

System Design

Narrator: When McGraw-Hill committed the resources to develop a custom textbook publishing process to address the demand for increasingly specialized content in print text, the company couldn't know the challenges it would face. The goal was to create a custom publishing system that was agile and could support mass customization of textbook content. Yet the technology for custom printing in 1988 was limited and since no major publisher had ever embarked on such an ambitious project, the road ahead was unfamiliar and untraveled. The Primus development team had a strong feeling that the work invested in overcoming the obstacles they encountered would pay off in the long run. With the initial feasibility study completed, the team began to develop and evaluate alternative system solutions. This meant comparing the existing publishing process to the newly proposed one and identifying a solution to best meet their needs.

Cathleen Mattura; Manager Custom Publishing: Every time the reps came back with a reason why the book wasn't adopted was because the content didn't fit – McGraw-Hill didn't have the exact fit that the professor wanted. At the same time a lot of copy shops were springing up and you would have course-packs. A lot of universities just wanted to use course-packs, they wanted to use original source materials to teach their course. So the feasibility was that Primus would satisfy that customer need. So it really wasn't the issue of would it work – we did think it would work. The issue was what we needed to do to the material. In the beginning, like any publisher, we wanted to editorially present the material in a way that it could be used and understood in any way. So for books that were developed in a very linear way, one chapter depended on another. So you needed to cover chapter one first then two then three to understand what was going to happen in chapter seven. If a professor reassembled those chapters and put them in a different order what would that do to the understanding of the content? So we went back as editors, and went through the content and edited it so that it was modular and any necessary content that would make the chapter stand alone was removed. So for example, in chapter seven it said, "remember in chapter two you learned this" we would repeat the figure or example from chapter two. Or if it was a concept that generally you would have understood, instead of chapter two we would say, "remember in the chapter on this concept, you covered this". So we went back and really did rethink a lot of these books to make them better.

Narrator: As the team worked on the details of the new system solutions, some of the uncertainty from the early stages of the projects began to resolve. The process required to custom publish took on a more defined form, for example. The design of the content database was determined and requirements for formatting documents for printing were developed.

Cathleen Mattura; Manager Custom Publishing: We would have to store the content somewhere, we would have to store the content in a reliable medium so that the vendors who were the compositors who were delivering that content to us could do that. And then how would we print that? So it had to be a medium that could be printed, so it had to be able to be read by a digital press or a copy machine or printer. So the companies that we went to were Xerox, IBM and then also Sun. We sent the RFP out to these companies. The other interesting fact is that the vendors all have proprietary systems which is a very unique challenge to try to get each compositor, which there are 40 or 50 that McGraw-Hill deals with to be able to say, "ok we need the content delivered to us in this way" and we had never said that before, the industry didn't have a standard. So we were trying to develop a standard at the time.

Narrator: As the team worked on the functional and technical design issues, internal tension began to rise.

Cathleen Mattura; Manager Custom Publishing: We chose Kodak because they wanted to use what was becoming the industry standard which was PostScript by Adobe. And there was a very big battle within the corporation because the corporation had ties with Xerox. So it was kind of going against the fray that we chose Kodak, we had to really plead our case on why we wanted to do this.

Narrator: With the completion of the process engineering activities required to develop, evaluate and select the best system configuration, attention was directed to how to integrate the new Primus system with existing back-end systems for printing, inventory management, ISBN management, royalties and order fulfillment.

Ginny Moffatt; VP Course Content Delivery: There are a number of back-end systems that Primus interfaces with. That was really the central challenge of creating Primus. It's not simple but easier to get the front-end of it, get stuff up on the web have people be able to select from it. What is difficult is making it so it automatically interfaces with the back-end systems. What you want is a system, in general, once a professor is in the system no human beings have to touch the system, that's the idea. So, the key systems it would have to interface with is the royalty system and that's essential because each of these chapters, cases, labs and readings that we put in there has its own unique identifying number called an ISBN number and that number is attached to a royalty contract so that we're signaled, "ok that author who created that content has to be paid royalty on this" and that's the only way you can run it through the system. So, what that means is that it has to interface seamlessly with our royalty system which was a challenge when we set it up. It also has to interface with our inventory group that creates the ISBNs. Primus right now runs through about 500 ISBNs a week – the entire rest of higher education uses possibly that many in 6 months. So it's a big challenge for inventory management system just to keep up with the creation of ISBN numbers. And then it interfaces with our master product database where we store all the information about the product, metadata and any identifying information about it. And we're working on having it interface with our sales rep database where we have got a lot of information about professors and what they might be interested in.

Narrator: The path to completing the Primus system was clear. Now it was time to create the system and put all the plans and processes to the test. As you consider the system's potential for success, think about these questions:

- "Process Engineering" is the design of business processes to achieve competitive advantage in cost, quality, speed and service. Which of these advantages were driving the development of the Primus system for McGraw-Hill?
- What types of system design tools do you think McGraw-Hill used to develop the system's functional requirements and technical specifications?
- Business customers must perceive products/services are solutions to their problems. How did the Primus system design keep this objective in mind?
- The Primus team knew that technology would change in the short and long run, affecting the design of the system. How did the team deal with the knowledge of this inevitable change and uncertainty?