Part 1

Content Management Basics for Digital Platforms

Chapter 1

Introduction to Digital Platforms

Digital transformation is a part of a technology road map for most of the enterprises (especially the ones operating in the B2C domain). Digital technologies are disrupting the way end-users engage with online channels and redefining the way enterprises do business online. Enterprises strive to provide differentiated experiences to its digital consumers. Digital channels personalize information at all levels to convey the right message that resonates with individual end-user's personality. Disruptive digital technologies build a participative digital platform enhancing user's digital journey and consistently aim to convert a visitor into a brand advocate. As digital experience assumes the prime focus of online platforms, it becomes imperative to understand various aspects of digital technologies and use them to their fullest potential.

This chapter provides insights into digital ecosystem and lays the foundation for core digital technologies including content management and enterprise search that are the main focus areas of this book. The chapter also briefly introduces the concepts related to digital content management and enterprise search and their value addition to the digital platforms. We will also look at the elements of enterprise digital strategy and digital content strategy. All chapters in Parts I and II are developed to provide in-depth details of various components needed to realize the content strategy. This chapter provides a foundation for upcoming chapters.

Chapter organization: We start by looking at various elements of an enterprise digital ecosystem, such as opportunities, challenges, and digital capabilities. We will learn how digital technologies are making a fundamental impact on the traditional business functions. We then look at enterprise content management (ECM) to understand the big picture of overall content management. Specifically we will learn about ECM features, applications, and differences between ECM and WCM. The next section discusses various elements of enterprise digital strategy and content strategy. The strategy discussion lays the foundation for concepts in remaining chapters for this book and helps us understand the role of each content component (and corresponding

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book chapter) in the content ecosystem. We conclude with a high-level discussion of content management and enterprise search along with its value-added.

Digital architects, enterprise architects, program managers, senior business executives, and business analysts will find this chapter useful.

1.1 ENTERPRISE DIGITAL ECOSYSTEM

A robust digital strategy involves leveraging digital technologies to actively collaborate, engage, and maintain long-term relationship with all key stakeholders and continuously optimize their experience with the digital channels. In this section we will look at the core elements of digital ecosystem from technology and functionality standpoint and understand the big picture of enterprise digital ecosystem components.

The digital transformation provides a wide variety of opportunities across a wide spectrum of business domains. We will look at various opportunities opened up by digital technologies, including a quick look at the key challenges while implementing them. Digital Experience, Digital marketing, digital commerce, and SMAC (Social, Mobile, Analytics, and Cloud) form a major chunk of capabilities required for customer-facing B2C enterprises. Collaboration, engagement, and innovation forms a vital portion of partner relationship through B2B channels. For internal stakeholders such as employees, productivity improvements, collaboration, operational efficiency, and active employee engagement form crucial aspects of B2E (Business-to-employee) channels. In the section that follows we discuss the topics related to digitally driven capabilities and technology enablers.

Digital Opportunities for Enterprises

The success of modern online platforms experiences is based on the customer experience with digital platforms. Organizations are transforming online channels to provide superior customer experiences to retain and grow an existing customer base. Key organization focus areas such as digital transformation, digital commerce, digital marketing, social and collaboration enablement, and legacy modernization comprise the main elements of a digital ecosystem.

Going digital provides the following opportunities to enterprises:

- Provide consistent Omni-channel experience to provide content anytime, anywhere, on any device.
- Enhance information discovery process and provide personalized and relevant information for a given context.
- Leverage social exchange and collaboration to engage, collaborate, and influence customer behavior. Monitoring and listening to social conversations helps in better branding, improved product quality management, and for achieving effective customer service.

- Gather real-time insights into customer behavior through analytics. Customer behavior, navigations, actions, purchase patterns can be used for enhancing and personalizing user experience.
- Provide contextual, personalized content and recommendations to drive customer's decision making.
- Leverage data from all customer interactions to provide highly engaging customer support and user experience. Move from transactional model to long lasting relationship model with customers.
- Provide unified and consolidated view of customer to design better marketing campaigns and sale offers, loyalty offers, and personalized promotions.
- Enable a self-service model across various customer interaction points and optimized operations.
- Convert the site traffic into sales through personalized and engaging experiences.
- Enhance productivity of the workforce through self-service tools and simplified processes and productivity-enhancing tools and accelerators.
- Streamline platform support, maintenance, and operations through intuitive dashboard-based real-time monitoring. Adopt agile delivery model to shorten the time to market.
- Provide "on the go" and on-demand services and optimize the infrastructure cost through cloud operations.
- Optimize administration features for managing multiple sites, multiple languages, and monitoring and multilingual content.
- Effectively comply with regulation and compliance policies through optimal usage of content systems and process optimization.
- Consolidate various views into a unified platform and eliminate heterogeneous content silos that lack integrated business view.
- Provide simplified, optimized, and automated processes for better user experience.
- Provide an collaboration platform enabling users to share the knowledge and artifacts to effectively use the collective knowledge.

As we can see, digital technologies have huge potential to disrupt enterprises and enhance user experiences. The next section presents prominent challenges digital enterprises face. Digital capabilities to address these challenges are presented in subsequent sections.

Challenges in Modern Digital Enterprises

The following list presents some of the key challenges that digital enterprises are facing today. These business challenges stand in the way of building a robust digital platform.

a. **Enterprise integrations**
   Due to explosive growth of enterprise data coupled with increased diversity of enterprise systems, integrating structured and unstructured data is becoming a daunting task. Making sense of such data would also be challenging in the absence of optimal integrations. Enterprises should collate data from various enterprise sources to allow digital platform to provide meaningful data to various users. Extracting meaningful data from various structured and unstructured sources is one of the key challenges for digital enterprises.

b. **Enterprise process modeling and optimization**
   As enterprises enter new geographies, the complexity of business rules and underlying business processes tend to increase. Modeling these business processes through workflows represents another key challenge.

c. **Matching digital consumer and market expectations**
   Tech-savvy consumers and increased competition pose a new set of challenges to the digital enterprises. Modern digital consumers expect dynamic, Omni-channel, and rich user experiences that are highly responsive and interactive. They want to be active participants in the collaboration, knowledge creation, and other similar processes. Digital customers share their experiences in online forums that can influence the community. Managing customer and market expectations and streamlining underlying processes/operations is another major challenge.

d. **Collaboration challenge**
   Organizations face challenges in creating collaborative and self-service platforms due to the lack of standard integration interfaces. Bringing the cultural shift and associated processes to drive collaboration is one of the key challenges.

e. **Consolidation challenge**
   Consolidating functionality, technology stack and content spread across various systems, geographies, and formats is another key concern. Eliminating content redundancies and increasing content reusability are some of the key drivers for digital transformation.

Additionally enterprises would face other functional challenges such as nonstandard interfaces, varied compliance requirements, and technology challenges related, among other things, to content duplication, content migration, and content distribution.

Now that we have looked at various opportunities associated with digital technologies and common enterprise challenges, we turn our focus to the means of filling the gap. In the next section we examine the role of digital technologies in this regard.

Enterprise Digital Capabilities

Here is a look at various digitally enabled capabilities that can effectively address the challenges discussed earlier.

