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Content as a Service (CaaS)

The future is challenging traditional publishing in ways hardly imagined before. Traditional publishing relies on assembling content from many different sources of information, including technical specs, procedures, and marketing content from their respective contributors and repositories. These silos of information need to be consolidated from various repositories and then formatted before publishing documents such as PDFs, apps, or web content. The old ways of traditional publishing can severely restrict what the customer can see at any given time. The customer might not have exactly the information he or she needs to get work done.

And yet, most complex manufacturing and laboratory systems rely on traditional publishing. For example, a manufacturer requires a laser cutter on the factory floor to cut a new material of a certain width. To cut the material, the firmware of the laser cutter must download information to set the machine correctly for cutting. In some cases, the machine requires a firmware update. The update must include many pieces of information from many different sources, including engineering specs, the firmware update, and the readme from various vendor repositories or even various pieces of information from multiple vendors. In any case, executing the firmware update to cut the material depends on consolidating many sources. Content has become so fragmented and is coming from so many different sources, in many use cases traditional publishing just doesn't work very well anymore. To update the proverbial laser cutter, it would be more efficient to pull blocks of content from different sources on-demand.

In a changing world, where people read content on many devices, where artificial intelligence (AI), "machine intelligence," can drive what people read, it's time to consider a new paradigm for content creation and delivery: Content as a Service (CaaS). CaaS already has a proven track record in retail (Spotify) and customer relationship management (CRM; Salesforce). CaaS is just beginning to be a useful technology in technical communications for on-demand delivery of technical content.

## DISTINCTIONS BETWEEN CaaS AND TRADITIONAL PUBLISHING

CaaS differs significantly from traditional publishing. While traditional content such as a PDF is prepackaged and then "pushed" to customers, CaaS content is "pulled": Content is requested by customers first, and only then is the content rendered, formatted, and filtered upon request. With traditional publishing, the customer gets a PDF manual or online instructions. On the other hand, CaaS delivers, assembles, and formats content on demand in the format required by the customer. See Figure 1.

Figure 1. In CaaS, content-on-demand is formatted to the appropriate deliverable only after the customer calls or requests relevant information from the content source. Adapted from Sarah O'Keefe, "What is Content-as-a-Service," Adobe DITAWORLD 2022.

Traditional Publishing PUSH		CaaS PULL	
1. Write	Owner	1. Write	Owner
2. Format		2. Publish	
3. Publish		3. Call content	Customer
4. Distribute		4. Format	
5. Use	Customer	5. Use	

CaaS is different from traditional publishing in the way content is managed. CaaS allows mobile app developers to feed apps with content from the backend. With CaaS, you can keep the core content in an app, but the screens for apps can change according to location or types of instructions on-the-fly. Because CaaS controls formatting only after delivery of content, CaaS assures omni-publication of content, including web, mobile, social networks, and smart devices. CaaS delivers significant flexibility and enhanced usability to customers.

CaaS goes beyond making publication more fluid. It is more efficient than traditional publishing. CaaS represents a single source of truth for omni-channel content delivery, because the IT architecture of CaaS links many repositories with a string of APIs connecting them. The APIs are bits of software that connect the repository to the downstream applications that are calling and formatting the content. So, instead of relying on disconnected silos of information from different groups who own the information, CaaS can require only a single editorial team to manage the connected information repositories. Because content is consolidated from many different repositories before formatting, CaaS can flexibly present content. See Figure 2.
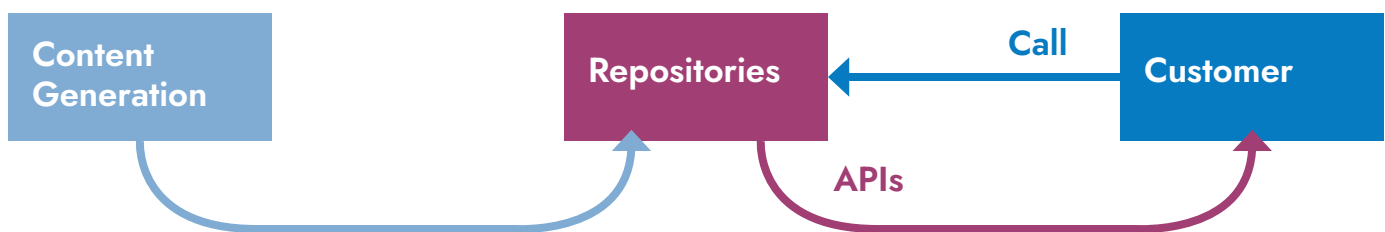
Figure 2. A customer calls for information from the content source (repositories). The APIs mediate delivery of content that customizes the target documentation. Adapted from a slide presented by Sarah O'Keefe, Adobe DITAWORLD 2022. Adapted from Sarah O'Keefe, "What is Content-as—a-Service," Adobe DITAWORLD 2022.

