Connecting the Business, Development, and Operational dots in an enterprise

[BizDevOps] - A TCS Approach

Enterprises are under continuous pressure to deliver innovative solutions that drive business results. This paper provides an approach towards achieving effective collaboration between the businesses, systems architecture, application development and operation functions. Hence this approach has been termed as BizDevOps.

The paper explains various dimensions of BizDevOps and provides the seed for modernizing our business analysis, architecture, application development and operations. It further utilizes service orchestration and model-driven technologies to achieve agility throughout the value chain. It also describes, knowledge sharing in the form of models across stakeholders to maintain consistency and thereby improve time to market and quality.

This paper provides an approach for capturing value derived from information technology, and subsequent mapping with the business drivers to articulate value creation. Emphasis has been given to systemic thinking that acts as a base to the BizDevOps approach. The paper is an initial attempt to describe BizDevOps approach which will further evolve with time.
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Executive Summary

The dimensions of today’s fast changing world have incorporated effective collaboration, futuristic thinking and better decision systems, but, IT delivery still relies on best practices and continuous process improvement (CPI) for evolution.

BizDevOps is an attempt to push the barriers on how business strategies can be effectively implemented and improved, using solutions, going beyond best practices and CPI.

In order to achieve business agility, enterprises need to realize a strategy that spans the entire value chain, from business requirements to deployment. As users interact with applications through the web, cloud and mobile, businesses have become more dynamic, while embracing the imperative to meet users’ expectations of usability, features and performance as soon as possible.

This makes collaboration a crucial element among stakeholders, that are part of this lifecycle and contributes value at each phase of the business delivery. This value will need to be measured phase wise, starting from capturing business requirements, through development, testing and operations. This requires a systemic rather than systematic approach towards getting a holistic view of the entire value chain.

BizDevOps comprise of technologies, processes and practices that unifies all the phases as part of continuous business application supply chain.

**Consistent Knowledge:** Consistent knowledge of IT aspects as well as business processes is the first requirement for developing effective BizDevOps. Within IT, it is important to gather an extensive knowledge of tools and platforms used by business analysts, developers, testers and operations teams. Business analyst teams drive, increasing business needs by explicating the requirements. The development team assumes the mantle of identifying changes, and the operations team is motivated to control changes as they undermine stability and reliability. This divergence in responsibilities can be efficiently managed by way of consistent domain knowledge, the resultant process knowledge and the required operational knowledge in the form of models. This ensures effective collaboration within teams.

**Automate Agility:** Automation at every level of the IT process can provide consistency, reliability, quality and speed necessary for IT to align with business needs. This will enable application releases throughout the lifecycle, including development, testing, operations, delivering value to users faster.

**Systemic Thinking:** A practice that transforms the thinking from pure analytic to systemic is the need of the hour to achieve an effective BizDevOps. Systemic thinking provides a view on interconnectivity of various systems, their components and how systems act as a whole, rather than in parts, is the basis of BizDevOps approach.

What is BizDevOps?

BizDevOps is a set of processes, technologies and systems for collaboration and integration among the functions responsible for business requirements, through design, development, assurance and operation to deliver software products and services in an agile manner.
Centered on trust and responsibility, the cultural aspects of BizDevOps address organizational structures by encouraging business, development and operations to acknowledge each other’s challenges and avoid conflicts. By developing a culture of collaboration between teams, BizDevOps aims to nurture shared interests in an enterprise. BizDevOps paradigm aims to boost the traditional approach by formalizing processes that effectively map IT to dynamic business requirements.

**The Tenets of BizDevOp**

TCS provides a consulting approach to measure the effectiveness of BizDevOps and provides services that drive its implementation efficiently. It focuses on the following four aspects:

1. **Culture Assessment:** This aspect assesses an organization’s background to sense and respond to major changes in terms of people, process and innovation. This is the stepping stone and the most important aspect, towards achieving the BizDevOps culture. Our approach for defining a culture metric towards BizDevOps adoption helps establish the “as-is” state and promotes ways to achieving the target BizDevOps state.

2. **Automation for improved efficiency:** This is another important aspect of BizDevOps. We provide an approach plan for enterprises to transform from a manual approach to a decision-supported stage, and eventually, to a fully automated state. Automation is supported by standards such as Kanban, lean, agile services and six sigma that lead to service excellence.

3. **Measurement parameters:** Conflicting KPIs can lead to differences between business, development and operations in business alignment and service delivery. There needs to be a uniform mechanism to measure the risk across the value chain. A successful BizDevOps implementation, measures KPIs such as performance metrics, process metrics and people metrics along the business interfaces to achieve business agility.

4. **Knowledge management:** There is a need to inculcate a common vision, vocabulary, knowledge and tools. We enable organizations to select the knowledge management platform that best suits their requirement.

