Collaborating to Create Microsoft Publisher 2000

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Introduction

The following is a case study of successful collaboration among varying professional industries in the creation of Microsoft® Publisher 2000[1]. This paper will show two areas of collaboration:

- Between the Publisher team and pre-press professionals
- Among the various disciplines within the team (Design, Development, Product Planning, Program Management, Testing, Usability, and User Assistance)

Alan Cooper demonstrates a method in his book *The Inmates Are Running The Asylum* that involves creating "personas" who are imaginary people based on common attributes of existing groups of people. Although this approach has been around for many years and, like any design tool, is effective in certain situations, we will show the primary differences between using personas and our collaborative effort and why collaboration was more effective for our needs.

The problem

Microsoft Publisher, which is the desktop publishing application for Microsoft Office, started out as a way for non-designers to create various types of publications easily with a little design flair. Over the course of five product releases, it became a full-featured solution for nearly all publication creation needs, be it print or web based, while maintaining its ease of use. However, there was one task that users had a very difficult time completing: getting their documents professionally printed.

With Publisher 98, users could have their publications professionally printed, but the process was far less than ideal and hardly what one would call easy. It involved printing the document to a file instead of a desktop printer. This created a Post Script file, which could in turn be processed by professional print shops… usually. Problems with Publisher's Post Script file format prevented some print shops from running the job. Even if the format was compatible with the printer's systems, the file could not be edited if there were any layout or typographical errors and the whole process would have to start over. For these reasons, nearly all pre-press professionals[2] either rejected Publisher files or strongly advised their clients to use either Adobe PageMaker® or QuarkXPress™, the two leading professional page layout software packages at the time.

This was not a good solution for end users for two reasons.

1. Both cost over $500
2. Both have steep learning curves because they are created for professionals who use them regularly and are willing to invest the time to learn its terminology, keyboard combinations, and overall workflow

Moreover, if users had already created their publication in Publisher, they had no way to convert a Publisher file to either a PageMaker or Quark file. This was a huge hurdle for someone who occasionally needs to have something professionally printed. In short, Publisher met 90% of its users' needs, but the last 10% kept it from being a complete package.

The solution

The solution to this problem was obvious (we needed pre-press tools in the product) but rather difficult (it had to work for both pre-press professionals and end users who were not professional designers). Usually when developing a software product or feature, the team tries to optimize it for one type of user. In PageMaker and Quark, the features are optimized for pre-press professionals. Graphic designers who regularly need to have their work professionally printed take the time and effort to learn the terminology and workflow because it will make their everyday jobs easier in the long run. Publisher, however, is aimed at the non-designer who occasionally needs to do desktop publishing. As a result, we needed to provide all of the necessary tools and information for the pre-press professionals while not scaring away the end user from functionality they might need.

To make things more difficult, Publisher already had a bad reputation in the professional print community for its poor support of their needs. We knew we only had one chance to get it right. If we didn't, we ran the risk of further damaging our reputation with pre-press community.

[1] Microsoft Publisher 2000 is a registered name of Microsoft Corporation. For simplicity's sake, this product will be referred to as Publisher from here on.

[2] Pre-press professionals prepare publications to be printed on what are called offset printers.

We did have one thing in our favor: we knew our end users. Microsoft has a strong tradition of understanding its users and their needs. From extensive research during previous releases, we understood how Publisher users created their publications, when they made design decisions along the way, how they added content to their publications, etc…. What we didn't understand well was how they printed them.

The typical design process

Traditionally at Microsoft, after the product vision is written, the feature design process starts, which begins in three ways:

1. Marketing and Product Planning analyze competitive products for features they have that ours do not
2. Usability proposes fixes to existing problems with the software seen in lab studies and site visits
3. Program Management (PM) and Development (Dev) create new functionality based on new technology

From there, the Program Managers write preliminary specifications for the features and development starts. As the development team is writing the underlying code, Usability and Design review the specs with Program Management to identify glaring problems with the functionality or workflow. Once this is done, the designers layout the necessary user interface (UI) elements and, if necessary, create prototypes for usability testing. If a prototype is not created, the actual code is usability tested, often several times, to reveal design problems. Changes are implemented to whatever degree time and resources permit. Concurrent with the refinement of the design, the feature's code is tested for stability and reliability. Errors, or "bugs", are fixed or postponed based on seriousness, resources and available time.

