
White paper

The State of Cloud Computing in the CCM Industry

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ABSTRACT

The Customer Communications Management (CCM) space is undergoing a significant and steady transition from on-premise, client-server architectures to multi-tenant cloud-applications running in serverless environments. In this analysis, Founder & CEO Kaspar Roos and Senior Research Analyst Will Morgan of Aspire CCS highlight the most important shifts in the market, provide an overview of the state of cloud computing in CCM, and explain what opportunities this transition presents to both enterprises and services providers who are ready to modernize their communications strategies. As you read about pure cloud, containerization, iPaaS, the Edge, and other relevant developments, you will also learn what the sponsors of this paper (Assentis, Ecrion and Messagepoint) are offering in this area.

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KEY RECOMMENDATIONS

- Enterprise buyers, whether in IT or on the business side, should consider the benefits that cloud-based CCM brings in terms of agility, flexibility, scalability, cost reduction, and innovation/experimentation.
- Developments in cloud computing are unfolding at a breakneck pace, and there are now many different types of “cloud solutions”. When evaluating them, enterprises must consider the benefits that containerization, micro-services, and deployment flexibility offer and how well their cloud solution integrates with the wider cloud-based content services, marketing, or customer experience (CX) technology stack.
- Service providers must realize that new developments in cloud technology may have the potential to fundamentally disrupt the services market for customer communications. In a time of accelerated and unprecedented change (such as we are seeing now in the wake of the COVID-19 pandemic), currently accepted best practices may soon be out of date. Especially now, it is imperative for providers to understand the benefits that modern cloud solutions bring, and to apply them to their business and operating models.



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INTRODUCTION

While the term “cloud” has become something of an overhyped buzzword, the growing popularity and influence of cloud computing has undoubtedly been one of the most relevant and far reaching developments in the Customer Communications Management (CCM) space in recent years. The goal of this paper is to outline what cloud computing means in the CCM space, what trends we expect to direct the future, and what the implications will be for enterprises that evolve their IT infrastructures and software implementation preferences.

We have structured this report into three main sections:

1. Technology (Chapter 1 to 3)
2. Pricing Models (Chapter 4)
3. Vendor discussion (Chapter 5)

For readers who are not familiar with the CCM industry, we have provided a succinct introduction and reference to more materials below.

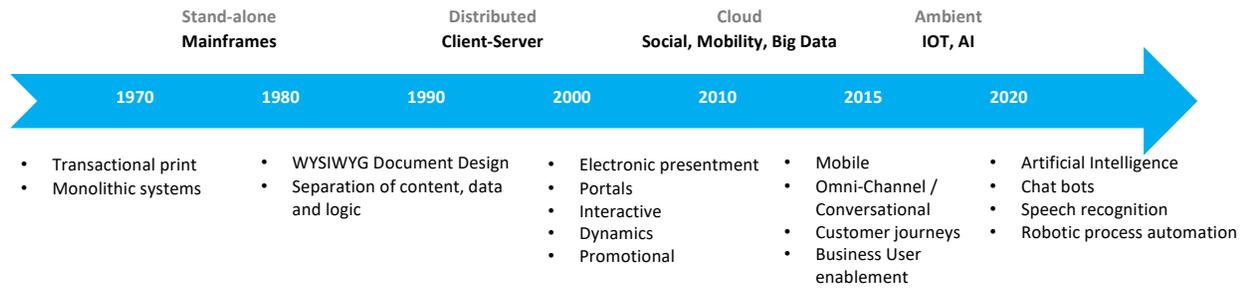
CCM DEFINITION

At Aspire, we define **Customer Communications Management (CCM)** as the creation, management, and fulfilment of personalized, omni-channel communications at scale. In this context, **omni-channel** refers to communications that are channel and/or device-agnostic, meaning that they can be sent across physical and digital channels with minimal friction and ideally reach a consumer with a relevant message at any point along the customer journey.

Over the last forty years, the CCM space has developed through very distinct phases. It first emerged as an industry that allowed organizations to leverage mainframes, grew to benefit from client-server architectures, and is now rapidly transforming to cloud-enabled software that will power the next revolution in customer experience and distributed Internet of Things (IOT) devices.



Figure 1: CCM Evolution over the years



Source: Aspire CCS, 2020

We have written about the transition of the CCM industry at length. You can access a number of free¹ resources on the Aspire Leaderboard website, including the following:

- Technical overview of CCM:
<https://www.aspireleaderboard.com/insights/the-evolving-ccm-landscape-2018-update>
- CCM overview for marketing:
<https://www.aspireleaderboard.com/insights/a-beginners-guide-to-ccm-for-marketers>
- Why CCM is still relevant:
<https://www.aspireleaderboard.com/insights/should-we-still-care-about-ccm-in-2018>

¹ Requires a free registration on the Aspire Leaderboard, www.aspireleaderboard.com



CHAPTER 1: KEY COMPONENTS OF CCM

To better understand the impact that cloud computing has on the CCM industry, it is helpful to look at the key components that comprise a modern CCM solution and see what impact cloud computing has on each one.

DESIGN TOOLS

A **design tool** is a graphical user interface that provides the ability to define layouts as well as data sources and specify the content blocks/elements that constitute a template. CCM design environments come in different varieties:

- a. **Stand-alone, thick-client editors** are the most common option. Most CCM vendors provide a proprietary thick-client editor that is installed on a desktop computer or laptop. Those editors are often designed for IT users.
- b. **MS Word editors.** Vendors that offer a plug-in to Microsoft Word also rely on it as layout editor. Their clients — typically B2C environments with many case or claims workers (such as insurance companies) — often prefer to create their own communications in a familiar tool. There are typically two main approaches when using Microsoft Word in this way:
 - i. Microsoft Word is the user interface, but the output format is a proprietary one developed by the vendor. Microsoft normally saves its Word documents in the DOCX format, but the “plug-in” modifies the output into a vendors’ native template format. In this scenario, the vendor typically expands the Word user interface with some additional menu options that allow for administration, data mapping, field referencing, business rules, content referencing, and more. The template is typically saved in an XML format that is then rendered using an XLS-FO transformation engine.



