Bridging the Functional Void in the Enterprise: PowerApps Complete the Last Mile

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Table of Contents

Introduction: New Users and New Requirements Need New Approaches ................................................................. 1

The Cloud, the “Last Mile,” and the Search for Business User Productivity ................................................................. 2

PowerApps and the Microsoft Stack: The Value of Integrating Technology, Business Processes, and Last Mile Application Development ........................................................................................................................................ 2

The Power of CDS and Microsoft Flow ............................................................................................................................. 3

PowerApps in the Enterprise: Early User Examples ........................................................................................................ 5

Conclusion: Conquering the Last Mile One App at a Time .............................................................................................. 9
**Introduction: New Users and New Requirements Need New Approaches**

The search for greater productivity in the enterprise has always ended at a similar dead end: the inefficient paper and spreadsheet-based processes that have sprung up to fill the void between what enterprise applications can provide and what users need to do their jobs. This void continues to grow as the requirement to empower greater numbers of users increases in order to meet their requirements of an increasingly digitized work experience.

Even in an era where vertical industry offerings have been segmented into micro-verticals, and specialized ISVs have delivered mass-customized solutions that cover increasingly specific use cases, there remains an enormous demand for “last mile” applications not covered by standard software portfolios. These last mile applications are needed to satisfy highly specialized requirements and impart significant value to an individual company, even if they are useful to only a relatively small number of users.

Customizing existing application environments to meet last mile requirements has been costly using traditional software development tools, and maintaining these customizations even more so. Even in cases where a significant amount of the data and business functionality needed already exists in the enterprise software stack, the fact remains that unlocking that functionality in a way that makes economic sense and meets users’ needs remains an elusive goal. The shift of some of these assets to the cloud has only made the last mile problem more complex.

Microsoft Dynamics has chosen to meet this challenge with a new offering for building “last mile” apps that circumvents the complexity of traditional development technology while leveraging the data and processes that are already available in the enterprise. The new offering, PowerApps, along with Microsoft Flow, a tool for automating business processes and tasks, and the Common Data Service (CDS), provides a potentially code-free development environment that can support building new apps and connecting them to data and business processes across Dynamics 365 applications, Office 365 and non-Microsoft applications as well.

Microsoft asked EAC to take a look at how well PowerApps, Microsoft Flow, CDS, and their associated services succeed in bridging this gap and supporting the “last mile” requirements of enterprise users. EAC’s initial findings show an offering that can help deliver on this promise in an efficient and effective manner. While the full environment for PowerApps is still emerging, early customer successes prove the potential for significant gains in productivity and a return on customers’ investments not just in PowerApps, but also in the existing applications and data sources on which PowerApps can be based.
The Cloud, the “Last Mile,” and the Search for Business User Productivity

The growing need for last mile functionality, driven by business complexity and an increasing user base, has become even more important in light of the increasing prevalence of cloud-based enterprise software. The requirements of multi-tenancy in the cloud have forced a fit-to-standard imperative on both vendors and their customers. Standardization is the antithesis of customization: all customers have access to the same functionality, which means that many “last mile” requirements won’t be met by fit-to-standard cloud functionality. Cloud software companies have dealt with some of the customization requirements of their customers by supporting a wide range of configurations that help personalize the cloud experience. But ultimately, the last mile problem continues to grow.

The problem is also growing because of the expanded palette of data and business processes – much of which lie outside the confines of a company’s enterprise software system – that, when tied to existing enterprise software functionality, become a major crucible for innovation. The need to unleash this innovation in the context of the cloud and fit-to-standard is the latest, and most critical challenge facing both the business and IT sides of the company. This is the problem that PowerApps were designed to solve.

PowerApps and the Microsoft Stack: The Value of Integrating Technology, Business Processes, and Last Mile Application Development

While there are still cases in which a last mile app is so complex that it must be built using traditional software development paradigms, many last mile apps would ideally be built as extensions to an existing cloud infrastructure. This would allow these applications to synchronize with the upgrade cycle of the cloud applications and platform as well as making use of the underlying infrastructure as a service (IaaS) functionality built into cloud platforms.

This is the approach that Microsoft has taken. Beginning last year, the company began to roll out PowerApps as a way to finesse that problem of building new last mile applications without breaking the fit-to-standard and no-customization requirements of the cloud.

At the most fundamental level, PowerApps provides a declarative, point-and-click development environment that is intended to be used by a wide range of business users and developers. PowerApps enables the former to build relatively simple last mile apps while empowering IT development teams to build robust, enterprise-class apps. Regardless of whether development takes place within the IT organization or not, either class of developer can build highly functional user experiences, tie in multiple data sources, leverage existing business processes, and produce a fully-mobile app that runs on the Azure platform alongside their Office 365 and Dynamics 365 applications.

