White Paper

Integration Is a Core Competency of Digital Transformation

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IDC OPINION

Digital transformation (DX) is the continuous process by which enterprises adapt to or drive disruptive change by leveraging digital competencies, such as harnessing sensor data or using location, customer profile, and a mobile app to make shopping recommendations. DX reshapes the organization's culture where required; leverages existing processes, systems, and assets; and creates net-new digital capabilities as needed.

With DX, there is the need to embrace new business models and new architectures and technologies that will help an enterprise with customer-facing innovation as well as transition existing systems, processes, organization structure, and relationships to support the transformation.

The focal points of DX involve digitizing the following:

- **Customer experiences.** Common projects include enabling customers to purchase through any channel or move from channel to channel to complete shopping; using analytics to improve the match between offers and customers, thereby increasing conversion rates; using predictive analytics to make promotional offers in near real time; and improving customer self-service capabilities for more engaging experiences.
- **Operating processes.** Common projects include exploiting technology to significantly improve the levels of automation within the process to reduce errors, accelerate cycle times, and otherwise make a process more responsive and less manual. Other projects involve adding collaboration, providing deeper and richer analytics environments to support decision making, and improving employee self-service capabilities.
- **Business models.** Common projects include identifying ways to enhance existing products and services by adding a layer of digitization as a service accessible through mobile devices, using sensors to accumulate data about things in order to improve performance, and adopting a strategy of participating in coordinated ecosystems that work together in innovative ways to deliver superior value.

DX initiatives strive to:

- Be oriented toward real-time actions, processes, and assessments
- Generate or leverage large volumes of data that can be utilized to feed into advanced decision automation, with a focus on anticipating or predicting rather than reacting
- Replace applications and manual tasks with automation
- Strive for rapid delivery of value
- Place customers and customer impacts at the core of the design
- Create digital services delivered to both mobile and browser applications that provide unprecedented levels of visibility and control to consumers and businesses to make them and their systems or machines healthier, financially better off, and more energy efficient

Rapid Shift from Experimentation to DX Repeatability

For the past decade, the rapid adoption of technology-based change was primarily focused on four technology pillars: cloud, mobile, social, and big data. DX came on the heels of the four pillars to place a business context over the technologies to better harness them to support innovation.

Cloud, mobile, social, and big data were driven into enterprises by end users, work teams, and business units taking control over technology adoption decisions, which then percolated up to senior leadership for broader endorsement and rollout. DX, on the other hand, has been widely embraced by leadership teams that then focus on driving change down through the organizations and their ecosystem. In a 2015 survey, IDC's DX team indicated that 93% of United States-based business leaders have moved past the initial ad hoc phase of DX maturity. In fact, the largest percentage of leaders consider themselves to be in the repeatability phase of DX maturity, having already experienced success in their initial efforts, and are focused on creating an architecture and an approach that allow them to do more, faster.

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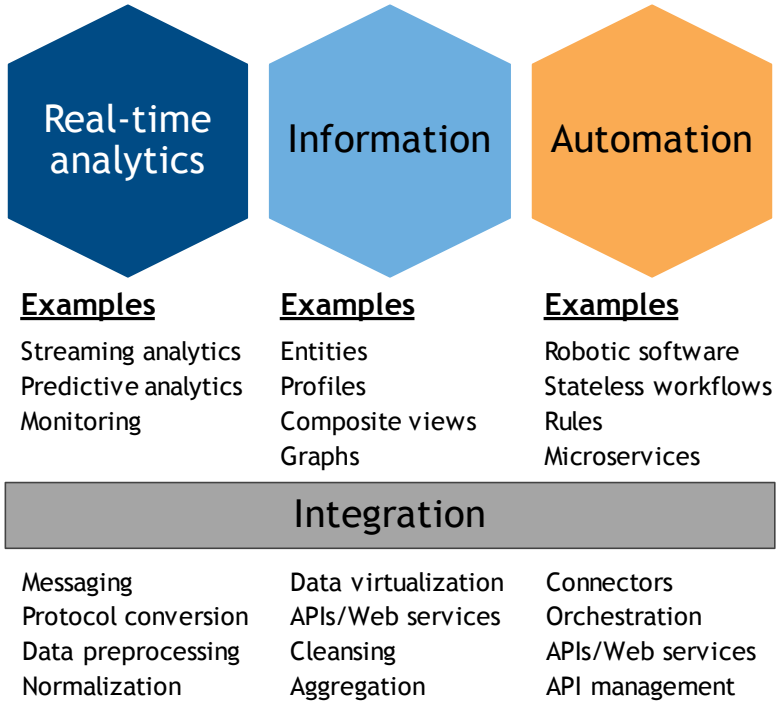
Core Midtier Building Blocks of DX Repeatability