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- ii. The Microsoft Word document is saved in its native DOCX format and the field references or markers are then parsed at the time of composition. In this case, the vendor typically offers a separate administration solution to help IT or business users setup mapping and manage version control outside of Word.
 - c. **Browser-based designers**, which mimic the capabilities of proprietary, desktop designers but run in the browser.

CLLOUD IMPACT ON DESIGN ENVIRONMENTS

Explanation

“HTML5 designers are so-called zero-weight editors because they don’t require any installation and run natively in the browser.”

When it comes to on-premise, thick-client designers, several vendors have developed browser-based versions of their thick-client design tools. A few years ago (before the advent of HTML5), development frameworks such as Flash or ActiveX were often employed because the HTML standard at the time could not be used to build robust user interfaces. Most ActiveX components have now been replaced, and vendors who built their designers in Flash are currently migrating them to HTML5 (if they haven’t done so already), because Adobe is no longer supporting Flash. In a native HTML5 approach, there no installation is required, and vendors can tailor the interface to the role of the user — employing more technical features for IT users, while creating more common/basic or text/content features for business users.

It should be noted that advanced browser-based designers allow users to copy-and-paste tables, graphics or content elements from other tools — such as Microsoft Word — directly into the browser while preserving formatting. Other systems support uploading of Word or InDesign files and converting them into an online format. Cloud designers can often also be easily enhanced or extended by downloading modular components or add-ons. For example, by downloading additional user interface components (like interface to chatbots, personalized videos, or Google Maps) from a marketplace.

Progressive cloud vendors such as Assentis, are embracing UX design principles and a micro-frontend approach (by leveraging their cloud native architectures) for browser-based application development to ensure that their design tools



follow best practices and are intuitive to use — especially for non-technical business users. Google’s Material Design is a great example of UX design philosophies that the CCM industry is increasingly adopting.

We have yet to see any of the vendors who offer a plug-in to Word launch a plug-in based on Microsoft’s web native HTML5 solution, Word 365. While Office 365 enables product extensions (for example, many CRM solutions offer product integration options for Outlook 365), it seems that Word 365 does not provide the same level of modification and control as the thick-client version. Vendors are therefore required to either build their own online editors or use best-in-class open-source components and embed them in an interface that looks like Word.

PRODUCTION MANAGEMENT – COMPOSITION & OUTPUT (INCLUDING ARCHIVING)

Composition (or rendering) is the ability to merge communication templates with production data and output customer communications in various formats, such as PDF, AFP/IPDS (print), email or web/mobile-optimized HTML5. Rendering is often part of production management tools that manage production and allow users to promote newly developed or changed templates through the software environment lifecycle (often defined in terms of Development, Test, QA, and Production). Most composition solutions come with advanced output management capabilities, including the option to prepare for print or digital channels or to optimize communications for archiving.

THE CLOUD’S IMPACT ON RENDERING AND PRODUCTION MANAGEMENT

There are several issues to consider when moving rendering and production control the cloud:

- a. Composition requires the generation of documents that often incorporate personal identifiable information (PII), such as social security numbers, bank account numbers, online security details,



personal health, or other sensitive details. Data privacy and security is a highly regulated area in most countries. Regulations such as GDPR, SOC2, HIPAA, PCI, PSD2, and others restrict companies from processing PII data in the cloud without having the proper safeguards in place. Companies that are relatively digitally immature may not have the risk and security frameworks in place to manage processing in the cloud. We will address security in more detail in Chapter 4.

- b. The instant scalability of the cloud offers many benefits. In Chapter 2, we will look at the technical benefits of cloud computing in greater detail, but in general, rendering is a CPU intensive process and native cloud rendering allows for companies to scale up processing capacity quickly at low cost.
- c. Hybrid scenarios are emerging in which rendering may happen on-premise but the management of communications, including its meta-data is handled in the cloud. Again, Chapter 2 will offer more details about the technological developments around containerization and serverless architectures that are enabling greater deployment flexibility.
- d. The cloud — and especially containerization — make resource promotion across different environments easier. In years past, promoting a new template into the next stage of the lifecycle (i.e. from Q&A into production) would often require a sequence of manual IT tasks which are now highly automated and easier to manage through modern host platforms such as RedHat OpenShift.
- e. Output is sent to delivery systems, (usually cloud-based gateway service providers) that distribute email, text/SMS, or mobile push/mobile messaging messages to the recipient. Some companies are starting to move part of their archive functions to the cloud and leveraging PaaS (defined in the next chapter) capabilities such Amazon’s S3 buckets for storage.



CONTENT MANAGEMENT, BUSINESS AUTHORIZING AND INTERACTIVE

An important part of CCM is the use of content management systems to store content elements, such as text fragments, headers/footers, images, among others. Vendors that specialize in this area, such as Messagepoint, offer capabilities that enable content sharing across touchpoints and channels, thereby creating greater efficiency, consistency, and control. Business authoring capabilities provide dedicated user interfaces to create, manage, and approve content, such as policy line items, terms and conditions, explanation of benefits, graphics, and more. Interactive capabilities are used to modify the communication itself (in the instance of a communication template). Typical use-cases include those for call center agents or claims workers that use the CCM interactive system to create or modify communications on the fly.

CLOUD IMPACT ON CONTENT MANAGEMENT, BUSINESS AUTHORIZING AND INTERACTIVE

As with CCM design, vendors are actively migrating their content management, business authoring, and interactive solutions to a zero-weight browser-based environment. They benefit by allowing business users to enable or disable features and functions based on their needs. Cloud-based software is also scalable, which is convenient when the number of users fluctuates throughout the year.

