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AI-DRIVEN DEVOPS (FROM CI/CD TO AIOPS)

The evolution of DevOps pipelines through AI and automation.





INTRODUCTION

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- Manual Operations -> DevOps (Automation) -> AIOps (Intelligence).
- Problem : Complexity is growing faster than human ability to manage it manually.
- Thesis: We are moving from tools that do what we say, to systems that understand what is happening.

AI IN CI/CD PIPELINES (SMART PIPELINES)

- Traditional devOps tools automate tasks, but they don't understand context
- AIOps introduces intelligence and awareness into devOps operations



DEVOPS

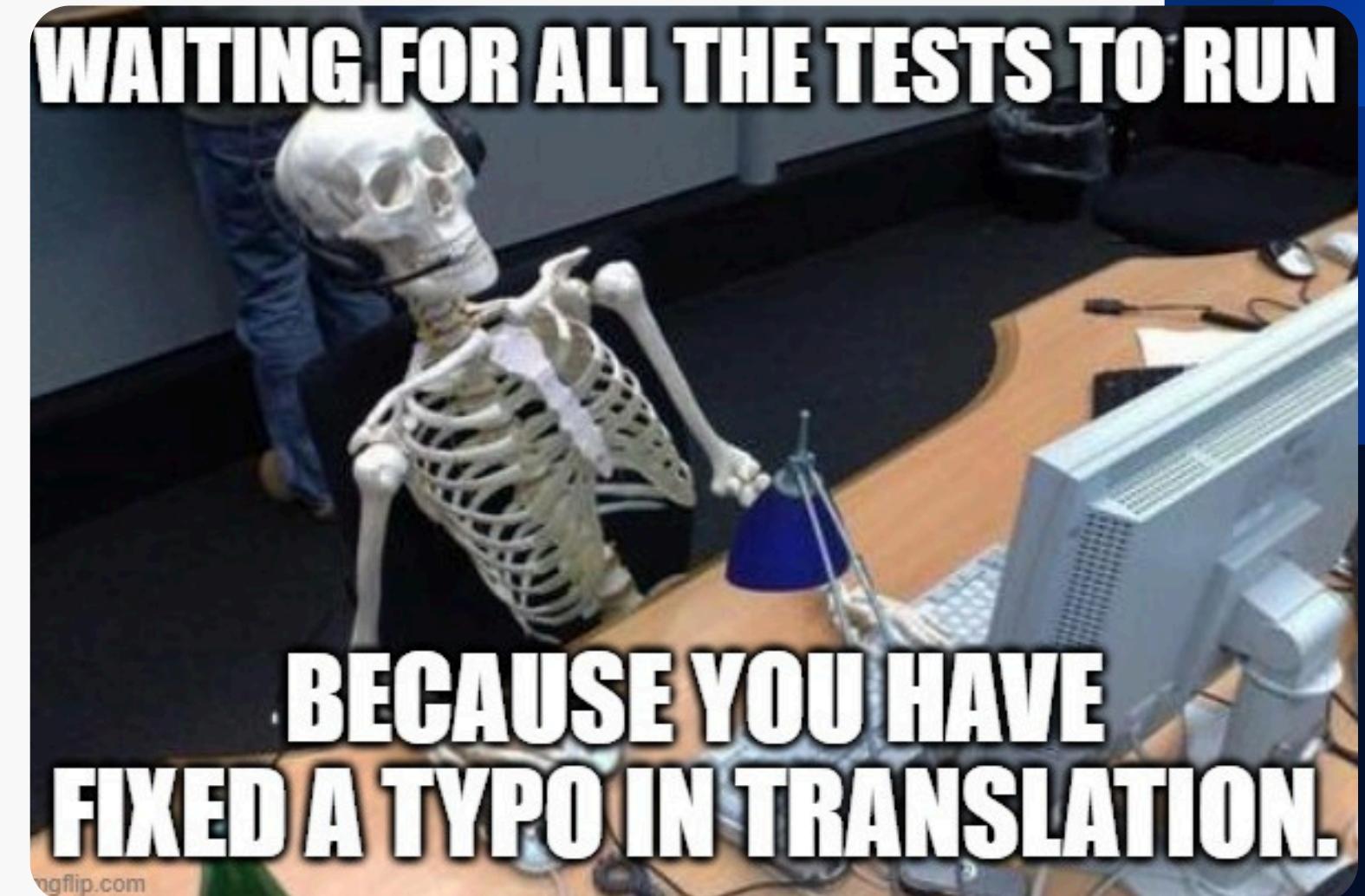


AI-OPS

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TRADITIONAL CI/CD

- Run build
- Run all tests
- Deploy
- Failures without explanations
- This creates slow feedback loops and wasted compute resources