Structuring for repeatability requires a separation or generalization from any particular initiative into a competency and resulting set of tools that can be applied to support a transformation project. The core midtier building blocks of DX repeatability are analytics, information, automation, and integration, as shown in Figure 1.

FIGURE 1

Buildings Blocks of DX Repeatability



Source: IDC, 2016

Analytics

Analytics is used extensively in DX. The cornerstone of a transformation initiative is the shift from using analytics that can show what happened in the past to analytics that can predict. If responded to appropriately, predictive analytics can enhance customer experiences that result in revenue growth and improved customer loyalty. Predictive analytics is used to increase the agility of a process that boosts profitability. And analytics is often the foundation needed to create new business models.

New competencies are required to determine what type of analytical techniques are needed for a particular initiative; for example, how to train decision models and improve the accuracy of converting unstructured content into structured data to feed back into decision models and move all of this into production for optimal runtime performance, how to flow and feed data into the analytical system to ensure accurate results, and what techniques to use to change paradigms as needed. There is also a need to connect the insights and predictions to the response required to drive business benefit.

Information

While DX is data rich, data must be converted to information assets accessible for use across the DX initiative. There is also a need to leverage existing information to make it available in entities and profiles, relationship graphs, and other virtualized formats so that end users and systems can interact with these information objects as part of an application or a process.

When focus shifts to repeatability, the ability to standardize key information assets across applications, domains, and regions speeds up development and reduces the cost of deploying localized applications. A common definition of a customer, an order, a product, or a thing becomes important. Because DX is so decision centric, there is a need to ensure reliability by adopting policies aimed at delivering quality and accounting for the consistent treatment of information and how it is updated.

Automation

The automation portion of a DX provides client-side functionality that allows end users to access digital services from mobile devices. Automation also removes manual touch points and replaces them with fully automated responses. Ultimately, a variety of styles of automation with related competencies are used, including:

- Creating and managing events, software robots, stateless workflows, and other techniques to replace manual tasks
- Building microservices to package and assemble digitization as a service
- Developing mobile apps for self-service

Integration

The support of analytics, information, and automation requires integration (refer back to Figure 1). A DX core competency in the midtier is the ability to:

- Deliver and continuously process data for use in streaming analytics required for automated decisions
- Create, capture, clean, enrich, normalize, and aggregate data to create the information assets that are required to support the transformation initiative
- Call Web services on behalf of an application or a system and access data through Web services by using either REST API or SOAP-based Web services