**TCS’ Model Driven Approach for BizDevOps**

In many organizations, achieving BizDevOps necessitates changes in process, people and technology in various ways. This could result in changes in roles, responsibilities, inter-team interfaces, while new tools and platforms may need to be installed and new skills adopted. We offer model-driven engineering-based development and assurance services. This approach is now being extended to business requirements and operational dimensions aimed at achieving BizDevOps. It ensures consistency of domain, systems and application knowledge among the stakeholders in the entire value chain.
Knowledge Repository: It all starts when businesses are required to initiate a rapid response to a change. Business change is captured in the form of models during the requirement analysis phase. Requirement gathering without the aid of tacit knowledge available in the organization makes it time and effort intensive for the domain expert. Our expertise in delivering services across domains, has captured business processes in the form of domain models in a knowledge repository. This knowledge engineering platform is empowered with tangible domain knowledge and can be used to build a lucid set of requirements that can lower cycle time and minimize errors. It enables meaningful use of subject matter expertise and effort, since it begins from an already present domain knowledge corpus as a starting point.

During the requirement capturing process, the focus is on getting a holistic view and interconnectivity of the system components that forms the eco system. The eco system can be captured with help of CID™ methodology which provides the influential parameters that impacts the system behavior. Once the influencers to the systems are identified the next step is to get an objective derived from the needs of the stakeholders. This is obtained through SNAC™ framework that determines various stakeholder’s needs, alterable and constraints to obtain a business analysis planning approach. We plan to share a detailed description of the framework in our upcoming papers.

The information related to application functionalities along with non-functional aspects are modeled in the knowledge repository. Platform and infrastructure components such as storage and network are modeled along with application models that are referred to during the deployment process.

Within application functionality, there is a value associated with each transaction. Modeling the value of such transactions as part of earlier lifecycle phases ensures that critical functionalities are assigned the requisite emphasis during subsequent phases. This value model culminates in the overall IT cost associated with a business transaction.
**Model Driven Development and Assurance Services:** The development team uses the models to create, in detail, the next level of service, UI and data models. Each process execution/transaction will be associated with a cost model. This enables tracking of overall service cost during production and would help in associating the IT cost with the business value.

Application development has advanced over the years by implementing newer, crisper methods and tools. However, the same has unfortunately not been the case with testing methods and tools. Testing tools are largely restricted to test management and test automation and do little to address the critical aspect of arriving at good test cases. We have devised the novel approach of using business process models created during the requirements process and reusing them during assurance services. This formalism in assurance approach provides a way of automatically generating test cases from the Business process models that assures IT alignment with business change, better coverage of test suite and improved productivity of the testing teams.

**Configuration Models:** Operations teams are facing complicated deployment challenges in terms of multiple tiers and service-oriented architecture. The number of deployment servers has increased since the introduction of virtualization, cloud and mobile-enabled technologies. Application release operations require a higher application model level that describes an abstract application topology, that is, the layout topology, dependencies between server types, application artifacts and the relationship between them. The model captures the relationship between the application artifacts and server types. This level of abstraction enables IT to create deployment procedures that can be easily applied in different environments without the need for handling each environment from scratch. A single application model across release environments ensures consistency in terms of release operations across the environment.

The automatic deployment process that is used during production is also used in the development and testing phases. Teams use the same approach while deploying their application in their respective development and test environments. This ensures that any negative impact is identified at an early stage of the agile development.

**Non Functional Model Configuration:** The non-functional application requirements (NFR) such as response times, user growth, usability, and criticality that influence system attributes such as scalability, availability, security, and maintainability are usually modeled during the production phase. The QOPD™ framework provides engineering and traceability of product attributes (functionality, security, compatibility, reliability, usability, performance, maintainability, portability) during the delivery process. These NFRs will need to be modeled at the requirement phase, carried over to the development phase and tested during the assurance phase and finally monitored and validated by the operations team. The frameworks increase maturity in product/software quality through adapting to international standards thereby ensuring certainty through delivery. This approach provides a holistic view of the system as perceived by end users and necessary corrective steps, if required, can be taken during the initial model creation. This enables the reuse of models for other similar product/service variants and improves time to market.
The backbone of BizDevOps – Collaboration Bus

In order to achieve effective BizDevOps through a model-driven approach, a robust collaboration bus is imperative. This helps drive communication effectively across stakeholders. This bus acts as a backbone for achieving BizDevOps and ensures appropriate flow of domain knowledge, product/services information, and process models across the agile value chain. The bus integrates the services required at every phase from application requirement, development, assurance and deployment. The bus also provides predictive analytics, workflow management, real-time monitoring and dashboard services to the users.

