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The Impact of Cross-industry Collaboration on the Effectiveness of Devops Practices

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Abstract

This article examines the influence of interdepartmental and cross-industry collaboration on the effectiveness of DevOps practices. As the demand for faster release cycles increases, organizations face the challenge of simultaneously enhancing system stability and reducing error rates. The study is based on materials from DORA, reports by Deloitte, Atlassian, Brainhub, DevMio, and publications by Ahmad and his colleagues, Dryka and his colleagues, Offerman, and Smith. A comparative analysis is conducted on internal collaboration models involving development, operations, testing, and information security teams, as well as on knowledge exchange between IT organizations and representatives of the banking, telecommunications, and manufacturing sectors. The goal is to assess the impact of collaboration formats on release frequency, time to incident recovery, and the proportion of failed changes. The research methodology includes literature systematization, statistical analysis of performance metrics, and synthesis of empirical evidence. The results show that integrating professionals from different domains accelerates delivery cycles, lowers failure rates, and improves team satisfaction. The article is relevant to project managers, DevOps team leads, digital transformation experts, and consultants responsible for optimizing the development and operations of software solutions.

Keywords: DevOps; cross-industry collaboration; cross-functional teams; release frequency; recovery time; DevSecOps; BizDevOps; knowledge sharing; digital transformation; reliability.

1. Introduction

As demands for rapid deployment of software products grow, companies seek to reduce delivery cycle times and increase service resilience.

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The aim of this study is to analyze the impact of collaboration between professionals from different industries and functions on DevOps performance metrics. The objectives are as follows:

1. To describe internal collaboration between development, operations, testing, and security teams.
2. To examine the exchange of practices between IT and representatives of the banking, telecommunications, and manufacturing sectors.
3. To compare the influence of these forms of collaboration on release frequency, service recovery time, and the rate of failed changes.

The novelty of this research lies in the inclusion of both forms of collaboration and their comparative impact on DevOps metrics, with the goal of generating recommendations for various types of organizations.

This article investigates how cross-industry interactions affect the efficiency of DevOps implementation. The hypothesis is that cross-functional collaboration within an organization enhances the speed and quality of DevOps processes, while cross-industry knowledge sharing fosters the generation of new ideas and best practices. Existing data and case examples are analyzed to support or refute this hypothesis.

2. Materials and Methods

The analysis is based on scientific and applied sources reflecting cross-functional and cross-industry collaboration practices in the field of DevOps. In particular, empirical findings summarized by T. Ahmad, J. Boit, and A. Aakula [1] describe digital transformation mechanisms at the intersection of organizational functions. Methodological principles for building cross-functional teams are presented in a report by Deloitte Development LLC [2], emphasizing enhanced innovation flexibility in organizations with mature digital processes. DevMio materials [3] provided a retrospective analysis of DevOps evolution, while publications by M. Dryka, O. Gerzhal, and M. Warcholinski [4] highlighted the practical integration of business components into the DevOps model, allowing comparison of BizDevOps principles with performance metrics.

The visualization of organizational transformations and analysis of silo dismantling were based on studies by T. Hall [5] and T. Offerman and his colleagues [6], which present examples of successful DevOps adaptation in multidisciplinary environments. The statistical data from the DORA Accelerate report [7] was used to verify the quantitative impact of collaboration formats on key DevOps indicators, including release frequency, MTTR, and change failure rate.

The methods used included comparative analysis, literature review, synthesis of practices, and generalization of empirical data. These approaches helped identify patterns in how cross-industry and cross-functional collaboration influence the effectiveness of DevOps.

3. Results

DevOps originally emerged as a methodology aimed at integrating development (Dev) and operations (Ops) within the IT industry to accelerate the release of software products. Over time, however, it became evident that

the effectiveness of DevOps is not limited to these two domains. Success is also influenced by interaction with other departments—such as security, testing, and business units—as well as by the exchange of experience across industries and companies. In the context of DevOps, cross-industry collaboration can be understood in two ways (see Table 1):

Table 1: *Cross-Industry Collaboration in the Context of DevOps*

Within the organization	Collaboration among teams with different specializations—not only developers and operations engineers, but also QA engineers, security specialists, analysts, and even business units.
Outside the organization	Exchange of practices and knowledge between different sectors—such as how DevOps principles, initially developed in web engineering, are adapted and improved when applied in banking, telecommunications, and manufacturing.

