to designated changes or events.

The work includes a research part and a development part. The research part provides analysis and research in this field of information technology based on the open cloud system of services MICROSOFT AZURE. The conclusions of the need and importance of developing a tool for centralized monitoring of the IT ecosystem are given.

It also provides a vision of the quality and ease of use of the tool. Examples of testing algorithms are given that allow foreseeing the behavior of the system and the possibility of running these algorithms while being in one centralized place.

In the second part of the work, the rationale for the chosen direction in the development of the tool and its description are given.

Examples are given of the fragmentation of important data in different places in a real ecosystem and the importance of tracking them in real time and their dependence on each other. It also describes the process of working and collecting information in one place with the ability to respond to ongoing events.

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# INTRODUCTION

What are MICROSOFT AZURE extensions? An extension for microsoft azure (devops division) is a set of standardized html,js,css type files that are well known to any developer with intermediate and above experience.

Such ease of development is due to the availability of extension development for any team, developer from any country. The extension deals with connecting microsoft products with developers in an accessible visual form.

This form of providing information greatly simplifies monitoring and response time to any of the emerging current problems.

An extension can be developed in any development environment familiar to the developer. The extensions themselves are published in the Visual Studio Marketplace with different levels of access. You can develop both specialized for your company or team, as well as publicly available to the entire community, which strives to increase work efficiency and minimize response time to non-standard situations that arise [1].

Extensions work using technology or another RESTful API library, which in turn unifies the development and communication between each other of all components, as well as the extensions themselves.



Figure 0.1 INTRODUCTION

A little more detail, any extension must have a manifest file in JSON format, which must contain the full description of the extension. Also, a resource structure called Discovery Resources should always be combined in the format Markdown, or otherwise, in a lightweight markup language format, designed to indicate formatting in plain text and images that makes it easy to understand and

understand the contents of an extension in the Marketplace. Files that do not change (static) contain extension logic, and static files themselves in HTML, JS and CSS formats.

All files in the extension are combined into a single package file with the .vsix extension, which is subsequently published on the Marketplace.
In the future, after publication, you can install the extension on any DASHBOARD directly from the Marketplace. (Figure 0.1 INTRODUCTION)

What can be done with extensions?

With the help of the extension, we combine 10 streams of data on the status of our repositories, CI\CD processes, the latest versions of our products, versions of packages installed in these products on one screen. There are many places where you can set up a user interface to instantly respond to running processes in unfavorable scenarios, such as deployment errors, package update errors, package compatibility errors, etc[2].

We will build a few widgets for managing builds and Azure Pipelines. Tracking deployment states in dev/stg/prod environments in the ecosystems of any company with many clients separated by countries. If necessary, we will improve the extension with tabs and the possibility of active actions. Thus, we will focus on creating a single state monitoring center for all CI / CD elements in one place "LIVEMON" Azure extencion for DevOps.

# BIBLIOGRAPHY

1. Jennifer, Davis ,Katherine, Daniels. *Effective DevOps Building a Culture of Collaboration, Affinity, and Tooling at Scale*. O'Reilly Media, Inc: February 2016. 153 p. ISBN 978-1-491-92630-7.

2. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 15.09.2022] Disponibil:
   https://learn.microsoft.com/ru-ru/azure/devops/boards/configure-customize?toc=%2Fazure%2Fdevops%2Freference%2Ftoc.json&bc=%2Fazure%2Fdevops%2Freference%2Fbreadcrumb%2Ftoc.json&view=azure-devops&tabs=agile-process

3. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 17.09.2022] Disponibil:
   https://learn.microsoft.com/en-us/azure/devops/extend/publish/overview?view=azure-devops

4. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 02.10.2022] Disponibil:
   https://learn.microsoft.com/en-us/azure/devops/extend/develop/styles-from-widget-sdk?view=azure-devops

5. GitHub is a global platform for developers and Git is a distributed version control software. [citat 10.10.2022]. Disponibil:
   https://github.com/Azure/azure-api-style-guide

6. GitHub is a global platform for developers and Git is a distributed version control software. 12.10.2022]. Disponibil:
   https://github.com/ALM-Rangers/Sample-Data-Widget-Extension/tree/oliver/ossmove

7. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 12.11.2022] Disponibil:
   https://learn.microsoft.com/en-us/azure/azure-portal/azure-portal-dashboards-structure

8. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 12.11.2022] Disponibil:

https://learn.microsoft.com/en-us/azure/devops/extend/develop/add-dashboard-widget?view=azure-devops

9. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 14.11.2022] Disponibil:

https://learn.microsoft.com/en-us/azure/cloud-services-extended-support/available-sizes

10. JetBrains s.r.o, Microservices. [citat 14.11.2022]. Disponibil:

https://www.jetbrains.com/ru-ru/teamcity/ci-cd-guide/devops-ci-cd-metrics/

11. Mass media www.osp.ru Founder: Open Systems Publishing House LLC Certificate of registration of the mass media of the online publication El. No. FS77-62008 dated June 5, 2015 issued by Roskomnadzor [citat 15.11.2022]. Disponibil:

https://www.osp.ru/cio/2017/10/13053606

12. Habr Blockchain Publishing LTD Регистрационный номер: HE 289873 [citat 16.11.2022]. Disponibil:

https://habr.com/ru/company/otus/blog/572194/

13. Habr Blockchain Publishing LTD Регистрационный номер: HE 289873 [citat 16.11.2022]. Disponibil:

https://habr.com/ru/company/microsoft/blog/186026/

14. Project of Network Performance Monitoring (NPM) and Diagnostics 289873 [citat 17.11.2022]. Disponibil:

https://networkguru.ru/metodologiia-devops/

15. blog portal about development and not only 289873 [citat 17.11.2022]. Disponibil:

https://coffee-web.ru/blog/the-role-of-continuous-monitoring-in-devops-pipeline/

16. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 18.11.2022] Disponibil:

https://learn.microsoft.com/en-us/sql/azure-data-studio/extensions/dashboard-extension?view=sql-server-ver16

17. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 18.11.2022] Disponibil:

    https://learn.microsoft.com/en-us/azure/devops/extend/develop/styles-from-widget-sdk?view=azure-devops

18. Microsoft Beveloper website [citat 19.11.2022] Disponibil:

    https://developer.microsoft.com/en-us/azure-devops

19. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 19.11.2022] Disponibil:

    https://learn.microsoft.com/en-us/azure/azure-portal/azure-portal-dashboards

20. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 19.11.2022] Disponibil:

    https://learn.microsoft.com/en-us/azure/azure-portal/azure-portal-dashboards-create-programmatically

21. Microsoft Learn website, Tech Profile and associated services of Microsoft [citat 19.11.2022] Disponibil:

    https://learn.microsoft.com/en-us/azure/azure-monitor/app/tutorial-app-dashboards