DEVX360

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Research Contribution

The development of DevX360 was grounded in rigorous research into the domains of DevOps performance analytics, artificial intelligence (AI)-driven software engineering, and data visualization for continuous delivery systems. The primary objective of this research was to identify and implement mechanisms that enable real-time, data-driven decision-making in software development teams.

A significant focus was placed on understanding and operationalizing the DORA metrics framework, which defines four key indicators of DevOps performance: Deployment Frequency, Lead Time for Changes, Mean Time to Recovery, and Change Failure Rate. Through a comprehensive literature review of research papers, industry case studies, and whitepapers published by Google Cloud and the DevOps Research and Assessment (DORA) group, the team derived benchmarks and thresholds to guide metric calculation and visualization within the system.

The project also explored the integration of artificial intelligence for contextual analytics, with a comparative analysis between cloud-hosted AI models (OpenAI) and locally hosted models (Ollama). This investigation examined their respective trade-offs in terms of inference latency, scalability, privacy, and cost-effectiveness. The hybrid approach adopted in DevX360—combining both local and hosted AI components—was informed by this research, allowing the system to leverage the flexibility of local inference while maintaining access to scalable cloud-based intelligence.

Further research was conducted into event-driven architectures and data processing pipelines commonly employed in modern DevOps systems. The design of the system's data ingestion and analytics layer was inspired by studies in distributed systems and stream processing, ensuring efficient handling of continuous GitHub event data through asynchronous pipelines and microservices-based integration.

Finally, the research contributed to the broader discourse on AI-augmented software analytics by demonstrating how smaller development teams can adopt cost-efficient, scalable, and privacy-conscious approaches to performance monitoring. The findings from the implementation of DevX360 highlight the practical viability of AI-driven insight generation and hybrid architectural models in supporting continuous improvement within real-world software engineering environments.

How you can aid development

Contributions to **DevX360** are welcomed from both the academic and open-source communities. The project is actively maintained on GitHub, and developers, designers, and researchers are encouraged to participate in its continuous evolution.

To contribute, interested individuals should begin by visiting the official GitHub repository at https://github.com/COS301-SE-2025/DevX360. The repository contains detailed documentation outlining the system architecture, coding standards, and contribution workflow.

Contributors are encouraged to:

- Fork the repository to their personal GitHub account.
- Create a new feature branch to develop or improve a specific module, feature, or documentation area.
- Ensure that their changes comply with the project's established **Coding Standards** and include appropriate documentation and tests where applicable.
- Submit a **Pull Request (PR)** describing the changes, rationale, and any relevant issues or dependencies.

Each submission undergoes peer review by the DevX360 development team to ensure quality, maintainability, and alignment with project goals. Feedback is provided to contributors, fostering an environment of collaborative learning and shared technical growth.

For inquiries, collaboration proposals, or further guidance, contributors may contact the development team at **doskscapstone17@gmail.com** or engage through the GitHub repository's **Discussions** section.

Through open collaboration, DevX360 aims to remain a dynamic and evolving research-driven platform that bridges the gap between academic innovation **and** industry-ready DevOps intelligence**.**