What's wrong with this process?

Several problems exist with this approach, the biggest of which is that the process is reactive rather than proactive. That is to say, instead of first determining what functionality our users will need and the scenarios under which they will use it and then developing the technology to enable this, we often first create the technology and then try to fit it to a user need. At other times, however, when Product Planning or Usability recognizes a specific need through research and features are based off of their findings. But even then, instead of continuing the collaboration effort with users to garner feedback throughout the project, the research process stops and the features are developed only with what information was initially gathered. As a result, our features tend to work for what our developers envision will be useful instead of what end users want or need it to do. This usually happens because the data collection process wasn't started early enough to give program managers the data they need to make the right decisions. Consequently, they are left with whatever data they have and make assumptions for areas where they don't have much if any data. It's not that they don't care about users, but rather that they don't have enough information or the right kind of information to make the right decisions.

When the features are eventually tested in a usability lab with actual end users, quite often major problems are found that require a good bit of time and resources to fix. However, by this time the product cycle is nearing the point when the team cannot add anything new or change any functionality if it is going to deliver the product on time. Consequently, there is not enough time or resources to fix things and products are often shipped with known usability problems, though the team may say "well, we'll fix it next time."

Clearly this problem does not happen with every feature nor is it always to such an extreme level that severe problems can't be corrected before releasing the product. But this approach forces problem triage because the problems are discovered late in the process. So why do we still do things this way when we know there are problems associated with it? To answer that one has to understand the current software product development cycle. Up until the release of a product, everyone on the team is working on making the product the best it can be before it is released. Product Planning and Marketing teams are gearing up to do product release demonstrations for software reviewers and conferences. Usability Engineers are conducting last minute usability tests as well as benchmark tests to compare overall performance between the current and previous releases. Neither team has much time to figure out what to research for the next version. Even when they do, the vision and focus areas for the next version usually have not been determined, without which neither team would be able to gather very much relevant information. The key is to deliver the right set of information at the right time, but we typically don't know what would be useful to research until it is too late.

So why don't we continue gathering information during the design and development process? There are several reasons. First, it's hard to justify the cost of ongoing research. There is currently no way to determine if and

how much better a given research technique is over our current approach. We have seen many products do extremely well with our current approach. Would they be any better with a different approach, and if so how could we tell?

Second, while usability is gathering research to determine if the product is on track, the development team could be waiting for the results, which can take several weeks. This is valuable time that they could be using to write code.

However both of these seem to avoid the real reason – we aren't getting the right information to the right people at the right time. To do this effectively our planning and usability teams need to know what kinds of information the rest of the team will need before design and development starts. They then need to know how best to gather that information and deliver it to the team. Our usability team is perfectly capable of gathering the right information if they know what kind of information is needed. The problem lies in knowing what information to gather, when people will need it and how to get them to buy into it.

What needed to change?

While the three sources for feature development listed above are part of a good design process, none of them on their own is comprehensive enough to base a feature design on that we can be reasonably sure will succeed. Given our need to get this set of features right the first time, we knew our existing processes would need to change. We had to get the right information up front and have the entire team buy into the data before design began. But how does a team go about changing its process that has largely been successful for many years and has made Microsoft a very successful company?

We had a few things in our favor that helped promote the necessary change for this project:

1. No one was very familiar with the technology, terminology or processes used by pre-press professionals. As a result, we couldn't fall into the habit of designing features for ourselves – a problem nearly everyone in the software industry succumbs to at one point or another.

2. While much of the pre-flight[3] is done on PCs, the actual processing of the publications usually takes place on expensive, dedicated hardware or uses expensive software, both of which are often customized by each print shop to meet its particular needs. As a consequence our product team had to rely on returning to printing professionals to answer our questions.

Both of these factors led to an interesting change in the team. It was suddenly okay, in fact expected, that people would say, "I don't know" when asked how something needed to work. Previously we could substitute ourselves for the end user and say, "If I was in this situation, I would use it this way". In this effort we didn't know enough about the specific needs of our target user to do that. The less a team knows and understands about the area they are designing for, the more they need to rely on experts to help them understand it.