Cross-functional collaboration refers to the strategic alignment and joint work of specialists or teams from various departments—such as marketing, finance, operations, and information technology—toward shared goals. This type of cooperation overcomes traditional departmental barriers, forming an integrated approach to problem-solving and innovation by leveraging a broad range of expertise, perspectives, and resources. In an increasingly complex and dynamic business environment, the ability to collaborate effectively across functional boundaries remains a critical factor for organizations striving for competitive advantage and operational excellence (see Figure 1).

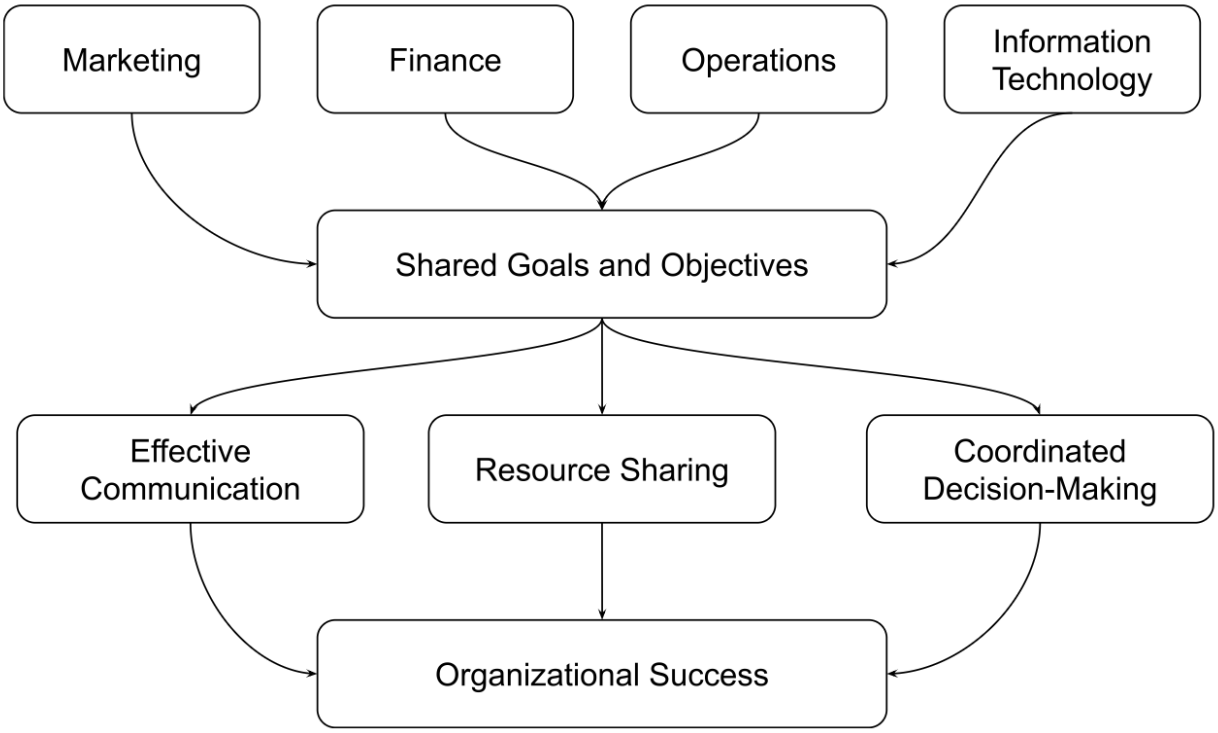

Figure 1: Schematic model of cross-functional collaboration between departments and its impact on organizational performance [1]

Cross-functional teams and breaking down silos. One of the key factors behind successful DevOps implementation is a culture of collaboration across roles. Studies show that organizations that have transitioned to unified cross-functional teams—including developers, testers, operators, and other necessary specialists—achieve significantly better results. According to the DORA (DevOps Research and Assessment) report, high-performing IT organizations are twice as likely to operate within unified, full-functional teams rather than dividing staff by narrow roles [7]. This eliminates situations where responsibility is handed off with the mindset of "our part is done," and instead fosters collective ownership of the product. As a result, the cycle from idea to deployment shortens, and release quality improves due to fewer task handoffs and misunderstandings of requirements.

