AN AGILE APPROACH HELPS OPTIMIZE DIGITAL PATHOLOGY SYSTEM

The potential gains from digital pathology are endless. The ability to capture, curate, analyze, and rapidly share information about the effects of newly developed molecules on specific tissue targets has accelerated drug development. Pathology has used digital tools for several years, but it got a boost thanks to pandemic-driven remote work. Today, scientists are increasingly using artificial intelligence and machine learning to better visualize, interpret, and further leverage the data.

TOUGH JOURNEY TO FARAWAY DESTINATION

A global pharmaceutical company saw the benefits of a cohesive digital pathology system. It already had various groups using different digital tools, some home-grown, others off the shelf or created by outside vendors. But the disparate tools meant different file formats and data analysis methods. Pathologists and research scientists couldn't share data seamlessly—if they even knew it existed.

The company wanted to use digital pathology to help with drug discovery and development. And, importantly, it wanted to connect the dots among the many functions that could apply the data. But its ambitious goals to create an enterprise-wide platform to ingest, curate, analyze, and share data, as well as apply machine learning to analyze images, soon got off track.

The complexity of the program and the shifting milestones caused the project teams to fall several months behind. They weren't effectively tracking progress, defining responsibilities, or holding each other accountable. One reason they struggled is that milestones and deadlines are difficult to predict and follow for discovery-phase projects. In other words, you need to build the solution as you go.

Until the program could gain traction, the company couldn't fully leverage the results from pathology data analysis to spark discovery. Eager to take advantage of those opportunities, it brought in Integrated Project Management Company, Inc. (IPM) to lead the effort.

Their remit: coordinate the workstreams to build an enterprise digital pathology solution to bring their current tools and systems under one umbrella and design a fully integrated system for the future.

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TAKING IT STEP BY STEP

IPM's dedicated program manager assessed the ongoing and upcoming projects. He found talented, knowledgeable teams in the research and development function. And he worked closely with the department's informatics team. Informatics owns data ingestion, curation, storage, and lifecycle management, as well as development of AI-enabled algorithms and design for digital pathology information systems.

To provide structure, the program manager developed a holistic roadmap. He helped the teams apply better tools to track status, prioritize tasks, identify and mitigate risks, and assign duties.

As he began to work on various workstreams, the program manager tailored suitable project management approaches for each project. Because most of the projects were complex and exploratory, he turned to Agile practices and took on the role of scrum master for these projects.

When requirements are incomplete or likely to change during a project, a waterfall approach may not be effective. Waterfall project management essentially assumes an end point and planning works backward from there. If the end point is uncertain, the plans break down. And the more complex the project or the longer the duration, the more likely this is to happen. Agile practice breaks down large-scale product features into specific user requirements. The team develops and delivers value-added results in cadenced, time-boxed sprints of typically two weeks. This lets them make steady progress, identify and manage risks, receive stakeholder feedback, and adapt quickly to build quality deliverables.

SUCCESSFUL STOPS ALONG THE WAY

Another benefit is that Agile enables teams to have quick wins. Prior to the shift to practices like daily standups and two-week sprints, the digital pathology project teams felt they were doing a lot of work but not seeing any results. Working in sprints as a scrum team, they were able to report on and remove any hurdles, make progress, and see successive wins. This built team morale and ownership.

For example, one team's objective was to determine a consistent way to organize metadata from wide-ranging sources. They first had to learn and catalog the metadata dictionaries of existing digital pathology systems and pathologists across the company. And they had to understand how the scientists were using the metadata. Early sprints focused on framing interviews to get the necessary information from end users, then building and refining the metadata taxonomy through cycles of learning. The team defined success for each sprint, such as the number of complete responses from the pathologists and a workable depth of metadata sub-categories. As they iterated the taxonomy, they checked in with the end users for feedback.

Other project teams embraced the Agile approach as well. One team developed a semantic ontology system that automatically organizes pathology data based on their relationships to each other. Another team improved the solution that ingests and curates data across the global organization. And yet another migrated an image-processing system that uses machine learning to de-blur scanned slides to a cloud-hosted solution.

With the Agile project framework and coaching to guide them, the digital pathology project teams gained confidence in developing acceptance criteria to test the pieces of work completed in each sprint. The positive feedback from stakeholders helped them enjoy the process, and in turn spurred them to deliver incremental improvements.

THE JOURNEY CONTINUES

The IPM program manager set up the organization for ongoing improvement by training its scrum masters, product owners, and their teams on Agile methods and tools.

Agile teams gauge their success on whether they provided the features their stakeholders requested and whether the deliverables met expectations. Because the product owner and developers define acceptance criteria and get feedback along the way, successful results are an ongoing occurrence rather than an end-of-the-road outcome.

In this case, the digital pathology project teams delivered—and continue to deliver—improved functionality to pathologists and data scientists. The end users have come to trust that if they need a new capability or function from digital pathology, the informatics team will strive to deliver it.

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