AI-DRIVEN SMART CI/CD

- Smart Test Selection to run only relevant test cases.
- Risk Prediction to identify risky commits before execution.
- Pipeline Optimization to detect bottlenecks and redundancies.

CI/CD stops being a blind conveyor and starts understanding the code.

DevOps Engineers when
AI takes over their job



Designers & artists
when AI takes over their jobs



PREDICTIVE MONITORING & INCIDENT DETECTION

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WHAT IS PREDICTIVE MONITORING?



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- AI-based proactive monitoring approach
- Uses historical + real-time data
- Predicts failures before they occur
- Moves DevOps from reactive to proactive

TRADITIONAL MONITORING:

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- Uses fixed thresholds (CPU > 80%, memory > 70%)
- Detects issues after failure occurs
- Mostly manual monitoring & analysis
- High number of false alerts
- Difficult to handle dynamic cloud environments



AI-DRIVEN APPROACH:

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- **Uses AI/ML models instead of fixed thresholds**
- **Detects issues before failures happen**
- **Learns from historical & real-time data**
- **Automatically detects anomalies**
- **Reduces false alerts and noise**



HOW IT WORKS

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- **Collect monitoring data**
- **Apply ML/anomaly detection models**
- **Detect unusual patterns**
- **Generate smart alerts**



Olga Shomarova

AIOPS VS. TRADITIONAL DEVOPS

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From manual monitoring to intelligent
Automation





KEY COMPARISONS

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Traditional DevOps

- React after break
- 1000 alerts/day
- Manual analysis
- Hours to fix

AIOps

- Predict before break
- 10 meaningful alerts
- AI-powered insights
- Minutes to fix

WHAT AIOPS ACTUALLY DOES?

- Watches everything automatically
Monitors 1000s of servers, 24/7, never tired
- Learns your normal patterns
“Tuesday 2PM always has high CPU - that’s OK”
- Connects the dots
“Database slow → App slow → Users angry”
- Predicts future problems
“Disk will be full in 3 days - fix it now”
- Auto-fixes common issues
“Server crashed → AI restarts it in 10 sec”



THE HUMAN ROLE: DEVOPS ENGINEER -> AIOPS ENGINEER



Manual operator

- Watch dashboards (8h/day starting)
- Sort through alerts (1000 alerts → find relevant)
- Fire fight emergencies (reactive problem solving)
- Be system expert (know everything manually)
- Work 24/7 on-call

AI Supervisor

- Review AI insights (AI watches for you)
- Act on smart alerts (10 pre-filtered)
- Strategic improvements (prevent problems)
- Collaborate with AI (AI suggests, human decides)
- Handle escalations (AI handle routine)

CHALLENGES AND LIMITATIONS OF AIOPS

- Requires quality data to train
- High initial cost & complexity
- “Black Box” problem
- Can’t handle completely new problems
- Risk of over-reliance



Lev Karavanov

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HUMAN-IN-THE-LOOP DEVOPS MODELS

Focus:

Safety, Trust, and Responsibility.

The Concept:

AI should not be fully autonomous in Production (yet).





WORKFLOW

AI detects issue -> AI suggests solution (e.g., Rollback or Config Change).

Human Engineer reviews and approves.

AI learns from the human's decision.

IMPORTANCE

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**Safety vs. Speed.
Accountability (Human is essential).**

WAS

CI/CD + Monitoring = Automation without context.

NOW

AI adds analysis, prediction, and context.

RISK

Blind trust in AI is dangerous.

SOLUTION

Human-in-the-loop AIOps.



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**THANK
YOU.**