Indeed, breaking down organizational silos is one of the fundamental goals of DevOps culture. Atlassian defines DevOps as being based on "increased transparency, communication, and collaboration between teams that previously operated in isolation" [5]. Numerous examples confirm that when Dev and Ops plan and work on a project together from the start, the issues of "we built it, they didn't configure it" disappear in both directions. Moreover, involving quality assurance (QA) and security (Sec) specialists from the outset (as in DevSecOps) allows quality and security controls to be integrated directly into the development process rather than applied after the fact.

Practical survey data support this: in 2022, Deloitte reported that 83% of digitally developing companies employ cross-functional teams for project delivery [2]. This correlates with their success in digital transformation,

indicating that cross-functional collaboration is becoming standard among organizations with mature DevOps practices.

Cross-industry collaboration also entails knowledge exchange. When a team includes professionals from diverse specializations, they contribute unique expertise. Working together enhances the experience of each member. A study published in 2021 found that effective cross-functional collaboration improves information sharing, accelerates problem-solving, and fosters innovation [1]. In the DevOps context, this is evident when a developer communicates closely with administrators and testers—resulting in code that already accounts for infrastructure and testability requirements. This leads to fewer defective builds that progress through the pipeline faster. And if an issue arises in production, a collaborative team can diagnose it more quickly by leveraging a variety of perspectives and competencies.

An interesting pattern emerges: "organizations with stronger collaboration cultures release software faster and more reliably." Data from the State of DevOps Reports and Accelerate consistently show that soft factors such as culture and collaboration correlate with hard metrics like deployment frequency and recovery time [7]. For example, when a DevOps engineer engages not only with IT but also understands business needs, tasks can be prioritized more effectively—thereby increasing the value of delivery.

DevOps initially focused on development and operations, but practice has revealed the need for broader integration. This has led to the emergence of concepts such as DevSecOps, BizDevOps, and DevQAOps. Such developments reinforce the idea that achieving optimal efficiency requires the involvement of all key stakeholders. If security remains a "detached observer," DevOps might deliver quickly—but then vulnerabilities must be patched later. It is now recommended that security personnel be embedded in the workflow. For example, Netflix integrated automated security checks into the pipeline, and security engineers began mentoring product teams [4]. As a result, potential threats were identified and addressed early in development, without delaying releases.

Similarly, involving business stakeholders (e.g., product teams) helps DevOps teams better understand end goals. This led to the term *BizDevOps*, which refers to integrating business feedback directly into the DevOps cycle. While in the past business requirements were handed over and teams awaited the final release, in the BizDevOps model, business representatives participate in team meetings, observe product increments, and influence priorities in real time (see Figure 2). Researchers note that this close collaboration increases project ROI, as developers concentrate on features that are truly needed [4].