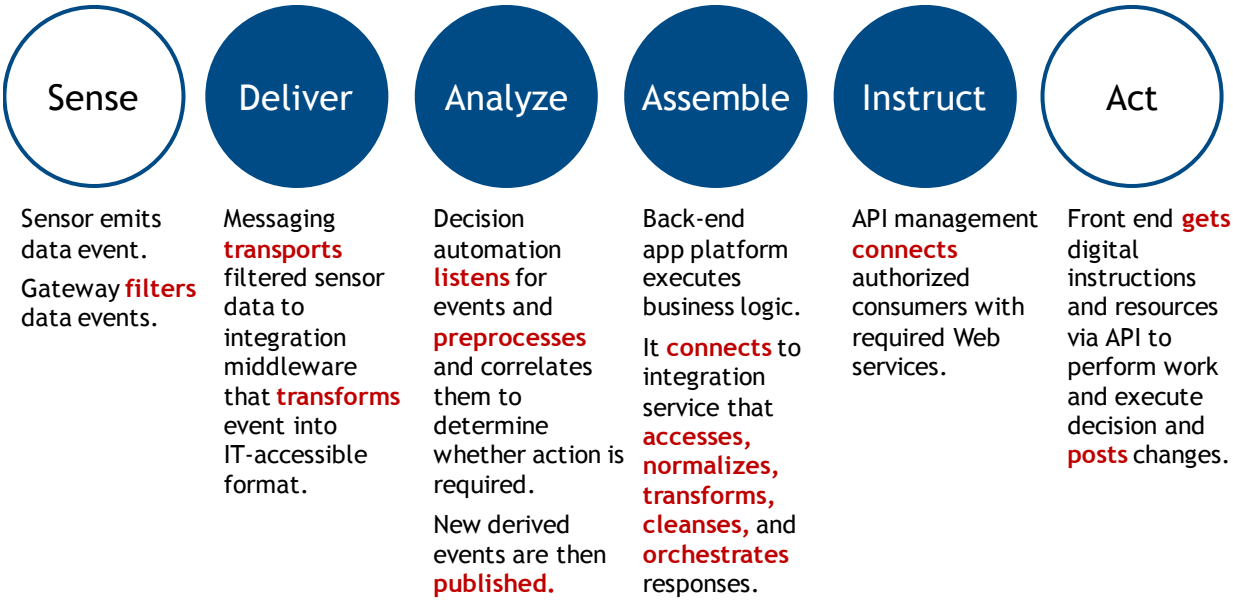
Integration abstracts the coordination elements of a distributed system from the business logic of the system. Coordination is associated with accessing, receiving, and delivering data; managing API calls from requesting applications; and coordinating the activities needed to execute both simple and complex workflows.

Figure 2 shows an example of an application front end and the set of typical back-end activities that must be coordinated to support an IoT initiative. Text in red describes discrete integration actions that are triggered across the activities that coordinate a system designed to respond to sensor data as required. A core assumption is the increasing use of APIs to create a service interface in front of an asset in order to standardize access.

This coordination is heavily dependent on integration, connecting the new digital capabilities with existing assets and processes. The ability to use integration effectively to handle end-to-end coordination of activities across the related systems within a DX initiative provides an opportunity for sustainable competitive advantage.

FIGURE 2

Use of Integration Middleware in IoT-Based DX



Source: IDC, 2016

RECOMMENDATIONS

- **Streamline integration for efficiency and speed.** Look for integration offerings that are lighter weight with a smaller footprint. This can mean they are efficient in using only the capabilities required for an intended task, support multiple deployment models (i.e., centralized deployment on-premises and decentralized capabilities across private and public clouds), support mobile and microservices endpoints, are as flexible as possible in supporting experimental and production-ready efforts, and do not have any single point of failure.
- **Evaluate the approach to integration in light of speed and minimizing the impact of change.** As the attention of enterprises shifts to repeatability and a focus on core competencies, building industrial-grade scalable integration becomes far more important for both performance reasons and simplified change management — an inevitable part of DX. When integration is embedded in application code, tasks such as identifying and making changes become increasingly challenging. An organization's ability to become expert at managing change enhances transformation.
- **Use API management and integration software in tandem.** Many organizations are creating separations in their set of integration offerings, with REST APIs managed using API management and made available to development teams and integration handled separately. This is not a bad separation, particularly when the API has no dependency on existing integration services. But when the API leverages existing APIs or other forms of integration, there is a need to understand how the spectrum of activities performs as a whole. Without that, there is no ability to guarantee performance.

  API management is unlikely to replace the need for full spectrum integration, but it should be part of the larger story, with:

  - API management focused on fast IT, including the development of interactions with front-end clients and services and other technology enablement designed to change easily and rapidly
  - Application integration used to call existing Web services, connect to systems of record, and create APIs to handle complex mediation and orchestration
  - Data integration to support an information architecture and handle large volume data normalization, cleansing, and aggregation requirements
- **Align technology enablement with the core characteristics and competencies of DX.** While it is tempting to put together teams to support discrete transformation projects, the patterns of DX are often complex, yet similar across initiatives. It often makes more sense — measured by speed, the ability to work at capacity, and the ability to build skills — to look at core competency enablement as a service offered by the appropriate subject matter experts inside the organization.

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