Office 365: The No-Code Solution Platform

A guide to using no-code approaches to solution delivery in the Microsoft cloud

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H3 Solutions

Contents

The anatomy of enterprise no-code solution delivery

If you are in any way involved in the enterprise software scene, you are likely familiar with the concept of software coding versus software configuration. Custom code can get you exactly what you want, but comes at a cost for building, maintaining, and upgrading. On the other hand, you can use built-in functionality and configure it as much as possible to meet your needs. The latter may not be perfect, but if configuration gets you 90% of what you need, it will get you the solution quicker and cheaper than custom code. The no-code concept is just this… configuration over coding.

The capacity and complexity of what can be delivered in Office 365 is constantly improving. This whitepaper details an approach to cloud-based, no-code solutions in the Office 365 ecosystem with an emphasis on solution standardization and data governance. We will look at SharePoint Online as the base platform, the tools Office 365 provides to build the basic components of any solution, and considerations around standardizing an approach to solution delivery early in the process to optimize the benefits. We then dive a bit into some 'low-code' options for extending the capabilities of our approach.

As noted above in the context of Office 365, there are many options out there for no-code solution delivery and this has accelerated with the broader adoption of the public cloud as an enterprise computing platform. Generally, any solution can be broken down into a common set of requirements:

(1) Data collection, storage, security (2) Workflow automation (3) Reporting (4) Search

These four basic concepts can define just about any solution in an enterprise setting. This over-simplification of the process of solution design is intentional to attempt to define 90% of a solution and then allows for a more focused effort around the 10% which is unique to the problem you are trying to solve.

Building no-code solutions on top of SharePoint Online, with the Office 365 suite of tools available, has an excellent story around all four, making it an ideal starting point for any solution design effort. This concept is not all that new, but there is a changing of the guard in some areas with respect to the tools available for the tasks above.

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For example, InfoPath is still supported in SharePoint Online but will be superseded by PowerApps in the very near future. Another example is SharePoint's built-in workflows (including SharePoint Designer workflows) and Microsoft Flow. It is not an easy one-to-one comparison, but Flow is quickly achieving feature parity with SharePoint Designer workflows and will be quite a bit more capable than SharePoint workflow while still feeling less integrated. Over time, this feeling of integration disparity will go away. As is the nature with any cloud service, improvements are being made regularly.

We are seeing a steady flow of updates from Microsoft around these two tools (PowerApps and Flow) whereas their older counterparts (InfoPath and SharePoint workflow) have been stagnant for quite some time now. Going forward, we will be focusing on how to use the newer tools for solution design and delivery. We also recognize there are third-party tools available for forms and workflow. This seems to be an area of investment by Microsoft and so we will focus on their offerings.

Before going into how the various Office 365 tools can be used to take care of the basics, it is important to recognize how a no-code solution built in the cloud lives. Here are some key considerations to make when defining the scope of cloud-based, no-code solution delivery in your enterprise.

Where does the data live?

This is a very basic question that, while not new, has new context when considering cloud-based solutions. Modern cloud services include rich APIs that make it simple to use even outside of the built-in interfaces the services provide. For example, a document library in SharePoint can be accessed from the standard web interface. That same library is also available from a synchronized OneDrive for Business folder, a link in Outlook, or on a tab in Microsoft Teams. This ability to interconnect services—essentially leveraging the capabilities you need from each feature to produce the final solution—is significantly easier to do in the modern cloud environment we have today.

It also means your solution may have data in multiple locations, including possibly across services. You may have data in Salesforce linked to lists in SharePoint. An opportunity in Salesforce produces work orders in a SharePoint list that are then processed by an internal team and marked complete.

These types of scenarios are very simple to define and integrate via Microsoft Flow. They produce disjointed data footprints, though, which need to be considered and planned around. Considering the data in question and how important it is to your organization; you should be able to answer the following questions:

1. Is it protected (access control, encryption, data loss prevention, etc.) consistently across all repositories?
2. Can you apply the same level of governance & information assurance at all points?
3. Can activity against the data be properly audited throughout its lifecycle?
4. What is your recovery model, based on where your data resides?

