

# Harnessing the power of agile development

Integrating an acquired business means adjusting business processes, integrating data and technology platforms, and onboarding teams. When we acquired Nokia, each area posed significant integration complexity for both our joining and existing teams due to differences in size, processes, and priorities.

A number of factors influence the level of process and technology integration between merging companies. In the case of the Nokia integration, we analyzed the state of the disparate and out-of-date product data management (PDM) systems that were in place and decided to migrate everyone to a new unified platform, OnePDM.

In considering this opportunity, Microsoft Device teams requested we use this as an opportunity to move our hardware teams to a platform with industry-leading capabilities. Creating a centralized solution was also an important step toward a larger initiative—establishing a single product lifecycle management (PLM) platform.

In practice, this created a complex challenge for us at Microsoft IT and the business teams. The many existing processes across the businesses evolved over years. Unifying them to a single PDM process and system would require significant collaboration with the product groups and Microsoft Supply Chain, consistent revisiting of future state requirements, and consideration of industry standards to define the new OnePDM platform's standard process and features. This complex collaboration needed to be done without affecting product build and release schedules.

The complexity required us to reconsider how we organized and engaged with others to quickly establish a robust, dynamic PDM platform. Agile development was integral to quickly prototype working software that global teams could evaluate quickly, resulting in faster, more efficient delivery of OnePDM.

## Developing OnePDM

Historically at Microsoft, business groups funded their own software solutions and typically did not share systems to operate their business functions. The push to move to a unified platform for several business areas marks a cultural shift for Microsoft IT.

## Integrating product engineering and the supply chain to support OnePDM

PLM is a complex process involving numerous global teams working nonstop to release new, innovative products. It spans from product envisioning through retirement and involves many areas of the business. PDM is a significant aspect of PLM and ensures critical product data flows correctly from the engineering groups to the manufacturing teams in order to fabricate and produce quality products according to specifications. Integration of the supply chain in OnePDM depends on hardware product data being mastered and controlled in one system. Successfully moving all product and device data management to one platform was critical to the success of creating a single PDM system.

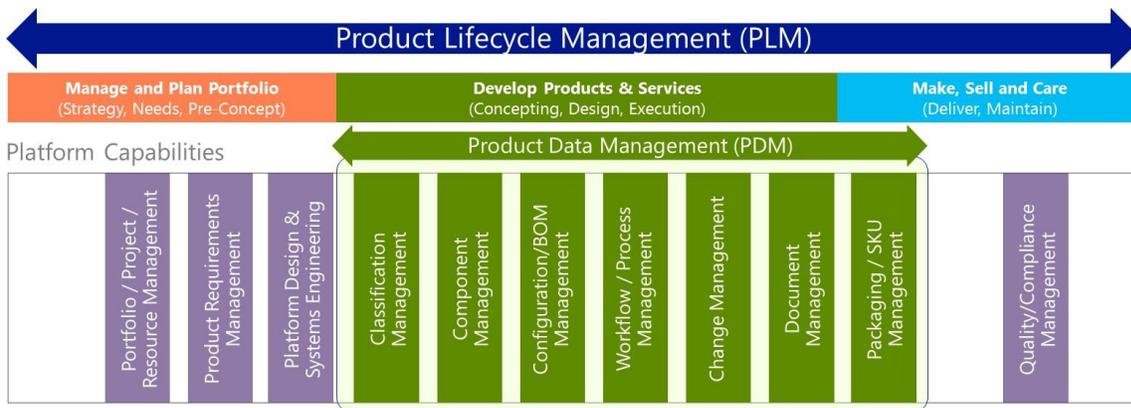


Figure 1. Product data management within the larger framework of product lifecycle management at Microsoft

## Rapidly release core capabilities using agile development

We needed a single functioning PLM platform to streamline product delivery from design teams to the supply chain. Based on experiences from other IT teams, we knew that to get a robust, functional tool out quickly required a fast, iterative approach. Agile development methodology was especially attractive to us to release working software quickly and to get real-time feedback from our business partners on a daily basis. The OnePDM system, with an initial set of core capabilities, was released rapidly so stakeholders could continuously improve the platform.