The main enterprise digital technology capabilities are listed in the Figure 1.1. The key digital technologies in Figure 1.1 are explained below:

- Access control and security forms core security requirement for all digital platforms. This includes authentication of various forms, fine-grained authorization, user registration, Web SSO, federated SSO, account reset, user administration, user provisioning, certification management, directory services, and similar security components.
- Presentation and personalization is the user experience layer of the digital platform. It mainly includes presentation components such as responsive pages and widgets as indicated in the Figure 1.1. This layer mainly handles user experience management through immersive, compelling, and inspirational content through easy-to-use, friendlier-navigation, easy-to-discover, and easy-to-complete processes across the entire customer journeys. Delivery of personalized and localized content on all channels is one of the main capabilities in this category. Presentation portal modules render the pages to end-users based on personalization rules. Templates and layout modules are used for page construction. SEO and analytics modules track and monitor customers' online activities and provide real-time intelligence through intuitive and actionable reports to concerned stakeholders. This can be used in a variety of ways, such as optimizing user experience, customer support, fine-tuning customer campaigns, business KPI tracking, and so forth. Localization modules render the pages and content in user-specific locales. Responsive Web Design (RWD) is the main technology enabler for Omni-channel delivery.
- As business processes are increasingly being automated and optimized, business process management (BPM) is one of the main components to optimize business processes through process orchestration, data transformation, automation, and enforcing the required business rules.
- The social networking layer includes social listening, social analytics, social CRM, social governance, sentiment analysis, social marketing, social integration, blog/wiki, community, and knowledge base and provides seamless two-way access to social platforms from the digital channels, enabling enterprises to engage users actively.
- Content management is one of the main technology enablers for an enterprise digital platform. This module includes content authoring and presentation templates, content metadata, taxonomy, adaptive content, content authoring and publishing workflows, content security, content versioning, content backup and archival, content services, localization workflow, digital asset management, and integration with metadata management systems and translation management systems. The layer also handles other concerns such as migration, multi-site management, user-generated content (UGC), content administration, plug-in management, and content services. Document management modules manage digital documents and asset management modules manage the lifecycle of the digital assets.

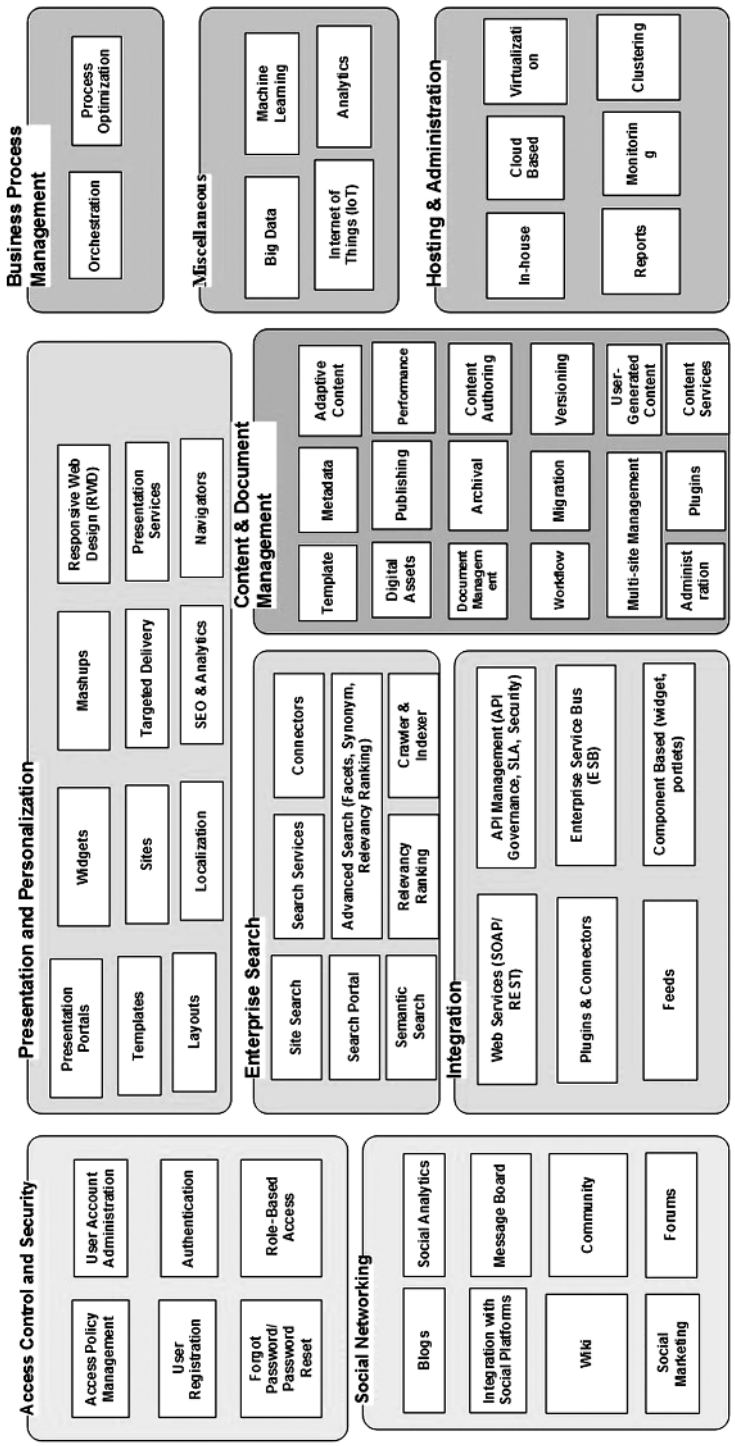

Figure 1.1 Enterprise Digital Capabilities

- Enterprise search is another predominant capability of digital platforms. Most modern digital platforms use search-centered experience to enable optimal information discovery and to facilitate self-service model. This includes search features such as site search, search portal, faceted search, synonym support, semantic search, and the like. Enterprise search system exposes its core features through search services for external systems. Plugins and connectors would be used to connect to various data sources for search indexing. Enterprise search also provides various configuration features such as relevancy ranking, business synonym configuration, artificial rank boosting, and such to enhance the effectiveness and relevance of search results.
- There are many emerging technologies such as big data, gamification, analytics, and Internet of things (IoT) and technologies such as machine learning and artificial intelligence that are also being used in digital platforms. These technologies help in analyzing huge data (such as social media, enterprise content, etc.), predictive analysis, natural language processing, intelligent search, and so on. B2C business enterprises would also include commerce capabilities such as registration forms modules, payment gateway modules, and other commerce modules.
- Hosting and administration capabilities include on-premise hosting, cloud, and virtualization technologies to provide on-demand content anywhere that lowers the operational and infrastructure cost. It also provides elastic scalability catering to growing business demands and agility. Administration also includes other infrastructure management activities such as health check dashboard reporting, infrastructure monitoring, migration, clustering, and others.
- The enterprise integration in modern digital enterprise is mainly based on services based on SOAP/REST and API with external/internal systems. Digital content is also exposed as feeds to external systems. An emerging trend in digital enterprises is that of API management. API management involves exposing business functions through APIs and integrating external systems through APIs to achieve cross-channel service virtualization using API Gateways. This category includes, among others, API governance, API security, API SLA compliance, and API analytics. There are other means of integrations such as component-based integration, connector/plugin/extension-based integration, and feeds-based integration. For complex enterprise integrations we use enterprise service bus (ESB) to provide a centralized integration and message exchange infrastructure.

The next section discusses how these digital capabilities enable specific business capabilities.

Digital Disruption across Business Domains

Earlier we had seen some of the exciting opportunities that digital capabilities have to offer. Here we extend that concept and examine how digital technologies can enable domain-specific features.

Figure 1.2 depicts functionality/features enabled by the digital technologies in various business domains.

Table 1.1 provides high-level summary view of changes across various business domains caused by digital technologies. This snapshot paints the picture of digital revolution that has redefined the business environment. Business capabilities in Figure 1.1 are mapped as business impact in Table 1.1.

