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6. Content Management

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Content management (CM) refers to the methodologies, processes, standards, and technologies that allow communicators to create and manage ***information*** as modular units for the purpose of reuse and multi-channel publishing. Having first emerged as an interdisciplinary area of practice in the mid-1990s, content management has redefined what it means to be a communicator and conduct technical communication (TC) work. For technical communicators, the practice has introduced new approaches to writing, new processes for managing and publishing content, new roles such as information architects and content strategists, and new competencies such as structured authoring and business analysis.

CM allows for writing content once and reusing it by different people at different times and in different contexts to create any number of information products. These products can be published through various delivery channels (e.g., websites, mobile applications, and ebooks) and accessed from various devices. In CM literature, the term *content* is typically described as "any text, image, video, decoration, or user-consumable elements" that help people understand "an organization's products or services, stories, and brand" (Abel, 2014, p. 12). It is what we produce (Abel, 2014) but also "how we produce and update" (Hart, 2013, p. 30). In technical terms, content is the meaning that is held within and transported by a container (Abel, 2014)—a set of standard markup tags that contain the content and allow for automated processing of content. For example, a single content unit might be a "medication description" that can be simultaneously published to a PDF of an informed consent, an online Q&A, and a medication insert. Content units can also be building blocks, allowing customers to generate a user guide on demand based on the product features that are relevant for them and for the device they are using.

In the field of TC, CM has often been used to refer to both web content management (WCM) and component content management (CCM). Whereas WCM has focused on approaches and technologies for creating, presenting, and maintaining content on websites (Clark, 2008) and for managing the web ***user experience*** (Gollner, 2015), CCM has focused on approaches for creating and managing content as small units of information rather than as entire documents. However, these distinctions in approaches are increasingly blurring because organizations now must produce content that can be rendered in different outputs for

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different delivery channels, a process that necessarily relies on principles of reuse, granularity, and ***structure***.

Reusable content has to have the potential to become various types of information (Gollner, 2013). Content thus must be freed from the confines of presentation so that it can be manipulated in multiple ways; markup tags that describe the content enable this manipulation. Content as potential information possesses the following qualities: it is dynamic (able to stay fresh and be subject to ongoing revision), customizable (able to change based on ***audiences'*** needs and preferences), linked and distributed (able to be reused), granular (able to communicate meaning at a micro-level), and interactive (able to provide users the support they need when they need it; Hart-Davidson, 2005, p. 29).

Granular content is the smallest unit of usable information (Sapienza, 2007), e.g., a warning statement or the procedure for accomplishing a particular task. In contrast, content at the document level is that of complete information products, e.g., user guides, training modules, technical bulletins. It is important to note that the relationship between the two levels is dynamic: what we consider a complete information product can in some cases also be the smallest usable unit, e.g., a mission statement. While several terms have been used to describe granular content, the term *topic* grew to be the most commonly and extensively defined. Topic derives from Darwin Information Typing Architecture (DITA), the open content standard that defines a common structure for content. In DITA, the term *topic* describes the content type and structure allowed for that content type.

Structured content enables reuse and multi-channel publishing, key goals of CM, through its use of "semantic rules that allow machine processing to meet specific business requirements" (Day, 2014, p. 62). Its mobile affordances give it the potential to automatically adjust to specific user requests and device capabilities such as screen size and orientation. Such content has been described as "adaptive" (Cooper, 2014; McGrane, 2012), "future-ready" (Wachter-Boettcher, 2012), "intelligent" (Gollner, 2010, 2014; Rockley & Cooper, 2012), "nimble" (Lovinger, 2010), "portable" (Bailie, 2009), and "smart" (Bock et al., 2010).

CM has a rich ***history*** in TC and has been a prominent practice since the mid-1990s. At that time, the need to keep pace with shorter product development cycles, to improve content quality and consistency, to expand product ***documentation*** into additional languages—and to do it all with smaller budgets—led some early adopter TC work groups to replace the desktop publishing approach to technical information with the CM approach. Early on, CM was most commonly centered on product documentation because the main purpose of the approach was to efficiently and effectively reuse information between similar products or versions of the same product.

Towards and into the early and mid-2000s, definitions and descriptions of CM as a new approach to technical publishing began to appear in the literature. These definitions and descriptions primarily focused on the separation of form and content and the shift from the craftsperson (one author crafting a complete

text) to the industrial (assembly-line texts created from parts written by multiple authors) approach to writing. During this time, the term single-sourcing was most commonly applied to describe CM (see, e.g., Albers, 2003; Ament, 2003; Rockley, 2001). Single-sourcing refers to a method for writing small content units once, storing them in a single information source, and reusing them in multiple contexts for multiple purposes (Ament, 2003; O'Keefe, 2009; Rockley et al., 2010). Whereas trade publications led the way in defining single-sourcing and its best practices, scholarly publications offered more critical perspectives, such as questioning the readily-accepted fact that separation of content and form is good (Clark, 2008) or theorizing single-sourcing as a ***rhetorical*** act (see, e.g., Albers, 2000; Hart-Davidson, 2005; Sapienza, 2007).

