

# Software Engineering Perspective of Adobe Experience Cloud(AEC)

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## **Abstract**

The digital content creator space has seen a great paradigm shift after the experience of the worldwide pandemic situation. This has led to increase in number of web footprint for various domains, businesses, and individuals. As Adobe states, the digital economy is a \$1 trillion opportunity. Adobe Experience cloud offers a suite of products that allows business to manage their customer experience by providing them with real-time data, personalization and scalability wherever needed. Their offering appeals to enterprises with sophisticated use case that binds content creation, insights, and orchestration together [27].

In this report on what Adobe Experience Manager Productivity Suite offers and analyze it in Software engineering perspective. It is an end-to-end content management platform that includes a set of tools to help medium and large-scale enterprises to manage their customer content engagement and delivery strategies. The biggest benefit of AEC is that it simplifies social engagement, management, and delivery of website content.

The report extends to talk about the business models and how Adobe became the leader in DXP (Digital Experience) segment.

# Introduction

Adobe Experience cloud is a comprehensive tool that manages companies every facet of an online management system. It is used to develop sites, mobile apps, and forms. It is also used to engage companies online marketing and all its assets under one roof. Studies indicated that on an average Enterprises manages 268 customer facing websites, and everyone wants it to be mobile and responsive [1]. It has never been more important for companies to manage this load under one single platform in a consistent way. Adobe has proven to improves its customers ROI up to 348 percent over a period of three years [2].

The main capabilities of Adobe Experience Cloud can be categorized into five components:

- **Content Management System** – Its powered by Adobe Sensei AI (Artificial Intelligence) and is built on a cloud native platform that is agile, scalable, and secure. Provides with complete foundation to build websites that cater to the customer's market. It also makes it easier to built sites for mobile apps, using a user-friendly developer facing tools.
- **Digital Asset management Suite** – Allows teams to collaborate in Adobe creative cloud, to create the types of contents that they need to scale. One factor that all the E-Commerce companies have in common is the need to have an effective customer data collection. They know that the right customer data can give them a competitive advantage in the open market. AEC set out to ease the process of wielding this analytical data to its customers to add up to the corresponding businesses advantage.
- **Digital Enrollment and Forms:** It offers a powerful feature to build a website, with faster form rendering, CDN capabilities for caching along with automated new features updates. Microservices based architecture is used to automatically scale sites, by managing the traffic demand to a site. AEC forms are integrated with Adobe Sign which helps in seamless and end-to-end form signature.
- **Cloud service** – AEC takes full advantage of what the modern solutions has to offer. Experience manager along with cloud integration was able to offer Modular, Scalable, and Secure platform with performance resiliencies that cater to a business growth.
- **Learning Manager** – Adobe strives to helps its customer in learning the platform and support a learning group at the customer space, in creating easy and personalized on brand learning experience about its products and improve their benefits with reduced cost, boosted performance and extended customer lifetime value.

## Application Domain and purpose

Adobe Experience Cloud offers smart automation and development tools with cloud hosting to deliver contents across digital channels.

Digital Experience platforms are cohesive set of technologies used to enable technologically advanced composition, management, delivery, and optimization of digital experience. Adobe has proven itself to be the leader in the DXP segment [3].

Adobe offers sophisticated and innovative set of functionalities for digital marketing use case especially for B2C. The primary use of Adobe Experience Manager resides in B2C cases, but few organizations subscribe to this productivity suite for certain B2B and B2E purpose.

AEC is available on premises or as PaaS, with few components provisioned as SaaS. The Experience cloud is used to create, enhance, and reshuffle the existing marketing and advertising technologies.

Adobe Experience Manager helps sales team manage customer relationships, deliver rich multimedia

experiences, and do targeted marketing.