The Enterprise Content Management (ECM) industry is rapidly moving to Content Services, or the notion of using API-based microservices calls to access centralized content or content-related services. From a CCM perspective, this enables CCM systems to pull in content from API endpoints, or push them as a content application server to other systems. In this emerging cloud ecosystem, new use-cases are being created that provide deeper automation or enhanced customer experiences. A good example is MARCIE, Messagepoint's artificial intelligence (AI) engine providing content services that can be plugged into CCM design environments to analyze content at the moment of creation, checking



for similarities or duplicates, and ensuring that each communication is written in the proper tone and designed for optimum readability.

Many ECM vendors specialize in **back-office automation**, or the creation and management of content to support payment processes, human resource (HR), or other business processes. The market is encountering a growing need to connect CCM solutions with API endpoints that deal with payments, electronic signatures, or workflow / case management. In Chapter 3, we will examine in greater depth what role integration and APIs have on the CCM industry.

DIGITAL EXPERIENCE

Many CCM solutions have evolved over the years from offering document-centric static communications to now providing dynamic, bi-directional digital communications. Delivery of digital communications is typically the domain of specialized gateway providers, but some CCM vendors offer their own digital delivery technology. Digital interactions are typically visualized through journey visualization software and require **omni-channel orchestration**, which Aspire defines as the ability to determine what message a recipient receives at what time through what channel, increasingly by employing AI and machine learning. Omni-channel orchestration also encompasses the ability to continue a conversation across channels. For example, through omni-channel orchestration, an enterprise should be able to switch to another channel (i.e. print) if the chosen delivery method (i.e. mobile/email) is not successful on the first attempt. Chat functionality, personalized videos, or smart / intelligent web forms are also part of a complete omni-channel orchestration offering.

CLOUD IMPACT ON DIGITAL EXPERIENCE

Most of those capabilities have been developed in recent years and are therefore already offered as a cloud-native SaaS solution. Some components may not be necessarily classified under CCM, but are leveraged from the marketing technology stack. However, CCM vendors typically come from a regulatory background and while the general functionality may look the same, the digital experience tools developed by CCM providers often address specific



challenges that may be overlooked by the marketing automation vendors (such as security, testing, support for non-digital channels, more robust compliance, and archiving).

DASHBOARDING, ANALYTICS, AND REPORTING

This is a somewhat underrepresented area of CCM, but one that is becoming more important in today's world, especially now that COVID-19 has placed brand communications squarely in the spotlight. Many enterprises are realizing that centralized control of communications across organizational functions and systems is an essential step towards creating better omni-channel customer experience. Detailed dashboards give business users insights into what communication processes are happening across the organization, what the costs are, and if SLAs/KPIs are being met.

CLOUD IMPACT ON DASHBOARDING, ANALYTICS AND REPORTING

The shift to the cloud and the wider shift to digital has resulted in two main trends when it comes to enterprise communications processing:

- a. The development of cloud-based integration frameworks (see Chapter 3) that are being extended with dashboarding and reporting capabilities to provide a deeper level of control and insights to business users in the organization. Unlike the enterprise IT vendors who develop iPaaS (again see Chapter 3) or application integration frameworks for general purpose, these offerings specialize in providing integration between systems that handle a high volume of transactional communications, including communications that are produced on industrial printing devices.
- b. There is a need for processing technology to be integrated with digital marketing communications in order to provide more robust omni-channel processing capabilities. Many organizations do not have a bird's eye view of what is communicated to a single customer at every point along their journey, and don't have the ability to track, analyze, start, or



stop communications. The cloud is making it easier for CCM vendors to setup cloud-to-cloud integration with systems in the marketing technology stack.

CHAPTER 2: CLOUD IN CCM

Now that we have taken a look at the capabilities of a modern cloud solution, we will next examine how they are usually provisioned through SaaS, PaaS, and IaaS. We will also explain the notion of containers, serverless architectures, and upcoming developments such as the Edge.

THE BASICS: IAAS, PAAS, AND SAAS

INFRASTRUCTURE-AS-A-SERVICE

Infrastructure-as-a-Service (IaaS) allows businesses to move away from their own hardware and rent servers in the cloud. There are two models here:

- a. **Dedicated servers** in a data center: The data center can be owned by the CCM vendor, but more often, a CCM vendor rents a dedicated server from a hosting provider. This is called, co-location or “co-lo servers.”
- b. **Public servers** offered by the likes of AWS, Microsoft, or Google are logically separated and offered as a virtual private cloud.

Vendors in the CCM space that were early adopters of the cloud (when public clouds offered by AWS and Microsoft were less mature), or those that have to comply with very specific regulatory requirements (such as those governing electronic health records or payments processing in certain countries that require physical auditing of data centers) rely on co-lo servers. The rest (the majority) either rent servers directly as IaaS or are (increasingly) using PaaS.



PLATFORM-AS-A-SERVICE

Platform-as-a-Service is the option in which CCM vendors do not rent a server but rely on platform functions from providers like AWS, Google, IBM, Microsoft Azure, or RedHat. The benefit of PaaS is that CCM vendors do not need to worry about operating system maintenance since they rent access to databases and file storage applications. PaaS is becoming increasingly popular, for two primary reasons:

Explanation

“Container orchestration is an important concept for containerized CCM solutions. It orchestrates web calls to multiple (specialized) microservices, start and manages workflows, and execute the right sequence of tasks. Some vendors develop their own engines while others embed leading open-source technology such as that offered by Netflix”

- a. The cloud platform industry is rapidly moving to containerization and serverless architectures, which means that vendors no longer need to worry about the latest Windows or Linux server on which their software runs. Instead, they can make their software available in so-called containers (i.e. Docker) which isolates the application from the operating system. It looks as if the application has its own instance of an operating system but in reality, it is Docker that enables multiple containers to run on a single operating system. By installing Docker on several hosts, and by leveraging Kubernetes as a container orchestration platform, CCM vendors can automate container provisioning, networking, load-balancing, security, and scaling across all these nodes from a single place of control. This makes it easier for CCM vendors to maintain their code base in a single place, helps them to deploy updates faster, and provides more innovation than the traditional on-premise/update model.