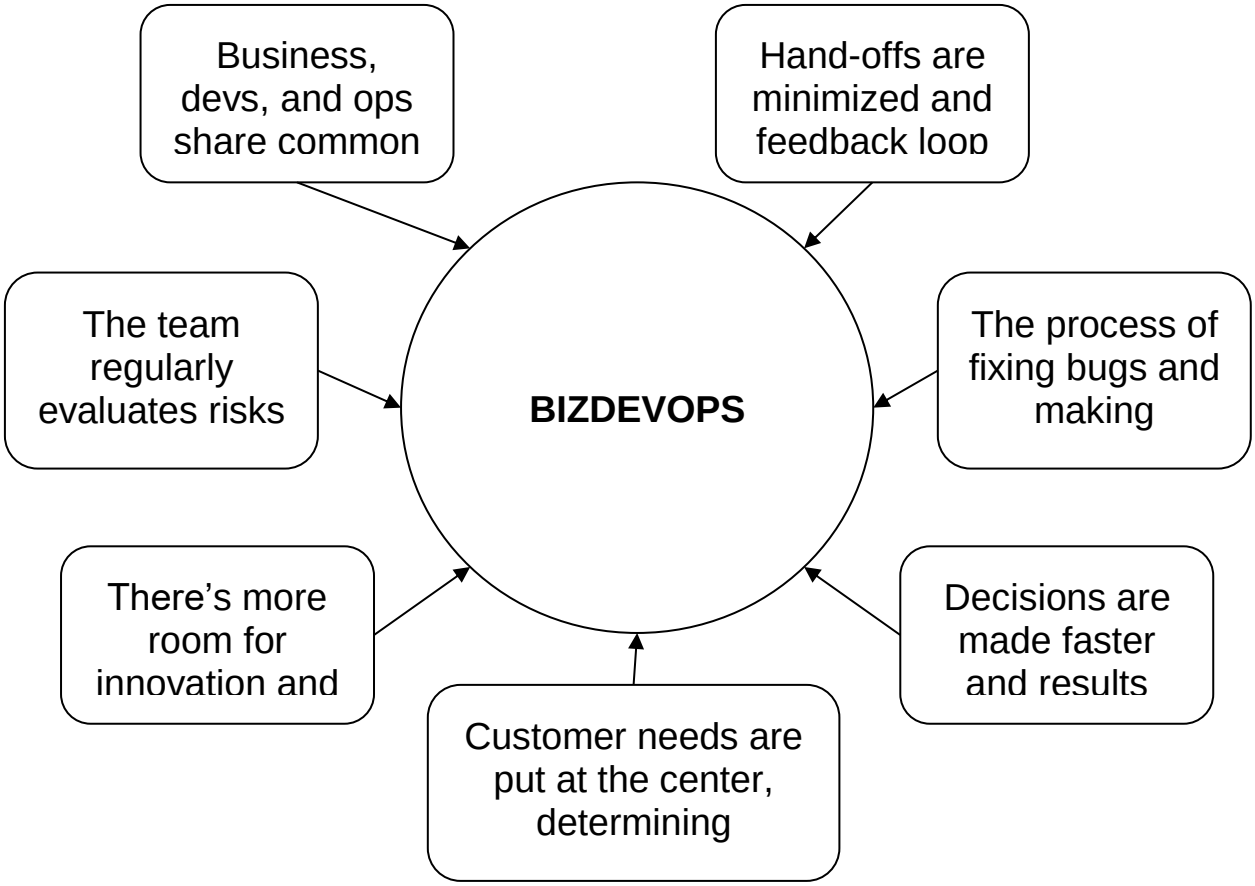

Figure 2: Work in the BizDevOps model [4]

The DevOps movement continues to expand through conferences, open-source projects, and professional communities. Experts from various sectors—finance, game development, automotive, and others—convene to share which practices proved effective and which did not. As a result, the industry undergoes a process of collective learning. For instance, the classical DevOps approach of continuous integration and delivery originated in web companies such as Facebook and Amazon. Later, banks, having studied these cases, adapted the practices to their regulated environments by integrating compliance requirements, thus forming a hybrid of DevOps with ITIL processes. A few years later, web companies, in turn, adopted certain reliability and control principles from the banking sector, further refining their own practices. This illustrates the synergy of shared experience.

Another example comes from the aerospace industry, which traditionally adheres to rigorous quality standards. When DevOps was introduced into aerospace software systems, the industry contributed its own practices—such as formal verification, a strong emphasis on automated testing, and failure simulation [4]. As a result, the DevOps community began engaging in a more mature discussion about implementing practices in systems where failure is not an option.

Organizations that participate in cross-industry communities, such as the Continuous Delivery Foundation and DevOps Days, demonstrate greater advancement in the evolution of their processes. The reason is that they gain earlier access to new tools and methodologies, effectively accelerating the innovation cycle.

Quantifiable outcomes show that several key DevOps performance indicators improve with cross-industry collaboration:

- Deployment frequency. Cross-functional teams release more frequently due to reduced handoffs and waiting times. According to the DORA report, high-performing teams deploy significantly more often—up to several times per day [7].
- Mean time to recovery (MTTR). Integrated teams resolve incidents quickly because all the necessary specialists are present. For example, Amazon follows the principle "You build it, you run it," where developers are responsible for on-call duties and service maintenance [5]. This reduced MTTR to minutes or hours, compared to the days previously lost to inter-team coordination.
- Change failure rate. Continuous testing and quality control throughout the cycle reduce errors. Cross-functional DevOps teams place strong emphasis on test automation, which leads to a significantly lower proportion of failed releases requiring rollback.

In addition to performance metrics, team satisfaction also increases. When people from different backgrounds collaborate instead of conflicting, the atmosphere improves. Team members feel valued and gain a full view of the work, which has a positive effect on motivation and productivity.

Naturally, cross-industry collaboration also presents challenges, such as cultural differences and the need to acquire new skills (developers need some knowledge of operations, and vice versa). However, according to numerous surveys, the overall effect remains positive [7].

4. Discussion

The results indicate that cross-industry and cross-functional collaboration is a critical success factor in DevOps practices. Why is this the case? First, DevOps is fundamentally about removing barriers. Any remaining silos—whether related to security, business, or other departments—become bottlenecks. Involving all necessary stakeholders is a natural progression, as reflected in the emergence of models such as DevSecOps. As one of the pioneers of DevOps, Gene Kim, noted, "DevOps is cargo cult without DevSecOps, because security is part of the product's value" [3].

