

Managing Technical Content:

Investigating the Value and Impact of a Content Management System
(CMS)

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Abstract

As the field of technical communication evolves and expands into various industries, the content and how it is created and managed evolves, too. The maintenance of content, specifically technical content in this case, is where content management systems (CMS) come into play. Companies often decide what kind of CMS they want to implement based on their needs. Adobe Experience Manager (AEM) is the CMS implemented by a global company. In this report, I analyzed some of the existing literature on CMS implementation and then interviewed four practitioners at the global company, who have some experience in the technical content industry, though not all identify as a technical communicator, and have been exposed to a content management system. My analysis shows that there are many reasons to implement a CMS, including reuse, translation, version control, and automation of document publishing, to name a few. Technical communicators are often introduced to CMS through their own research for content solutions or by another who is conducting that research. Through communication, collaboration, and involvement, others may be convinced of a CMS's value. While there are many challenges with implementation, it is a matter of how they are handled that will determine whether or not an implementation is successful.

Keywords

Technical communication, content management, content management systems, CMS, CCMS, WCMS, ECMS, Adobe Experience Manager, AEM, translation, localization, reuse, version control, change management, implementation

Managing Technical Content: Investigating the Value and Impact of a Content Management System (CMS)

As the field of technical communication evolves and expands into various industries, the content and how it is created and managed evolves, too. Technical communicators have found themselves bearing different job titles, such as content strategist or usability experience (UX) writer, as they develop more skills beyond traditional technical writing. One of these skills is “the ability to understand publishing tools, to understand and implement the tools to publish content” (Johnson, 2020). There are a multitude of publishing tools from Microsoft Word to WordPress to Adobe FrameMaker, just to name a few. Each publishing tool serves a different purpose and technical communicators often decide which tool best serves the purpose of their content. While different tools can be used to publish content, once that content is created and published, it has to be maintained.

The maintenance of content, specifically technical content in this case, is where content management systems (CMS) come into play. The term *content management system* is a rather broad one as there are many kinds available, such as web (WCMS), component (CCMS), and enterprise (ECMS). Companies often decide what kind of CMS they want to implement based on their needs. For this study, I will use the broad term, where CMS is a tool that creates, manages, and modifies digital content. I will specifically investigate Adobe Experience Manager (AEM), which Adobe describes as a system that “combines digital asset management with the power of a content management system” (Adobe, n.d.). AEM is the CMS implemented by a global company with an expansive product portfolio, which will be referred to by the pseudonym SciTech.

There are plenty of reasons why a company would choose to implement a content management system, though it is unclear why they would choose one system over another. When companies produce large quantities of technical content of varying types (documentation, presentations, video, etc.), it has to be managed in some way and it is possible to become overloaded. Documentation can get lost in convoluted folder structures. Version control may be more difficult without an efficient way to track as content may go through rounds of revisions and approvals. Translations and localization must also be considered as with each revision the translations would need to be updated as well. What about reuse of approved content pieces? Technical content may be used in multiple places.

Because technical content may be published in multiple places, companies, like SciTech, have to consider regulations, both at the state and federal level in the United States as well as regulations existing in outside governing bodies. When writing for an industry that is highly regulated, such as in medical, financial, or worker safety, version control and documentation of those versions is essential. For the technical content group at SciTech, AEM's ability to function as a CCMS is integral to the documentation creation and management process as it "manage[s] components by tracking links, versions, and metadata relevant to each component" in addition to "location in the repository, relationship with other components, uses, and so much more" (Baker, 2020). Despite understanding the capabilities of AEM, I decided to investigate why SciTech chose AEM as the CMS tool to meet their content needs.

Key Questions and Problem Statement

While AEM offers solutions to many of the complex problems that come from creating large amounts of content, how do technical communicators get introduced to such a tool? How do they convince their teams to implement a CMS in general? When technical communicators already use an array of publishing tools, it can be challenging to convince others of the value a CMS may bring. Technical communicators might recognize the need for a CMS and the solutions it offers, but those who are not in the field may be skeptical if it will work as advertised and could be resistant to the change (Coggio, 2015). Convincing upper management could potentially be another barrier as well since many content management systems are costly, from customization to implementation to training to administrative upkeep (Samuels, n.d.). This study sets out to answer these questions while also considering what challenges are faced by key stakeholders and users when implementing a CMS.