What types of data do you have and how is it used?

The *what* and *how* of your data help determine the tool selection for no-code solution delivery. In the context of Office 365, all types of data can be supported. Document creation and lifecycle management can sit alongside inventory management and order processing.

Coming back to the basics, we should be asking what data will be collected via web forms. These forms will take many shapes; some will be a simple screen while others are multi-stage with conditional branching based on business logic (still without code!). Web forms will be used from desktop computers and mobile

H3 Solutions

devices. Our solution should be able to identify most of our data model in web forms as the way the data is collected.

Data collected in forms can be considered *user-sourced* data. For the sake of classifying the data, documents authored by users are also user-sourced. Conversely, workflow automation will normally require data elements that work behind the scenes to manage the state of any workflow process. This *system-sourced* data should be smaller in volume than user-sourced data, and the two combined should be the vast majority of your no-code solution's data footprint.

This is the data model of your no-code solution. While usually a term used when discussing database design, it is also very appropriate for no-code solution delivery.

Who are your target users and what percentage of their day is devoted to your solution?

Enterprise knowledge management is an exercise in multitasking and delivery. Users are engaged in many projects and have multiple systems they must be trained on for business, security, compliance, or other reasons.

A no-code solution should be designed to make a business process easier to manage and deliver value in the form of improved data, time savings, and reduced costs.

A no-code solution should be designed to make a business process easier to manage and deliver value in the form of improved data, time savings, and reduced costs. It should also be recognized that your no-code solution is one of many tools a user uses on a day-to-day basis.

The more seamless the experience with other everyday tools, the more your solution will be used. This can include basic productivity tools they already use daily. In Office 365, this means integration with Outlook, Word, Excel, PowerPoint, Skype for Business, Teams, Yammer, etc. Building on top of platforms integrated with these tools gives you a solid head start.

Establishing conformity across solutions creates a simpler environment. Simpler environments are easier to use, easier to train on, and cheaper to run.

SharePoint Online as your primary solution delivery engine

So, we have reviewed some basics of getting started with no-code solutions in the cloud, with an emphasis on Office 365 and SharePoint Online. You are either an existing Office 365 customer and considering it as a platform for no-code solution delivery, or are planning to move to Office 365 imminently. You may have had SharePoint installed on premises (if so, you most likely still have it running on premises) so you are familiar with the tool and what it can do. You are hearing that SharePoint Online is the same as on-premises, except it has more new features, sits alongside many other tools in Office 365, and seems to get updated more frequently than on-premises SharePoint. So, really, it's not the same as SharePoint on premises.

Both statements are true. It will look familiar to anyone who has used SharePoint 2013 or 2016 on premises. Users will be able to get started and will understand how to navigate their sites quickly. They will also see a new Office 365 UI chrome around their SharePoint site with an app launcher (lovingly known as "the waffle" thanks to its similarity of design) that brings up all sorts of new applications for them to try out. They will see a new SharePoint tile in their waffle that takes them to a listing of sites they follow and recent sites they have visited. But it will be familiar enough that users will pick it up quickly.

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The same is true when considering it for a foundation for no-code solution delivery. The basic tenets of SharePoint are all there, plus quite a bit of new capability made available when running from the Office 365 cloud ecosystem.

Some key benefits of standardizing on Office 365 and SharePoint Online as the base for no-code solutions are discussed below.

Consistent data governance

A constant challenge in any organization, and Office 365 being no exception, security and compliance in Office 365 is getting easier all the time. Microsoft is providing regular enhancements to this area with immediate benefit to all data stored in SharePoint Online, OneDrive for Business, and Exchange Online. If you are using tools such as AvePoint Online Services' Governance Automation, Compliance Guardian, or Perimeter, those tools can be configured to apply governance rules, then scan and classify your solution data in the same way it manages other SharePoint content. AvePoint Cloud Backup (if you are currently either using it for cloud data recovery or looking for a cloud data recovery solution) can also be used for data recovery of your solution data.