The technical requirements for CaaS are reasonably straightforward. Content for CaaS can be stored in XML format but usually requires a "neutral format storage," Content will be formatted later. After content has been identified for use, the stored files are delivered in JavaScript Object Notation (JSON) format. In CaaS, the logic behind what is relevant or useful content at delivery depends on the pull system. The pull system could be driven by AI or by much simpler data tables.

CaaS coupled with AI can further drive efficient content delivery through machine learning. If AI can learn to identify the intention of customers through their requests, then CaaS can deliver content that is specific to that intention. We'll see how AI can drive the development of meaningful responses in chatbots.

ADVANTAGES OF CAAS OVER TRADITIONAL PUBLISHING

CaaS offers a number of potential advantages over traditional publishing. For instance, CaaS affords significant customization in comparison to traditional publishing. Writers of marketing, engineering, or technical topics can tag the content with associated metadata. By appropriately labeling conceptual, procedural, or referential content according to product platform or system state, CaaS transfers only relevant content to the requestor. That laser cutter will call and receive a software update to cut the new material only.

As an example of customization through use of APIs, consider Swagger, a suite of API developer tools offered by Smartbear Software. CaaS can be used in the publication of content after its processing through Swagger-generated APIs. APIs are fed to structured content in DITA (Darwin Information Typing Architecture) so that content is pushed to a CMS such as an Adobe Experience Manager (AEM) CMS. Through use of Swagger in CaaS, the Swagger API toolset converts content into DITA and then, after publication, Swagger APIs call the repositories to customize and publish the content. Relevant topics for the task can be inserted into the standard documentation to tailor the content for the customer.

Another advantage of CaaS over traditional publishing is economical delivery. There is no on-device storage of content. Content owners need only update the content repository, not the content on the device, because the content is pushed to the device. The laser cutter calls for specific settings to cut the new material; it doesn't call all settings for all materials. Economical delivery by CaaS reduces the burden of data capacity and cuts the delivery time of content.

APPLYING CAAS TO REAL-WORLD PROBLEMS

To demonstrate the practical use of CaaS, consider a current real-life application. Using technology to apply CaaS, microcontent can be used to populate topics in structured content or in chatbots for flexible content delivery of small components of information. The company Precision Content drives use of microcontent in CaaS. This company defines microcontent as content about one idea, fact, or concept. The content is easily scannable and can be clearly labeled by the technical communicator at the time of authoring the content through tags and metadata. This is how blocks of microcontent can be scaled. Precision Content says that microcontent can be used anywhere and at any time. For example, the components of a task topic in DITA, such as purpose, task, and reference, are all created from microcontent blocks. These blocks can be freely exchanged to build new topics or be used in omnidelivery of content. Therefore, microcontent is perfectly suited for CaaS, because microcontent are deliverables in this pull technology.

