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How to deliver on the low-code promise

Easy, engaging and smart enterprise applications

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Executive summary

Low-code platforms are becoming one of the most strategic investments for IT organizations. These platforms have grown from tools for simple, departmental applications into tools for digital transformation, changing the ways users interact with organizations, and the ways organizations interact with information.

OpenText sees low-code development as the key for every enterprise or government organization to increase user engagement with its most valuable asset: **information**. While organizations have long sought a "single source of truth" for key information objects at the center of their operations—such as customers, vendors, contracts and the like—the reality is that this information still exists in a variety of enterprise systems and content repositories. A fragmented information environment leads to significant barriers to digital transformation, including:

- Disjointed tasks that reflect content silos.

- Rigid processes that meet the needs of a few internal users but can't easily be modified for a broader audience, such as customers who desire self-service.

- Disconnected processes with manual steps filling in the gaps.

- Significant efforts to deploy functionally rich applications that must integrate with disparate systems.

- Lacking insight into process execution.

System-to-system integration technologies, such as the enterprise service bus (ESB), pull information from one system and insert it into another. However, they fail to expose information in a way end users can interact with it, nor do they help developers easily make use of enterprise information. OpenText aims to change that.

OpenText™ AppWorks™ enables developers to efficiently access information from disparate systems and repositories. Users can then interact with that information through applications **aligned to their personal and business needs, rather than to the data models and workflows in the internal systems**. AppWorks combines information from core enterprise systems, creating a common information layer that users can engage with to drive action. Once the information is brought into the platform, developers can use it to build new processes or new applications that serve different user populations than those of the core systems. The information can be modeled through a process or lifecycle to express complex business processes, including:

- Workflows that orchestrate cross-function processes, where the end users see a consistent user interface and consistent interactions regardless of the systems being accessed.

- System-to-system workflows that remove manual steps for application end users.

The AppWorks platform powers digital transformation that's **engaging, smart and easy to deploy.** By building low-code applications with OpenText, organizations gain:

- Greater ability to tap into existing information assets to generate more business value for the organization, its stakeholders and its customers.

- Significantly lower costs to deploy functionally rich applications.

- Rapid deployment, enabling the organization to live-trial new ideas and adapt based on learnings.

- Stronger collaboration between business and IT.

- Lower risk, with built-in consistency and governance.

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Low-code platforms: IT's new strategic asset

Over the last two years, low-code application development platforms have taken on an increasingly important role in enterprises and government organizations. Adoption statistics indicate that they will soon be one of IT's most strategic investments:

- Forrester Research predicts that low-code software will be a $10B market by 2020.[1]

- IDC expects spending on low-code platforms to exceed spending for traditional application platforms running developer-written custom code by 2018.[2]

Some in the industry view low-code platforms only as a means to build simple applications with limited functionality, filling gaps in the IT portfolio. OpenText **sees low-code platforms as the key to unlock new interactions with enterprise information**, engaging users with functionally rich applications that touch multiple enterprise systems.

This white paper discusses the need for this new breed of low-code applications and the OpenText approach for empowering IT organizations to deliver applications in partnership with business stakeholders.

Low-code meets IT's growth challenge…

It shouldn't be any surprise that the rise of low-code platforms coincides with a new wave of digital transformation in virtually every industry. Low-code platforms offer significant advantages for organizations with many projects to deliver:

- **Much faster application development:** A recent OpenText customer survey[3] shows that IT now wants the capability to deploy applications in a matter of weeks and iterate many times per year.

- **Better use of scarcer resources:** OpenText estimates that a project staffed with skilled low-code developers (not necessarily developers) can save more than 20 percent of cost and time versus traditional projects. Leveraging staff with capabilities that are different than traditional developers is essential since Forrester Research estimates the US economy alone will have a gap of 500,000 developers by 2024.[4]

- **Joint business-IT ownership:** Business leaders want levels of visibility and control that they don't always get with traditional development. In addition, consumer and departmental do-it-yourself cloud applications have reset their expectations of how an IT project should proceed.