These are immediate benefits which will help get buy-in from your security team and other stakeholders. A consistent security model will have similar benefits to a consistent productivity model enterprise-wide. When your data is secured the same way across solutions and use cases, it will reduce total cost of ownership.

A great way to combat Shadow IT

As a first step towards taking Shadow IT head-on, you have embraced the Office 365 ecosystem with the wide breadth of capability it brings across communication, collaboration, and productivity. Building no-code solutions on top of Office 365 and SharePoint Online gives users that much more capability using the tools they are authorized to use while at the same time maintaining conformity. Both sides (IT and users) get what they want.

Simple structure for data storage and interface management.

SharePoint sites are a well-known and easy-to-understand construct for data storage. A site can contain multiple lists and libraries where data resides. Lists and libraries can be configured to store any type of data required. Interfaces to lists and libraries (forms and data listing) are built into the site and pages can be built to present the data in a contextually relevant way. With proper technique, this will be mobile-ready as well.

Security is very simple to implement in a site, list, or library. Users will only see data they have access to and data governance practices in place for other SharePoint data can be implemented in your no-code solution as well. This includes how access is requested and granted, and ensures the same level of audit traceability when managing permissions in your no-code solution without additional cost burden.

Another basic and very useful feature in SharePoint are content types. By simply defining the *things* in a list as something more than just an Item, solution design has more context and a better outcome will be realized. For example, if the list managing internal work orders is tracking *Work Orders* as opposed to the standard SharePoint *Item*, we have an easier time defining user stories around forms interfaces, search experience, and workflow automation. Reporting will benefit from the additional context as will data lifecycle auditing. Finally, as will be noted in a later section, when planning on how to integrate with Azure Cognitive Services and other Microsoft Machine Learning offerings for enhanced capability, this simple use of content types to identify the things your organization recognizes is a critical component.

H3 Solutions

A common concern with using SharePoint lists and libraries is scale. It is important to understand the scale of your data when planning no-code solutions. This is also an area where Microsoft is improving constantly, including adding machine learning capabilities to lists and libraries to intelligently index columns based on how they are used. While it is going to be challenging to design a no-code solution with internet of things (IoT) scale data (achievable with low code, discussed further, below), managing hundreds of thousands of records of data is very doable and even millions can work with proper planning.

Web forms are about to get a major shot in the arm

InfoPath, a staple of SharePoint no-code solution delivery on premises, is a powerful tool that is past its prime. Built in the age of SOAP web services and pre-Web 2.0, it filled a key need for any no-code project: forms. No matter what the solution does, there is a very good chance you need forms for users to interact with. SharePoint has excellent out-of-the-box forms built into all lists and libraries, but InfoPath was a great way to add business logic, business data, or tailor the submission process to meet the need. As technologies matured around it, though, it became more and more challenging to work *with* as opposed to work *around*.

PowerApps is the cloud successor to InfoPath in Office 365.

PowerApps is the cloud successor to InfoPath in Office 365. While currently only supporting phone and tablet screens, web forms for desktop consumption will be available sometime very soon. As of this whitepaper's publication date, they are not available but per the 2017 Microsoft SharePoint Virtual Summit, PowerApps web forms will be launched this year.

Once this update is launched (and the beauty of the cloud is we all get it immediately!), this tool will be the standard for web form generation within Office 365. Built mobile-first in mind, solutions built with SharePoint and PowerApps will have an incredible breadth of capability, all while staying within the same security, governance, and information assurance controls established for Office 365.

Reporting/Dashboarding with Power BI is amazing

The title there pretty much says it all. When comparing to SharePoint on premises, Power BI is a pretty big improvement. PerformancePoint, if your organization used it, was powerful but very complex. SQL Server Reporting Services (SSRS) was equally hard to set up, but easier to use. SSRS is quite capable with a good integration story in SharePoint. Finally Excel Services was an option with the lowest barrier to entry (assuming you had Office Web Apps configured) but with the least amount of data connectivity capability without help from other tools like PowerPivot and SecureStore.

