



MODERN
DELIVERY

CONTINUOUS AUTOMATION – THE GIANT LEAP TOWARDS FLAWLESS MODERN DELIVERY



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1 Executive Summary

Businesses are aware of the increasing importance of the fact that automation becomes hollow without 'continuous automation'. Continuous automation, which is a part of Hexaware's strategy leaf 'Automate everything' and is also a foundational pillar of our Modern Delivery services is aimed at providing faster time-to-market with optimal quality, improved velocity, enhanced customer experience and reduction in operational costs. This Point of View discusses in detail about the current challenges in adopting and implementing continuous automation, how a workable automation framework can be strategically architected and the e-business benefits an organization stands to gain by adopting the continuous automation approach.

2 Embarking on the 'continuous' journey

Agile DevOps has attained a remarkable stage of maturity and is leveraging automation a lot for optimizing product management to its maximum and on a continuous basis. Today, automation is being implemented to such a large extent that the terms 'continuous automation' and 'BizDevOps' are interchanged often. However, it is important to understand that continuous automation is a key enabler for BizDevOps and it goes beyond DevOps. Continuous automation focuses not only on automating the entire product delivery cycle but also ensuring that every step and process needed for software release is as efficient and repeatable as possible. Continuous automation is a key tool of modern delivery ecosystem which helps enterprises enhance IT- business alignment, increase frequency and pace of releases and focus on innovation for a flawless delivery.



Continuous automation is an on-going activity just like continuous planning, continuous integration, continuous deployment, continuous testing, continuous monitoring, and continuous governance. The crucial point is that automation is the key enabler for all these activities. While most businesses have already gained momentum and attention by implementing one or more of these activities, the implementation of continuous automation is still inconsistent and has enormous scope for improvement.

3 Challenges on the Journey

Present day organizations assume that a few things are implicit and will not impact their businesses in any unusual way. But as soon as these assumptions prove wrong, the challenging times start. To avoid such scenario, focusing on even the smallest changes and communicating them at the right moment in the feedback process can give businesses a competitive edge. Product development space is changing so rapidly that what holds relevance today may become irrelevant tomorrow. Therefore, it's imperative that the gaps be identified to establish a strong feedback loop via continuous automation that help in avoiding mediocre delivery. Let us check some consequences arising due to lack of continuous automation.

3.1 No Proper Alignment of Business to IT

If the business teams are not a part of feature planning, release or prioritization, it is considered a red flag for the program and this clearly indicates that there is no proper alignment between business and IT. Continuous automation requires synergies between business and IT to improve agility and operational efficiencies. The alignment also helps in better functioning with improved ROI. Business teams can decipher developed Vs released/future features, automation, security, compliance and governance and integration for a strategized business goal.



Alignment of business and IT does not mean combining business, development and operations teams in reality. It means integrating business into engineering practices, embracing continuous automation from product ideation, validation, design, prototyping, development, testing, deployment, delivery to sustenance in a continuous feedback loop.



3.2 Inconsistent Automation

Inconsistent automation leads to the following outcomes:

- Passing of errors to the later stages
- Increased risk of continuous deployment causing downtime
- Delayed rollback, which in turn impacts end users



It is understandable that there can be a few processes that cannot be stitched under continuous automation framework of capturing feedback from delivery pipelines and setting up notification triggers. However, depending on the processes, technology landscape, applications, and architecture, organizations need to identify critical steps from where significant and timely feedback is relayed to the team.

3.3 Identifying Issues at Later Stages



Most organizations are trying very hard to identify and resolve errors in the early stages of software development lifecycle but haven't been able to achieve expected results. Identifying defects in the later stages of development cycle is a critical sign of ineffective continuous loop.

Mistakes are a part of the learning process, but spotting, preventing or resolving them in a controlled environment is possible by using continuous automation loop. This requires a shift of mindset from 'defects are usual' to 'improve feedback loop for identification and fixing of defects as early as possible. The entire team should collaborate and align with the development process to identify errors in advance and follow the best practices of Test Driven Development.