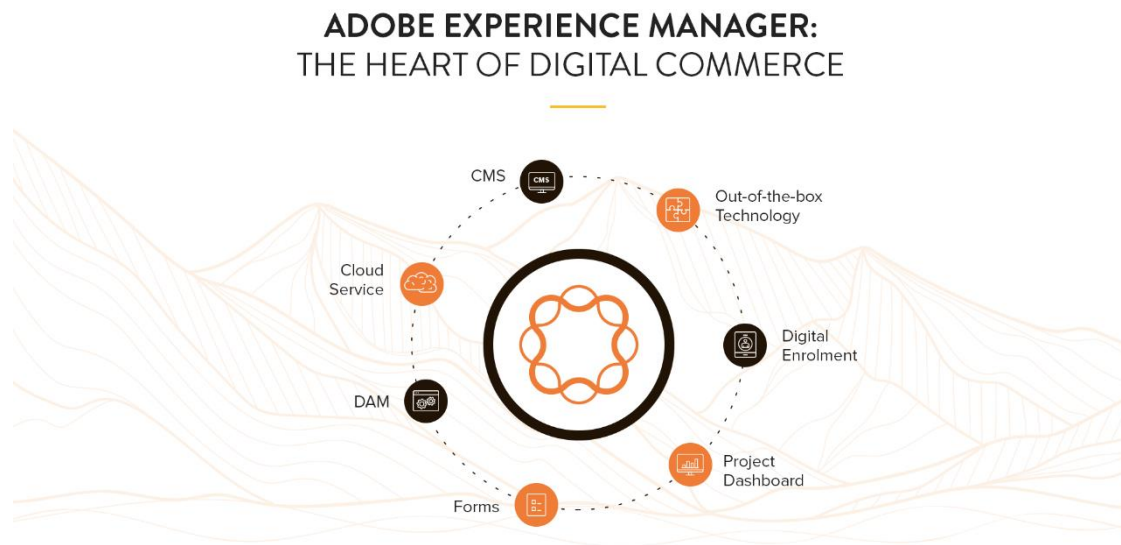


Image illustrating Adobe Experience Manager's feature (vaimo.com)

## Software Development Practices at Adobe

Adobe suggests and follows the following Development Practices [4] as a standard across its products development. They work by defining Definition of Done (DoD) for each feature built under a productivity suite. They believe that without a proper DoD they might end up in a situation where things are halfway done [24].

Criteria that are commonly specified by Adobe includes:

**Code reviewed for formatting:** They try and make their code readable and maintainable. And each team decides and agrees upon their conventions. For example, Comments/Javadoc to be added wherever needed.

**Meets required test coverage levels:** As the product list and features grow based on demand, it becomes tedious to evaluate and evaluate large code base. Hence Adobe developers suggest practicing TDD (Test Driven Development), writing failing unit tests before the production code that will fulfill their requirements. Automated tests should be created to ensure systems works as expected.

**Staying Demo ready:** Product needs to be available for demo to business after each iteration and therefore technical debt can be to a maintainable level.

**Continuous Integration:** Creating a CI environment will allow to repeatably run unit tests and integration tests. It also decouples deployments process from the development, empowering the other parts of the team to be more efficient and making for more stable and predictable deployments [24].

**Low build times to speed up the development cycle:** short build times are prioritized to ensure that they have invested time into their test coverage and CI infrastructure continue to make the team more productive.

## Development Strategies followed by developers at Adobe Experience Cloud

Adobe creates products with the idea that revolves around building value for customers.

For the sake of understanding the strategies involved in developing their suite of productivity software's, we shall consider the "Control Panel" launched by Adobe Campaign (a sub-product under AEC suite). It is a microservice to empower its user to deliver a better administration experience.

