

# Research on the Transformation Path of DevOps in the Digital Era

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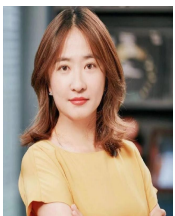
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**Abstract**—DevOps has become one of the most important ways for enterprises to succeed. Enterprises use DevOps to integrate and optimize procedures, such as agile development management, continuous integration, continuous delivery, technical operation, application design, security and risk management (DevSecOps), system and tool construction, monitoring state, and quality assurance. This greatly accelerates the delivery of high-quality software products to users. Combined with agile, lean management, and continuous delivery, this approach has been reconstructing the way to effectively develop cloud service and try out hypothesis safely. Firstly, the flow through the lifecycle, which is divided into plan, design, code, build, test, release, deploy, and operate, should be identified and accelerated by automated test and CI/CD. Then, measurement should be integrated into each part of the flow, and the monitoring system should provide instant feedback. Quality assurance covers the entire lifecycle of development and operation, which is beneficial for identifying defects at an earlier stage and preventing downstream problems.

**Keyword**—DevOps, agile development management, Continuous delivery, Security and Risk Management



Xiaoling Niu is the leader of DevOps Standards Working Group and the editor of DevOps International Standards. He has been engaged in research work related to development operation and maintenance for a long time, including operation and maintenance management system review and other related work. Participated in the compilation of "Cloud computing Service Agreement Reference Framework", "Object storage", "Cloud database", "Development and operation management (DevOps) capability Maturity Model" series standards, "cloud computing operation and maintenance intelligent general evaluation Method" and other more than 20 standards. Participated in the compilation of several white papers and survey reports, including the White Paper on Enterprise IT Operation and Maintenance Development and the Survey Report on the Status of DevOps in China (2019).



Lingling Yang is currently the Director of the Governance and Audit Department of Yunda Institute of China Academy of Information and Communications Technology, and the Secretary-General of the IT Risk Management Working Committee of the Internet Society of China. She is mainly engaged in the research work of digital governance, focusing on the core fields of XOps system construction, information technology risk governance system, and IT value insight. The initiator of the IT New Governance Leadership Summit (GOLF+), led the establishment of the personal information protection compliance audit pilot program, presided over the completion of more than 10 standards in the field of science and technology governance. Prior to joining the firm, he was a partner in Information Technology and Digital Services at Deloitte Touche Tohmatsu and has more than 13 years of IT governance related consulting and auditing experience.



Kailing Liu, engaged in DevOps, DevSecOps and other IT development research and industry standard formulation work for five years. She is one of the core members of the DevOps industry standard and research work group. She has participated in the preparation of more than six industry standards and five research reports.



Zhaowei Liu is graduated from Nanyang Technological University in Singapore with a master's degree. He has been engaged in related research work in development and operation for a long time. He participated in the preparation of the "R&D Operations Integration (DevOps) Capability Maturity Model" series of standards and the "Business R&D Operations Integration (BizDevOps) Model" and other standards. Participated in the preparation of multiple white papers and survey reports, including the "China DevOps Status Survey Report (2021, 2022, 2023)", etc., participated in the evaluation of more than 40 DevOps capability maturity assessment projects, and has rich experience in standard preparation and evaluation testing.