…and the bigger win is to create more engagement with information

Organizations have long sought a "single source of truth" for the key information objects at the center of their operations: customers, vendors, contracts and the like. Yet even after decades of application consolidation and system-to-system integration projects, few have reached their goal. The barriers remain high:

- **Users want the right application for the right job.** Even organizations that have standardized on a single ERP system usually have additional point solutions or custom-built applications serving specific audiences, for example customers or partners.

1 John R. Rymer, "Vendor Landscape: A Fork in the Road for Low-Code Development Platforms," Forrester Research, Inc., July 31, 2017

2 https://blogs.opentext.com/information-centric-design-broadens-variety-use-cases-low-code-application-platforms/

3 OpenText survey of 100 customers, May-June 2017

4 Jeffrey S. Hammond with Christopher Mines, Claudia Tajima, "The (Social) Future Of Software Development," Forrester Research, Inc., May 4, 2016

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- **Different business problems demand different perspectives on the same information.** For example, a customer applying for a loan needs to see what information is required and where the application sits in the process. The loan officer needs a similar view, but the loan processor should be focused on uncompleted tasks. The customer-facing application needs to evolve along with trends in user interaction patterns, while the internally facing application should be more stable to reduce training costs.
- **The application landscape is continuously growing.** With each new business application comes a potentially new set of integration points.
- **Valuable information sits outside of enterprise systems,** stored in a variety of content repositories in unstructured or semi-structured form.

System-to-system integration technologies, such as the enterprise service bus (ESB), pull information from one system and insert it into another. However, they fail to expose information to end users in a way that they can interact with it.

Even when system-to-system integrations are accessible within a low-code platform, the low-code developer must navigate the complexity of the external system's API. For example, a low-code developer who wants to display an overview of an individual customer's orders must understand the nitty-gritty details of fetching pages of orders by customer ID using the CRM system's definition of the customer object. Any mistakes could result in poor information integrity.

The OpenText low-code approach: A new way to unlock information

OpenText has been working to solve the enterprise information challenge for more than a decade, and has approached low-code development with this broader perspective. The AppWorks platform enables low-code developers to efficiently bring in information from disparate systems and repositories. Users can then interact with that information through applications that are **aligned to their personal and business needs, rather than aligned to the data models and workflows in the internal systems.**

Architect for engagement with a common information layer

AppWorks opens an organization's systems of record to the world of low-code by creating a common information layer, called entities. This common information layer is the key to evolving low-code development beyond limited-functionality applications into functionally rich applications that can serve different user populations, while bringing together all the information and systems at the core of the enterprise.

Entities are the basic concepts or units of information at the core of each low-code application. Low-code developers can bring entities in from any external database, or they can create them within the application itself. Once a unit of information is encoded as an entity, it can be modeled through a process or lifecycle and trigger complex business processes, including:

- Master workflows that orchestrate cross-system processes, where end users see a consistent user interface regardless of the systems being accessed.

- System-to-system workflows that remove manual steps for application end users.

Entities connect with enterprise information via Enterprise Information System (EIS) connectors, which then connect directly to semi-structured content and documents stored in repositories or to enterprise systems via a connector framework. The EIS connector separates low-code developers from the complexity

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of external systems' APIs. A developer knowledgeable with those systems codes connectors based on the exposed APIs, and then low-code developers can access the full functionality of these integrations via drag-and-drop tools, just like any other information object in an entity.

AppWorks offers pre-built connectors for common systems like SAP® and Salesforce®. The AppWorks community has also contributed a wide range of connectors for sources such as AS400, Microsoft® Exchange and more than two dozen industry standards. AppWorks can interact with virtually any system via a REST or web services API, so developers can build as many other integrations as they like.

Entities are different from traditional object types used by business process management (BPM) systems because they don't force the low-code developer into a particular functional approach. For example, a BPM system may define an invoice as a document. This structure works well for accepting scanned paper images, but makes it challenging to add collaboration steps within invoice processing. With entity modeling, the functional approach follows the business goals of the application.

Create smarter low-code applications

…with the right organizational structure

Low-code applications may be fast to build, but they should still be built with best practices in mind. AppWorks and its entity modeling structure support a business/ IT partnership. Business users bring their domain expertise and knowledge of information flows, while IT injects a perspective on the overall IT landscape.