As an example of digital transformation, we can look at the digital transformation of a health care domain. The digital transformation journey of a healthcare system consists of connected members and health care providers, digital wallet, digitized health records, Real Time Claims processing, Unified Enrollment & Payment, wearable device integration, marketplace model and such forward-looking features enabled by digital technologies. A typical digital healthcare platform consists of following features:

1. Commerce & Marketplace: Which consists of modules for Product Comparison & Recommendation, Cross Sell, Promotional campaigns on new plan offerings, Targeted campaigns based on current usage
2. Connected members: Unified view of Benefits, DocFind, Cost Share navigator, Preventive Care, Remote patient care, Notification and Care Alerts
3. Engaged provider: Clinical Data Integration, Access to personal health information, Real Time Claim processing, Referrals
4. Care delivery: Health Index Tracking, Treatment Options, Care Plan and Wellness adherence, Virtual Care – Video consultation, Tele medicine add-ons
5. Flexible payment modes: Advanced Payment Options – ApplePay, Google Wallet, Android Pay, Personalized statements
6. Loyalty discounts: Loyalty discounts, Discounts on early bird enrollment, Discounts on full payments, Adherence to Care Plans, Wellness Programs
7. Personalization: Personalization based on preferences, sentiment analysis, Recommendations on plans based on member history, conditions
8. Gifts: Sponsor insurance plan to loved ones, Sponsor part of premium or deductible
9. Discounts: Loyalty discounts, Discounts on early bird enrollment, Discounts on full payments, Adherence to Care Plans, Wellness Programs
10. Targeted Campaign: Promotional campaigns – free community health checkup, vaccination camps, Evidence based programs and practices – active parenting

In addition to the impact factors given in Table 1.1, digital technologies are also enhancing user's experience in other innovative ways. Here is a quick look at digitally enabled trends.

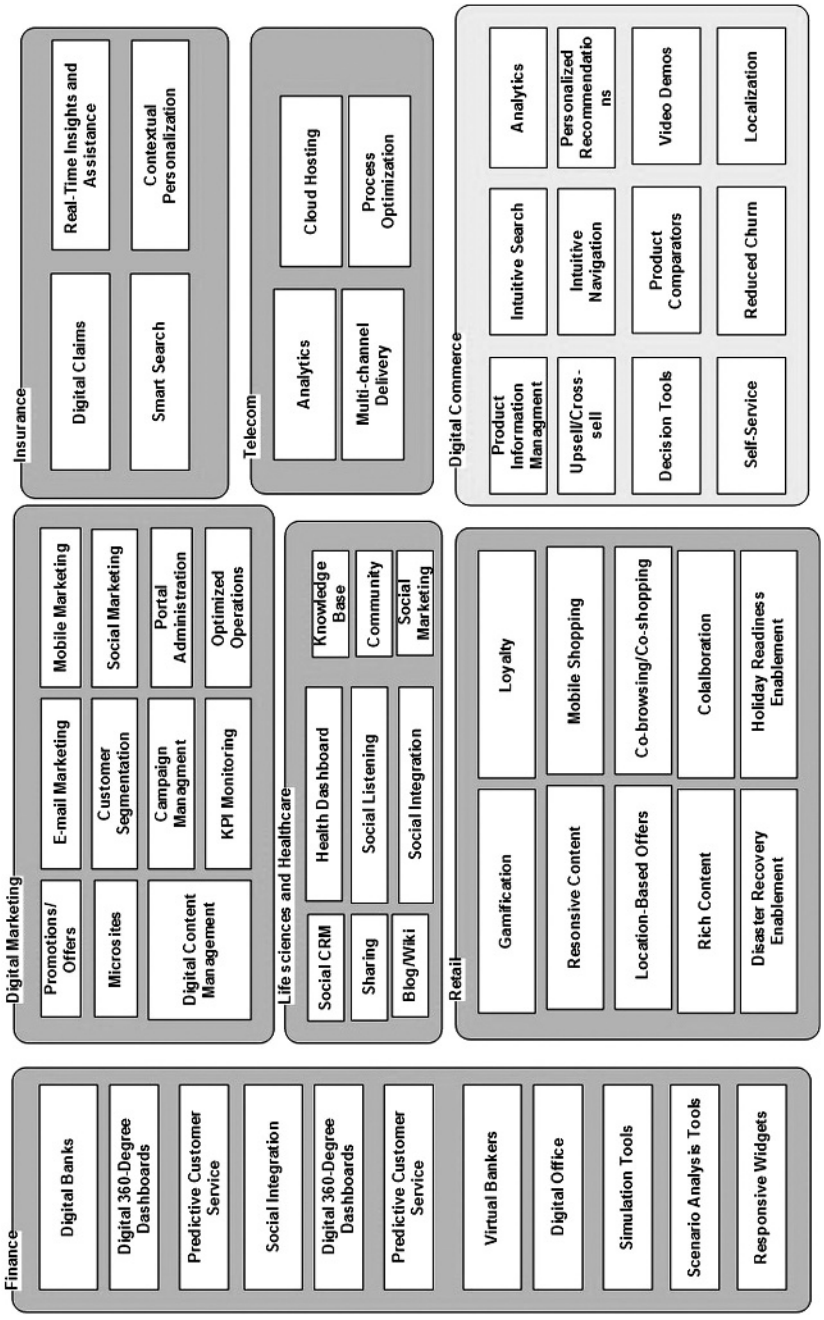

Figure 1.2 Business capabilities enabled by digital technologies

Table 1.1 Impact of digital technologies across business domains

Business Domain	Business Impact of Digital technology
Finance Industry	• Unified customer views through dashboards and 360-degree views • Real-time customer insights and Online Loan Application • Automated decision-making tools such as risk analysis tool, forecasting tools, financial calculators, advisory tools, budget planners, Portfolio Valuation tool, credit analysis, intuitive visualizations, and graphs • Digital branches, digital office, Personalized Investment Proposals, and virtual private bankers to provide a real-life bank branch experience to customers virtually • Predictive fraud and risk discovery tools and simulation tools to help customer take the informed decisions and aid in decision making
Insurance Domain	• Personalized offers and customer service to provide enhanced user experience • Enhanced scenario analysis, plan analysis, and plan comparison • Optimized claim processing through BPM and workflow optimization • Digital claims and smart search to promote a self-service model • Analytics-based targeted offers and personalized content delivery
Life Sciences and Health Care	• Unified health dashboard view of patients • Increased partnership with hospitals, pharma companies, and patients • Leverage the insights gathered from Internet-of-things (IoT) to get real-time health information • Integration with social media platforms to actively engage patients through social CRM, blogs/wiki, social marketing, Voice of customer (VOC), and virtual communities
Telecom Domain	• Cloud-based services to provide competitive plans and provide anytime-anywhere services • Analytics-based customer behavior prediction, churn calculation, predictive customer service, predictive offers/promotions • Multi-channel delivery on all customer access channels and devices.
Retail Domain	• Multi-channel, seamless experience through responsive and rich content • Mobile shopping through native or hybrid mobile apps • Optimized shopping experience through simplified checkout and order processing • Higher conversion rates, improved loyalty through personalized navigation and recommendations

Table 1.1 (*Continued*)