Related to the rise of containerization, is the rise of RedHat OpenShift. This is a PaaS arrangement for hosting applications developed in common programming languages such as Java, Ruby, Python, and others, which allow software developers to quickly write code, test, and deploy it. OpenShift also supports the ability to add other older programming languages like Cobol, thereby helping enterprises to move some of their legacy systems onto more modern architectures.

- b. Enterprises are increasingly looking for hybrid deployment, an innovation pioneered by vendors like Messagepoint and widely supported by many others, including Assentis and Ecrion. Through



containerization, CCM vendors are developing software once that can then be easily deployed across a range of options – whether it is AWS, Google Cloud, Azure, or their own servers running VMWare, the deployment options and the orchestration can all be controlled and managed by the platform. As we mentioned in the previous chapter, some enterprises may not yet be comfortable enough to process PII in a public cloud environment, but they could see this as a future option. For them, a hybrid PaaS may be ideal as they can specify which components need to run on premise (i.e. composition) and which components can run in a public cloud (i.e. design tools or content management). We’re also seeing models in which the rendering takes place in a public cloud (because of the advantages in scalability) but no output is written to disk. That all happens on-premise. Other organizations are comfortable writing output to disk in a public cloud, but insist that the data needs to be deleted after a certain period. In short, containerization makes deployment flexibility much more viable.

SOFTWARE-AS-A-SERVICE

SaaS is a popular option for enterprises, allowing them to rent software that is fully managed by the vendor. The vendor keeps the software up-to-date, ensures it’s always available, and typically charges based on consumption.

In the CCM space, several vendors have moved to a SaaS model because it offers several advantages:

- a. It allows business executives or digital change agents to procure CCM independently from IT. While IT will always be required for implementation, SaaS puts a much lower strain on scarce IT resources.
- b. SaaS is typically faster to install and implement because SaaS vendors often understand the importance of integration and connectors.
- c. SaaS is easier to scale and scales much faster and at significantly lower cost than on-premise CCM solutions. Many enterprises deal with peak volumes throughout the year and base their capacity and performance



requirements on those moments of peak volumes. With SaaS, the system can intelligently scale up and down depending on actual throughput.

- d. SaaS vendors typically provide a greater degree of control and deeper insights because their systems are more modern and can be incorporated in the digital experience stack.
- e. While cloud may sometimes be perceived as relatively insecure, the reality is that data breaches can happen anywhere and are, in 70% to 90% of cases, linked to social engineering or advanced phishing, and not because the cloud provider is hacked². Also, cloud native platforms offer built-in encryption and often come with automatic data backup capabilities.

THE NEXT FRONTIER: PURE CLOUD AND THE EDGE

PURE CLOUD

“Assentis, Ecrion and Messagepoint, the sponsors of this paper are all so-called “pure cloud” vendors. With that we mean they have purposely developed their CCM solutions for containerization and deployment flexibility”

The “cloud” is a concept that is continually evolving. As we described, the latest development of containerization requires vendors to rethink how they build their solutions, and it is a fundamentally different notion than installing monolithic systems on a rented server in co-lo or even on a virtual private cloud. To differentiate between those two versions of clouds, we at Aspire are starting to use the term “pure cloud”(although “cloud-native” is a commonly accepted alternative) in reference to vendors who are building CCM solutions that have been purposely developed for containerization and have deployment flexibility in mind. Several vendors who claim to be cloud-based are in fact “cloud-enabled”, meaning they have simply installed their monolithic applications on a virtual machine in a public cloud environment. As a result, they won’t be able to address the evolving needs around the hybrid cloud that we’ve described. The benefit of containerization and microservices is that

² <https://blog.knowbe4.com/70-to-90-of-all-malicious-breaches-are-due-to-social-engineering-and-phishing-attacks>



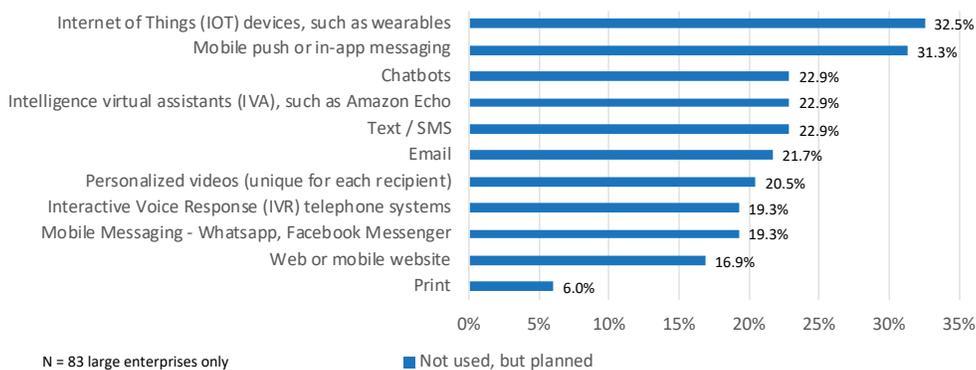
software can be created at more granular level. We like to see that as “Lego bricks” which can then be used by business analysts or enterprise architects to build the right solution for their business.

EDGE COMPUTING

Another trend that we’re seeing in the market today relates to Edge computing. Whereas the cloud favors centralization of processing and data storage, the Edge is the opposite and favors a distributed model. The Edge is closely associated with the rise of IoT and the fast mobile connectivity provided by 5G. Devices in the Edge will increasingly be able to act as a communication endpoint. (Think of devices fitted with a screen, such as Home hubs, smart refrigerators and electric cars or voice-activated interfaces like smart speakers). Our research shows strong growth in those channels, and having cloud native CCM software should make it easier to capitalize on this future trend.