Literature Review

Literature review was conducted through the University of Minnesota's library system (lib.umn.edu) to search several databases collectively. Keyword searches included "content management," "content management AND technical communication," "content management AND motivation," and "content management AND implementation." Through these keyword searches, article titles were analyzed for relevancy as well as the journals in which they were published (e.g., *Journal of Business and Technical Communication*, *Technical Communication*,

EEE Transactions on Professional Communication, Technical Communication Quarterly). Other articles were located via practitioner sites, such as TechWhirl and idratherbewriting.com.

Keywords for these practitioner sites included “content management,” “CMS,” “CCMS,” and “version control.” Keywords searched on practitioner sites were slightly different because they yielded relevant results whereas they did not yield relevant results when searched on the library system. Locating articles in relation to content management was relatively easy, which required me to be selective based on when articles were published. Most of the literature reviewed has been published within the past ten years (2011-2021) with the exception of a few pieces dating back to 2007.

The literature review proved to be lacking when trying to understand how companies are introduced to CMS and how they implement them. This lack of specific information apparently is not new as Andersen (2014b) notes: “the scholarship has been less helpful in increasing our understanding of how organizations are actually transitioning to CM[S]” (p. 117). One explanation for the lack is that “[o]verall, the number of different technologies used for composing is striking, indicating that no single technology can be called a ‘standard’ tool” (Blythe, Lauer & Curran, 2014, p. 275). However, despite CMS not necessarily being considered a standard tool, the literature offered plenty of insights for why companies seek out CMS implementation as well as the challenges they face when transitioning.

Reuse, Standardization, and Consistency

Reading through the literature, multiple reasons were given as to why companies transition to CMS. One of those reasons is driving down cost, and one way to drive down cost is through reuse. When content is reused, it becomes “adaptable and portable” (Andersen, 2014b, p. 116), something that is echoed across the literature (Carliner, 2012; Batova & Andersen, 2014; Dush, 2015; Batova, 2018; Baker, 2020). Reusing content not only saves cost; it saves time. Because content can be managed at a component level, users will only have to make a change in one place rather than many (Bailie & Huset, 2015). Reusing content in such a way requires standardization, which enables content to be consistent. Components managed in a CMS “conform to rules defined by standards and schemas, which ensure that the topics are consistently structured and can be assembled into different information products that are rendered in different outputs for different delivery channels” (Andersen, 2014b, p. 116). These different outputs can vary by file type all while originating from a single source (Lanier, 2012).

When a CMS allows for content to be reused and shared in a variety of formats, sharing content across regions, including other languages, becomes even easier.

Translation and Localization

Another consideration for driving down cost is the management of translation and localization (Batova & Clark, 2015; Batova, 2019). Companies often need to decide whether they want content to be translated or localized. Translation is cheaper as it only requires the text to be duplicated in another language with the same meaning. However, there are nuances to this as localization can assist with product resistance due to it being more involved, taking into account the “cultural, rhetorical, educational, ethical, legal, and other characteristics of readers and the global, national, and local contexts” (Batova & Clark, 2015, p. 223). Working within a CMS, content that would need to be translated and/or localized would be sent at the component level while also allowing the view of the whole document so as not to lose context (Batova, 2019). Sending content at the component level would also allow components to be translated once, removing the chance of doubling the translation work and cost (Baker, 2020). However, translators do not perceive the management of content at the component level as a positive. While they are provided context for the specific component they are translating, they do not know all of the possible uses (Batova, 2019).

Issues, Resistance, and Failure

While cost is one of the drivers for implementing a CMS, it is not the biggest challenge, nor the only one, that companies face. Dayton and Hopper (2010) noted in their study that about 1 in 10 companies reported a failed implementation. Reasons cited include poor fit, difficulty, and cost as well as lack of management support and the tool not performing as expected. Another reason is “lack of analysis and strategic planning before selecting a CCMS” (Andersen, 2014a, p. 216). Lanier (2012) found that the very organizational structure was altered as the CMS “created new responsibilities and effectively a new position in each office” (p. 105). As it turns out, the literature had much to say about change management. Not only do workers have to learn a new tool, but they also have to learn new procedures and vocabulary (Lanier, 2012; Coggio, 2015). These tasks can be difficult, especially to those naturally resistant to change. The resistance to change increases when there is poor communication from management, a lack of resources and

training, and when people involved do not feel valued or invested (Andersen, 2014a; Bailie & Huset, 2015).