The continuous loop should also reflect customer's perception of poor quality. For example, customers may be fine with the defects that don't impact usability of the product irrespective of how critical these defects are but they might object to other inconsequential defects that impact the usability. And they may judge the product quality depending on this understanding. Thus, tracking customer perception of quality with duly developed testing strategies exploits the continuous process around perceived quality. This also helps to resolve the bugs in alignment with customer's perception of quality. So, it is not the underlying application technology or performance but the customer experience which acts as the key enabler.

3.4 Ineffective Monitoring and Automation Loop

Continuous monitoring without taking decisive actions is a clear sign of ineffective continuous loop. Monitoring the infrastructure alone will not give a clear indication but application and other logs should also be continuously tracked to get a comprehensive picture. Continuous feedback should also be a part of monitoring.

Monitoring should be mandatory at every stage in a simple and continuous automation loop. The monitoring methods are as follows:

- **Development:** Build notifications/results, unit test result and code coverage with analysis metrics
- **Testing:** Non-functional testing results with comparison trends
- **Deployment:** Production environment monitoring, database and deployment reports



3.5 Faster Releases without Customer Insights

It is a common perception that deployment speed is all about continuous improvement in the area of releases (without stressing on having a feedback loop in place). Faster releases without feedback may compromise on quality and might not provide optimal benefits.

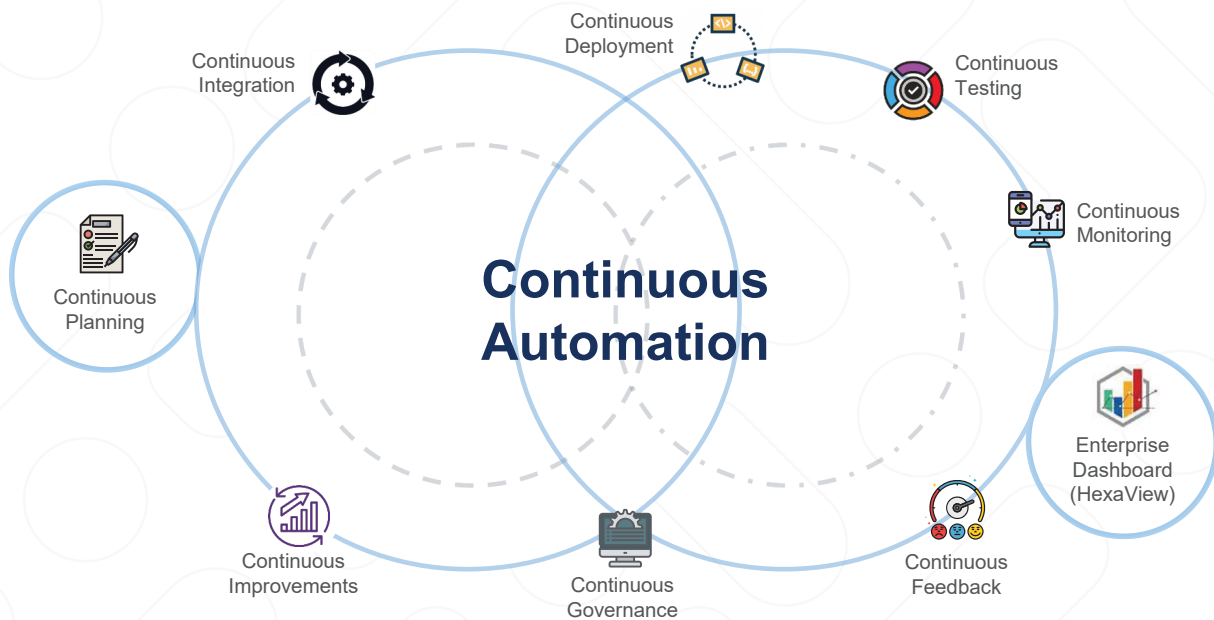
Having customer-centric improvements and quality compliance will help show process efficiency and reduces the time taken to provide quick feedback to developers about their codes. Effective feedback mechanism can be faster if unit tests are automated early in the process.