According to Adobe Experience Blog by Jaemi Bremner, a former developer advocate for the Adobe Experience Platform, mentioned about the development framework that they used to design systems. To stay focused on making excellent enterprise software, they use the acronym CARE ("How Developing Products With "CARE" Puts Customer ... - Medium") [5]

### What does CARE Acronym mean?

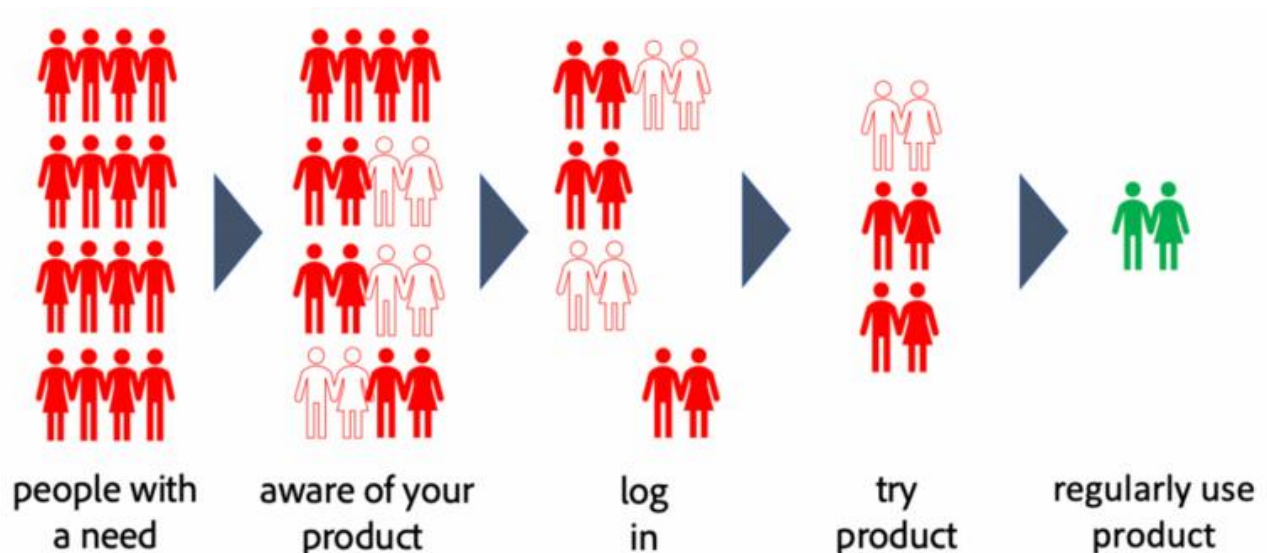
**C** — Customer needs drive all your work, so focus on the "why" instead of "what"

The development steps were focused on addressing the customer issues from the point of need rather than diving straight into the developed with minimal information. User centric crucial steps were considered than just finishing the development for the required product.

Software specifications being the foremost part of software process, and Acceptability characteristic of a product is vital before starting with development. The 'C' in CARE accounts for these.

**A** — Adoption paths

End-to-End mapping of customer experience with the product starting with a need, moving on to awareness about the product, then evaluation, consideration, selection before ending with customer loyalty was adopted framework. This allowed to ensure that user find it easy to use features at each touchpoint in a streamlined fashion with no clutters.



Illustrates Adoption Path framework.

**R** — Recognize that the happiest scenario is not all there is.[5]

The control panel team had considered all the best-and worst-case scenarios in which the user can use

the product. They developed help tools, kits, guides, error messages and video tutorials to assist the user whenever the product encountered an issue when used in the intended or unintended manner.

This leads to the product being more Dependable and reliable. In case of system failure, the product help tools will function as a reliable source of additional information, keeping the downtime minimal and the users to be more aware of the possibilities and rectification methods.

**E** — Enable teams that support your customer and product.

Control Panel team worked closely and iteratively with the customer care team, asked for feedback from the consulting team, and scheduled demos for customer success managers [5]. UI reviews were deemed to be important at regular intervals to focus on being on the same line as the requirement.

This Development framework indicates an Iterative and Incremental development process model where it follows a combination of Plan Driven and Agile methodology for building software. The team continued to add additional features and security patches post the release of the product [6].