With AppWorks, IT may play one or more of the following roles:

- **Best practices oversight:** IT can review application design to ensure applications don't have a negative performance impact on other systems and can be maintained and improved upon over time.

- **Information model review:** Building an application from the beginning helps it grow more successfully over time. IT experts can look at the business problem of a single application in the context of all of the systems and repositories across the enterprise. They can identify systems of record and prevent data duplication.

- **Integrations:** IT can build integrations, which are then available to all low-code developers through the graphical development interface.

- **Low-code development as a shared service:** IT can develop low-code apps with direction from the business, in an accelerated version of the traditional application development model.

…and access to artificial intelligence

AppWorks can tap into artificial intelligence and big data analytics for smarter automation, utilizing virtually any dataset that could guide user actions or drive outcomes within a process. For example:

- An insurer could adjust insurance claims faster and eliminate human touch by giving systems more data to make decisions.

- A government employee processing court dockets could get suggestions that would improve efficiency.

- Digital business automation applications could include analytics that provide management with insights to reengineer processes going forward.

With AppWorks, developers can incorporate algorithms anywhere in their applications where analysis is surfaced.
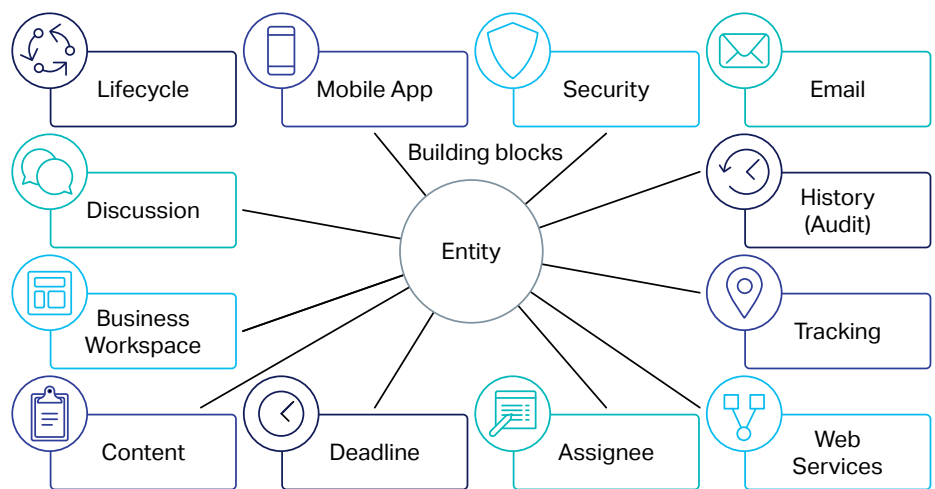
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Make development easy

AppWorks improves work for low-code developers. In addition to providing simple access to enterprise information, the platform is designed for fast deployment, easier iteration and easy growth.

Easy path to meet business requirements

With AppWorks, once the low-code developer defines the set of entities at the core of the application, they use predefined building blocks to add information or attributes and create the functionality that moves the entity through a process or lifecycle.

Building blocks

Lifecycle · Mobile App · Security · Email · Discussion · Entity · History (Audit) · Business Workspace · Tracking · Content · Deadline · Assignee · Web Services

The building blocks are prepackaged functionality, like LEGO® bricks that the low-code developer builder uses to construct the application. Examples of building blocks include identification numbers, forms, task assignees, attaching a document, generating an automated email or capturing an audit trail. Each building block is functionally rich, scalable and designed for localization and a responsive user interface. Each delivers instant functionality to the application, accelerating application deployment.

Easy path to productivity

Entity modeling lets the low-code developer choose between information-first or process-first development. In other words, the developer can start by defining the information that requires action (the entities) or by defining the process model or lifecycle that the application will automate. Either method provides full access to all predefined building blocks. Whether the low-code developer is a business analyst or a professional developer, they can employ the method that makes the most sense and enables the easiest communication with subject matter experts. As a result, it's easy to get started, easy to develop and easy to keep all stakeholders on the same page.