Business Domain	Business Impact of Digital technology
	• Increased cross-sell/upsell opportunities through personalized recommendations
	• Provided targeted content, advertisements and promotions, and personalized recommendations
	• Proactive problem resolution and personalized customer support
	• Context-aware offers and personalization based on location, time, geography, location, device, and other parameters
	• Faster times in launching marketing campaigns and microsites
	• Targeted campaign management by providing a holistic view of customer activities across various channels and using analytics-driven insights on customer behavior
	• More effective and cost-efficient digital marketing through real-time customer insights and personalization
	• Gamification of main business processes to provide effective incentives to customers
	• Development of holiday readiness strategies to handle increased demand and of disaster recovery plans to provide continuous availability
	• Influencing purchase decisions through immersive and inspirational content
Generic B2C Enterprises	• Engaging and relation-enhancing features
	• Incentivizing collaboration concepts and encouraging end-user driven co-creation. Leveraging gamification concepts for active engagement.
	• Provide holistic single-stop-shop dashboard view of all customer activities
	• Provide optimal Omni-channel experience
	• Enhance information discovery and easy-to-use user experience and navigation
	• Analytics-based personalization to enhance customer loyalty
	• User-preferences-driven user interface customization
	• Reduction in customer churns using predictive analytics
	• Personalized customer service
	• Enabling collaborative and self-service capabilities such as knowledge management systems (KMS), solution repository, document repository, and media database
Generic B2B enterprises	• Optimized process integration
	• Optimized business processes through content workflows
	• Increased collaboration across all business stakeholders
	• Business-centric process redesign

(*continued*)

Table 1.1 (*Continued*)

Business Domain	Business Impact of Digital technology
Digital Commerce	• Productivity-improving tools and features • Managing product content efficiently through product information management • Intuitive product search based on keywords, metadata, and other relevant parameters. Providing various filters to find the most relevant and appropriate product. • Analytics tools to understand customer behavior, popular product downloads, exit ratio, etc. • Personalized recommendation to increase the cross-sell and upsell opportunities • Intuitive and decision-making tools such as product comparators, etc. • Enhanced self-service model through FAQ, process automation, self-help content/videos, collaboration tools, product and solution knowledge base, etc. • Help with product information management (PIM) • Product review, sharing and rating features • Personalized promotions, offers, and loyalty programs to incentivize customer contribution

Emerging trends in digital platforms

Across business domains the key trends noticed in modern digital platforms are:

- Increasing popularity of human natural gesture interfaces such as touch-enabled smartphones, gaming consoles
- Responsive, interactive user interfaces that offer immersive experience
- Single-page applications (SPA) with simple and easy navigation model
- Social, mobile, analytics, and cloud enablement
- Active user engagement through collaboration, co-creation, and co-invention
- Hyper-personalized contextual content, service, and functionality.

Having looked at opportunities, challenges, and capabilities enabled by digital technologies, we now turn our attention to the key focus areas of this book: content management and search. It is evident from the above discussion that content management and search play a pivotal role in building a robust digital platform. Here we begin the journey of understanding these two key digital technologies in detail, starting with enterprise content management (ECM) concepts.

1.2 CONCEPTS OF ENTERPRISE CONTENT MANAGEMENT (ECM)

An enterprise content management (ECM) system manages all enterprise content, including Web content. For many functional domains, Web content management is also one of the concerns of ECM. ECM helps organizations handle the enterprise information efficiently:

- Integrated business processes linking inter- and intraorganizational boundaries lead to increased efficiency
- Provides quicker access to information when it matters the most
- Distributed scalable solution architecture is capable of handling anticipated growth
- Ease in meeting regulatory compliance for records keeping and handling
- Unified access to derived, personalized, and categorized information yields more business value
- Readiness for handling disaster recovery

In the next section we take a brief look at ECM concepts to understand the bigger picture and then elaborate on WCM concepts. Exploring key concepts of the ECM system at a high level helps us understand how the enterprise and Web content fits into the overall digital strategy.

Enterprise Content Ecosystem

Enterprise content management (ECM) is a solution platform that enables people to collaboratively create, manage, deliver, and archive information that drives business operations. ECM has evolved as a comprehensive solution platform for efficiently managing a wide variety of enterprise data. ECM involves various technology solutions to business problems associated with the production, storage, and distribution of enterprise information.

Enterprise content management (ECM) consists of managing the end-to-end lifecycle of all structured/unstructured enterprise content. Enterprise content is of diverse nature: it includes, among other elements, Web content, enterprise records, print content, data forms, enterprise assets, and electronic documents. Enterprise content forms the lifeblood of any enterprise. Enterprise information could be stored in variety of formats (structured and unstructured) such as Web content, digital assets (images, video, scanned forms), office document (e.g., PDF, MS Word), database data, collaborative content (e.g., blog, wiki, message boards, chat), corporate records, and rich media content.

Due to the diverse nature of enterprise content management, it encompasses several functions such as Web content management, digital asset management (DAM), workflow management, records management, Omni-channel management, search, collaboration, security, and others. ECM also deals with other enterprise

content aspects such as, among others, content syndication, content migration, e-mail/collaboration content, paper and electronic content, metadata management, and localization.

The main features of an ECM system are as follows:

- Document Management: This includes secure authoring, indexing, versioning, and presentation/publishing of technical and/or legal documents. It includes management of all types of documents (paper, forms, proposals) throughout their lifecycle.
- Workflow and Business Process Management: This includes management and modeling of complex business processes such as document tracking, document and asset approval flows, and other business processes.
- Imaging: Consolidated storage and access of data-intensive static images and print stream data. Also includes forms capture and processing (OCR/ICR) and scanning.
- Web Content Management: Manage authoring, management, publishing, and presentation of text and/or graphical content on various delivery platforms.
- Enterprise records management to maintain enterprise digital records and forms.
- Digital rights management (DRM) to secure enterprise assets and content.
- Digital asset management to manage digital assets such as images, media, video, and other binary files.
- Enterprise search to index and organize all enterprise sources.

ECM also handles other capabilities such as storage, knowledge management, information lifecycle management, collaboration, case management, and the like.

A high-level view of ECM capabilities is shown in Figure 1.3.

The following is a brief overview of various capabilities depicted in Figure 1.3.

Content Presentation

The content access and presentation layer covers user applications, portals, and other business applications (such as business intelligence applications, reporting applications, dashboard portals, etc.). Online Web applications are other key user presentation components in this layer. Presentation APIs and presentation Web-services are used for integration across presentation applications and with underlying platforms such as document management, workflow, WCM, and KM.

Content Applications

Content management applications form the core of the ECM functional architecture covering applications around document and records management, workflow, WCM (web content management), enterprise search, content analytics, knowledge