## Noteworthy features of the Adobe Experience cloud

Adobe's collection of data centers worldwide called 'Edge' are optimized for low-latency interactions with client devices. The interaction between the client-side tech and edge creates great digital experiences for their customers. Experience Cloud has edge data centers around the globe that responsible for [27]:

- Collect behavioral telemetry.
- Real time decisioning and providing personalized offers and recommendations.
- Push notifications and emails to end users

### Business Implication

On business front, Experience cloud SaaS products at scale are tremendously rewarding for businesses and make a meaningful impact on enhancing the digital experience, which in a way has a catalytic effect on economy. A fast-paced web presence brings a great benefit for a business as appeals to end users.

## Functional Limitation and Quality Constraint in AEC

Like every other CMS product in the market, Adobe Experience Management comes with a set of limitations that are indicated by its users across multiple review platforms [7].

To state a few:

1. **Lack of Flexibility in the Experience Manager structure:** Users have complained that the rigid structure of AEM (Adobe Experience Manager) causes them to be forced to publish within the established paradigm without many customization options. AEM follows a complex folder-based structure to navigate within the system, which makes it hard and time consuming when looking for a specific item.  
Touch UI and the Classic version of AEM are ways to publish content. It is important to know that one must learn both if they want to publish the full range of content they want for marketing.
2. **Process Intensive setup:** The initial setup of the software requires the IT department to be highly involved as it is a complex process. Every tweak will require the IT team's involvement and cannot be done by content editors alone.

According to reviewers from G2[8] and Capterra [9], once you grasp Adobe AEM — which is difficult, customizing it to fit your workflow can prove a task on its own. Whereas its competitors in the CMS space like dotCMS allows for thorough customization and enables technical and non-technical users to build features and extend its functionalities [10].

## **Ethical concerns with respect to AEC**

1. Pricing and cancellation fees: Adobe have a premium-priced product portfolio- Its total cost of ownership is exceedingly high compared to other vendors in the industry. in any case, the company can charge whatever it sees fit. A 2019 Forbes report on Adobe's stock price noted that it is also doubly hard for customers to stop using its products [12].

Adobe says: "Should you cancel after 14 days; you'll be charged a lump sum amount of 50% of your remaining contract obligation and your service will continue until the end of that month's billing period" [13]. Fifty percent cancellation fee could work out to be lot of money, while Adobe only allows continued use of the service until the end of the monthly billing period.

2. Poor Customer service: Customers have raised complaints stating that they have sometimes misled by free trails and various subscription offers. It is as if the company has made these options intentionally impenetrable [14].

## **Security Concerns**

Two Cross site scripting vulnerabilities were discovered in Adobe Experience Cloud, which was indicated to lead to leaking sensitive information of user. In a competitive space of e-commerce, this could result in a potential loss in business for the customers who subscribed to Adobe service [25].

Few subversions of AEC 6 [6.2,6.3,6.4] had stored cross scripting vulnerabilities which was prioritized, and severity marked as imported with a description "Sensitive information disclosure" and was later patched with and updates that were addressed to this relevant vulnerability [15].

