Establishing Platform Engineering Paradigms: Unleashing a DevOps Metamorphosis

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ABSTRACT

This paper presents a high-level overview of a company's initiative to transform into a 'DevOps' organization, particularly focusing on the establishment of a Platform Engineering Group. In response to evolving industry dynamics, HealthEdge, a provider of healthcare payor software, embarked on a journey in 2018 to embrace DevOps principles. The Platform Engineering Group undertook the ambitious task of modernizing an antiquated technology stack, transitioning towards a contemporary, Software-as-a-Service (SaaS) paradigm. The article delves into the goals of reshaping an engineering focused organization and navigating the complexities of transitioning a flexible software stack into a self-serving, efficient, and scalable technological framework. While acknowledging the inherent variability in the implementation of such models, the article offers a simplified yet insightful perspective on HealthEdge's approach to addressing specific challenges in their DevOps transformation. Importantly, the paper emphasizes that the presented process/model is based on practical experiences and acquired knowledge rather than being an invented or rigidly adhered-to framework.

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Introduction

HealthEdge provides a software platform for healthcare payors. Using the patented HealthRules software suite, health plans, health insurance companies, and other payors can finally respond to new business opportunities and market changes in hours, not months or years, while drastically reducing both IT and operational costs. Leveraging an investment of over $125 million, HealthRules is the most modern, scalable, and cost-effective technology in the industry. HealthEdge is the only choice for payors to survive and thrive in the emerging healthcare economy.

Around the year 2018, HealthEdge initiated its transition into a 'DevOps' organization [1]. Engineers, engaged in diverse products within the Payer ecosystem were exposed to discussions about 'shift left,' InfrastructureAsCode (IAC), and DevOps Transformation at informal settings such as the water cooler. Subsequently, a Platform Engineering Group was formed to spearhead these transformative efforts.

In the domain of Platform Engineering, the company undertook the formidable task of transmuting an antiquated technology stack into a contemporary, Software-as-a-Service (SaaS)-driven paradigm. Objectives encompassed the restructuring of the infrastructure consumption model to explore advanced technology stacks and tackle the intricacies of transitioning a flexible software stack into a self-serving, efficient, and scalable technological framework.

The primary objective of this article is to furnish a succinct overview of HealthEdge's strategic approach to overcoming a specific challenge. It is important to note that, akin to all models, this representation is a simplification of reality. The outlined process may not be strictly adhered to in every instance, with inherent local variations. However, the paper serves as a comprehensive guide, offering a general understanding of the approach taken.

Identifying the Problem Space

It was taking at least 5-6 weeks to build one customer environment by teams of Operations engineers, Infrastructure engineers, Software Developers and Account Managers working with various clients on a daily basis and building and maintaining their customer environments that hosted Healthedge's Software. These teams spent most of their day in firefighting and addressing customer problems. Creating a customer environment was a time-consuming process, taking several weeks for an Operations engineer. This inefficiency raised concerns about scalability. It was also an extremely frustrating and time-consuming process. Additionally, the Sales team was about to close multiple sales deals and they also had about 15 more customers lined up in the sales funnel. This implied the necessity to create a minimum of 15*5=75 environments, encompassing those dedicated to Development, System Integration Testing (SIT), User Acceptance Testing (UAT), Pre-production, and Production. Looking forward, manually delivering these environments on time seemed nearly impossible, especially considering the anticipated increase in their number.
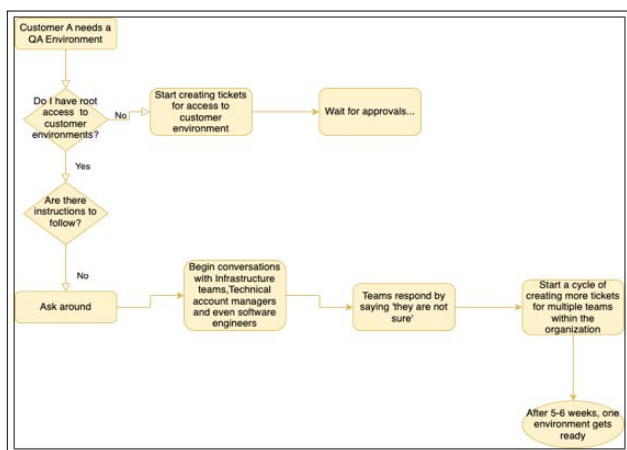
Figure 1: Creating a process flow of the challenge faced by manual environment builds

