



# How to teach DevOps in Universities



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# What is DevOps?

“.....*Everyone talks about **it**, nobody really knows how to do **it**, everyone thinks everyone else is doing **it**, so everyone claims they are doing **it**.....*”

where **it** applies to *DevOps, Agile, AI, Big Data .....*



## What is DevOps ?

DevOps is an engineering **approach** to *deliver values as early as possible through high quality of services*, which applies better decoupling to support higher internal specialization and better external collaboration.

# Challenges and Opportunities for Academy

- Challenges
  - DevOps stems from the industry
- Opportunities
  - New area and new topics
  - New context for traditional SE
  - Easily recognized SE issues

# How to teach DevOps in Universities

- Work with experts from industry
- Practice is vital, however
  - To evaluate students' performance in practice project is always a challenge, and now with higher frequency...
  - Various tools with multiple logins to form a tool chain
  - Process data stored in different systems (e.g., git, jenkins, SonarCube, etc.)
  - Lack of certain tools (e.g., project management tools)

# DevCloud: An enterprise solution to support DevOps education



- *Base on a national scale program--Xin Gongke (Emerging Engineering Education, the 3E program)*
- *Next step*
  - *To customize this environment for education propose*
  - *To collect materials for cases*

# DevOps @ Nanjing University

- Research
  - BOK
  - Maturity Model
- Education
  - Textbook
- Service
  - DevOps China (NJSJ, NASAC, etc.)  
(<http://www.devopchina.org>)
  - Annual Report

## DevOpsEnvy: An Education Support System for DevOps

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## From Monolith to Microservices: A Dataflow Driven Approach to Service Decomposition

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**Abstract**—As a software features more practitioner mainstream app Many university students enjoyed. However, as a compared to traditional frequent than ever increase the worst evaluation. In th (DevOps) to student teams pre address this challenge such as group a top-down analysis, decomposition algorithm system also provide first, engineers together evaluation. Our p analysis and construct several advantage of the business logic

**Keywords**—Dev operations with the i strict dataflow final of "operation and to dataflow to represent We have employed to decomposition mechanism an existing service definition show that, our is able to deliver more consistent microservices practical implements

**Keywords**—micro business logic

## Abstract

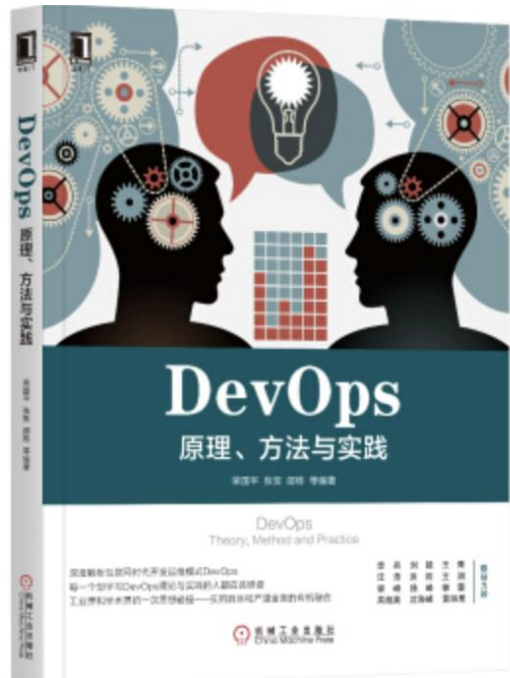
Recently, more and more software companies adopted DevOps to adapt to ever-changing business environment. While it is important to differentiate the mature adoption of the DevOps from the immature, no dedicated maturity models for DevOps exist. Meanwhile, other maturity models such as CMMI models have demonstrated their effects in the traditional paradigm of software industry, however, whether the CMMI models could guide the improvements with the content of DevOps is still unclear. This paper reports a case study aiming at evaluating the feasibility to apply the CMMI models to guide process improvement for DevOps projects and identifying possible gaps. Using a structured method (i.e., SCAMPI C), we conducted an interview with four employees from one DevOps project as interviewees we collected in the case study, we managed to characterize the maturity/capability of the DevOps project to a certain degree, which implies the possibility to use the CMMI models to appraise the current processes in this DevOps project and guide future improvements. Meanwhile, several gaps also have been identified between the CMMI models and the DevOps model. In this sense, the CMMI models could be taken as a good foundation to design suitable maturity models so as to guide process improvement for projects adopting the DevOps.

## Keywords

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views to the customers. According to a world wide survey [12], the DevOps could support high performance for IT organizations regarding quality (60% less failures), throughput (200 times faster for deployment) and stability of the service (108 times faster for recovery from failures). According to [10], DevOps will evolve to a "mainstream strategy for 29% Global 2000 organizations". The survey mentioned above also confirmed the increased adoption of the DevOps in all types of organizations regarding size and industrial field [1].

The term DevOps came from a combination of "Development" and "Operations", which may have various definitions under different contexts. Jones et al. defined the DevOps with three inter-supported elements, i.e., Capabilities, Cultural Enablers and Technological Enablers [2], and argue that the Capabilities is the main DevOps aspect, which includes capabilities such as continuous planning, collaborative and continuous development, continuous integration and testing, continuous release and deployment, continuous infrastructure monitoring and optimization, continuous user behavior monitoring and feedback and service failure recovery without downtime. To strengthen these capabilities requires process improvement in various aspects. However, process improvement usually means differently for different companies due to the unique issues they are facing. To this end, a relatively thorough understanding about the performance of current process and effective guidance for future process improvement is thus needed.





# THANKS

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