The more traditional waterfall method includes gathering in-depth requirements, developing a solution, deploying to a test environment, and then moving it into production. With agile methodology, development cycles (sprints) are rapid and iterative. Once the core functionality was built and released, we began working with the business groups to test and refine additional capabilities using daily builds.

## Understanding existing business processes and industry standards

We looked at the needs of large groups that would use OnePDM and analyzed the strengths, capabilities, and weaknesses of existing PDM processes and systems. We also worked with stakeholders to determine new features or improvements that they would like to see in OnePDM.

It was very important for us to clearly understand our stakeholders' current situation and how their groups' processes were aligned with, or were different from, industry standards. Whenever possible, we want to move our business processes toward leading industry standards, so our partner's experience will more closely resemble the experiences they have with other businesses.

## Defining business objectives

OnePDM was designed to integrate multiple systems into a modern solution that will enable new strategic product lifecycle capabilities. Early on, we defined the following high-level business objectives for OnePDM:

- Accelerate design collaboration across product lines
- Establish core foundations for product data
- Maintain traceability across the entire product lifecycle
- Enable internal and external collaboration models for design and engineering
- Enable in-house and contract manufacturing

## Creating a development roadmap

We developed a roadmap that documented and prioritized the capabilities that needed to be included to achieve the first minimally viable product (MVP). The roadmap also included the iterative path of additional features that would be added and improved upon after the OnePDM MVP release was rolled out.

## Building OnePDM using the agile methodology

We were merging two entirely different businesses while also looking for standards that would work for all groups within the company. We wanted to benefit from the strengths of each business and build aligned end-to-end processes. The agile methodology helped us release a functioning OnePDM platform quickly, by allowing rapid prototyping of industry-based processes so that groups could decide if they could be adopted as a common process or if a unique process had to remain unique to Microsoft. End-user representatives from our business groups and IT team members met daily in scrum meetings to discuss how the business process could work and provide feedback.

## The agile team structure

Three different groups each play a key role in our program, representing the primary governance, steering, and delivery roles.

- The governance board meets quarterly and includes executive sponsors that provide organizational sponsorship. They review execution plans, the program roadmap, and “go forward” recommendations, and they assess impacts.
- The steering committee meets weekly and is made up of leadership that provides core business group decision-making and program guidance. They identify business group participants for implementation, integration, and deployment, and drive change management and communications activities for their respective business groups.
- The development team and their partners met daily for functional and technical decision making that identifies business group reviewers, defined as part of the overall project. They also broadly run program activities, from collecting requirements to reviewing and approving solutions; and supporting deployment.

## Using agile to constantly deliver

Agile development makes it possible for us to try out more configurations faster. Using agile development, we could configure and build working software within a day or two to obtain immediate feedback from the device groups. This helped not only how features and related user stories were being implemented, but established buy-in from the users on how the application functioned and how it supported the underlying processes. With traditional development, we would have spent a lot of time talking about how a new capability would work as it was added to a list of features scheduled to be built into the next version release or update. Agile development empowered us to make decisions, take actions, fail fast, and constantly deliver features that produced business value. It has been more resource efficient than the traditional approach.

## Starting with a third-party, Azure-certified PLM platform

OnePDM used a third-party, Azure-certified platform in order to get up and running quickly rather than building a system from scratch. This gave us an industry leading starting point to develop our business processes and a standardized taxonomy across Microsoft business groups. The platform’s out-of-the-box capabilities and processes were used as our starting point and provide us the added benefit of receiving future innovations from a PLM industry leader. By determining what was available out-of-the-box and how they mapped to our existing systems, processes, and tools, we were able to adopt a standard system that aligns with industry best practice.

## Best practices

While developing the OnePDM platform, we established best practices that might benefit other organizations that are considering agile development to build or simplify a process-based platform.