These tools, though, share a common limitation: their use is not centralized and so it is easy to lose track of all places where they are used. Work gets duplicated and information is not as easily shared as it could be. It would take significant discipline to achieve a more centralized state, which can break down fairly easily and become cost-prohibitive to continue chasing.

Power BI is a service in Office 365. Anything reporting/dashboarding in Office 365 can go through Power BI, immediately providing a single story for these purposes. Any no-code solution can tap into this easily and benefit from this powerful tool. Data from within your no-code solution can be quickly and easily shared as a packaged unit in Power BI. Users can then consume reports and dashboards you have produced, or configure dashboards with data from multiple sources. Reporting is immediately centralized. Information is available, securely, in context and to the appropriate audiences.

H3 Solutions

Immediately integrated into SharePoint search

Easily searchable data is more valuable. SharePoint search is very mature, extremely powerful, and highly customizable while still staying within a no-code framework. Search results are always security trimmed, which means users only see results to data they have access to. This also means your search results will be in line with your other interface elements where data is presented.

Search experiences can be integrated into the built-in SharePoint search, or a solution-specific search interface can be established. Utilizing features like refiners, sorting, and complex logic queries is immediately available to your solution. Once you understand how the SharePoint Online search engine works and to the extent you can plan your data model around it, you will realize significant benefits from this powerful tool.

Search is a good example, as well, of where data location can be a factor. By default, SharePoint Online search crawls SharePoint Online, OneDrive, and Outlook attachments. Additional consideration will need to be made if data stored in other services (e.g., Salesforce, Dynamics 365, ServiceNow, etc.) needs to also be searchable. There are third-party tools that can do this, so that might be something to consider. What those essentially do is allow the *things* in other places to be crawled like the *things* in SharePoint. The SharePoint search index then includes entries for them to return as search results. Normally these links will send you to the external service. With good planning, they can include the required context to keep the user within your no-code solution.

How to get started

So, we know SharePoint Online is a great platform for our cloud-based, no-code solutions. How easy is it to get started, and what is a good way to start? Let's take a look at the basics again and the tools you can use quickly to start creating your solutions. We discussed:

1. Data collection, storage, security;
2. Workflow automation;
3. Reporting; and
4. Search.

The Tools

To cover the basics above, you can always start with the combination of the following four tools:

1. SharePoint Online (data storage, search, security);
2. PowerApps (data collection);
3. Flow (workflow automation); and
4. Power BI (reporting).

As you start to use Flow it will become apparent quickly this is where Microsoft is making their investments in automation.

As long as you have access to SharePoint Online in your Office 365 tenant, you will have access to PowerApps, Flow, and Power BI. They all work extremely well together and there is no additional charge. It's a great combination with huge potential.

SharePoint Online is your container. Stand up a site, create a list and configure it with the columns necessary to store your data and appropriate security. You now have a place users will go to and the beginnings of an interface for them to use to work with your solution's data. You will also find that PowerApps, Flow, and Power BI can see your list and the columns in it. You are integrated from the start. Add some sample data to

H3 Solutions

your list and within an hour (usually less) a continuous crawl will index your data. Try performing a search against data in your list. You will see you have immediate search capability as well.

PowerApps and Power BI have desktop software available but can also be authored completely within the browser. SharePoint Designer, a staple tool for SharePoint solution delivery, is no longer a part of your tool chest. While still useable against SharePoint Online, Designer has not been updated with support for features like Flow. You would still be working with SharePoint workflow when using Designer. While there will be cases where a SharePoint workflow will work just as well as a Flow, standardizing on Flow as your workflow engine puts you in position to benefit from future updates to the service. SharePoint workflow, on the other hand, will most likely not see any future updates. Additionally, when considering low-code enhancements to your workflow automation there is a significant increase in complexity trying to accomplish this with SharePoint workflow. ROI is realized much quicker with Flow.