In order to support this broad an audience, PowerApps has abstracted a significant amount of the underlying complexity that would otherwise be needed. The declarative nature of PowerApps and its built-in user experience tools obviates coding the user experience and/or predetermining whether it’s deployed on a desktop or mobile device. PowerApps supports rich, touch-and-swipe user experiences, as well as supporting collaborative development effort between users and PowerApps developers.
The Power of CDS and Microsoft Flow

PowerApps also offers declarative access to data and process as well as the orchestration of events and tasks, using CDS and Microsoft Flow. In the PowerApps framework, data sources can be made available through the CDS, a declarative data store that provides point and click access to data and data models from within the Microsoft business application family as well as from non-Microsoft sources. Importantly, CDS can act as an integration hub for data and applications. This means that an app built using PowerApps can, for example, access and update customer records from multiple cloud applications by pointing the new app to the appropriate data element in the CDS, which handles the integration and updating.

Key PowerApps Components and Assets

- PowerApps Development Environment
- Common Data Services (CDS)
- Microsoft Flow
- PowerBI
- SharePoint
- Azure Active Directory and Other Authentication and Security Functions
- Direct Access to Dynamics 365 and Office 365
Microsoft Flow adds a “workflow light” functionality to PowerApps by allowing events to trigger “flows” that automate tasks and workflows between applications and services. This allows an app to string together disparate tasks and events while hiding the complexity of the underlying interaction model from the user.

The power of these two capabilities is significant. CDS can expose a significant amount of data from across the enterprise for use in PowerApps development – including data from non-Microsoft applications and sources – and leverage existing process functionality in the enterprise via Microsoft Flow. For app users, the combination of these two capabilities unleashes a tremendous amount of functionality that otherwise might be too complex or costly to access.

The declarative development environment of PowerApps also makes it easy to upgrade or change an app after it’s been created. The lack of code means that changes to the underlying logic or data can be made in the same declarative manner that was used to build the app in the first place.

*Figure 2: PowerApps Framework*

Living inside the Azure family means that PowerApps automatically leverages the authentication and security technology built into Azure. The Azure connection also enables the use of SharePoint as a primary data source. Indeed, using the data stored in SharePoint is a common starting point for PowerApps built by business users. PowerApps can also access PowerBI for building out in-app analytics, and can use the telemetry available in Azure to improve the functionality of PowerApps apps post-deployment. Finally, as an added bonus, PowerApps development and deployment is free to existing Office 365 and Dynamics 365 users.
PowerApps in the Enterprise

THE VALUE OF POWERAPPS IN THE ENTERPRISE

EAC’s research and interviews with PowerApps customers identified four common ways in which PowerApps can support innovation in an enterprise quickly and without the investments in time or budget usually associated with “last mile” app development:

**Filling a Last Mile Gap in Productivity**

Having a framework specifically designed for this task placed a whole class of business problems that were previously too complex or too arcane into the realm of possibility for early customers using a new paradigm that didn’t require old-school software development resources or capabilities.

**Enabling Business User Empowerment**

Customers reported that development typically involved iterative collaboration between users and IT, ensuring user needs were considered and that user acceptance of the end result was high. In addition, running these apps in a mobile, touch-based environment ensured that users, especially millennials and digital natives, would have the user experience they take for granted on their phones and tablets.

**Speed and Ease of Development**

The “masking” of complexity that PowerApps supports, along with the user empowerment noted above, means that PowerApps can be developed more quickly and more completely. User acceptance testing is largely done “in flight,” not after the fact.

**Leveraging of Existing Data and Applications Resources**

Basing PowerApps in the Microsoft Dynamics 365 and Azure product families has multiple benefits beyond being free for licensed Dynamics users, including the ability to use the built-in security and authentication services of Dynamics and Azure as well as tapping into user and developer familiarity with these environments and associated services such as Office 365, SharePoint, PowerBI, and other Microsoft technology.

PowerApps in the Enterprise: Early User Examples

Going Where ERP Systems Can’t

For Integrated Power Services (IPS), a Greenville, South Carolina-based electric motor maintenance and repair company with locations throughout the US and Canada, the need to streamline the management of its core business process was the main impetus behind its use of PowerApps. The company’s main business, in-shop repair of industrial electric motors and generators found in power generation, oil and gas production, steel, mining and other industries, generates an enormous paper trail as the motors are checked in, assessed and then repaired in IPS’ facilities. That paperwork, and the photos that go along with the assessment and repair process are different for each type of motor and are cumbersome to fill out, and time-consuming to manage. Furthermore, there was no easy way to capture the data input during the process for use in future analysis.
Automating these processes and digitizing that data was seen as a potentially significant opportunity for IPS. “If we could turn around a final report in a matter of hours instead of days, this could give us a competitive advantage,” said Scott Melzer, the Vice President of IT and Purchasing at IPS. “We knew our competitors were struggling with the problem as well.”