Methods and Approach

To gain a better understanding of how technical communicators are introduced to a CMS, what motivates them to implement, and what challenges they face, I set out to interview some practitioners in the industry currently undergoing implementation of the CMS tool AEM. Four participants at a global company, referred to as SciTech, were interviewed via Microsoft Teams (audio recordings). The company was chosen based on my work experience there. Participants are people who have some experience in the technical content industry, though not all identify as a technical communicator, and have been exposed to a content management system. There were 10 interview questions, which were formulated to gain an understanding of how participants were introduced to AEM and their thoughts and experiences surrounding it. These questions were the same for each participant with opportunity for clarification or follow up questions. Interviews were conducted in a semi-structured way. The interview questions were:

1. What is your current job title?
2. How long have you been working in the technical content industry or role?
3. What is your experience in creating and/or managing technical content?
4. What is your experience with content management systems?
5. Considering Adobe Experience Manager (AEM/Adobe Assets), how were you introduced to this particular content management system?
6. What was your first impression of AEM and have you noticed any impressions others may have had?
7. Whether during implementation or general use, what advantages or disadvantages are there, or that you foresee, when it comes to content management systems, such as AEM?
8. Have there been challenges faced by key stakeholders or users, including yourself?
9. If you had to introduce AEM to someone who has never heard of it but would need to use it in the future, what would (or did) you say?

10. This concludes the interview. Is there anything you would like to add that may be beneficial to my research that I didn't ask about?

The approach was qualitative in nature as I did not intend to gather quantitative data. Rather, I gathered personal experiences and opinions regarding the creation and management of technical content. The global company and the participants are not identified in the paper. Pseudonyms are used in place of their names to maintain confidentiality. This research project was reviewed by the University of Minnesota Institutional Review Board (IRB) under STUDY0001243, and the IRB determined this project as "not research involving human subjects defined by DHHS and FDA regulations." I emailed participants directly to recruit them, to send them the consent form (Appendix A), and they consented in their email responses. Management approval of these interviews being conducted was also expressed by email. In addition to comparing the responses in the interviews, I analyzed the literature to gather insights, experiences, and case studies to further understand how certain content management systems are chosen and implemented.

Discussion and Findings

Introduction to AEM

The literature review did not provide much information on how technical communicators are introduced to content management systems. Many of the articles focused more on the why, briefly mentioning that the implementation of a CMS was a requirement from upper management. The articles never touch on why it was becoming a requirement or how upper management came to the conclusion that they needed a CMS at all. The interviews conducted with the participants at SciTech were far more enlightening because not only did I learn what experience with CMS the participants had prior to the implementation of AEM, but also that their introductions to AEM, directly or indirectly, tied back to the same person.

Talia

Let us meet Talia, a Technical Content Leader. She has been in her current position for well over a year and a half and has been working in the technical content industry since 2007. Her experience in creating and managing technical content varies across the spectrum, displaying a wide range of skills, such as authoring, layout formatting, working with translations, syndication, printing, and strategy, to name a few. When it came to AEM, Talia learned about it

through research as she was deeply involved in the strategy for selecting, choosing, and piloting a CMS. Through the research process, she met with 22 out of 24 divisions within SciTech to discuss how each area created and managed their content. She sent out a global survey, even to those not necessarily labeled as content creators, to get feedback on what they would like and expect from a system. Using these insights, their goals for what they wanted to use the CMS for could be presented to upper management. And how was AEM ultimately chosen? Talia spent six months researching a few weighted options, utilizing free subscriptions to measure how easy the systems were to use as ease of use was one of the most important factors to those she received feedback from. After determining that AEM suited their goals and business needs, Talia proceeded to be a part of the process as she helped implement the CMS as well as helped train others how to use it.