Customer experience feedback is a must to improve overall quality and flawless delivery. Customer experience insights should be shared across the organization, reviewed by cross-skilled pods and discussed to improve end user experience. It is recommended to derive a product roadmap leveraged with customer insights to help plan faster releases for quicker value to end users.

4 Continuous Automation Approach

Listed below are some of the critical steps that need to be followed in the delivery workflow to ensure continuous automation:

- Strictly follow the core principles of continuous automation method for planning, integration, deployment, testing and monitoring
- Build a robust engineering team that connects all product delivery aspects into a unified ecosystem with one vision
- Maintain minimum number of code branches to avoid integration issues
- Automated testing should complement manual tests
- Having a production environment clone in place can be helpful to experience real-world conditions
- Integrated toolsets should have a single source of truth
- Inject monitoring at every stage and extend it to oversee pipeline health



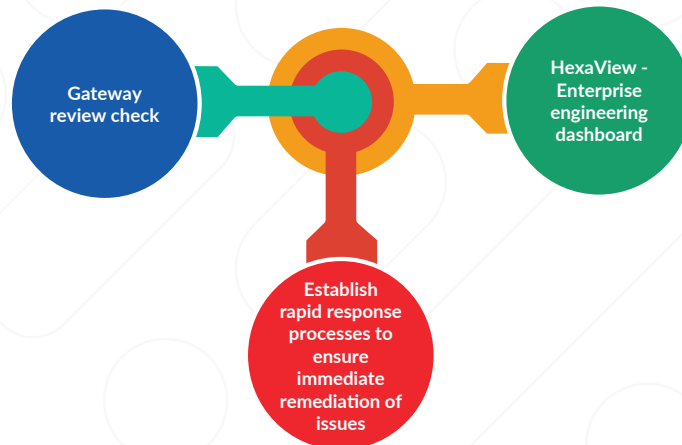
Although we have come a long way, there is a constant need and emphasis on a continuous automation loop in the entire lifecycle. Well-directed continuous loop results in offering new dimensions to act upon such as customer demands or adding business values.



4.1 Focused Workflow

Continuous automation needs constant focus from planning to post-deployment. The basic idea of continuous loop is simple - gather real-time data based on the code changes in the pipeline, decipher this information and collaborate with the engineering team, create processes to fix issues and improve continuously.

The continuous process should always focus on enhancing customer experience. At a high level, continuous flow requires the criteria as shown in the image below.



4.1.1 Gateway Review Check

Set a gateway review at each level with a specified threshold at each stage for acceptance. This requires brainstorming and ideas from various teams such as product managers, BA, developers, QA, support team etc.. Gateway review check ensures the following:

- Code is moved into different environments like SIT, UAT, Pre-prod and that production has the highest quality standards including sign-off, approval, security, compliance and governance
- Code is stopped from being released if defects threshold is reached and the respective team is notified
- Traceability matrix – in/out links between stories and design, code, defects and enhancements
- Build release confidence by showcasing a centralized Release charter and schedules with environment allocation and configuration
- Rollback plan & strategy
- Backup procedures



4.1.2 HexaView - Enterprise Engineering Dashboard

Many tools are already available in the market, but most popular tools are focused on the segments like testing, build, application performance monitoring, performance/ load testing, etc. It has become imperative for business owners, leaders and engineering teams to have a transparency and visibility into the quality. This is taken care of by HexaView, Hexaware's proprietary enterprise engineering dashboard. It is an innovative platform focusing strongly on elevating business agility and boosting team performance for optimal engineering effectiveness through informed decisions, transparency and reliability. It integrates with all leading toolsets and presents almost real-time data at different layers of the organizational structure. Alerts and notifications can also be configured.