Best practices and security considerations

"Cloud-based, no-code" does not mean "solutions are built without any discipline applied to the process." The same level of planning should be applied as a traditional software solution. The Office 365 ecosystem is so feature rich and scalable, solutions built via configuration will easily support thousands of users and terabytes of data. No-code solutions can become critical to an organization's day-to-day operations and so should be planned accordingly.

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Data governance, security compliance, and information assurance can all be easily applied as well. The beauty of building on the SharePoint Online platform is your solution's data is still in SharePoint. Whether it is structured data in lists or unstructured data in documents, Office 365 and SharePoint Online come with excellent security and compliance tools. AvePoint Online Services' tools such as Governance Automation Online, Compliance Guardian, and Perimeter can also be configured to work with your solution's data. Add a service request to Governance Automation Online to allow users to request access to your solution. Configure Compliance Guardian to restrict any Personally Identifiable Information (PII) being added to your solution's data model (both structured and unstructured data). Add the Perimeter app to your solution site and allow certain internal users to share key document-based work product from your solution with external partners.

What about all the other features in Office 365?

Yes, there are quite a few other features in Office 365, many of which can be used to add value to your solution. But you should not feel compelled to use a feature just because you have it. Keeping your solutions simple when possible is still best.

If we were to try to categorize some of the Office 365 features and how they could be utilized alongside the four already mentioned:

1. Communication
    a. A staple of any SharePoint experience is email alerts. Adding email alerts to your solution will most likely make the short list of requirements as users currently still rely heavily on email.

H3 Solutions

b. Combining Microsoft Flow with Office 365 Groups, a connector can be added to a group to receive messages to the group mail based on activity in your solution. This is a bit more advanced, but possibly fitting more particular business needs.

c. Similar to Groups, use Flow and Yammer to automate activity in your solution based on a message posted to a Yammer group.

2. Collaboration

a. If your organization is using or looking at using Microsoft Teams, a SharePoint Online-based, no-code solution can integrate easily with a team channel. In some cases, Teams could become the primary entry point for users to your solution.

b. Use Flow to generate tasks in Planner based on activity in your no-code solution. Manage your Planner boards from Teams with daily virtual standup meetings. As your team updates the tasks in the Planner boards, use Flow to feed your solution with the updated state of your data.

3. Productivity

a. If your solution includes document management and authoring, you can immediately work with them in Word Online, Excel Online, and PowerPoint Online, the browser-based versions of the Office suite. Display the documents in rich tile-based presentations in SharePoint and engage in collaborative co-authoring seamlessly.

b. Use Flow to generate events and feed them into an Office 365 Group calendar. A more advanced alternative to displaying SharePoint list data in calendar form, with the benefit of being more integrated in Outlook in the browser and other mobile apps.

c. Use Flow to integrate your solution across Dynamics 365 and SharePoint Online; feeding data from your SharePoint Online-based, no-code solution into Dynamics 365. This allows you to use the appropriate tool for the job. Cloud-based, no-code solutions can take on more sophisticated workloads without necessarily becoming overly burdensome to maintain when the right tools are being utilized.

This is just a sampling. There are over 20 more features and services in Office 365, all of which are designed to work together. The Office 365 ecosystem will grow as well. Microsoft has been releasing new features regularly since the launch of the service. Your cloud-based no-code solutions will be in position to benefit from this constant improvement.

Notice how often Flow comes up when we talk about integrating with other Office 365 features? It is an incredibly useful tool and provides a significantly elevated reach to your no-code solutions in SharePoint Online. As you start to use Flow it will become apparent quickly this is where Microsoft is making their investments in automation.

We do not go into detail about it here, but Flow also integrates with non-Office 365 services. If you are a user of Salesforce or Trello, for example, Flow can work with those services. In larger organizations, this can lead to a debate as to whether Flow is enabling Shadow IT. There are excellent controls in Flow to ensure your solution's data can only be used by certain services. An additional benefit of standardizing on

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SharePoint Online for no-code solutions, Flow can be configured to only allow other Office 365 services to work with SharePoint Online data to limit the paths your solution's data can take.