Gina

Next, there is Gina, a Content Management Specialist, who started working with technical content in 2000. When she was not in a position where she was creating technical content, she had positions around product and project management, software development, and engineering. Before AEM, Gina did not have previous experience with a CMS. Rather, she used the concept in other ways: creating network drives and organizing them, researching Darwin Information Typing Architecture (DITA) and Extensible Markup Language (XML) because the coding aspect was appealing. At the time, CMS were fairly new, and companies were not willing to invest in them, did not know much about them, or did not have the resources available. For Gina, she often started out as the only technical writer, which made having a CMS implemented unlikely. With what Gina had available, she made the concept of CMS work without actually having one.

In 2017, Gina met Talia, who was researching content management solutions. Talia made a point of meeting with Gina and her coworker to discuss CMS and the capabilities of AEM, and she asked for their help with onboarding and piloting the system. Gina and her coworker felt excited for the opportunity to transform how they work. The realm in which technical content was created kept changing as Gina recalled documents being created and managed in Microsoft Word to being created and managed in unstructured FrameMaker and then into structured FrameMaker. She felt AEM would only take technical content to the next level since it meant separating form from content which would allow them to gear how the content was distributed.

Diane

Diane, a Technical Content Manager, is not too different from Gina. Most of Diane's career has been authoring technical content, specifically as a health and safety expert, and she has been with SciTech for the last 20 years. Originally, technical content was created and managed manually, which meant it was routed and approved manually as well. Diane recalled having paper folders with a list of names where reviewers would take their red pens and mark up documents before crossing their names off the list and passing the document on to the next reviewer. To manage these physical documents and their versions, they were kept in an archive. The game changer to this process was Lotus Notes, an application owned by IBM, which allowed for documents to be routed, marked up, and approved digitally. While Lotus Notes was a game changer to the process, Diane learned of CMS, specifically AEM, through the presentations that Talia gave. Diane met Talia five years before Talia joined the same division within SciTech. It was through word of mouth that Diane learned what Talia was doing with content and the tools she was looking at for managing it. Diane said it was through these one-on-one conversations, interactions, updates on the tool, and tech forum presentations that she learned about AEM.

Nick

Then there is Nick, a business analyst/systems administrator for corporate research and development. His first exposure to technical writing was in 2013 when he was hired as an intern under IT, creating documentation for applications in sales operations. While in this position, Nick created user instructions for the Oracle application as well as Standard Operating Procedures (SOP) and a central repository that corporate could use to analyze sales from around the world. His prior experience with CMS was related to Salesforce, though not technically a CMS, but that is where he built the central repository, using it like a CMS. Nick also mentioned other types of applications that may not be traditionally viewed as CMS, such as Moxie and Knowledgebase. It was in 2019 when he interviewed for the position he has currently that he was introduced to AEM. During the interview, he was told he would lead the project for AEM, the CMS that SciTech had already purchased. Nick eased himself into learning more about AEM by finding out what kind of technical content was being routed and approved; he did not know all the types of content SciTech created and the laws involved with each type. His introduction had him collaborating with others involved with the system and who were experts in it, like Talia.

Motivations for Implementation

The literature review and interviews revealed that there are plenty of reasons and motivations for implementing a CMS. Some of those reasons listed in the literature review are that CMS make content adaptable and portable (Anderson, 2014), provide standardization and efficiency (Dayton & Hopper, 2010), make reuse of content feasible (Carliner, 2012), and push down costs of translations and localizations (Batova, 2019). McCarthy, et al. (2011) noted that the importance of version control was another reason for implementation as all versions of documents “are stored in one location and organized within the database, in which the most recently approved version is the default view, but previous versions are retrievable” (p. 383). These reasons were echoed in the interviews, and the interviews offered additional motivations as well.

Gina

For Gina, she liked the connection AEM has to its other products. The CMS would allow content created in structured FrameMaker to be leveraged. Due to its user interface, Gina felt that AEM also provided a better experience for creating outputs. While she was more comfortable with FrameMaker, she was happy once she understood how the programs functioned together as well as how they functioned separately. AEM also enabled Gina to create in a way FrameMaker would not allow. For example, she was able to create a table to store values for a topic in AEM, but not in FrameMaker. These topics were listed as a key advantage for Gina because they enabled cleaner and more succinct writing. AEM allows writers to pay more attention to reuse, which means a smaller number of variations across documents.