## **Improvements recommended by Enterprise users.**

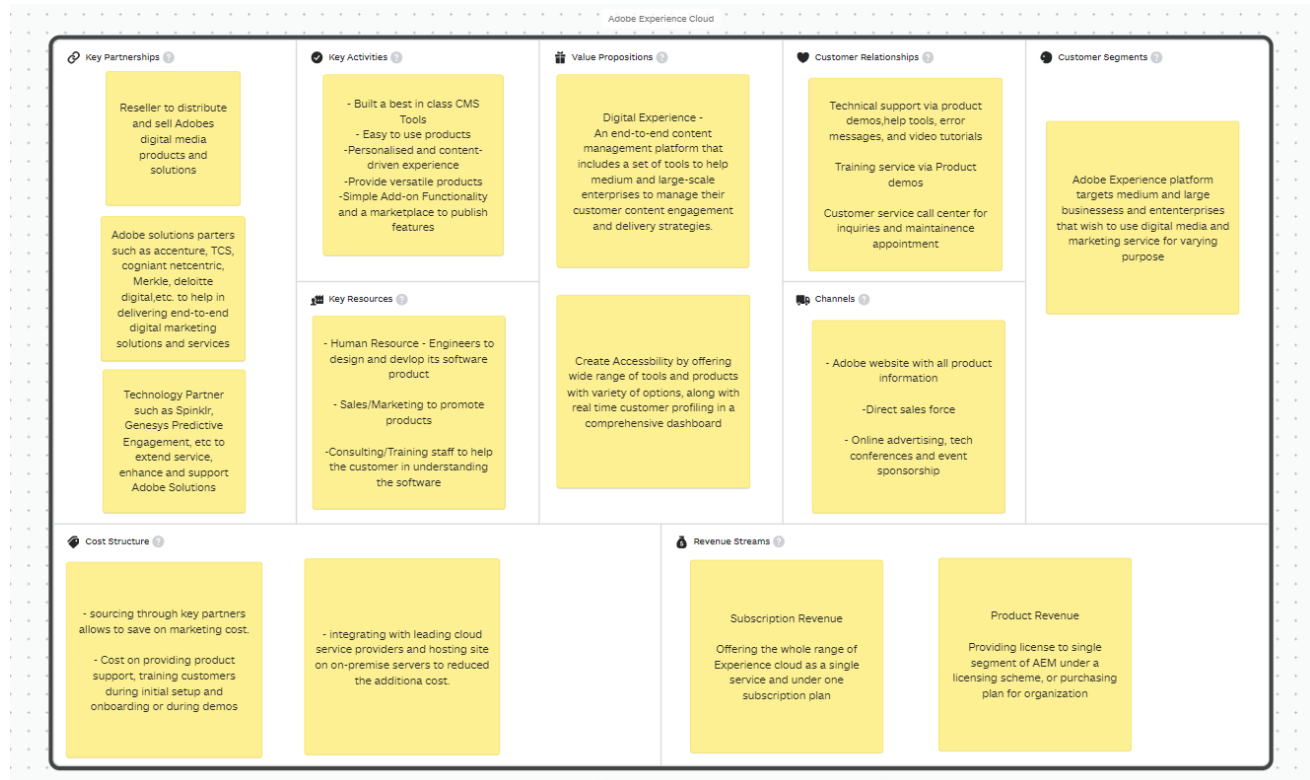
As stated in some of the critical review posted on Gartner Peer Insights [16], by the vendors, it was highlighted that Adobe needs to better their demo approach as little options is shown during product trials. Costing on the other hand is higher than that of the products in the same segment offering at a lower price which can be improved with cost effective solutions.

As the suite offers a large variant of products, the business requirement analysis and the kind of product that will suit the customer is a gray area and can lead to margin of error, that ends up with the vendor paying more for less usable features.

# Adobe Experience Cloud Business Model

On contacting the sales team of Adobe, I got information that they operate a flexible pricing structure. The costing entirely depends on the business type and the components that we need to develop.

## Business Modal Canvas for Adobe Experience Cloud



This is a self-generated Business model canvas for Adobe Experience Cloud using Strategyzer [17] and by analyzing information gathered on Adobe Revenue and customer success story [18], Adobe and Microsoft cloud integration [19], Adobe partner in Experience Manager sites [26].

## How Adobe Experience Cloud became the leader in DXP segment in 2022.

Adobe is positioned highest and furthest to the right for both the Ability to Execute and for Completeness of Vision [20]

Differentiators that are believed to be the reason for Adobe Experience clouds success.

- Integrated insights and action.
- Adobe Sensei AI integration with its products.
- Ability to deliver content at the quality the customer demands.