Findings align with the performance gradients reported in Accelerate [7] and extend them by showing that mixed-sector knowledge transfer produces gains similar in magnitude to traditional cross-functional integration. While Ahmad et al. [1] and Offerman et al. [6] concentrated on intra-organisational teamwork, the present study juxtaposes those results with data from banking, telecom, and manufacturing cohorts, revealing a consistent uplift in deployment frequency once inter-industry communities start exchanging runbooks and reliability patterns. Deloitte's survey of 2022 [2] indicated that innovation velocity rises when governance structures facilitate open information flows; our comparative metrics confirm that this effect persists even when regulatory environments differ markedly, thus broadening the external validity of earlier single-sector analyses.

Second, there is the synergy of knowledge. Different industries face different challenges, and sharing solutions contributes to the overall maturity of the field. For example, the concept of site reliability engineering (SRE),

developed by Google, can be seen as the result of combining the reliability mindset of traditional operations with the speed focus of development. Today, SRE is viewed as the "second wave of DevOps," and the concept has spread across industries—from web companies to banks. Such synthesis occurs precisely at the intersection of professionals from different domains.

It is worth noting that external collaboration is not always easy. Companies may be reluctant to share practices due to competitive concerns or confidentiality. However, in the context of processes and culture, competition tends to recede, and even direct competitors share DevOps experience at conferences. A notable example is joint presentations by major banks on CI/CD topics. This is because mature processes are often considered a commodity—a foundation upon which competition is built at the product level, not the process level.

As for internal cross-functionality, the challenge lies in culture and change management. It is not easy to get departments that have worked in isolation for decades to collaborate closely. This requires leadership support from the top and a willingness to shift mindset from the ground up. Some professionals used to narrow roles resist broader responsibilities. For instance, system administrators may be wary of infrastructure-as-code practices or of developers deploying to production themselves. In such cases, successful examples help: when a team sees that collaboration leads to fewer emergencies and less blame-shifting, skepticism fades [6].

Ultimately, cross-industry collaboration also impacts business outcomes: new features reach the market faster (reduced time-to-market), service reliability improves (fewer outages and penalties), and costs are reduced through the elimination of inefficiencies. A ResearchGate report cited that companies with strong DevOps capabilities, reinforced by collaboration, achieve 24% higher customer satisfaction due to better product quality [6].

Transferring practices across industries is another key aspect. It is important to recognize that DevOps is not a one-size-fits-all approach; each industry has its own specifics. Interaction between sectors enables practice adaptation to different contexts. For example, fintech companies adopted DevOps quickly but added strict compliance requirements—giving rise to the concept of DevOps compliance. Manufacturing firms are learning DevOps from IT, but provide feedback in return: physical production requires consideration of material cycles, so DevOps tools must be integrated with product lifecycle management systems and industrial controllers. In practice, this leads to the convergence of DevOps approaches with PLM platforms and IIoT frameworks, where changes in machine logic are committed to repositories, tested on digital twins, and then scheduled for deployment to physical production lines.

The enquiry synthesises secondary datasets and public case reports; direct ethnographic observation or controlled experiments were outside its scope. Performance indicators originate from organisations that opted into voluntary disclosure, so survivorship and publication biases could skew effect sizes upward. Sector coverage, while broader than in prior work, remains concentrated in highly digitalised domains; capital-intensive industries such as energy or healthcare received limited attention, constraining generalisability. Temporal granularity is another restraint: most metrics reflect snapshots from 2023–2024, leaving long-range sustainability of reported gains untested. Future research should incorporate longitudinal tracking and primary

surveys to validate whether the documented improvements persist once early-adopter enthusiasm plateaus.

5. Conclusion

The analysis confirmed the hypothesis that integrating specialists from different domains accelerates the release of updates and reduces error rates. Internal collaboration contributed to shorter incident recovery times and a lower proportion of failed releases. Cross-industry knowledge exchange enhanced the innovative aspects of processes and increased deployment frequency. All three objectives were achieved: the forms of collaboration were characterized, the exchange of practices between sectors was examined, and the quantitative impact on key DevOps metrics was identified. The findings can be used by professionals in developing DevOps strategies and implementing DevSecOps and BizDevOps practices.

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