Digitizing the process would also enable IPS to provide customers and the motor and generator manufacturers with a degree of visibility into the repair process that had never existed before. “The customer would be able to see where their equipment is in the repair process … and the manufacturer would be able to have insight into what’s happening to their motor in a specific application and industry,” Melzer added.

The business case was solid, but the ability to automate the process to this degree was not obvious. Each repair job was a custom project, with considerable variability in terms of the data required to track the project as well as the reporting requirements once the job was complete. Being able to fulfill these requirements was beyond the capabilities of most enterprise resource planning (ERP) systems, said Melzer. “We knew there was no ERP solution that did this, and even if it did, we would have to completely customize it anyway. Our shop floor experience is unique.”

Further complicating the choice was the fact that, even if there was an ERP system that could be customized to handle this problem, the company didn’t have the budget or management interest in bringing on a new ERP system at the time. The app had to be adaptable to existing and future ERP systems instead.

This meant that Melzer’s team would have to look outside their ERP software market for a solution. One of the solutions they did try essentially allowed them to “take really bad paper forms and make them into really bad electronic forms,” Melzer said; and then the vendor updated the solution and changed how images were rendered on the screen, making it hard to use the tablets that IPS was trying to deploy on the shop floor.

The early availability of PowerApps caught Melzer’s attention, and the fact that it could run seamlessly on tablets and other mobile devices and support the process control and routing he needed internally furthered the case for PowerApps. In addition, IPS had recently started using Dynamics CRM, which meant there was both a growing familiarity with the Microsoft stack as well as an opportunity to leverage PowerApps for free.

The use of PowerApps allowed IPS to rethink an essential part of its repair process: the paper forms that were used to track progress and report the final result to the customer. “We realized that the form was only for the final customer,” said Melzer. “We talked to the shop floor and started building forms based on how they tear down a motor or generator. Once we had the data we could then put the output into the right form for the customer.”

This was where the user empowerment capabilities of PowerApps came to the fore. “The shop floor people were integral in designing the forms. We tried to make it their project; we wanted to show them that their input was valued,” said Melzer. “Once we built the forms they were saying ‘this is great, this is how we work and it’s so much easier to use.’” Putting the shop floor users into the development process was a key advantage, and a guarantee that user acceptance would be high. “It wasn’t our app, it was their app.”
Using PowerApps also helped IPS manage an important generational shift in the labor force. On the one hand, the usability and reliance on a mobile “touch and swipe” user experience for the new app “puts us in a great position when we go out to get new [millennial] employees,” said Melzer. “But even the older employees who were most reluctant realized how much they didn’t like using pen and paper.”

The value of the new PowerApps is still being tallied. Making it easier to track and report on the repair process has value, as does the savings that accrue from using tablets to take and manage the photos needed to track the progress of the repair. The new PowerApp also supports customer loyalty by providing better visibility into the repair process and turning repairs around faster: “It’s about showing them what we can do that truly differentiates us in this space,” added Melzer.

More Data, Faster Analysis, Better Decisions

The decision to deploy PowerApps at TransAlta Corp., a global power generation company based in Calgary, Canada, also started with a business opportunity that couldn’t be handled using traditional enterprise software applications. The company’s division in charge of managing wind farms had a problem: they needed to optimize their maintenance scheduling to ensure that the decision about when to repair a wind turbine was made based on what makes the most sense economically, not just because a particular turbine was suddenly out of commission.

There was a model, embedded in a spreadsheet, that attempted to analyze all the different economic and technical variables and decide whether to dispatch a repair crew immediately – often at considerable expense – or wait until a more propitious time that was less costly but still allowed the wind farm to operate in an optimal fashion.

Figure 3: TransAlta’s PowerApp

The model’s problem was the complexity of its underlying data sources. “The business side quickly figured out that managing all the data sources would be a challenge,” said Kent Weare, a senior enterprise architect at TransAlta. With over 12 sources of data, including price forecasting, ERP data,
PowerApps in the Enterprise

and SCADA data from the wind turbines, among others, the spreadsheet model was simply not up to the job.

Building an app that used this many data sources looked like a complex undertaking using traditional software development technologies such as the development tools offered by TransAlta’s ERP vendor. The fact that TransAlta wanted to leave open the possibility of expanding the functionality of the app at a later date also made the team wary of using a more traditional application development environment.

Finally, working in conjunction with the business users, it also became obvious that the app would need a very modern user experience, something Weare felt would have required too much custom coding if they were to go the traditional route.