As a result everyone on the team needed to get up to speed on what the relevant issues were surrounding professional printing. We capitalized on the fact that people had a good understanding of whom our end users were and how that knowledge helped them create a better product. Also, it was very clear who this "new user" was that we needed to understand. The pre-press field is a clearly defined vertical market with well established processes. Because of this, we were able to avoid the problem of defining who we were going to focus on and what their needs were; it was already defined for us. With everyone in agreement on our ignorance, we easily convinced each team that they needed to see this new type of user – the pre-press professional – first hand.

Making the change

At Microsoft, several functional disciplines are involved with creating products. Normally, these groups have set roles within the product cycle:

- **Program Management—**A program manager is responsible for maintaining the "big picture" and weighing risks against costs. They are responsible for making projects ship on time and on budget.

[3] Pre-flight is the term for preparing a publication to be run on an offset printer. It involves checking the file for the correct colors, fonts, graphics, layout, and any spelling errors among other things.

- **Development—**Developers write the code instantiates all software products. They literally make the product.
- **Test—**Test engineers develop and execute test plans and scripts that are designed to detect problems and ensure quality.
- **Design—**Designers enhance the computing experience. Through iterative design and prototyping designers affect the way people interact with their computers and each other.
- **Product Planning—**Product planners perform quantitative and qualitative customer research, identify needs and desires, and analyze the competition to determine which features will better serve the end user.
- **Usability—**Usability engineers work throughout the product cycle to understand our users' activities, to conduct studies of design ideas with users, and to work with designers and program managers to develop easy-to-learn, easy-to-use, and enjoyable products.
- **User Education—**As products reach their markets, end-users need information that teaches them how to use the products and get the most from them. Providing this highly specialized form of communication is up to the Writers, Editors, and Production Specialists in User Education.

However, for this project, we wanted to make sure that while each of the functional groups have their own area of expertise with the product, they were all equally represented and had buy-in for the commercial printing features. To accomplish this goal, we formed what was know as the "Print Feature Team" (PFT). This team had a representative from each of the groups outlined above. The charter for this team was to work together to make the commercial printing feature a success. To this end, all members of PFT participated in data collection and analysis. The key here is that the team members admitted to themselves that they were not the end users, and therefore they couldn't design for themselves. They had to get feedback from actual end users, and it had to be done at all stages of the development process. Otherwise the product ran a huge risk of not succeeding and over a year's worth of effort would be wasted.

Conducted research

To achieve the goal of making the commercial printing feature a success, the PFT conducted a series of studies prior to starting the design process. All of these studies were designed to learn more about our users, their goals and their problems. These studies were conducted over the course of a year and often involved people outside this core team. The 5 studies we conducted included:

1. **Document creator site visits—**The purpose of this study was to gather information about Publisher users' goals and behaviors that could be used to improve outside printing. We examined the usability of Publisher's Outside Printing feature in the small business environment by observing and interviewing users in their normal settings.
2. **Pre-press professional site visits—**This study was a series of 13 site visits with pre-press professionals. We observed users, pre-press professionals, in their own environment. This study was designed to learn more about how printing is done in a commercial setting.
3. **Pre-press professional focus groups—**In this study, we sought to understand what features and capabilities Publisher would need to add in order to gain support among pre-press professionals. Six focus groups were conducted with pre-press professionals in order to investigate their needs, behavior and attitudes with regard to DTP applications.
4. **End-user focus groups—**This study sought to understand some fundamental questions about end users who have their publications commercially printed. Questions such as why they would go commercial, how they learned what they needed to do to prepare their publications and who they turned to for help were answered in this set of four focus groups.
5. **Market research—**We conducted over 300 interviews with commercial users of Publisher. The overall goal was to gain a better understanding of Publisher usage within franchise and independent commercial printers with regards to (a) satisfaction; (b) ways to improve commercial printing, including trapping and imposition; (c) hardware used to print files; and (d) satisfaction with product support.

From this data, we learned that Publisher users

- Rely heavily on the pre-press professional to help them use Publisher's professional printing functionality;

- Take the terminology that pre-press professionals use and expect to find that terminology in the software UI; and
- Have no idea how to successfully print commercially.