Diane

Diane also noted the advantages AEM brings to a large organization, like SciTech, that creates high volume and complex content with a broad reach across countries and languages. She said that from a management perspective AEM provides efficiency, speed, and consistency, and it makes it easier to manage all of the content. While Diane does not identify as a technical writer, she points out how technical writers would see different advantages, such as the automation of document publishing. Because the CMS is an Adobe product, Diane also mentioned the ability to customize the product across the enterprise as it gets deployed.

Nick

Because of Nick's position as a business analyst/systems administrator, his view is unique in that he did not necessarily feel motivated to implement since the implementation had been planned before he was hired. However, he noted that he was optimistic about AEM. He thought it was "very cool" and he felt excited because it had a lot of great features to offer the organization. Nick recognized AEM as a place where files could be uploaded and shared, including outside of the company. Since AEM is also considered an enterprise Digital Asset Management (DAM) system, there is potential to share documents to a variety of places: universities, news outlets, manufacturers, customers, and even competitors (he cited competitive analysis when mentioning this last one).

Talia

Having a deeper involvement with AEM, Talia offered a view as unique as Nick's. She understood that AEM is a very large tool, where people could do a lot of things from one location. She called it a "one-stop shop" as it offers enterprise-level solutions that can handle content creation, routing and approval, translation, layout, and distribution. The tool also has the ability to take over things they are doing manually or disconnectedly. Another key advantage to choosing this specific CMS was that Adobe, the company itself, was continually investing in the tool. Talia stated that some companies do not invest anymore in their CMS tools, where instead they offer a yearly update or they charge extra for add-ons and changes. Partnering with Adobe allowed access to their customer connections as the company listens to what their customers are saying, providing updates as they become feasible.

Challenges

Gina

Because SciTech is still in the process of implementing AEM, it is too soon to label it a success or failure. However, challenges must still be addressed as CMS implementations are often cited as failures or plagued with issues and resistance (Dayton & Hopper, 2010; Coggio, 2015; Anderson, 2014a; Batova, 2018). During our interview, Gina said that one of the disadvantages is the amount of planning the implementation of a CMS like AEM takes. She stated it is difficult to make the time to get it all going and that all of the documents would be impacted. Because AEM changes the technical content process, other considerations needed to be made as well, such as naming conventions of files and making sure everyone is on the same

page so as not to duplicate content. Gina also noted that other users would be using AEM differently and so their needs would differ from those of the technical content team. She said it is important to keep the audience in mind, even when the audience is your coworkers. To counter challenges, Gina emphasized explaining to the team why the change to AEM was occurring. Citing change management as a key to ensuring success, this approach would require more team engagement to help team members understand their role, what new skills they needed to learn, and how this change impacts their roles.

Diane

Diane noted similar challenges as well. She said since implementation is in phase 1 that not all of the features of AEM are unlocked, which makes the system clunky and time consuming to use. However, Diane recognized the importance of implementing in small stages to make it successful and that it was an iterative process; the system would not always be clunky as more of its features are deployed. Like Gina, Diane cited change management as key. She stated, “You’re never going to please everyone.” There are a lot of different systems and one-size fits all generally does not work, though you also take risks when getting too customized. There is also a challenge in finding the right balance around the expectations, needs, and musts around the system itself as well as what was considered nice to have that would make certain teams happy. Being at the management level, Diane mentioned how there is a challenge in finding the right vendor to work with a company like SciTech, where all parties have to be onboard and work with everyone’s timelines.

Timing is also everything. Some people are too busy and do not want to learn a new system while other people just do not like change. It is difficult to take on new responsibilities in addition to the ones that are needed for day-to-day business. Diane stated the importance of reading your audience to understand what the motivating factor is for them. She also emphasized that top-down messaging needed to be as clear as possible in addition to making sure the strategy, goals, and timelines are communicated. When it comes to those who resist change, she said it is about finding a balance between leading and pushing.

Nick

For Nick, the challenges were viewed differently. From a user perspective, he noted how AEM currently does not have the ability to edit PDFs in the browser, that there is no on-screen

editing for a multipage document. Right now, these documents have to be downloaded and reuploaded during the routing and approval process. Due to SciTech's size, Nick said there is some sway in asking for customizations, however, it takes time to get product changes when working with a large software company. From a corporate and security perspective, Nick noted challenges that were not found in the literature review. Some of the business requirements were not necessarily aligned with the system capabilities which made configurations difficult. He stated there was not an easy way to administer security at the user level of who is allowed to review and edit documents once they were approved. Nick also considered security challenges to the organization as a whole, stating that SciTech "is entrusting Adobe with the security of their assets" in the CMS. Near the end of the interview, like Gina and Diane, Nick also recognized the importance of change management during implementation. He noted that any mergers and acquisitions with SciTech have to be taken into account because the business groups function differently.