- Real time information with respect to customer sites metrics.
- Adobe is trusted with safety in terms of user data, as they have an exceptionally low turnaround time when it comes to resolving issues pertaining to security issues.

Statistics On Adobe Experience Manager sites [21]:

- Productivity for digital content teams using AEM Sites 23% higher.
- 348% ROI in 3 years.
- Fifty-six percent less time to put up launch page.
- Sixty-four percent faster to make minor editorial changes to sites.
- Six percent less time to deliver brand page.

The Forrester Wave, a leading tech research company, rates Adobe Experience Manager as one of the few leaders in Digital Experiences Platforms, by analyzing the individual strength of a platform's strategy and offering [22].

## THE FORRESTER WAVE™

### Digital Asset Management For Customer Experience

Q1 2022

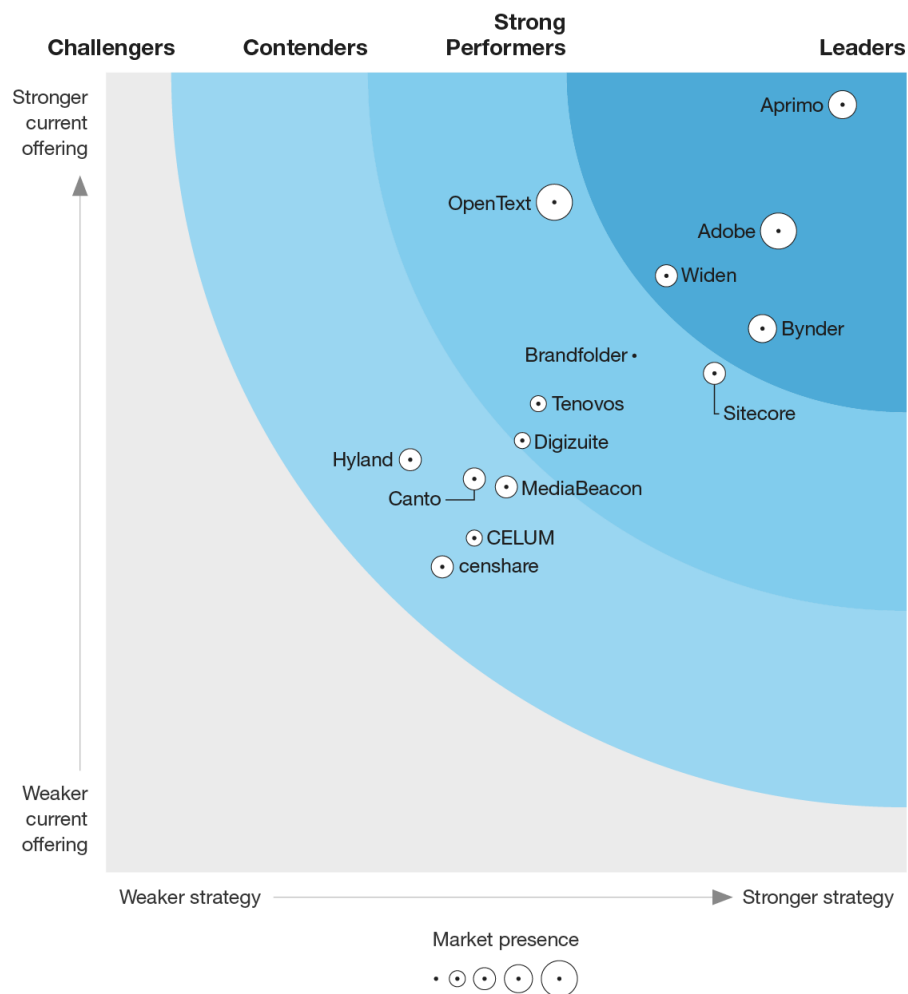


Image illustrating the comparison of various CMS solutions, (The Forrester Wave™: Digital Asset Management for Customer Experience, Q1 2022)

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