Collaboration Engine and Management - The collaboration bus built on Web3.0 technology provides a social platform woven into the business processes. This focuses on relevance, usability and timeliness of knowledge shared between teams. The bus has several tools that supplement each other to capture project knowledge as well as tacit knowledge an enterprise to foster collaboration within teams. This collaboration bus includes the models imported by respective teams during the agile process. Each update to the bus triggers an alert to the next stakeholder for model import. With a Web 3.0 feel, it prompts greater collaboration, increases productivity, and reduced time-to-market through the sharing of critical knowledge. The collaboration bus also provides features like powerful search, expert identification, crowd sourcing and gamification that allows organization to harness knowledge by leveraging skills from the vast resource pool. Based on appropriate qualification criteria, associates are provided access to contribute to the project.

The collaboration bus also provides a virtual connection between teams in an agile environment. Our virtual connection platform allows the teams to seamlessly collaborate in a virtual 3D environment space that mimics a real office with an identical layout and seat allocation. TCS GNDM ™ enables the execution of agile development through distributed business, development and operations team and virtual connections bridge the gap between these distributed teams by creating life-like avatars of the associates that leads to increased frequency of interaction and develop better relationships.
Architecture Evolution Engine – The architecture evolution engine deals with enhancing existing system architecture through feedback from the continuous integration process. It contains a change management module that gets triggered by a change, to both functional and non-functional systems aspects, suggested by operations during production. The resultant change is validated with the domain and system models and an appropriate workflow is triggered. This engine provides domain and system models management and, based on the change suggested by the stakeholder, it is sent back for architectural review with the business owner. It also provides auto recommendations about the system and domain models and, once the change is approved, the model gets updated and flows back to development and testing and finally to production. This effective, smooth flowing model-based approach leads to faster time to market for the change with minimal cost incurred during the lifecycle due to consistent information flow in the form of models.

Service Automation – The service automation function automates repeatable services that are part of support activities in the production environment. This module in the collaboration bus proactively senses and responds to alerts generated from the operational environment and provides predictive analytics for tickets. Our Support Analytics Platform, uses a domain-driven data-mining approach to support analytics that help improve the service level agreement. This analysis is leveraged by the operations team and, through the collaboration platform, shared with business analysts for development in the form of models to identify potential functional and non-functional improvements.

Introducing risk factor acceptance enhances the success of transitioning new developments into production. At the beginning of implementation projects, the business, development and operations team should jointly evaluate the risk factors to production as a feed forward loop. In case the risk value is higher, then corrective processes can start instead of waiting for acceptance testing. In such cases, the teams share responsibility for achieving targets on business interface metrics.

Data Visualization – In the current state, there are different KPIs measured and reported differently by each stakeholder in the value chain. There is a need to obtain a unified view of the entire value chain, specific metrics need to be defined at business interfaces, carried over and tracked in the other dimensions. There are metrics prevalent in development such as percentage rework after testing and the number of test cases. There is also a different set of KPIs for the operations team like SLA requirements, number of defects, and so on. We need to have KPIs like handover time, risk factor acceptance, number of deployment related incidents measured at the business interface. Performance measurement cannot be performed in isolation, but steps are taken to link engineering models with business results.
Value Delivered

It is imperative to measure value at each phase of the life cycle. There are standards available that measure IT value during the development, assurance and production phases. These measures ensure that individual teams follow the guiding principles and meet SLAs as per requirements. For example, the development team has to ensure minimum defects in code, the assurance team has to ensure maximum test coverage during testing and the operations team has to comply with stringent SLAs post deployment.

There are steps available to measure KPIs in the most effective way, but the need is to align IT with the business change. For instance, if business triggers a need to address requirement immediately to stay competitive in the market, the IT system should be agile and the change in the IT system should be mapped back to this business change effectively. The BizDevOps approach achieves this objective as shown in Fig.3 by ensuring that value is recognized not only in the individual phase of the life cycle but also during the business interfaces that directly map the value to the business. This enables tying the KPIs in the Business, Development, and Operations direction and also in the reverse where the value of each KPI in the operations can be mapped to business.

Fig 3. Value from BizDevOps – Business Interface
Conclusion

In the bid to achieve competitive advantage, enterprises all over the world aim to release their applications to end users within a very short span of time to achieve competitive advantage. Enterprises expect that IT investments made towards building applications should align with the business objective and start realizing value at an early stage of the lifecycle. This requires consistent and effective sharing of knowledge among various groups involved in achieving the business objective. BizDevOps not only brings effective collaboration between business, development, assurance and operations teams but also offers automation and a tight feedback loop to speed up the refinement and updates to applications. This enhances collaboration and communication between teams that leads to increase in business agility, improved efficiency and predictability.

References

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