Unlocking DevOps Insights: The Latest Edition of 'The Phoenix Project' and its Impact on the Team

Simultaneously, the 5th edition of the Phoenix Project book was released. Five years after its groundbreaking impact on the IT landscape, the 5th Anniversary Edition of The Phoenix Project remained a guiding force in the ongoing DevOps revolution [2]. The nascent Platform Engineering Group embraced this edition, concurrently navigating the intricate journey of understanding the existing state while constructing customer environments.

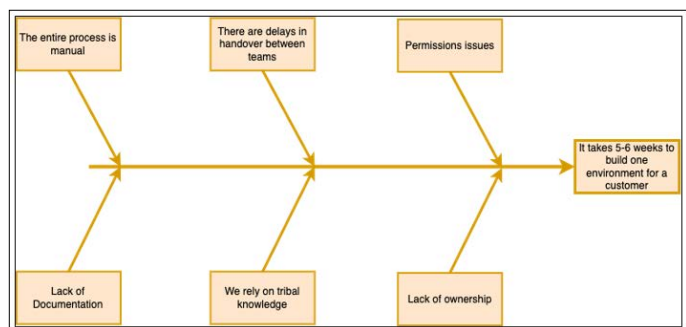A Fishbone diagram successfully unveiled the critical culprits behind the inception of the primary quandary.

Figure 2: A breakdown and mapping the identified challenge using a fishbone diagram

After figuring out the challenges, the Platform Engineering Group, made up of Ops and Software Engineers, leaders, and support from architects, gathered in a big room to brainstorm solutions.

To kick things off, they carefully went through the process of building environments, pretending to be Ops engineers. Although it took some time and encountered delays, every step of the process was meticulously documented for future reference. Communication efforts were extensive, involving discussions with product teams, infrastructure teams, and Technical Account Managers to gather the necessary information.

After documenting all the steps, the subsequent phase involved breaking them down into smaller components and addressing delays through the implementation of automation. Ansible® was chosen as the scripting tool, a user-friendly open-source software written in Python [3]. Ansible® helps IT teams to configure systems, install software, and manage complex workflows, making it easier to deploy applications, update systems.

Unveiling High-Performance Dynamics: A Case Study of the Evolution of the Platform Engineering Group into a Cohesive and Goal-Oriented Team

The notion of high-performing teams, as delineated by Hackman, revolves around their efficacy in serving customers and continual improvement. According to Hackman, individuals within such teams experience personal learning and fulfillment. Katzenbach and Smith assert that high-performing teams exhibit a profound sense of purpose, ambitious goals, complementary skills, and robust mutual accountability [4-6].

The Platform Engineering Group underwent a transformative journey to become a high-performing team. Marked by a shared goal, seamless collaboration, effective communication, and a culture of psychological safety, the team actively sought knowledge through questioning and embraced constructive conflict. Working in a conference room adorned with expansive windows displaying the multitude of environments to be built in the coming months, numbering in the hundreds, became a source of inspiration rather than intimidation. Each day, the team found motivation in the lean process maps, sticky notes on the windows, and, most importantly, the camaraderie among colleagues, making every workday eagerly anticipated. An automated pushbutton method to build customer environments slowly started taking shape.

Diving into Some of the Common Factors of High-Performing Teams
Psychological Safety
Research shows that Teams perform better than individuals, becoming sources for firms' sustainable competitive advantage [7,8]. Encouraging team members to ask questions in meetings and messages, promoting a culture where feedback is valued, and making sure everyone understands the importance of their contributions helps build a strong sense of trust and safety in the team. This, in turn, cultivates a positive atmosphere and facilitates the flow states crucial for accomplishing deliverables even in challenging circumstances. Every Team's Product Manager and Engineering Manager should bear in mind the mantra, 'Stay composed and harness the power of the team.'