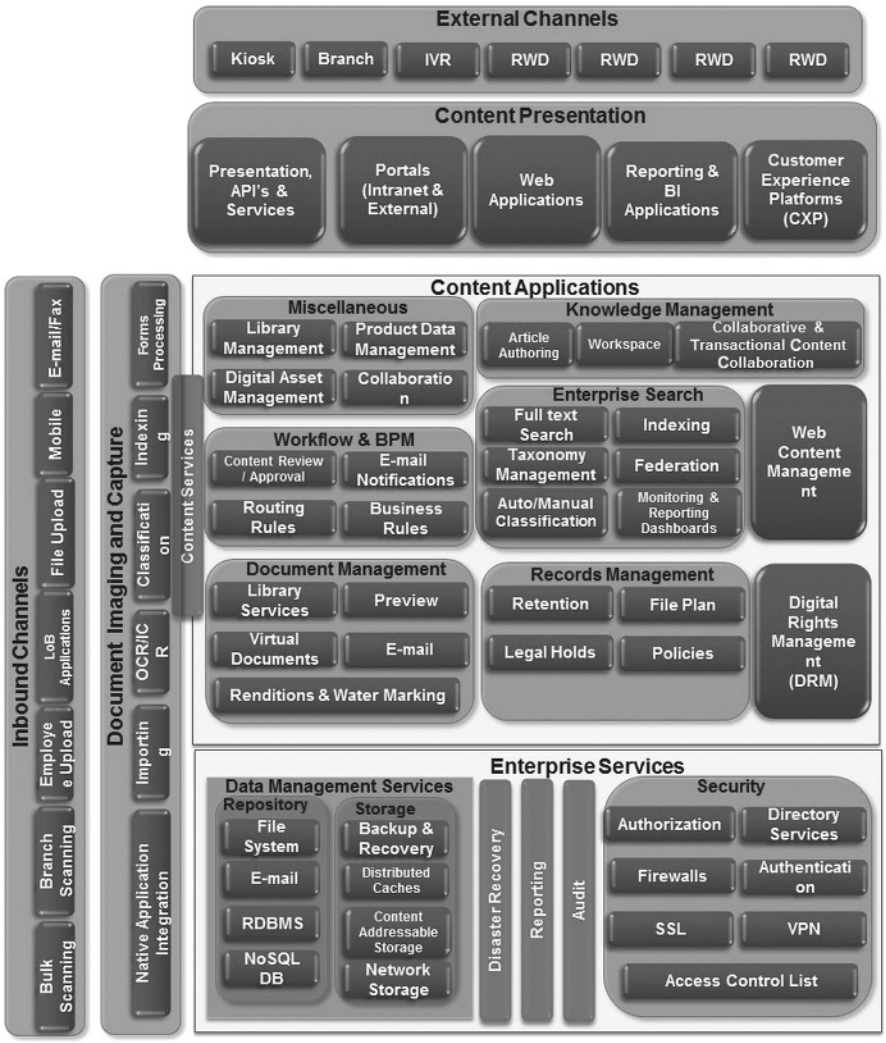

Figure 1.3 ECM Capabilities

management, and collaboration applications. These applications can be delivered by a combination of various technology platforms, with any single technology platform delivering capabilities within more than one functional area.

- A document management application provides document-processing capabilities including document library management, document preview, document rendition, document watermarking, and so on.
- Records management platform helps organizations be compliant to industry and legal regulations through enforcement and implementation of policies (such as retention policy, legal policy, disposition policy, etc.).

- ECM workflows support robust and complex processes and are closely modeled on business processes and implement related business rules. Business process management (BPM) capability is realized through workflows.
- A Web content management platform manages digital Web content and related assets. It provides management of complete lifecycle of Web content.
- Enterprise search and content analytics capabilities organize the enterprise data and use taxonomy to provide crucial business insights to aid decision making.
- Knowledge management modules provide knowledge creation (through article authoring tools), knowledge storage, and knowledge distribution. The modules are closely integrated with enterprise search to discover relevant knowledge assets.
- Digital rights management (DRM) module enforces access restrictions to the enterprise resources.

Other capabilities in this category are digital asset management (DAM), library management, collaboration, and product data management.

Enterprise Services

Services mainly fall into data management services and security services categories. Data management services include repository services, which abstract data sources such as file system, e-mail, and database; and storage services, which provide backup, network storage, recovery, distributed cache, and similar features. Security services include services related to authentication, authorization, and access control list, among others.

Access Channels

ECM platform could be accessed by a number of inbound channels (such as scanners, file uploaders, internal applications, etc.) and outbound channels (such as branch, kiosk, IVR, mobile, Web application, e-mail SMS, etc.). Enterprise documents are captured/ingested through OCR scanners, imports, integration, and file transformations.

The main focus of this book is on digital content management using Web content management systems (WCM). As we can see from the previous sections, Web content and digital assets are also some of the key concerns of ECM. Along with digital content management, we will also discuss underlying technologies such as workflows, digital asset management (DAM), document management, content analytics, content SEO, and others. In Part III we will also look at enterprise search, which is another key aspect of information management.

Note: Core ECM topics such as records management, business process management, digital rights management, and imaging are beyond the scope of this book.

Table 1.2 ECM vs. WCM

	ECM	WCM
Information type handled	Wide variety of structured and unstructured enterprise data such as documents, enterprise records, files, media files, records	WCM system mainly handles digital content such as Web content, digital assets
Workflow	Robust and sophisticated workflows to manage business processes Used mainly to model business process management (BPM)	Workflows mainly for handling digital content and assets
Publishing and content delivery	Publishing to a variety of platforms such as desktop, collaboration platforms, print media, enterprise systems, etc.	Publishing is mainly to Web and mobile platforms and as services and feeds
Applicability and usage scenario	Mainly for managing entire enterprise content	Mainly for managing online channels
Web capability	Mainly uses traditional Web channels and thick clients	Offers highly intuitive, responsive, and engaging Web experiences through Web 2.0 features
Target audience	Mainly internal enterprise audience	Internal and external web users
Social and collaboration	Features are implemented through integration with collaboration platforms	Provides robust social and collaboration features

ECM vs WCM

There are lot of overlapping concerns and features between ECM and WCM, but there are also subtle differences. Table 1.2 presents the salient features of both systems, which should allow us to differentiate their usage and applicability scenarios.

Technologies such as ECM, WCM, CMS, and portals handle overlapping concerns. Some of these technologies are also converging. For instance, a few portals are bundled with WCM capabilities and a few CMS systems also provide portal features.

Note: WCM is sometimes referred to as a content management system (CMS). However, there are differences between CMS and WCM. For instance, some CMS are designed to handle records, whereas WCM does not normally do records management.

As the terms CMS, WCM, and ECM are widely used in various contexts, the following section will help us understand better the exact scope of them, covered in this book.

Book's Focus Areas

Figure 1.4 depicts the features that are covered in this volume. Book scope items in content areas appear in bold. Topics such as workflows, asset management, and

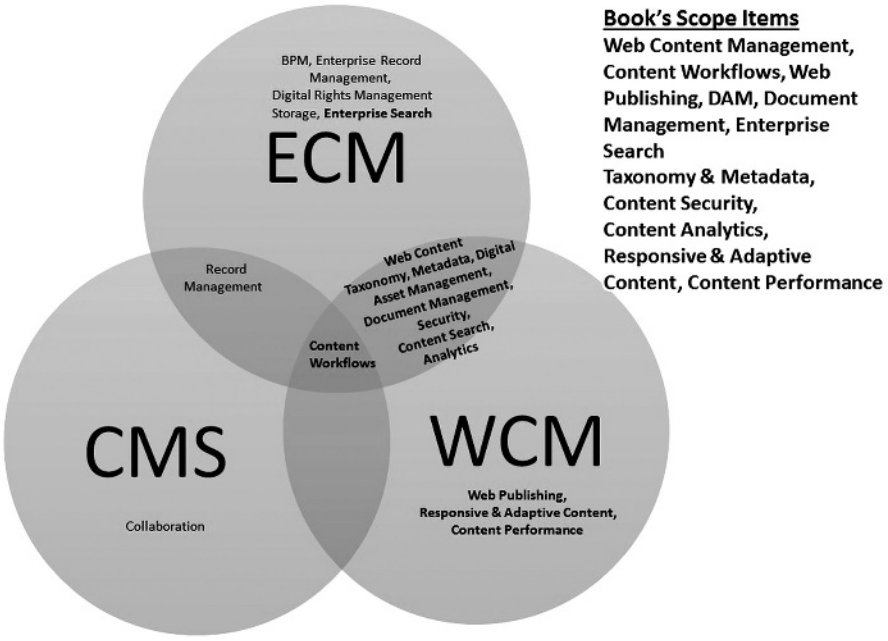

Figure 1.4 Book Focus Areas

Web content are at the intersection points of ECM, WCM, and CMS. Thus, the book covers all concepts of WCM, most concepts for CMS (except for record management and collaboration), and search and DAM topics in ECM.

Note: In this book CMS and digital content management are used to elaborate the content scope items depicted in Figure 1.3. Records management and collaboration are not covered as part of this book.

Digital technologies alone cannot ensure the success of a program. There should be a solid strategy within which the digital technologies would be put to use. A digital enterprise needs to have a robust strategy to take maximum advantage of any technology. Strategy provides the vision and direction, and ultimately leads to a comprehensive execution plan. In the next section we discuss the various aspects of enterprise digital strategy and content strategy.