From pre-press professionals, we learned the

- current state of the commercial printing market;
- most common problems a pre-press professional has with customer files;
- strategies pre-press professionals use to solve customer problems;
- pros and cons of common pre-press software; and
- minimum pre-press feature requirements for Publisher.

But most importantly, we learned about the importance of collecting user data as a team. These types of studies have been used for years at Microsoft for gathering research on nearly every product we make. Typically though, when this type of research is being conducted the rest of the team is focusing on finishing the product and not involved in the research. When the research is finished and the team is ready to start designing and developing the next version, Usability and Product Planning present their findings to the team. But since the rest of the team hasn't been part of the data collection process it is easy to discount the findings. When this happens, months of valuable research can be wasted. However, if the team is involved in collecting and analyzing the data, the team members gain understanding of users firsthand, and rather than discount the findings they evangelize them to others.

When attending site visits, each member was trained in how to conduct a site visit, what types of questions to ask, how to gather data, etc. Once each team returned to Microsoft, they would gather in a conference room and hold a debriefing session to which any and all other team members were encouraged to attend. By doing this, those who went on site visits got a deeper understanding of the document creators while those who could not attend site visits could walk down the hall and take an hour or so to hear about a particular site. In short, we made it hard for anyone to not get some sort of understanding of who these users were and what unique needs they had.

Disseminating the knowledge gathered from the focus groups and market research posed a challenge. The focus groups were conducted in 6 different cities, making it difficult for team members outside the PFT to participate. The 300 interviews were conducted via phone; again making it difficult for all team members to participate. Our solution to this dilemma was to hold a "Commercial Printing Kick Off" team meeting. At this meeting, the PFT presented all data we had collected about both sets of users. This meeting was very successful for a variety of reasons:

1. Rarely, do we have a complete picture of the user *prior* to starting the design process. Because we had formed the PFT we able to complete a large amount of research prior to thinking about UI or design. The team was excited to know so much about the users and their problems. The problem space was clearly defined, so it was exciting for the team to rally around finding a solution.
2. It was clear to the team members that they would be a part of developing solutions. The PFT did not pretend to know the best way to solve the user's problems or how to implement the solutions. All functional groups would be instrumental in developing a piece of the solution.

Turning the data into a design

Once we had collected our data and understood the nature of the users' problems (both document designers and pre-press professionals) it was time to work on designing a solution. To help us in this endeavor, we employed the contextual design technique as outlined by Hugh Beyer and Karen Holtzblatt in their book *Contextual Design: Defining Customer-Centered Systems* (1998). While this methodology helped form the basis of our design decisions, we still had to figure out how to work effectively as a team.

As with any collaborative team, it is difficult to (a) keep the design conversation on track; (b) focus the issues and not each other; (c) manage group dynamics; and (d) find the root cause of disagreement. To build team cohesion and avoid collaboration pitfalls, we used the following strategies

- **Set design goals—**Based upon the data we collected, we set specific design goals. For the document creator we decided as a team that (a) users should not be exposed to features that they do not need. In other words, the more complex features that pre-press professionals would need to print a file would not need to be exposed to the document creator; and (b) industry terminology should not be hidden from the document creator. In past releases of Publisher, technical terminology was not used in order to protect the user. The net result was that users thought that Publisher did not have functionality that it did and users couldn't find features/commands that their printer told them to use. For pre-press professionals, we decided that the tools that we added should be consistent with other pre-press software that they use. We believed that if we differed too much from the industry standards, Publisher would not become an accepted tool. The key point to remember here is not so much that we set design goals, but that we did so as a team. By doing this as a team we were able to have everyone agree on what we needed to do to have a successful product.
- **Used brainstorming techniques—**When coming up with solutions to the users' problems, we used brainstorming techniques, specifically the premise that "there's no such thing as a bad idea." We spent a large portion of our time coming up with as many solutions as possible that met our design goals and fit into all user's mental models of how things should work. When brainstorming, we didn't focus working out the fine details or even if what we were proposing was technically feasible. We focused solely on ways to solve the users' problems. This method allowed all team members to be heard, helped us arrive at innovative solutions, and avoid unnecessary conflict.
- **Evaluated the pros and cons of each solution—**After we had a list of possible solutions, we would take an idea and fill out the details. We were still not thinking about UI at this point. We were thinking about task flow and if the sequence of steps would lead to users' success. We had not, at this point, drawn any dialog boxes, UI widgets or menu items. When we had filled out the details of an idea, we would make a list of all the pros and cons of the solution. We would then move on to the next idea and repeat the process. After all ideas had been discussed, we picked the solution with the most pros and fewest cons. We then discussed how to minimize the cons. Again, we used brainstorming techniques, allowing us to easily work as a collaborative group.