Figure 2: Planned investments in communication channels, 2020-2021

Communication channels your organization plans to use in next 12-24 month (not used, but planned)



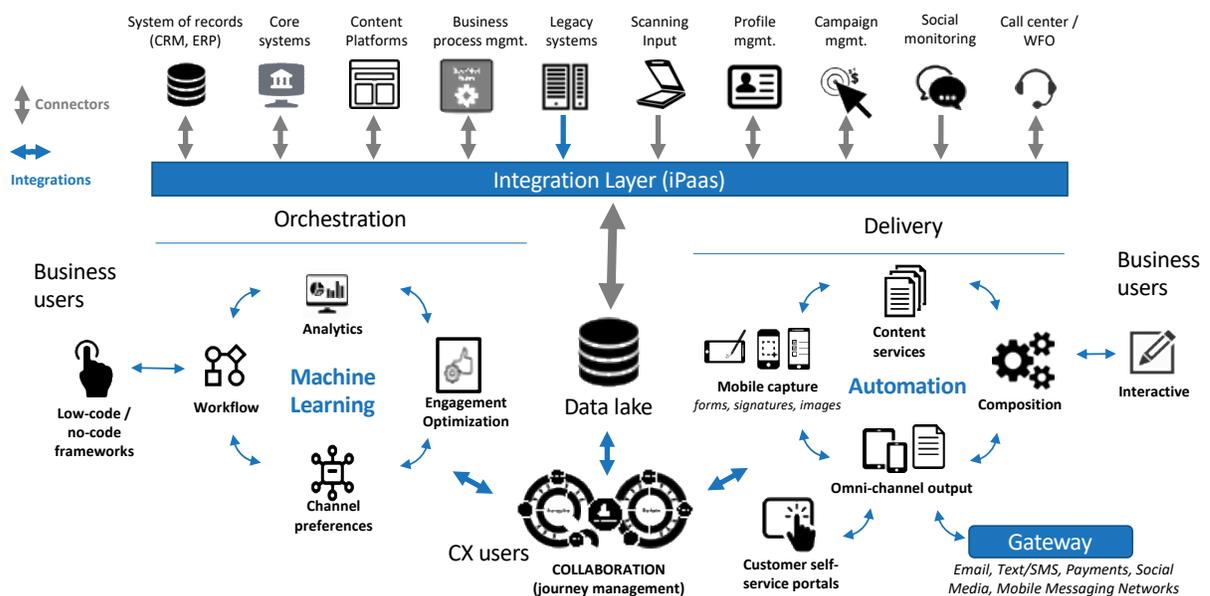
Source: Aspire, *The State of CCM0-to-CXM Transformation, 2019*



CHAPTER 3: INTEGRATION AND MARKETPLACES

As we mentioned in the previous chapter, the growth of cloud-based platforms is an emerging trend in the enterprise IT industry. Conceptually, customer communications software can be seen as a front-office experience technology that allows enterprises to provide communications to its customers at scale. That front-office technology needs to be connected to the back-office (business processes, core banking systems, insurance systems, or even customer relationship management systems).

Figure 3: Emerging CCM ecosystem



Source: Aspire, 2020

As the figure above shows, modern CCM solutions are deeply embedded in core systems and platforms within the wider enterprise IT stack. We're seeing several options for enterprises to connect their systems:

- a. Direct integration points using APIs supplied by the vendor are the most popular method. There is little overhead, and most vendors offer them

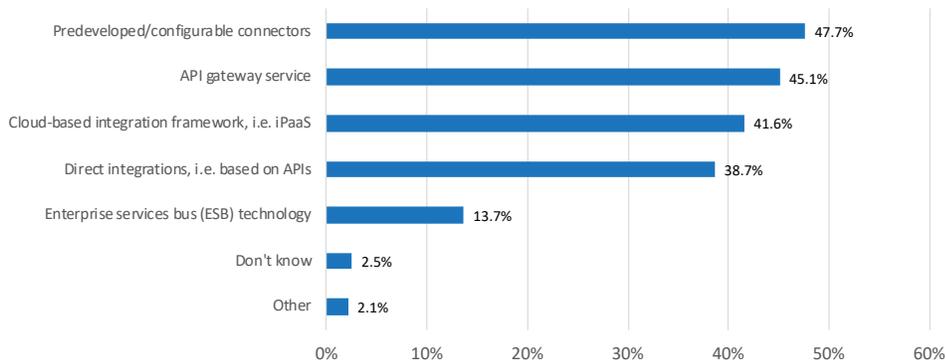


as prebuilt connectors, especially when they connect to popular platforms such as Salesforce, Microsoft Dynamics, or SAP.

- b. API gateway services provide some level of abstraction within the APIs, and make it easier for enterprise architects to control integration.
- c. iPaaS solutions can be used to connect CCM systems to other CX or enterprise IT systems, thereby offering security and tracking capabilities. iPaaS systems may integrate cloud-to-cloud (zapier.com is a good example for the SMB market), or can be setup to integrate ground-to-cloud or ground-to-ground. Some vendors partner with third party solution providers, while others build this themselves or add it as part of their platform. iPaaS is becoming the most popular option for digital change agents and transformation professionals because it allows them to manage integrations at scale.

Figure 4: Integration Preferences

Which of the following best describes how your organization typically integrates CCM with other IT systems?



N = 512

Source: Aspire, *The State of CCM0-to-CXM Transformation, 2019*

Beyond iPaaS or direct integrations, in the last decade, many large software vendors such as Salesforce and SAP built their own cloud-based platform onto which CCM vendors can publish their connectors, thereby benefiting from access to core functionalities and the data sources of the host platform.



ONLINE MARKETPLACES

A rising trend among pure cloud CCM vendors is the notion of an online marketplace. This is a website or online environment where users can download modular extensions to their platform, such as “business applications”, accelerators, or connectors. Aspirational vendors in this area, like Ecrion as well as Messagepoint with its Touchpoint Exchange, are allowing their customers to build business apps themselves that can then be published on the marketplace for the benefit of the wider community, or to allow clients to distribute it internally, (e.g., to insurance agents or brokers).