Team Psychological Safety (TPS) is a collective belief reflecting individuals' sense of security concerning interpersonal risks within a team setting [9]. Examining over 250 team-level variables, "Project Aristotle" identified five common elements in successful Google teams: psychological safety, dependability, structure and clarity, meaning, and impact of work [10]. The research emphasizes psychological safety as the pivotal factor, serving as a prerequisite for fostering the other four elements. Surprisingly, despite the significance of this psychological component, only 47% of employees worldwide describe their workplaces as psychologically safe and healthy [11].

Optimal Information Exchange
Thanks to the establishment of psychological safety, a conducive environment for effective communication was fostered. In practical terms, team members consistently shared updates on their work, actively sought assistance when facing obstacles, and engaged in succinct and efficient standup meetings. Collective team meetings were dedicated to collaborative problem-solving, ensuring seamless progression beyond individual challenges.

Swift Feedback Loops
Working closely with end-users in an open space accelerated feedback loop. The proximity enabled rapid development of solutions, collaboration with the Operations team, sharing crucial

setups, scripts, and tools for deployment, and quick testing. This approach expedited error identification and resolution, with immediate ticket creation and tracking for swift resolution.

Autonomy

The backing and autonomy provided by the organization's leadership played a crucial role in the triumph of this project. There was no scrutiny over work hours, granting the team the freedom to operate without constraints. Access to customers for queries and collaboration was readily available, enhancing the ability to seek guidance. Complimentary lunches were a welcomed perk, fostering team cohesion during lunch hours without the need to venture out. Leadership's active involvement in the team's successes and their support in overcoming setbacks were integral to the project's success.

Navigating Burnout

Burnout remains a less-discussed topic among both high-performing individuals and teams.

Figure 3: Credits https://www.activtrak.com/resources/reports/state-of-the-workplace/20-22/workload-balance-utilization-levels/#finding-7 [12]

A significant hurdle the team confronted was burnout. As tight deadlines approached, stress levels soared. In Mihaly Csikszentmihalyi's exploration of flow states, he posits that maintaining the delicate balance between challenges and skills is crucial to preventing burnout or succumbing to boredom [13]. Despite being a team of highly skilled engineers with appropriately challenging tasks, the looming time constraints heightened the sense of responsibility for achieving set goals in delivering customer requirements. In retrospect, taking a week-long break to disengage from work could have been a beneficial approach. While stress levels and instances of illness were prevalent, the realization that the team was on the brink of burnout did not dawn upon the team at the time.
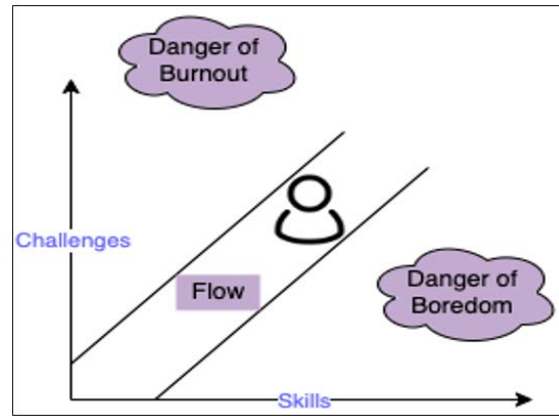

Figure 4: Burnout [14]

Conclusion

Despite the odds, a robust pushbutton script emerged. This script, when initiated, substantially minimized hands-on work and wait times for engineers, liberating them to redirect their efforts toward pursuits like mastering new tools or pioneering innovations. The script's prowess extended to automating the provisioning of environments and handling product installs/upgrades for customers. Notably, within a month, the count of delivered environments surged to 203, a direct outcome of this transformative enhancement. The time investment for deploying a new environment plummeted from 50 hours to a mere 6 hours per resource. Additionally, scrutinizing the script's deployment across 21 customer environment upgrades unearthed automation and process issues, paving the way for refinements to be incorporated into the backlog. This iterative approach resulted in a commendable 25% enhancement in upgrade efficiency, reducing the time from 2 days to a swift 1.5 days. HealthEdge Experienced Record Growth in 2019 and the Company Reported a Significant Uptick in Revenue and Number of Customers [15].

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