Precision Content provides a solution to generation of meaningful answers in chatbots through CaaS. The company resells WittyParrot™ from AcroWit. Precision Content calls WittyParrot an "intelligent Communication & Knowledge Automation platform." The platform is used with a Precision Content product called WittyDITA™ to identify, through machine learning, the intent of a question, say, in a chat. Next, the algorithms in the platform (particularly in the WittyDITA™ application of the platform) match intent in the question with the relevant microcontent to return a meaningful reply in a chatbot. If a user asks how much oil her Kawasaki motorcycle needs and how frequently, the chatbot will reply, perhaps, 1 quart every 3000 miles. See Figure 3.
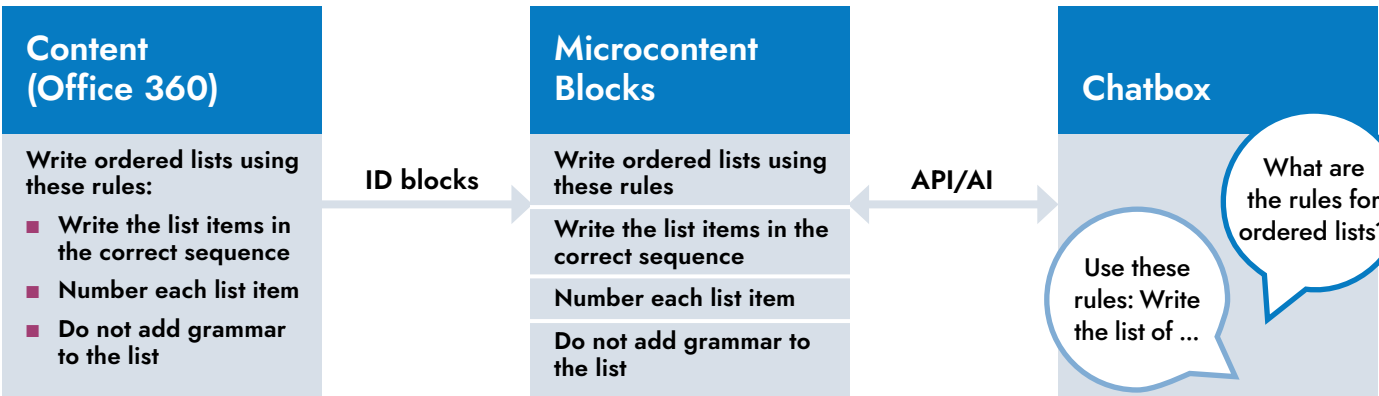
Figure 3. The WittyParrot™ platform in conjunction with WittyDNA responding to a chatbot request for information with microcontent blocks. Adapted from a slide presented by Rob Hanna, Adobe DITAWORLD 2022. Adapted from Rob Hanna, "Microconent and the Future of Publishing," Adobe DITAWORLD 2022.

While an AI-powered platform like WittyParrot is proof of principle of CaaS, the continued use of CaaS depends on its wider application. Precision Content sees wider use of its platform with AI-driven tools like Acrolynx, which helps users create content.

As CaaS is finding use in retail and marketing, CaaS is evolving. Sarah O'Keefe, CEO at Scriptorium Publishing, sees CaaS to become integral to product lifecycle management. CaaS could be used to update machinery on the factory floor. In medicine, the FDA is increasingly focused on Software as a Medical Device (SaMD). Software could alert doctors to medical emergencies in the ICU minutes before they happen. SaMD would rely on delivery of customized content that the doctor would use so that the software itself can make highly specific diagnoses at bedside. It's not out of the question that SaMD will drive advances in health.

SELECTING AND IMPLEMENTING AN EFFECTIVE PUBLISHING METHOD

Choosing between traditional content or CaaS is straightforward. If the content is static, then choose a PDF or other static content to perform the task. If the content needs to change according to the software or system, then choose CaaS. CaaS can also mean faster delivery of content before the business pulls the customized content to its systems.

Wide use of CaaS could mean that we, as a project team, will work differently. If our repositories are more accessible for content via APIs, product managers, engineers, and technical communicators might collaborate more effectively to write the required deliverables for launch. The work of technical communicators might be particularly impacted by CaaS through a more conscientious use of XML format and assiduous tagging of content blocks with metadata. The metadata would be key toward curation of microcontent by CaaS, say, by matching the blocks of content with ontologies (structured indices) that are used toward omni-publication.

The challenges for implementing are not insurmountable. Content needs to be separated from formatting. As long as content is stored in a neutral format and is linked by APIs to relevant repositories, content can be rendered as needed. CaaS promises to revolutionize content delivery by clearing the clutter in our daily lives at work and home - its ultimate publication efficiency.

CONCLUSION

As manufacturers and laboratories look to find efficient methods of creating and delivering content, it is becoming increasingly clear that traditional publishing is no longer the answer. In contrast to the limited capabilities of traditional publishing, CaaS facilitates significant flexibility, requires a far less involved process, and allows for greater customization, among other benefits.

CaaS is the content management method of the future; therefore, it is crucial that marketers and developers take action to implement CaaS and begin working to integrate this solution into their business workflows. This involves numerous factors, such as determining the right CaaS provider for them. In order to navigate these challenges and ensure that the implementation of CaaS will promote maximum business value, it is essential that businesses partner with professional consultants who are able to aid them through the process and who have the necessary skills to create content that is compatible with CaaS. In doing so, businesses will be in a better position to stay up to date with today's fast-paced world and their customers' constantly changing needs and expectations.

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