4.1.3 Establish Rapid Response Processes to Ensure Immediate Remediation of Issues

Continuous automation feedback loop ensures identification of errors in advance. Even if the errors slip into production, it enables faster responses without any major impact to the customer. This requires solid process around root cause analysis, impact analysis and prevention mechanism. Another key element which drives continuous automation is the organizational culture. Strengthening the automation process requires creation of a dynamic and agile culture in order to have the flexibility of changing course whenever required.



5 The Business Value of Continuous Automation

Every organization is in an urgency to deliver at market speed and with innovation for enhanced customer experience. Thus, deployments are more frequent and need continuous monitoring of quality delivered. This often requires integrating all components of Modern Delivery viz. Agile, BizDevOps, cloud& API and microservices. These demand for a product management mindset and UX- driven culture that is achievable by having cross-skilled full stack developer pods. As continuous automation touches upon all the elements of modern delivery, it can play a vital role in restoring normal and later enhanced productivity during COVID-19-like situations and help achieve flawless delivery.



5.1 Culture and Mindset Powers Constant Evolution

Implementation of automation across an organization demands product management mindset and a cultural transformation from top to bottom. Continuous automation mandates involvement of different stakeholders, starting from a business team who can share ideas, collaborate and steer delivery with constant feedback loops throughout the lifecycle from ideation to release and continuously thereafter.

Culture combined with progressive mindset encourages teams to experiment and innovate. This fundamentally gives them the freedom and autonomy and thus, creates more standardized delivery approaches for flawless delivery.

The process involves various phases of planning, development, delivery, feedback, improvements and deployment on a continual basis. It requires strong collaboration that helps the entire organization, including business and IT teams, to create strategic value more rapidly, reduce failed deployments and foster a culture of customer centricity and continuous improvement. In the current COVID situation, remote working is becoming a new normal. Thus, the culture and mindset will play a critical role as COVID-19 has already shrunk the time available to implement continuous automation.

5.2 Elimination of Operational Cost

Continuous automation aids in faster time-to-market and also reduces delivery time. Through continuous integration and testing, errors, issues and anomalies are detected early and rectified automatically. This makes it possible for an organization to plan for faster releases and faster time to market unlike before. In case of failure, automation helps in faster recovery. Thus, significant operational efficiency is realized, thereby lowering operational costs drastically.



5.3 Enhanced Customer Experience

One of the surest ways to deliver quality to customers is to have trust in your teams by giving them freedom and authority. Team empowerment along with the necessary training to handle customer issues can ensure better performance every time.



Create small and iterative continuous automated feedback loops between business and delivery teams and constantly engage customers to share and track feedbacks. This would help to act quickly on the changing needs.

The integrated collaboration of modern delivery components and teams makes it easier to deliver as per the customer demands without compromising on quality. Adopting a metric dashboard, like HexaView, will help teams stay focused on the goals.



6 Conclusion

Modern delivery is designed for agility and speed and is considered as the forefront operating model of continuous automation. It understands the blurring lines between business and IT. Modern delivery mandates IT delivery on the three important aspects: faster time-to-market, optimize costs and enhance customer experience. However, given the extent of change involved in the shift, it is not something that can be achieved overnight. It must be underpinned by a journey of cultural change and continuous learning, by using integrated toolsets which are driven by design thinking and business alignment.

Continuous automation must be implemented as the sure way to deliver value. While challenges are a forceable part of innovation, the success of innovation is defined by the success of those who have already adopted it. Continuous automation has become a clear directive in the current COVID situation.

Continuous automation is a way to perform well and provide faster releases with flawless delivery. Continuous automation is a way to remove the obstacles between organizations and customers, by achieving customer-obsessed, goal-oriented culture.

7 Author Info



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