### Document your processes

A guiding principle for OnePDM was to use industry-standard processes, unless a process that was unique to Microsoft had business justification or provided a benefit over the industry-standard process. However, not all of the processes across Microsoft were well documented, which caused some re-work. In cases where documentation was available, agile development sprints had much better momentum in ensuring solutions were workable for all groups. We encountered the most difficulty in judging the best way forward when documentation was lacking.

### Understand that a better way may already be defined

We recognized the need to consider industry standards to maximize our capabilities. Not only did we see variation between Microsoft and industry, we also understood business groups within Microsoft were operating differently. Adopting standards has far-reaching effects, since all business groups would need to adopt them as well. Industry standards were consistently evaluated to decide how they could enable and benefit the hardware product groups. By reviewing and understanding existing industry best practices and processes, we could effectively make reasoned decisions on when to adopt or reject an out-of-the-box process.

Doing this forced us to consider why certain processes and definitions were unique to Microsoft. Was it because those unique processes provide a benefit—or because they evolved from solutions that were built without determining what the industry standards were? When unique processes provide a benefit, we looked at them to see how they would fit within our overall objectives and be incorporated into the Microsoft standard. However, moving to standards allows Microsoft to be at the forefront of industry capabilities and adapt quickly to new advances. In the absence of a key business rationale or benefit, it makes more sense to get the businesses to snap to the industry standard (out of the box) process.

### Maintain agile momentum through participation

Agile emphasizes daily collaboration to achieve the end goal. This enables teams to consider features and test, retest, pass, and fail fast on a daily basis. Therefore, agile methodology will only be effective if teams invest time in trying out the new capabilities and features released in almost daily incremental builds. It is important to secure sign-off from leadership and adequate participation from business groups. User feedback is essential to the process and derails momentum if user participation is intermittent or drops off.

### Treat product data as an asset

Having multiple teams collaborate in an agile team is an opportunity to also consider complex improvements enabled by data. By moving all master product design data into a single system, we are driving agility and faster decision making. Allowing users to find all of their data in one system drives efficiency by saving time that would have been spent looking for information across multiple systems. It also helps align the hardware product groups to adopt a new level of confidentiality within OnePDM, which maintains access controls to data elements. By standardizing confidentiality across business groups, we were able to enable collaboration and reuse of product data that is global and non-confidential, both of which will drive better cost decisions and reduce waste.

## Benefits

Typical PDM implementations take 18 to 24 months with less complexity than we had here at Microsoft. Agile development greatly accelerated our program rollout while maintaining high quality. In six months, we had our first program release with working software. Within the year, we were able to replace our old systems and deliver additional capabilities. Other benefits of using agile development include:

- Reduced development and deployment times. Code builds and environment deployments were reduced from 7,200 minutes once every three weeks to 10 minutes a day.
- Improved interoperability across engineering, manufacturing, and supply chain reduced time-to-release product data from the PDM system to upstream and downstream systems.
- Similar capabilities were modeled, developed, and deployed 50 percent faster than past efforts. This is increasing our agility and responsiveness to the needs of the business.

OnePDM will save several million dollars (USD) in its first two years of operations by eliminating the operating expenses of multiple old PDM systems. In addition to those cost savings, business benefits of OnePDM include:

- Enabling adoption of global parts and driving re-use across hardware product lines.
- Uses Microsoft technologies to deliver simplified user experience capabilities to access the system and product data.
- Fewer business resource requirements. Consolidating the PDM systems and increasing automation reduced the amount of effort required to perform engineering and supply chain activities.
- Availability of a much more agile foundational platform reduces the time and effort required to onboard new groups or businesses.

## Conclusion

OnePDM gives all Microsoft business groups a unified way to create, manage, and release their hardware product data. We built and are evolving a platform that is expanding classic PDM roles toward the company's goal of having one platform that covers the entire product lifecycle. Agile development made it possible for us to consistently and incrementally improve our platform based on our business needs while still working toward our long term objectives. Additional meaningful benefits from this approach are less cost and accelerated delivery timeframe.

## For more information

### Microsoft IT Showcase

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