In traditional product design at Microsoft, when a Program Manager suggests a solution it is often met with resistance. Team members want to suggest alternate solutions or discuss why that solution is that is being suggested is not the best. Everyone's goal is to have the best solution, but convincing team members can take a lot of effort. Because the PFT had worked as a group to develop a solution, there was not one person that was suggesting a solution. All team members were aware of the brainstorming process and bought into the design. Thus, when it came time to discuss implementation, we did not lose time on re-evaluating whether or not this was the "right" solution.

Collaborating with the pre-press professional

Once we started working on developing the solutions, we realized we knew how to design for document creators, but we still did not have a complete understanding of the pre-press professional world. Publisher had spent 5 product cycles learning about small businesses and understanding how they would respond to software. However, we had never designed for pre-press professionals. We knew we would run into issues as we developed the product that we could not solve with our existing pre-press data. For these issues, we would need to a user in the pre-press community. Our solution to this problem was to form what we called the "Printing Advisory Council" or the PAC. We had two goals for creating the PAC: (1) to build an on-going relationship with key commercial printing partners to ensure success for Publisher; and (2) to get early feedback on planning, user interface design, features, user assistance text and evangelism for Publisher's professional printing.

The PAC met a total of 6 times over the course of 6 months and were recruited from the local yellow pages. The members where either

- Service bureaus that shoot film but send printing offsite.
- Service bureaus that shoot film and do digital printing and/or color copying.
- Professional printers of all sizes that have in-house pre-press departments. These printers employ a range of printing technology, including digital, direct to plate, image-setters, and/or offset presses (both sheet-fed and web).

From our market research, we knew that this mix of participants would accurately reflect the printing market.

At these meetings, we drew on the expertise of the printing professionals to

1. Prioritize the list of printing problems to help users fix;
2. Whether or not to add trapping[4] capabilities to Publisher;
3. Provide feedback on our design solutions
4. Discuss the hurdles for accepting Publisher into their shops
5. Discuss the marketing message Publisher should have

While we knew that end users were running into problems getting their publications printed, we didn't know what information printers were giving them to help them solve their problems. While end users would eventually succeed in getting their publication printed with the help of their printer, it was often a long and painful process of going back and forth to the printer with revised copies of their file. Without collaborating with pre-press professionals in this way, we would never have been able to provide the level of information we did to help users get their documents printed.

While on site visits, we rarely saw anyone manually trap objects while pre-flighting a publication. Therefore, we could have easily assumed from that data that trapping functionality was not necessary. Through the input from the PAC though, we realized that there were specific instances where they would trap certain objects manually, and that although they rarely changed their trap settings, they relied on the trapping defaults built into other software packages.

As a standard practice with all Microsoft software packages, Beta releases[5] are given to groups of users in the target market for that product. While this is typically the end user, for this release we focused on Beta feedback from pre-press professionals. While lab studies can reveal errors in tasks we give them to perform, we can't always anticipate all of the tasks they will want or need to perform with the software. Letting them use a Beta release gave us valuable feedback that we would not have been able to get simply by testing it ourselves.

By discussing what our marketing message should be and the hurdles involved in getting Publisher accepted into professional print shops, we not only had a better understanding of how to promote the product to this specific market (i.e. talk the talk), but it also helped us prioritize which features were critical to Publisher's success in this market. This information comes into play during the final phase of the product cycle when features often need to be scaled back or cut from the product all together to meet the product release deadline. By understanding what our marketing message needed to be, we knew what we could safely cut from the product without hurting that message.

Were we successful?