CHAPTER 4: SECURITY

Security is a key concept in CCM, and when we look at cloud computing for CCM, security generally refers to a set of policies, controls, procedures and technologies to:

- a. Secure the infrastructure and CCM application
- b. Protect customer data and stored/archived communications
- c. Provide secure communications to the recipient
- d. Ensure regulatory compliance

INFRASTRUCTURE, APPLICATION AND DATA STORAGE

CCM vendors that run their software in the cloud take security very seriously. Securing the infrastructure and applications touches on several aspects:

- **Authorization:** Ensuring that only authorized users have access
 - Access at the enterprise level (for business users) is typically governed by Single Sign On (SSO) services based on secure standards such as oAuth2.0.



-
- Access at the portal level by end-users is typically governed by username and password, but it is increasingly enhanced with multifactor authentication, such as confirming a PIN code received by text message or using a mobile device identifier.
 - **Encryption:** The ability to encode plaintext into ciphertext so that it can no longer be accessed by unauthorized parties
 - Using encryption for storing data at rest. Most cloud-based platforms have built-in encryption as default.
 - Using encryption for API calls and data transfers based on the HTTPS protocol. Now that microservices and API connections are growing, so is the need for automatic key management to ensure digital certificates remain valid.
 - **Data and tenancy isolation measures in multi-tenant environments:** Container security measures which go beyond the scope of this paper, but are important when running mission-critical systems on multi-tenant SaaS CCM systems.
 - **Data residency:** It's a persistent perception that data residing in the cloud is unsafe compared to data stored on-premise behind the firewall. According to a recent AWS whitepaper on this topic³:
 - The physical location of data has little or no impact on threats propagated over the Internet. Internet-connected systems expose an organization to a broad array of threats, all of which are propagated from any location.
 - Human process failure is the root (if not the entire) cause of most cybersecurity breaches. A common example is a failure to patch vulnerable systems with published software updates for many months prior to an exploit.

³ https://d1.awsstatic.com/whitepapers/compliance/Data_Residency_Whitepaper.pdf



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- The vast majority of major data breaches have occurred either through unintentional errors or intentional malicious behavior by individuals using authorized accounts that had the right to access the data.
 - **Geographic location of data stored in the cloud:** Here, there are two forces at play:
 - European enterprises have traditionally had concerns about storing data on American-owned Cloud Services Providers' (CSPs) infrastructure because of the risk that data could be confiscated (for example, as result of US legislation such as the PATRIOT or CLOUD acts) or because they believed that data stored outside the European Union would be subject to lower standards of data privacy.
 - The concern about confiscation was particularly strong in the private banking sector and has been reduced in recent years as the US government has significantly stepped up its efforts to control tax avoidance by its citizens.
 - CSPs have evolved their offering into geographical "zones". It is now perfectly possible to specify in which geographical area data should be stored and processed. In addition, several European governments, such as the UK, have certified cloud services providers such as AWS and deem them safe enough to have their own public agencies use them.

PROVIDING SECURE COMMUNICATIONS

Delivering secure digital communications is critical, especially when it concerns communications that contain PII. The common way to secure delivery channels is by encrypting the payload and the channel, typically by using a secure web



API call. CCM systems typically push digital communications to an email or mobile gateway provider who then distributes it to the client.

Some key trends in this area include:

- **E-mail is still used as the dominant channel** even though it is inherently insecure. The common way to deal with this challenge is to store a communication in a secure repository that can be accessed by a mobile app or web portal once a user has been authenticated.
 - Mobile push communications are used to provide an interactive experience and reduce the need for email notifications.
 - While there are some technologies to simulate mobile push without an app, most often mobile push requires users to have installed a mobile app. This can be a significant barrier depending on the vertical, use-case, or intended recipient.
 - **Interactive or more secure email.** Google's Accelerated Mobile Pages (AMP) development may open up the way for more interactive — and potentially more secure — email communications. AMP allows the email message to contain interactive containers, however, this needs to be supported by the email client, and it is uncertain how this will evolve in the years to come.
 - **Password encrypted PDF attachments are still popular,** however, they don't provide a good customer experience on mobile devices. Also, new regulations such as PSD2 in Europe, require stronger authentication rules than password protected communications can offer.



REGULATIONS AND RISKS

Cloud computing for CCM has been impacted by developments in regulations. The number of regulations that are relevant to consider differ by use-case and industry, but common ones include:

- **GDPR:** After going into effect in May 2018, the General Data Protection Regulation (GDPR) became the international benchmark for data protection legislation. The regulation was designed to give European Union citizens greater control of their data by outlining the legal actions of any business that use their information. Many national and regional legislatures have used GDPR as a model to craft regulations to protect their own citizens. One of the most noteworthy recent examples is the California Consumer Privacy Act (CCPA) which grants California consumers similar protections, including the right to know what personal information businesses collect and the power to opt out or delete their records with that organization. CCPA went into effect on January 1, 2020 and the final proposed regulations package was submitted to the California Office of Administrative Law on June 1.
- **HIPAA:** Enacted nearly 25 years ago, the Health Insurance Portability and Accountability Act (HIPAA) is the chief regulation governing the protection and management of personal health information in the United States. It requires healthcare organizations to ensure their secure access to records and data, to abide by strict guidelines when handling electronic transactions, and to report any security breaches.
- **PCI DSS:** Developed by four major US credit card companies in 2004, the Payment Card Industry Data Security Standard (PCI DSS) set up measures to protect cardholder data and prevent outside infiltration. An update in 2016 established new standards for multifactor authentication and data encryption.
- **PSD2:** The revised Payment Services Directive 2 (PSD2) is a new EU regulation designed to jump-start innovation and competition in the financial services market by giving consumers the power to share their



banking data with third parties. If GDPR was meant to rein businesses in by limiting their use of consumer data, PSD2 is designed to disrupt the financial services sector through open banking, which would enable consumers to share their data with the third parties they choose. Open Banking, which technically describes the use of APIs that enable third party developers to build applications and services around traditional financial institutions, will give consumers full control over their finances and the details on how, where, when, and on what they spend their money — data that, until recently, has been the exclusive purview of traditional banks. In doing so, open banking empowers consumers to trade their data for a superior customer experience (CX) with the chosen provider.