1.3 ENTERPRISE DIGITAL STRATEGY AND CONTENT STRATEGY

We have seen various opportunities and disruptions caused by digital technologies to various business functions and domains. An enterprise embarking on a journey of digital transformation needs to develop enterprise digital and content strategies for a successful digital transformation. In this section we look at the key elements of these

strategies. As the content strategy is a quintessential element for successful content management, Chapter 2 is dedicated to a more detailed discussion of it.

Enterprise Digital Strategy

Enterprise digital strategy defines the overall digital vision for an enterprise. It provides the direction for digital transformation and digitization of enterprise functions. It encompasses various other strategies such as, among others, content strategy, integration strategy, and user experience strategy. The digital vision lays out a road map for digital capabilities such as content management, portal, search, API management, and service-oriented integration to provide anytime-anywhere content.

A comprehensive three-dimensional enterprise digital strategy is depicted in Figure 1.5.

Figure 1.5 looks at the enterprise digital strategy from three perspectives. At the intersection of these perspectives we have depicted the digital enablers, processes, and digital technologies.

- **Digital transformation path** ranges from traditional (such as AS-IS scenarios) to personalized digital experience to responsive user experience to Omnichannel-enabled platform to a self-service platform. This is depicted at the top of Figure 1.5.
- **Key digital capabilities (on Y-axis)** are customer touch-point optimizations, integrated experience, and information value optimization. These capabilities act as functional enablers for the realization of a digital vision.
- **Core digital technologies (on X-axis)** are the technology enablers for the realization of digital capabilities. They include enterprise portals, content management system, enterprise search, and analytics.

Note: Figure 1.5 maps only the core digital capabilities and technologies and is mainly focused on portals, content, and search. Digital landscape is evolving and changing to cater to user needs. Hence there are other technology capabilities (such as IoT, AI, Big Data) that are not the focus areas of this book are not covered in Figure 1.5.

Let us look at the digital strategy elements in detail. We will first look at key digital capabilities on the y-axis:

Customer touch-point optimization: The focus should be on customer centricity for providing engaging relationships. We should analyze all customer touchpoints across customer journey and optimize them to move from transaction-oriented to relationship-enhancing features. This includes personalized user experience, user-centric design, unification and consolidation of information, optimizing customer service functions, self-service capabilities, loyalty programs, personalized offers/campaigns, collaboration features, knowledge management, leveraging social platforms, and so on.

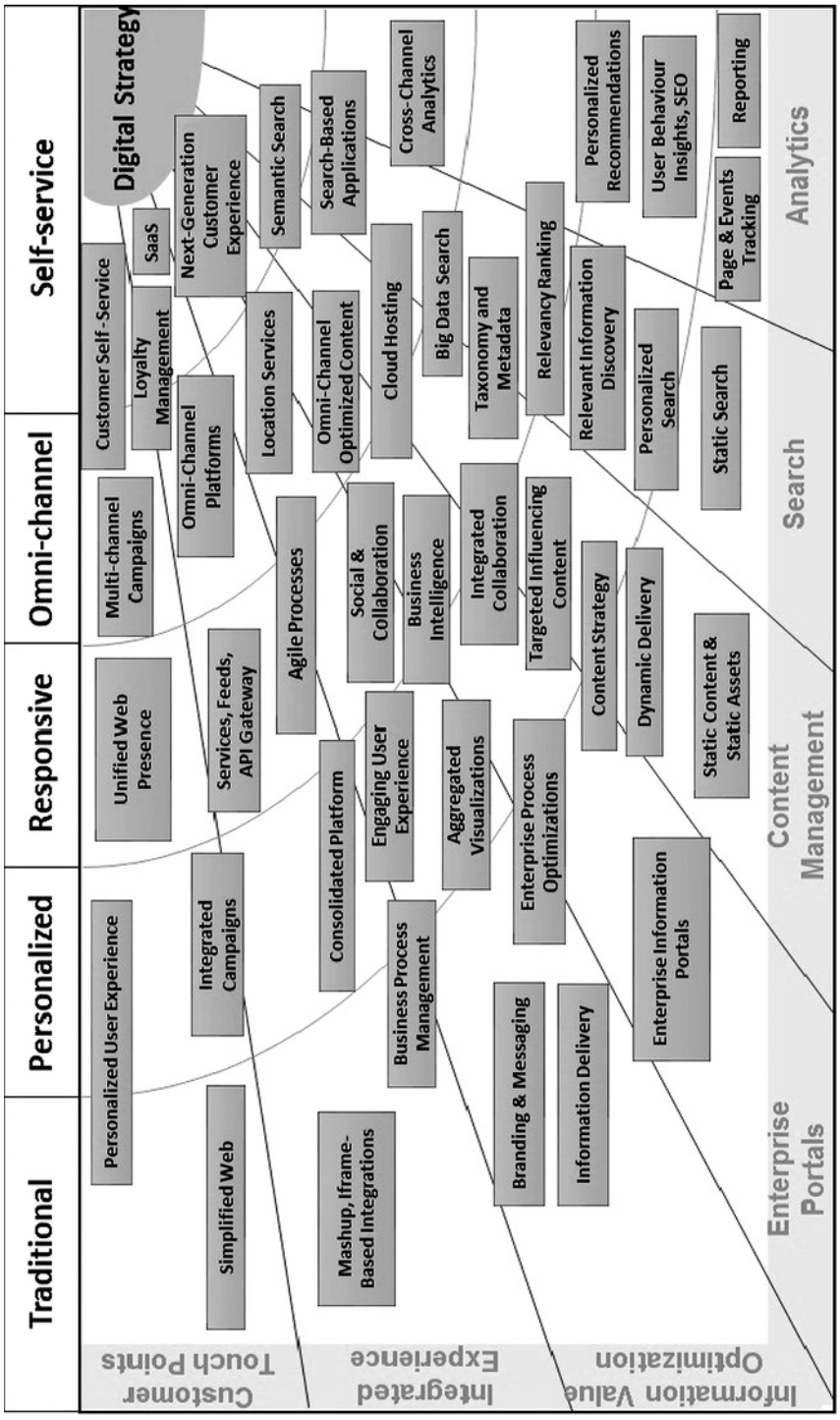

Figure 1.5 Enterprise Digital Strategy

Integrated experience: The digital platform should provide seamless and optimal experience on all devices to create an Omni-channel-enabled consolidated platform. Service-oriented architecture (SOA), API gateway, ESB, feeds, mashups, components, and widgets are the modes of integration for creating the next-generation customer experience that encompasses these capabilities:

- Personalized and relevant content delivery: This can be done leveraging analytics and implicit and explicit customer preferences.
- Optimal content strategy: This includes providing immersive, rich, engaging, inspirational content that is easy to find and easy to use.
- Digitally enabled legacy systems: Modernized legacy systems through wrapper services or migration initiatives.
- Digitally enabled business functions: Aligned business functions to leverage the digital capabilities. For instance, e-commerce platform can provide cross-channel integrated sales/promotion offers by leveraging analytics-driven customer insights and enhance cross-sell/upsell and conversion opportunities.
- Analytics: Gaining 360-degree insights into customer activities across various channels and using them to enhance user experience, provide personalization features, provide recommendations, and enhance a navigation model.
- Newer business models: Based on digital technologies, we can provide newer business models such as newer product delivery model (such as software-as-service [SaaS] model), newer revenue models (such as usage-based pay), newer hosting model (such as cloud-based hosting), and so forth.
- Business process management and process optimization: A fresh look at all business processes to understand optimization opportunities such as, among others, process automation and process optimization. Creating optimal process orchestration through process redesign and efficient workflow and rules management.
- Agile processes to become a responsive digital enterprise: Using an iterative delivery model allows the incremental buildup of the capabilities with faster turnaround times.

