

Title	インターネットサービスにおける投資効率を最大化するソフトウェア開発プロセスの研究～継続的デリバリーサイクルの短期化による効果とメカニズム～
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Research on software development processes
that maximize investment efficiency in internet services.
-Effects and mechanisms of shortening the continuous delivery cycle.-

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In today's VUCA environment, companies must respond quickly and continuously improve. Therefore, it is crucial to quantitatively assess how shorter software release cycles help manage investment uncertainty and maximize profits.

In this study, we conducted a simulation based on a real case at Recruit Co., Ltd. to analyze how shorter Continuous Delivery cycles contribute to mechanisms for addressing investment uncertainty and increasing profit from the perspective of Continuous Software Engineering (CSE). Specifically, we accounted for the success rates of various improvement measures and examined how changes in these rates affect the expected value. We also clarified how early identification of successful measures, as well as the reliable detection and removal of unsuccessful ones, can influence business outcomes. These processes are enabled by shorter delivery cycles and by releasing improvement measures in the smallest measurable units, even when success rates are low.

The simulation results show that shorter delivery cycles are an effective means of increasing investment efficiency in highly uncertain environments. In particular, even in cases where success rates are low, the introduction of shorter cycles can improve overall profitability by actively capturing the success of improvement measures and quickly eliminating failures. This study provides rational criteria for internet service companies to adopt a rapid improvement process and offers empirical support for the economic benefits of shorter delivery cycles.

Previous studies have suggested the importance of CSE and the existence of benefits from shorter delivery cycles. They have often been vaguely expressed as “faster is better in a competitive environment” or “Just in Time.” The novelty of this research is that it quantitatively demonstrates these benefits, thereby clarifying the study's purpose and business significance—for example, by highlighting the challenges of introducing Continuous Delivery and proposing potential solutions. The academic contribution lies in demonstrating the importance of CSE research and enabling quantitative evaluation of CSE in future studies.

The results provide useful information not only for practitioners in software development but also for managers and investors. In particular, it is expected to play a vital role in corporate decision-making by concretely illustrating the business benefits gained through the adoption of shorter delivery cycles.

Nevertheless, this study has certain limitations. Our simulation model assumes a single developer and uniformly sized improvement measures, neglecting interactions among them.

Real projects often involve multiple developers, and overhead persists even with automation. Future simulations that address these complexities could provide a more accurate view of real-world software development processes and better validate the economic benefits of shorter delivery cycles.

Keyword: Internet Service, Software Engineering, Project Management, Program Management, Continuous Software Engineering, Continuous Delivery, Software Development Process