- **FISMA:** Effective since 2002, the Federal Information Security Management Act (FISMA) governs the security practices of the United States' federal government and is designed to ensure that its agencies protect their data by abiding by internal security regulations. Each agency must undergo an annual review of their security practices to ensure that they are up to date and effective. FISMA allow applies to the technology security of outside entities who meet the compliance standard if they host services within a data center that abides by the act's regulations.
- **SOX:** Passed by the US Congress in 2002, the Sarbanes-Oxley ACT (SOX) is designed to ensure transparency in financial reporting by publicly traded companies. In addition to requiring upper management to control financial records and certify the accuracy of reporting, SOX also requires the formation, communication, and enforcement of formal data security policies that protect stored financial data used to conduct day-to-day operations.



MANAGING RISKS

When selecting a cloud services provider, it is helpful to understand if they conform to security standards or certifications. Some common ones include:

- **ISO 27001 and ISO 27018:** The International Organization for Standardization (ISO) is a collection of experts who have developed over 23,000 standards that are administered by a number of external certification organizations. The ISO 27001 is a framework that helps companies build tailor-made information security through the assessment of relevant risk and the development of necessary prevention. ISO 27018 is a set of guidelines for protecting PII in a public cloud.
- **SOC2:** SOC 2 is an auditing procedure that ensures cloud providers securely manage client data. It requires companies to establish and follow strict information security policies and procedures encompassing the security, availability, processing, integrity, and confidentiality of customer data.
- **FedRAMP:** The Federal Risk and Authorization Management Program (FedRAMP) is a rigorous security compliance standard designed to protect the data of all US citizens. In the past, third party vendors working with the federal government were forced to comply with varying standards depending on which federal agency they worked with, but these new guidelines govern risk assessment for cloud computing within and across all US federal agencies.
- **UK Government G-Cloud:** The G-Cloud initiative, begun in 2012, is intended to make the government procurement process easier by setting up a digital marketplace for public sector organizations to buy services from approved vendors without being forced to undergo full tender, review, and bidding. Services are classified in three different “lots”, including Cloud Hosting (IaaS) and (PaaS), Cloud Software (SaaS), and Cloud Support.

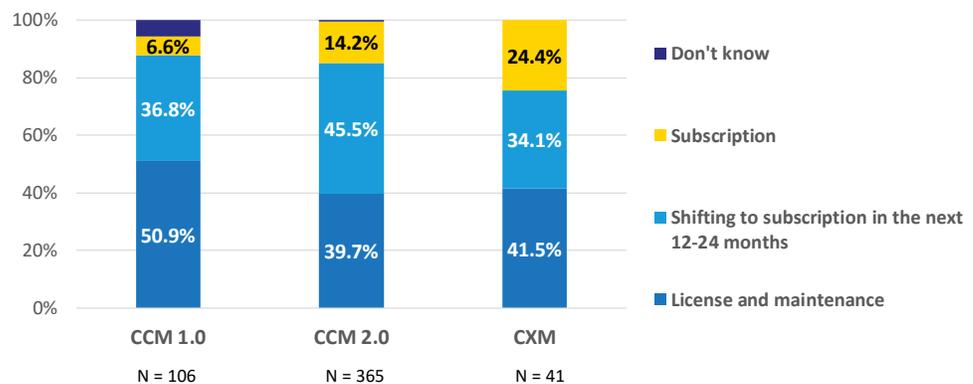


CHAPTER 5: IMPACT OF CLOUD ON LICENSING

SUBSCRIPTIONS

As the market continues its progression from IT led communications strategies toward a faster and more interactive CXM ecosystem, Aspire believes an increasing number of B2C communications schemes will be provisioned through cloud-based, micro-services architectures. Our September 2019 survey entitled, "The State of CCM to CXM Transformation" found that the most mature organizations (labeled as CXM) were the most likely to prefer to secure CCM services through subscriptions. Those in the middle of their evolution (CCM 2.0) were the most likely to say that they are in the process of switching to a cloud/subscription model.

Figure 5: CCM Purchase Preference by Maturity



Source: Aspire, *The State of CCM-to-CXM Transformation, 2019*

Across all the surveyed organizations, job roles, and verticals, CCM purchase preference is shifting toward subscriptions. While only 13% of businesses preferred to pay for CCM software through a subscription in 2019, more than double that amount reported that they expect to move to subscriptions by the end of 2021.



MOTIVATIONS FOR SUBSCRIPTION AND CONSUMPTION-BASED PRICING

The motivations behind cloud migration and purchase preferences vary by evolutionary maturity. For instance, when IT led organizations begin moving CCM to the cloud, they are working to reduce operational cost, increase security, comply with regulations, and manage risks. They often prefer buying perpetual software licensing because it keeps expenses predictable.

Enterprises with a more advanced digital maturity typically have the Line-of-business (LOB), shared service, or CX teams act as the key buyers in CCM. Their business cases are built differently. Often, they need to reduce “business-as-usual” spend in order to free-up cash for digital transformation initiatives. An OPEX model works better in these scenarios since they won’t need to tap into IT budgets, (although IT remains involved). Consumption-based pricing may be a good fit for buyers at this level because they often prefer a cloud / subscription model that allows them to circumvent not only high capital outlays, but also long cycle times and bureaucratic red tape. The cloud’s instant scalability and faster integration, combined with a scalable pricing model and the low cost of performing a proof-of-concept, allows these buyers to experiment at low cost and find the solutions that best fit their needs.