Information value optimization: Digital strategy should be able to use enterprise information as an asset to maximize its impact effectively. We need to move from static information delivery mode to integrated and engaging user experience. In order to achieve this, we need to consolidate, communicate, and conserve the information:

- **Information consolidation:** Information assets from various enterprise and external sources should be consolidated. This process includes content categorization, content processing, content modeling, intuitive information architecture, and similar activities. It includes the following:
  - Information strategy: Assessing information gaps and needs and defining ways to provide seamless information aligned with business goals.

- Information architecture: Providing a blueprint and structure for information access.
- Information integration: Consolidating information across various sources.

- **Information communication:** This includes providing the meaningful content to the target audience. Based on insights drawn from customer behavior, the content is optimized to suit user's preference and delivered in most optimal way on end-user's device. Optimal messaging strategy, branding, and integrated visualizations are part of effective information communication. It includes the following activities:
  - Information Delivery and access to enable and reach various devices and channels. Use intuitive visualization to convey differentiated experience.
  - Enterprise Intelligence to makes sense of enterprise data
  - Content Management to manage the Web content and related assets and documents
  - Real-Time Technologies for providing on-demand information
  - Intelligent Process Automation to deliver seamless integrated information
- **Information conservation:** This includes content evolution and adaptation to changing business scenarios. It includes the following activities:
  - Information Life Cycle Management to capture, store, revise, retrieve, preserve, destruct, and distribute content and data
  - Compliance and Risk/Security to protect information assets and be compliant with regulatory requirements
  - Governance to enable functioning of the overall strategy and information architecture. It also measures and monitors the effectiveness of the strategy and provides course correction actions when needed.
  - Capitalize on Information Model to leverage business value and drive business transformation

Let us now look at core digital technologies on the x-axis to enable digital capabilities.

Core Digital Technologies

Enterprise portals provide robust presentation and personalization capabilities in delivering feature-rich, integrated, engaging user experience. Content management system organizes enterprise content and assets through optimized content processes. The combination of CMS and presentation engine redefines the digital experience through targeted content delivery, integrated collaboration, and providing Omnichannel optimized content. Enterprise search plays a vital role in information discovery through flexible relevancy parameters. Enterprise search also provides advanced information retrieval capabilities through Big Data search and semantic search, and it forms the backbone for search-based applications. Analytics provides key user insights and helps in recommendations, metrics tracking, and reporting.

As we have seen, content strategy is one of the main ingredients of the overall enterprise digital strategy. It is also closely aligned with content focus area of this book.

Digital Content Strategy

Content strategy is the quintessential factor for the success of the content. In this section we provide a high-level overview of content strategy.

Content strategy is a comprehensive exercise concerned with creation, management and delivery of usable content aligned with an enterprise's business vision. Content strategy encompasses, among other factors, content planning, content delivery, content governance, and information architecture. It also leverages various related technologies such as digital asset management, workflow management, user experience, and others. As this is the core concept of content design, we have dedicated Chapter 2 to discussing content strategy in more detail. In this section we lay the foundation for content strategy and connect the elements related to content strategy with the book chapters.

Figure 1.6 provides various aspects of content strategy framework. This is a high-level framework that covers major aspects of content strategy used in the majority of scenarios. The content strategy framework covers the scope items, process, and content governance. Book chapters in Parts I and II are closely modeled on this content strategy framework.

Business functions requiring content strategy

Content strategy is required in almost all scenarios where content plays a major role. Digital marketing, brand management, information management, campaign management, Web site design, promotion management, online learning and education systems, and public relations management are some of the prominent business domains where content strategy plays a major role.

Content strategy should be fine-tuned and aligned with business vision. Business vision varies across domains. For instance *providing personalized and influencing content* forms the main business goal for an e-commerce domain. *Presenting easily accessible content* would be the primary goal of a health care domain; similarly, *engaging and interactive content* would be important for social and collaboration platforms, and *providing actionable content* is essential for a business intelligence domain. In all such scenarios the content strategy should aim toward providing usable, compelling, engaging, and actionable content that can fulfill the primary business goals. Content strategy helps organizations realize the key business goals such as:

- Unified marketing and sales experience with consistent branding across channels
- Consistent cross-channel experience
- Automated processes to reduce cost and increase productivity
- Social listening and sentiment analysis.

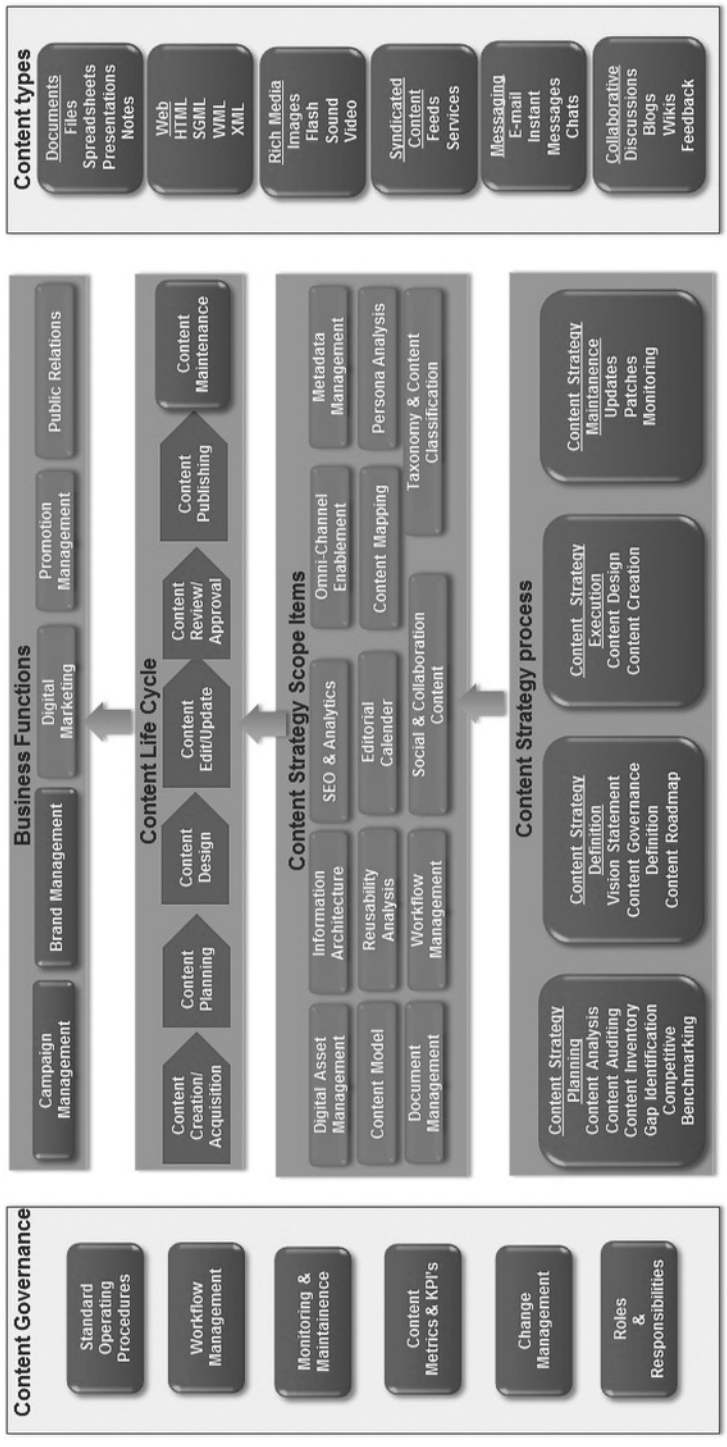

Figure 1.6 Content Strategy Framework

Content lifecycle

The principal aim of content strategy is to create and maintain meaningful content for the business. This naturally requires management of all content lifecycle phases starting from content acquisition through to maintenance and purging. During content strategy execution phase, a content strategist oversees content design and content creation activities including authoring content, editing, publishing, and managing content.