Part of determining whether the collaboration was successful involves determining whether the design itself was successful. To determine the success of what we designed, we ran usability tests with both end-users and pre-press professionals. Unfortunately, with the end-user portion of the product, we had to change our design prior to testing; therefore, we were unable to test whether our collaborative effort was effective. It turns out that another Office application was developing a feature to help users transfer large files from one computer to another. Since we had modeled one of our pre-press features on this existing method, we thought it best to make the two as similar as possible so our users would only have to learn one process. Therefore, we had to make some changes in order to be consistent with the other Office applications. The end result was that it broke the end-user task flow for printing. This break in flow was evident in the results of usability testing. While users were successful at saving their files as postscript, they were not successful at properly collecting all the collateral material for printing, including all of the fonts and graphics. In other words, users would not be much more successful at getting their documents commercially printed then they were before we started. This change came late in the development cycle and therefore didn't leave us time to create a new solution that avoided the usability problems.

[4] Trapping is the process of adjusting the size of overlapping objects on a page to avoid gaps between them when printing on an offset printer.

[5] Beta releases are versions of the product that have not been fully tested for release to the public and are known to contain 'bugs' or defects in the code, but are stable enough to use to collect feedback from a small set of users.

Our design for pre-press professionals was much more successful. During the first usability test, we learned that the main usability problem was that our design for pre-flighting a file worked backwards from what pre-press professionals are used to, causing a high failure rate. For example, pre-press professionals are used to working in a model with the focus is on color. All tasks, including trapping are done through a color palette. Therefore, pre-press professionals think of the task of changing how an object traps as changing how that color traps in the particular object. As a result, they will select the object and look for the color palette to tell Publisher to trap that specific color. We thought that we could easily address this issue by adding a button to a color palette.

We made this change and re-tested the user interface. In this test, all participants could successfully pre-flight a Publisher file. Errors that participants made during the test were a result of hunting for the tools, not a result of being unable to correctly use the tools. However, once they learned the correct location for the tools, they were able to find them easily on subsequent tasks.

Why were we successful?

Even if we weren't as successful in creating the right flow through all of our professional printing features, we were very successful in collaborating both within our organization and between Microsoft and the PAC. There were several key factors associated with this project that led to its successful collaboration and thus a successful design and development process.

1. **Clearly defined target user** – we had a limited amount of time to develop this release of Publisher due to the fact that we needed to synchronize our schedule with the rest of the Microsoft Office team. The pre-press market was already slated to be a major focus for the release, but so were several other areas that focused on the end user. This forced us to cut back on our focus areas and pick just one area to improve for Publisher 2000. From our previous research, we knew the pre-press area alone, if properly designed, could be easily developed and marketed in our given time frame. By focusing our efforts on just this one area, we were able to clearly define whom we were designing for.

   This is one of the main points in Alan Coopers recent book *The Inmates Are Running The Asylum*. Cooper contends that in order to create a successful interface design for a software product the intended user has to be clearly defined before the process starts. Without this clearly defined target, it would have been difficult for the team to focus its energy and gauge its success.

2. **Predefined user workflow** – Most new features for Microsoft Office products enable people to do things that previously weren't possible. Since the functionality these features enable don't exist at the time of development, users have no existing workflow for these processes. With Publisher 2000 though, we were designing for a specific process that had been clearly defined for several years by the pre-press community. This made it easy for us to determine not only what functionality needed to be in the product but also how our target users would navigate through the pre-flight process.

   This point goes beyond what Cooper suggests in *Inmates*. While his process does include the creation of 'personas' – imaginary people based on an amalgam of real people – it deals mostly with the persona's high level goals rather than the lower level of an existing workflow. If we had simply created a persona of the pre-press professional and not included their existing pre-flight workflow, we would not have the pre-press community accept the product as readily as they did.

3. **No assumptions were made** – Product teams at Microsoft constantly research their end users to find out who they are, what their goals are, what technology they're using to accomplish them, etc… As a result, the entire team has a fairly clear picture of whom they are designing for. This was not the case with Publisher 2000. While the team understood the end users' needs, the world of professional printing was largely a mystery. When a team has a clear picture of their target user it is easy to make assumptions about what they will want to do without taking the time to find out if the assumptions are correct. The longer these assumptions go without being tested, the harder it becomes to change them if they are wrong. Since the Publisher team was unfamiliar with the pre-press domain, they were unable to make these assumptions. This forced the team to regularly consult with the Printing Advisory Council to answer their questions about necessary features and workflows.