Easy iteration

The OpenText compositional development approach is based on building blocks, prepackaged functionality that makes it practical to deploy an initial application quickly and modify or add to it in short cycles. Because entities don't assume there is specific functionality attached to them, low-code developers can seamlessly add building blocks to entities at any point in time—or add more entities to the application, with their own lifecycles.

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Easy reusability and portability

With AppWorks, a single data domain model can be shared across all low-code applications to eliminate data duplication and minimize the number of integration touchpoints. Low-code developers can reuse entities and business objects across systems. For example, the same contract object can live in a low-code legal application built by the organization and in OpenText™ Contract Center. An employee in OpenText™ People Center™ is also a contract signer in OpenText Contract Center, leveraging the same employee entity.

Seamless extensibility with hybrid low-code/custom code

AppWorks is fully extensible so that professional developers can supplement low-code applications with custom code as needed to meet their business goals. Custom-coded functionality can directly interact with entities built using the low-code platform to extend or replace its capabilities. For example, a customer might want a custom front-end on a customer onboarding application to deliver the exact brand experience they require, while taking advantage of the efficiency that low-code brings to case management and integrations.

Developers can use OpenText™ AppWorks™ Gateway to deploy and manage APIs, web services and mobile applications.

Instant browser and mobile readiness

AppWorks enables low-code developers to design functionality once and use it anywhere at build time for mobile-ready applications. Applications built through the low-code platform will automatically resize for mobile devices and tablets. In addition, developers can efficiently build smartphone apps and manage their distribution through AppWorks Gateway. AppWorks also eliminates the challenges of multi-browser support, which can be quite time-consuming to optimize with traditional development.

Built-in consistency and governance

AppWorks guides developers to achieve consistency and governance in several ways. First, all entity models are based on a single integrated metamodel. This approach to building an application not only captures the structure, but also the information on the (graphical) visualization, constraints, the building and packaging procedure and so forth. A key objective of the low-code design interface is to deliver application consistency. AppWorks also discourages data duplication by promoting a "single source of truth" for data.

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How to deliver on the promise of low-code development

Low-code development offers the most efficient way to connect users (and systems) with the right information in the context of the tasks they're performing or processes they're completing. And it can do so without creating new data silos across the enterprise. The OpenText approach to low-code development positions the AppWorks platform as the strategic low-code application platform that is quickly emerging as a must-have for IT.

The evolving role of strategic low-code platforms	
Yesterday	**Today and tomorrow**
Tactical applications are ready in days or weeks.	Strategic applications are ready in weeks, not months or years.
IT saves money by leaving development to business users.	IT saves money by eliminating expenses in designing, writing, testing and maintaining code and by coordinating work with business developers within IT and in business units.
Applications automate simple business processes.	Applications unlock the value of information residing in existing enterprise systems and content repositories.

Here are guidelines on how to drive the most success from the low-code movement today:

1. **Use low-code for strategic, customer-centric applications, not just tactical tools.** Empower users to take action that's aligned to customer needs, rather than the data models and workflows in your internal systems. By doing so, you'll gain more value from the information in your systems of record. Look for a low-code platform that offers a comprehensive information layer, not just system-to-system integration that requires extensive development resources in order to support functionally rich applications.

2. **Build a roadmap to start fast and iterate faster.** With low-code applications, you can deliver better functionality faster by deploying and learning from your users. Keep low-code developers focused on your organization's immediate needs and leave stakeholders' wish lists for future releases.

3. **Think about low-code and traditional custom-coded applications as a spectrum.** There's no hard line where one approach is for simple apps and the other for serious applications.

4. **Architect for a business/IT partnership, not for business-focused developers to go it alone.** Build your applications to last, and build them with room to grow. To maximize maintainability, look for a platform that encourages consistency and supports an enterprise-wide governance structure. Think now about how you'll be able to incorporate new technologies such as artificial intelligence.

OpenText AppWorks makes low-code applications engaging, smart and easy to develop and deploy. Contact OpenText to explore the platform today.

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About OpenText

OpenText, The Information Company, enables organizations to gain insight through market leading information management solutions, on-premises or in the cloud. For more information about OpenText (NASDAQ: OTEX, TSX: OTEX) visit: opentext.com.

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