During content design and development phases, we define the content tone, style, messaging guidelines, and chunking strategy aligned with business goals. During content editing, we identify the frequency of updates, delta updates, and other similar aspects. For a more in-depth discussion, see Chapters 3 and 4.

Content strategy scope items

Content strategy covers the following areas:

- Digital Asset Management (DAM): All digital assets such as media files, graphics, and style sheets need to be properly managed. We will discuss this in detail in Chapter 8.
- Information Architecture: This includes aspects related to content discoverability, content navigation, content hierarchy, content and site structure, and other similar aspects. We will discuss this in Chapter 6.
- SEO and Analytics: SEO helps in bringing visibility to content, and analytics provides usage statistics for the content. We will discuss this in Chapter 10.
- Omni-channel enablement: This includes aspects related to rendering optimal content on all devices. We will discuss Omni-channel content (through adaptive technique) in more detail in Chapter 2.
- Metadata Management: Semantic metadata tagging helps in enhancing the content usage, discovery, and effectiveness. We will discuss this in Chapter 6.
- Workflow Management: Content workflows are closely modeled on business processes. This includes, among others, workflows related to content authoring, content editing, content publishing, and content localization. We will discuss this in Chapter 5.
- Content Security: This mainly deals with securing content and assets, which is discussed in Chapter 11.
- Social and Collaboration Management: User-generated content (UGC) forms a major part of social and collaboration platforms. This includes management of collaboration and social content (such as blog content, knowledge article content, wiki content, etc.).
- Taxonomy and Content Classification: This deals with categorizing and organization of the content. We will discuss this in Chapter 6.
- Content model that provides the structure for the content is discussed in Chapter 2.

- Reusability analysis to identify reusability opportunities is discussed along with content strategy in Chapter 2.
- Editorial calendar to provide the activities and road map for content activities is discussed in Chapter 2.
- Content mapping that maps the content to user journey steps is discussed in Chapter 2.
- Persona analysis is to identify the user segment and analyze the needs, wants, and goals of a particular user group. It is discussed in detail in Chapter 2.

Content strategy process

Content strategy definition is a multi-step process. This includes content strategy planning, content strategy definition, content strategy execution, and content strategy maintenance. Each of these phases involves various activities. We have discussed these processes in detail in Chapter 2.

Content types

Content strategy applies to various content types such as, among others, digital assets, documents, collaborative content, Web content, syndicated content, rich media content, and messaging content.

Content governance

Governance provides structured processes and well-defined role-responsibility matrix for smooth content operations. As part of content governance, we also will track content effectiveness through well-defined metrics and KPIs, and handle ongoing maintenance and change management activities. Governance is covered in Chapters 2 and 17.

After having looked at ECM big picture along with enterprise digital and content strategy, it is now time, in the next section, to discuss digital content management and search.

1.4 DIGITAL CONTENT MANAGEMENT AND ENTERPRISE SEARCH: AN OVERVIEW

Digital Content Management

From the previous discussion we have seen that content management is one of the key components of a digital ecosystem. Digital content management involves end-to-end managing the content lifecycle starting from design and ending with maintenance. It provides features for, among other things, metadata tagging, content workflows, content publishing, content analytics, and content translation.

Value addition of CMS to digital platform

CMS is one of the main digital capabilities that organizations need. CMS provides the following features:

- Provides a centralized content management platform providing a single view of content of enterprise data
- Streamlines enterprise content-related processes to make them more efficient and agile
- Helps enterprises stay competitive through faster turnover and efficient publishing
- Provides content in a structured format so that it can be reused across various applications and services.

Enterprise Search

An enterprise has content distributed across various data sources in various formats. For instance, information about an employee could be distributed across employee database, finance ERP, and internal collaboration platform. In order to get meaningful data about an employee, it is essential to organize the information holistically and present it in relevant context.

Enterprise search plays this key role of organizing and integrating the enterprise information and making it easily discoverable in the relevant context. Digital enterprises can reap various benefits from search technologies. Search function can be positioned as the key navigation enabler and information discovery tool in a prominent position on the page. As this is one of the main focus areas of this book, Part III is dedicated to a detailed discussion of the enterprise search technology.

Value addition of enterprise search to digital platform

Search enables digital platforms to achieve multiple business goals such as:

- Relevant information discovery through relevant search results
- Dynamic content aggregation of all enterprise content sources
- Promotion of self-service models through solution search, saved search, etc.
- Cross-selling and upselling of products by bundling related products through product search and recommendations
- Promoting newly released products through techniques such as artificial relevancy boosting
- Exposing the enterprise information to third-party systems through search services
- Assisting in legacy modernization and digital transformation by indexing the legacy content and making it available through search functions.

Enterprise Sources Used by Search Engine

Normally an enterprise search engine uses these enterprise content sources to index and organize information:

- Online Web content: Search engine can crawl and index all enterprise Web applications using the base/start URL.
- Secure content: Search engines also support various authentication mechanisms to crawl and index secured systems (such as private Web pages). The search results for authenticated content are made accessible for authorized roles.
- Network file share content: The search engine crawler can access content/files residing in file servers.
- Enterprise databases: Search engines use database connectors to index data from a database.
- ERP systems: Search engines use services or adaptors to index data in ERP systems.
- Services: Search engines can also consume (and expose) content from internal or external Web services.

1.5 CHAPTER SUMMARY

- In this chapter we discussed the high-level concepts of enterprise content management system (ECM).
- ECM system provides end-to-end management, storage, retrieval, and publishing of enterprise data in various formats.
- Features of ECM include document management, workflow management, imaging, Web content management, records management, digital rights management, digital asset management, enterprise search, and collaboration.
- The chapter discussed differences between ECM and WCM and presented the book's focus areas.
- The chapter presented various enterprise opportunities and capabilities that can be realized by digital technologies. Digital technologies provide various opportunities such as Omni-channel enablement, social engagement and collaboration, real-time insights, personalized delivery, self-service capabilities, productivity improvements, streamlined processes, compliance adherence, content consolidation, and optimized administration.
- Digital trends and challenges were discussed. The main challenges are in the area of enterprise integrations, process optimization, meeting market and consumer expectations, collaboration, consolidation, and culture change.
- Enterprise digital capabilities include, among others, capabilities related to user experience, social engagement, access control and security, content

management, enterprise search, process management, integration and administration, and API management.

- Digital technologies enable various business functions such as finance, digital marketing, insurance, telecom, digital commerce, retail, life sciences, and health care
- Enterprise digital strategy should include digital vision, customer centricity, seamless Omni-channel experience, information consolidation, information communication, and information conservation.
- Content strategy is needed for efficiently designing and managing content.
- Digital content strategy includes managing content lifecycle for an optimal experience.
- Digital strategy includes various elements such as DAM, document management, information architecture, SEO, analytics, metadata management, workflow management, social engagement and collaboration, and taxonomy.
- Content strategy includes various processes such as, among others, content analysis, competitive analysis, content visual definition, content design, and reusability analysis.
- Digital content management involves end-to-end management of digital content throughout its lifecycle.
- Enterprise search helps in organizing enterprise information and improves it findability.
- Enterprise search adds value to an enterprise through relevant information discovery, dynamic content aggregation, self-service, content/product promotion, and search services.
- Enterprise search indexes data from sources such as Web content, secured content, file sources, enterprise database, and ERP systems and services.