   Here we differed largely from Cooper's method. As stated above, the method of creating personas does give a high level picture of whom the team is designing for, but it does not give any details about

specific processes for attaining that user's goals. If we had not collaborated with the PAC throughout the design and development process, we would not have been able to stay solidly on track. Put simply, we would not have had the information necessary to create a successful product.

4. **Getting "buy-in" from the beginning** – For the initial research phase of this project, we formed a Print Feature Team that was made up of at least one representative from each discipline on the Publisher team. Instead of having everyone focus on finishing the current product, these representatives focused half of their time on finishing Publisher 98 and half on planning for the next release. This team was responsible for researching the pre-press domain, brainstorming solutions and creating the overall workflow of the features. While not everyone on the Publisher team was included in this stage, everyone on the team knew that someone from their group was representing his or her opinions and viewpoints. While this team was not directly involved in the design of the UI for the features, they were involved in determining the higher-level flow among the features.

   Again, this goes beyond Cooper's method outlined in *Inmates*. While he does maintain that everyone needs to focus on the persona that is developed, he gives no indication as to how that can be done. We found that this initial buy-in from the whole team was essential to our success.

5. **The right information at the right time** – As stated above, the Print Feature Team was comprised of individuals from all areas of the Publisher team. The key point here is that the team was formed early enough to have the appropriate data available at the start of Publisher 2000 product cycle. If we had formed the team at the start of the product cycle, we would not have been able to provide useful data when the team needed it and thus would have run the risk of Print Feature Team loosing credibility, and therefore buy-in, from the rest of the team.

   While we were able to have appropriate data at the beginning of the product cycle, we did not have all the answers we needed to create a successful product. There were questions and issues we couldn't know about at the beginning of the cycle that needed to be answered later on. This is why it was essential to create the PAC and continue our collaboration with them throughout the project. To this end, we conducted several focus groups, each of which addressed a different set of functionality within the product (e.g. graphics, fonts, trapping, etc…). As questions arose within the Publisher team about a given feature, the PAC could answer them in one of the focus groups.

   Again, Cooper does not address this issue in *Inmates*. While the process for creating a persona is clearly illustrated, he does not give any insight as to what the rest of the team is doing while this process is happening. It is critical that research happens well before product development starts. Without the proper data to start with, the team has nothing clear to focus on.

6. **Getting feedback** – Microsoft is well known for its process of creating Beta releases of its products to get feedback from users, who are also able to find more product defects than Microsoft alone. It was through this process of collaboration with the PAC that Publisher 2000 gained its high level of fit and finish. We sent numerous test files to PAC members who would then run them through their pre-flight process using the new product before it was released to the public. Without this channel for direct feedback, Publisher would have had many defects that would not have been detected until it was in the hands of the general pre-press community. By this time it would have been too late. We knew that if it posed too many problems for the pre-press community on the first try, we would probably not be able to gain acceptance in this market.

7. **Shared goals** – for both areas of collaboration on this project, within Publisher and between Publisher and the PAC, we shared a clear and common goal: to enable Publisher users to easily have their publications professionally printed. The Publisher team was motivated by the desire to help our users easily achieve their goals and to have Publisher more fully recognized as a viable solution for the Office user's publication needs. The Printing Advisory Council was motivated by their desire to have a product they felt fit their technical needs and existing workflow. If we had not started the project with a shared goal that benefited all groups involved, the group might have polarized into factions who would struggle against one another rather than working together.

   These last two points are outside the scope of Cooper's notion of personas. By their very nature they are collaborative and not directly relevant to the creation or use of personas. Nonetheless, they are a critical part of any successful product development process whether or not personas are used.

While not many software products developed at Microsoft have this level of predetermined focus and dependency on outside experts, they do all share the need for a unified set of goals that the entire team believes in. The steps listed above allowed us to work as a unified team from the beginning of the project. Without shared goals, we would not have been able to create a product as successful as Publisher 2000, especially in a time frame as short as we had.