LICENSING STRUCTURES

When it comes to licensing of cloud-based CCM solutions, we typically see that pricing is structured around the following components:

1. **Base price:** This is a monthly cost to cover hosting, maintenance, and other core functions, and it is typically fixed. Some vendors offer a lower monthly fee but include an additional one-time charge for initial setup. Others, like Ecrion, do not charge a setup fee, but bundle in the cost of implementation and professional services.
2. **Communications volume:** This charge is typically set up in tiers which — depending on the country, vertical, and size of the organization — can range from small to large volume bands. Some vendors differentiate by type of output, so that, for example, the generation of a PDF and a



HTML5 file from a single customer record will count as two communications. Others have inclusive models, but may charge a higher base fee depending on the number of output options selected.

3. **Data volume:** This charge is usually based on the amount of data that is uploaded and processed in the cloud. Even though buyers generally don't like this model because it is hard to predict how much data is consumed in a single communication, we do see it used, most often when monolithic CCM systems are deployed in a virtual private cloud.
4. **Number of users:** In this case, a distinction can be made between technical roles (such as administration and IT communication template developers) and business users who employ the system to create or manage content and communications. Seat licenses for technical users are often included in the base price of the system, but for interactive and business authoring solutions, vendors charge based on the number of concurrent or overall users.

CHAPTER 6: HIGHLIGHTED VENDORS

This paper was sponsored by Assentis, Ecrion, and Messagepoint who share an interest in educating prospects, customers, and industry followers about the latest developments in cloud. Below, you will find a short description of each vendors and the cloud services they offer.



ASSENTIS TECHNOLOGIES

Assentis Technologies AG (Assentis) is a privately owned, and dedicated CCM solutions provider for the global financial services and insurance markets. Assentis is based in Rotkreuz, Zug, Switzerland, and has offices in Germany, Austria, the U.S. and Singapore as well. Most of its customers are in the DACH region, but the company is growing outside of their home market, particularly in the U.S. and the Far East.

Assentis is very strong in the banking sector — most of its customers are large banks — and it has built seamless integration with many core banking systems such as Avaloq, Finnova, Temenos, and SAP. Avaloq has even embedded Assentis technology (OEMed) in their system, selling it to dozens of large banks across the world.

Assentis leads with their DocFamily CCM platform, which was built as a cloud-first solution (but also runs on-premise or in hybrid configuration) and has recently been enhanced into a cloud-native solution supporting containerization, microservices, and greater deployment flexibility. This new offering will be branded OC2 for “Orchestrating Customer Communications”. Not only does DocFamily support all major CCM use cases, it also comes with specialized features for specific industry segments, such as a highly secure chat and remote meeting solution which allows financial advisors to securely share confidential information — a feature that is highly relevant in today’s market.

For more information, please read or watch our analysis of Assentis or visit their website:

- <https://www.aspireleaderboard.com/review-of-assentis>
- <https://www.assentis.com>



ECRION

Ecrion is a software provider specializing in CCM and CXM technology. The company is headquartered in Rockville, Maryland in the U.S. and has offices in Romania, the U.S., and the U.K. Most of its customers and reseller partners are in North America, Europe and Asia. Ecrion is experiencing high growth and was very recently acquired by the U.S.-based MHC Software, a content automation software and services company.

Ecrion leads with the Ecrion Engage platform, a comprehensive, pure cloud platform that provides microservices and deployment flexibility (meaning that it can run fully on-premises, in the Ecrion cloud, in a customer's cloud, or in a hybrid configuration). Ecrion supports all common use cases in CCM, including batch, on-demand, and interactive, and offers data management as well as customer experience capabilities such as journey orchestration. Its dynamic rendering capabilities allow significant interaction with the communicated data. Finally, Ecrion has recently enhanced its platform with low-code "business apps" enabling a faster way to build industry-specific vertical solutions for its 250+ customers.

In June 2020, Ecrion was acquired by MHC Software, which has a history in back-office content automation and processing, particularly in automating and optimizing accounts payable, supply chain management, human resources, payroll, and other mission-critical business processes. MHC and Ecrion are working on an integrated roadmap for their combined cloud-first, content-centric automation platform focused on self-service user enablement powered by intelligent automation and analytics.

For more information, please read or watch our analysis of Ecrion or visit their website:

- <https://www.aspireleaderboard.com/review-of-ecrion>
- <https://www.ecrion.com>



MESSAGEPOINT

Messagepoint specializes in content management and content intelligence solutions for the CCM industry. Messagepoint is based in Toronto, Canada, and has its European office in London. The company has customers in North America, Europe, and other parts of the world.

Messagepoint is a pure cloud vendor that offers micro-services, containerization and a mix of on-premise, hybrid, and SaaS solutions. Their Messagepoint platform helps organizations manage content independently from the place of composition, giving it more control, agility, and flexibility. This is extremely relevant now that many enterprises are looking to maintain social distancing by managing communications remotely so they can provide more consistent, timely, relevant, and empathic messages to their customers in response to the COVID-19 pandemic.

Messagepoint does offer its own rendering solution (mainly for business correspondence) and partners with other providers for more demanding use cases. Its core development direction is in applying AI and machine learning to CCM use cases, particularly around AI-supported content migration and content optimization processes. To this end, Messagepoint has launched MARCIE, an API-based AI engine for CCM that provides a set of capabilities that help identify duplicate documents and similarities in content. It also analyzes text based upon readability, jargon, and sentiment, and provides content migration capabilities as well. Those content migration capabilities are productized through Rationalizer, a product that helps organizations speed up migration of content from legacy communications. Rationalizer is also available for service providers or other CCM solutions vendors that want to migrate legacy content from Messagepoint to another system.

For more information, please read or watch our analysis of Messagepoint or visit their website:

- <https://www.aspireleaderboard.com/review-of-messagepoint>
- <https://www.messagepoint.com>





ABOUT ASPIRE CUSTOMER COMMUNICATIONS SERVICES

Aspire Customer Communications Services (Aspire), is a London-based CCM/CX analyst and strategy firm with offices in the U.S. and the Netherlands. We work with C-suites across the globe to realize high-impact customer communications transformation.