Talia

Talia, on the other hand, did not mention change management. She said, "A new tool is always difficult to learn." No matter what it is, change will need to be dealt with and so it is an expected part of the process. Instead, challenges Talia noted focused more on the strategy. She said they had to consider if they were resourced enough in order to take advantage of a system like AEM, whether or not there was a budget for it, and if it fell into the list of priorities. There was concern in getting a full corporate approach and resources to implement. Talia said there were additional challenges in communicating the technical value and a lot of it had to be simplified greatly so stakeholders could understand the raw value of the CMS rather than explain it at a granular level.

Conclusion

Through the interviews and literature analysis, I found there are many reasons to implement a content management system, such as AEM. Reasons include reuse, standardization, consistency, efficiency, translation, localization, version control, compliance, automation of document publishing, and routing and approval. How companies decide to implement a CMS comes down to how people are introduced to the tool. In the case with SciTech, it came down to a proactive person researching solutions and then communicating that knowledge to others.

However, that is not to say one person is responsible because collaboration and involvement is key to convincing others of the value a CMS offers. In this way, issues and resistance with implementation might be avoided, where otherwise they might cause a failure altogether. As the interviews revealed, people generally do not like change and implementing a large, complex CMS takes a lot of time and planning. As Diane said, “A system is just a system; it’s about the process.” It is a matter of handling the challenges.

Areas for Future Research

At the end of my interview with Talia, I asked if there was anything she wanted to add that might be beneficial. She noted that she foresees a lot of opportunity within the technical communication industry in the next 10 years, describing a shift within IT as more digital roles will likely appear that are similar to IT but are actually more related to content management. From a content creation perspective, there might be a switch from the technical writer to the science-based individuals, or Subject Matter Experts. In higher education, universities may start to prioritize courses around content management to better prepare students for these digital roles. Future research may include tracking career paths in content management, analyzing workplace practices and content creation as companies shift to CMS, and studying what kinds of coursework in content management are needed.

Limitations

This study is limited in scope as it only investigates one case of a CMS being implemented by a global company due to the study’s short timeframe. It also has limitations in that the pool of participants was small and so, therefore, offers specific and unique perspectives that may not be true for other cases of CMS implementations. Answers provided were subject to the interview questions formulated, which means more information could be provided if there were additional questions.

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Appendix A

Consent Form

Title of Study: Driving Technical Content: Assessing the Impact of a Content Management System (CMS)

You have indicated an interest in being interviewed for a research study in which you will be asked to provide your thoughts on the content management systems.

This study is being conducted by Miranda De la Victoria, Master of Science student in Scientific and Technical Communication at the University of Minnesota – Twin Cities.

Background Information

The purpose of this study is to learn about technical content and content management systems.

Procedures

If you agree to be interviewed, your participation will consist of an interview about your experience with technical content and content management systems. Your participation will not exceed one hour of your time.

Risks and Benefits

There are no foreseeable risks associated with your participation in this study. Participation in this study may benefit you by encouraging you to think about the ways in which technical content is written, revised, and translated.

Voluntary Nature of the Study

Your participation is strictly voluntary, and you are not required to participate in this study. You can withdraw from the study at any time. Your decision to withdraw will have no effect on your relationship with the University of Minnesota.

Confidentiality

The records of this study will be kept private. In any sort of report that may be published, no information will be included that will make it possible to identify you or the company.

Pseudonyms or numbers will be used in place of your real name to protect your identity and the company. If you agree to participate in interviews, your interviews will be recorded (audio). I will be conducting interviews over Microsoft Teams and at the outset of the interview may ask if I can record our session. If I record our session, the file will be stored on my laptop until May 4, after which I will delete the recording. Only I as a researcher will have access to these data.

Contacts and Questions

The researcher conducting this study is Miranda De la Victoria. You may ask any questions you have about the study now. If you have questions later, you may contact me through email: nels7188@umn.edu.

You will be given a copy of this form to keep for your files.