Do I have any other options? What about Azure?

So, up to this point we have stuck with no-code options and techniques. An exciting aspect of using the above approach to cloud-based, no-code solution delivery is how easily it can be enhanced with low-code additions. While easily the subject of an entire paper itself, some thoughts on your options around adding low-code enhancements to your solutions can be found below.

> *The RESTful nature of all services in the Microsoft cloud stack lend themselves very well to elegant integrations between Office 365 and Azure assets.*

Connecting to SQL Azure with Flow

While not necessarily adding code to your solution, when you move your data outside of Office 365 (assuming your Flow sends data to SQL as opposed to pulls data from SQL), additional complexities will come about as it relates to security, information assurance, compliance, and governance. If your organization has planned their use of SQL Azure, this should not be a problem and more a matter of coordination.

Azure Functions

As advertised, Azure Functions are web endpoints where your custom code can reside and is available via REST. These endpoints can be developed in your language of choice and there are built-in hooks in PowerApps, Flow, and Power BI to consume data from them. Your Azure Function can then work with APIs such as the Microsoft Graph to feed data back into your solution or trigger other processes outside of your solution. Once called Service Oriented Architecture (SOA), or more recently, Microservices, the RESTful nature of all services in the Microsoft cloud stack lend themselves very well to elegant integrations between Office 365 and Azure assets. Flow will tend to be the primary glue between the services and a low-code introduction of Azure Functions can be an excellent way to extend your solution as lightly as possible.

Another exciting use of low code in tandem with an Azure Function is integration with Microsoft's Cognitive Services and Machine Learning capabilities. A mobile PowerApp where users out in the field upload pictures of farming equipment can be integrated with Cognitive Services' Vision API to be able to automatically identify the equipment and the state it is in. This metadata can then be tied to the picture in your solution for search and reporting purposes. With properly planned content type definitions, I can create intents in LUIS (Language Understanding Intelligent Service) and allow users to interact with the *things* in my no-code solution using natural language requests (think chat bots or voice control).

Big data analytics and the internet of things

Whether it is data being fed into HDInsight (Azure's Hadoop) or PowerApps consuming IoT data (from the Azure IoT Suite) to give your users insight during interaction with your solution, this is still a low-code undertaking with a very simple implementation story. Proper planning will still be required, but when your solution is built on a service and you can introduce low code enhancements via additional service engagement, solution delivery becomes conveniently repetitive and simple.

SharePoint Framework or SharePoint Add-ins

A relatively new feature to SharePoint Online, custom user interfaces (web parts or full screen) can be added to SharePoint Online in a packaged way with exclusively client-side code. This can be achieved via either a SharePoint Hosted Add-in or SharePoint Framework. Without going into heavy details, both options provide the ability to develop and deliver customized functionality in your solutions. When used with low code in mind, they are complementary to your use of no-code tools such as PowerApps, Flow, and Power BI.

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Conclusion

Building cloud-based no-code solutions on top of Office 365 and SharePoint Online has never been easier. The diversity of workloads which can be met with cloud-based, no-code solutions in Office 365 and SharePoint Online has never been this broad. And it is continuously getting easier and more capable as Microsoft improves the ecosystem.

If you are already in Office 365 and SharePoint Online or are currently planning on moving to it, you have considered and have at some level, security, governance, and other forms of information assurance controls planned and/or in place for your data. Building no-code solutions within the same environment allows data in those solutions to be managed in a consistent way with your other data. Additionally, your solutions can integrate with various Office 365 services, depending on which ones your organization plans to use. Finally, the tools you use to build these no-code solutions are mobile-ready and are easily extended with Azure integration. Going from no-code to low-code is a seamless process with minimum impact and maximum benefit.

When considering a cloud-based, no-code approach to solution delivery, maximizing ROI and minimizing TCO are front-and-center. With proper planning and execution, your organization will benefit from the increased data quality, user engagement, and consistent security model. The sky is the limit in what you can achieve!

When you are ready to dive into this brave new world, feel free to contact me with any questions.

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