Faced with these requirements, the nascent capabilities of PowerApps caught Weare’s attention. “I’m in the Microsoft MVP program, so I had had a sneak preview of PowerApps in 2015” said Weare. “Microsoft is also one of our strategic partners. We use Office 365 across the company, and we’re doing a lot in Azure as well.” Weare’s understanding of what PowerApps was intended to do, combined with the fact that there was no additional licensing requirement due to TransAlta’s use of Office 365, cinched the deal.

While the specifications looked complex, the actual development process was decidedly simple, according to Weare. The backend was developed by a single IT resource who was able to use PowerApps to integrate both internal and external data sources into a proprietary model that calculated, based on the market rate for energy, internal labor rates, and other data, whether a repair needed to be dispatched immediately or not. The user experience side was developed in PowerApps by a relatively inexperienced new hire. The total development time was three weeks, and the payback for the effort took place in another three weeks, according to Weare.

This effort was transformational in terms of the ability of Weare’s team to meet the needs of the business side of the company. “The business wanted to change the people and resource model, and they wanted to do this fast,” said Weare. “PowerApps allowed us to support this change: we enabled them to get a repair green-lighted or red-lighted without worrying about the data behind the decision.”

Behind the scenes, using PowerApps meant that Weare’s team didn’t have to worry about what would otherwise have been some basic requirements. PowerApps are inherently mobile, and Weare “has no interest in custom coding mobile apps to work across platforms.” Nor does Weare’s team have to worry about the security of the apps it builds with PowerApps. “Microsoft’s security infrastructure means that security is already built in,” said Weare. “That reduces a lot of the heartburn of developing.”

The positive experience with this first app has set the stage for a number of other PowerApps-based projects at TransAlta. Built-in security, the ability to build mobile apps without aligning them with a third-party mobile app store, and the ease of development and deployment, are factors that have all led Weare to look into developing several more PowerApps. “Those are the things from an enterprise perspective that make life so much easier, said Weare. “It’s a huge win for us.”

Enabling Partners to Deliver More

The PowerApps framework isn’t just a tool for customers. It’s also an effective means for Dynamics partners to improve how they service customers by changing how a partner interacts with its customers,
PowerApps in the Enterprise

according to Amir Jafri, CTO of Microsoft UK Partner of the Year eBECS. Partners like eBECS are increasingly interested in delivering high levels of business value to customers, and the ability to work closely with business users during the development process is a key advantage of PowerApps.

“With PowerApps you’re engaged directly with the business user,” said Jafri. “Co-building with the user opens up other scenarios where we can help improve business processes and do more than just implement software.”

In its several PowerApps engagements, eBECS has been able to deliver last mile apps that fulfill the promise of “leveraging assets that were previously behind the IT wall,” said Jafri. “It puts data in the hands of the business user without being constrained by the software.”

The apps that eBECS has built share a number of characteristics with apps built with the framework. The apps eBECS builds with PowerApps typically leverage Microsoft Flow and PowerBI in order to extend the data and functionality in the Dynamics products that are already running in the enterprise. “These tools empower the business user and allow the app to resonate with them,” said Jafri. “This allows the discussion to be about the business process, not just the need to satisfy a functional requirement.”

The end result is that customers are making the most of their existing software assets, Jafri added. “You end up building much more intuitive and useful apps.”

Conclusion: Conquering the Last Mile One App at a Time

The proliferation of software development tools and frameworks has made the choice of development environment a complicated one, and for the most part the differences between traditional tools are negligible relative to their similarities.

PowerApps breaks that mold in an important way: PowerApps can be used as a standalone development environment as well as one that is purpose-built to leverage the existing assets of an enterprise that has some, if not a predominance, of Microsoft technology in use. Either type of application can use CDS and Microsoft Flow to include non-Microsoft data and processes, providing a single development environment that can build apps that are functionality-rich without being difficult to develop.

Perhaps the best case for using PowerApps, however, is engaging the business user in the development process. This provides built-in usability testing and, as noted above by customer IPS, a sense of ownership on the part of users that is literally priceless, particularly in a software development culture that is typified more by shelfware than software that is fully and avidly embraced by its users.

PowerApps won’t solve every development problem in the enterprise; no single tool can. Based on these initial use cases, however, it’s clear the PowerApps can be a powerful weapon in the arsenal of any company that is using Microsoft Dynamics and is looking for a cost-effective way to build last mile apps that will extend the existing software footprint without incurring significant costs or breaking the “fit-to-standard” cloud model. Those characteristics alone make it well worthwhile for any company that has a last mile problem to fix, particularly one that can’t wait months or soak up expensive development resources to resolve.