From the mid-2000s into the early 2010s, concerns shifted towards the many problematic and sometimes failed implementations of CM (see, e.g., Andersen, 2011; Bailie, 2007; Schumate, 2011), particularly content management systems (CMSs), which are packages of integrated technologies (XML authoring tools, schemas or document type definitions, database platforms, and publishing engines) used to collect, manage, and publish large quantities of content components (Andersen & Batova, 2015). Given these concerns, authors of scholarly publications sought to better understand CMS adoption challenges and contributed ***research***-based heuristics and theoretical frameworks for studying CMS adoption (see, e.g., Andersen, 2014; Batova & Clark, 2015; Dayton, 2006) as well as theoretical frameworks for understanding content reuse and ***knowledge*** work in CM contexts (Hart-Davidson, 2009; Swarts, 2010, 2011).

During this period, ***translation*** and localization practices also received increased attention, because CM promised significant return on investment (ROI) in these areas. Trade publications typically focused on the "why" (making a business case for CM) and "how" of multilingual CM (e.g., indexing DITA topics for translation, adapting XML for localization purposes, publishing multilingual content with a CMS, and integrating translation memory with a CMS; e.g., Cowan, 2010; Freeman, 2006; Hackos, 2008, 2010; Swisher, 2014).

Potential issues of using CM for translation and localization were also points of discussion. These issues, among others, included micro levels of segmentation leading to ungrammatical translation for highly inflected languages, lack of training for translators who are traditionally freelancers, and problematic implications for job satisfaction and motivation (Batova, 2018b; Byrne, 2013; Gattis, 2008; Swisher, 2011). The issues surrounding translation and localization continued into the 2010s, with academic authors calling for more collaborative, user-focused, highly contextualized strategies for translation and localization quality assurance (Batova, 2014, 2018a, 2019; Batova & Clark, 2015).

The rate at which industry was adopting CM in the 2010s incited many academic authors to research and develop approaches to teaching CM and the competencies and skills needed to perform CM work. Authors published teaching cases (e.g., Duin & Tham, 2018; Evia et al., 2015; Robidoux, 2008) and reviews

of the CCM teaching landscape (e.g., Batova & Andersen, 2017; McDaniel & Steward, 2011); they contributed to edited collections focused on competency and curriculum development (Bridgeford, 2020; Getto et al., 2019) and created practical strategies for teaching structured content (Evia, 2018).

What is more, during the 2010s, maturing technologies, such as CMSs, high-speed networks, artificial intelligence, and XML-based languages and standards, combined with the explosion of smart devices and conversational interfaces, created the need for "intelligent content" (see, e.g., Gollner, 2010, 2014; Rockley & Cooper, 2012). Intelligent content is "content that can be managed efficiently and dynamically delivered to an unlimited range of targets using high-precision automation" (Gollner, 2011). In other words, it is content that is well-structured and semantically rich, as well as both human- and machine-readable. This content could now be "designed and engineered to interact with chatbots, voice assistants, and intelligent machines and to populate PDFs, online help, mobile, video, and other content delivery channels" (Evia & Andersen, 2020, p. 216). The process of creating, managing, and publishing content that could achieve these goals became immensely more complex, requiring an organization-wide content strategy and engineering approach, particularly as CM outgrew the realms of TC departments.

In the early 2020s, given this complexity, terms such as *content strategy*, *content engineering*, and *content operations* have gained prominence as content management no longer sufficiently describes the various disciplines of content (see Evia & Andersen, 2020).

Content strategy moves beyond the management paradigm of CM to include the entire content lifecycle, or the phases of development through which content moves. While definitions of content strategy, just as with CM, come primarily from industry sources and vary based on consultants who produce these definitions, the common themes in the descriptions of content strategy are that it is a systematic plan that defines the vision for how content will be created, managed, and delivered and that grows out of business goals and needs as well as customer goals and needs (see, e.g., Bailie & Urbina, 2013; O'Keefe & Pringle, 2012; Rockley & Gollner, 2011).

Not surprisingly, the relevance of CM has grown for all areas of content production in organizations (e.g., marketing, training, product support, technical documentation), as it offers a way for teams to share and reuse content and to publish content to a multitude of devices and platforms (Leibtag, 2014; McGrane, 2012; Wachter-Boettcher, 2012), including web portals where customers access pre- and post-sales content. Key to enabling this larger organizational adoption of CM is an integrated content strategy that serves as a unifying vision and action plan for producing, governing, and publishing content across the organization (Rockley & Cooper, 2012).

Whereas the discipline of content strategy focuses on the strategic vision and plan for content (the "what"), the discipline of content engineering focuses on

the technical aspects of publishing workflows (the "how"). Content engineering is concerned with defining "the content structure, metadata, content reuse planning, taxonomy and other content relationships" (Saunders, 2015, p. 17). It focuses on how content is created, manipulated, and processed to achieve business goals; content engineers do not write the content but rather create the tools and processes that allow content to be created more efficiently and with less variability (Baker, 2013). The emergence of the disciplines of content has allowed for a more precise and narrow definition of CM, now more commonly described as the discipline focused on managing content after it has been created (Saunders, 2015).

Most recently, the term *content operations* has gained traction for its focus on how the disciplines of content relate and interact (see Barker, 2016; Jones, 2019; Saunders, 2015). Content operations has been defined as effective management of content that happens behind the scenes and that encompasses people, process, and technology (Jones, 2019); it accounts for everything between content strategy and content management.

As this brief history shows, the disciplines of content will become increasingly important knowledge and skill areas for technical communicators who want to contribute to content activities in meaningful ways.

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