

Advances in Customer Engagement Platforms: 2019–20

From isolated CRM to enterprise customer engagement: The evolution of eight leading platforms

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Summary

Catalyst

While customer experience is a top business transformation priority, based on Ovum's *ICT Enterprise Insights 2018/19 – Global: ICT Drivers and Technology Priorities* study, only around 10% of the 4,889 enterprises surveyed, felt that they could support customer engagement across all channels.

Meanwhile customer expectations continue to rise, shaped in part by their positive experiences with internet native businesses, from Amazon through to Uber. Among the many reasons why digital transformation progress is proving painfully and dangerously slow, is a lack of understanding of how the art of the technologically possible, has changed. Customer relationship management (CRM) applications that once promised so much have all too frequently proved disappointing. CRM applications were at best a component or set of components within a broader engagement IT landscape. Over the last few years, however, a new phenomenon has emerged from the ashes of CRM – the customer engagement platform (CEP). In this Market Radar report, we explore CEPs from eight vendors, the advances each has made over the last year, and what we can expect in 2020.

The eight vendors included in this report are as follows:

- Adobe
- bpm'online
- Microsoft
- Oracle
- Pegasystems
- Salesforce
- SAP
- SugarCRM

Ovum view

This natural evolution from CRM to CEP was signaled by Ovum back in December 2015 in its 2016 *Trends to Watch: CRM*, report. Nevertheless, the CRM acronym has stubbornly glued itself to the enterprise vernacular, with all its baggage of failed promises.

As a front-office system of record, traditional CRM solutions provided limited support for customer engagement. Too often they were used to provide management with the illusion of control through transactional reports and dashboards. They increased the administrative burden of front-line employees, offered minimal insight into the customer experience, motivations, and behaviors. The value was disproportionately weighted towards the enterprise at the expense of the customer and the employee. At long last this is beginning to change.

Since Ovum's 2012 report, *The Customer-Adaptive Future*, it has outlined the critical attributes that any enterprise must exhibit to ensure persistent customer relevance. The delivery of a positive customer experience allied to continuous innovation were essential attributes, to keep customers coming back for more. Above all it required a customer orientation across the entire value chain or network, shared by all employees that creates a systemic ability to create and deliver value. The

benefits derived would be weighted in a symbiotic balance, first by generating value for customers and as a result, for the enterprise and its shareholders.

What may have been viewed as an idealistic aspiration in 2012, is today a necessity for continued survival. Across every industry and sector, we are seeing the emergence of new businesses, that can scale rapidly to disrupt the status quo. Speed of transformation is essential, and traditional businesses that understand this, recognize that a coherent approach to customers must be taken – a platform for engagement, that delivers a predictably easy and rewarding experience for customers across any and all channels, physical and digital. This is the key driver behind the evolution from disparate CRM applications applied one department at a time, into an integrated, intelligent customer engagement platform for the enterprise. While all the CEPs are modular and enterprises can continue to take the departmental approach to adoption, it is as a platform that they will create the greatest value in the long run.

To meet Ovum's criteria of a CEP fit for an omnichannel environment, orchestration capabilities must span the entire value chain, in conjunction with back-office and any logistics systems. Customer experience is not just about receiving personalized offers or the brand promise. It includes fulfilment of that promise, which is one of the critical drivers behind how the customer feels about the enterprise. Our research found that around 50 vendors claimed to be providers of CEPs, but on closer inspection, these were limited in scope, often to a single department such as marketing or customer service, with no intention of straying beyond these departmental confines.

Key messages

- The ideal CEP consists of eight technology layers.
- Get your customer engagement strategy in place first before selecting technology.
- Adobe extends its reach way beyond the marketing department.
- bpm'online evolves from CRM to a CEP.
- Microsoft is well positioned for real-time customer engagement at massive scale.
- Oracle builds on its data heritage to create an effective CEP.
- Pega Infinity has an architectural advantage for large-scale high-volume and complex environments.
- Strategic acquisitions and developments boost Salesforce's digital transformation credentials.
- SAP C/4HANA is at the vanguard of the intelligent enterprise and permission-based CXM.
- SugarCRM goes native and transforms into SugarCloud CEP.

Recommendations

Recommendations for enterprises

The pressure on enterprises to transform their customer engagement capabilities is increasing all the time. Progress however is proving elusive for many organizations across industries and every sector. Part of the challenge is to realize that 20th Century CRM thinking is not appropriate in an environment where customers increasingly expect to enjoy frictionless and connected experiences across any channel they choose to use. Research into digital transformation by Dr. Jeanne Ross of the MIT

Center for Information Systems Research (CISR) shows that the most successful organizations are those that develop a platform for customer engagement, rather than those that try to satisfy the internal needs, department-by-department. In this report we highlight the major advances in customer engagement platforms from eight vendors. They are all jockeying for position in this new transformational era, and each has different strengths and areas for improvement. Many enterprises will already have partial platforms in place, having subscribed to different modules provided by these vendors and others. Ovum's advice is to create a unified customer engagement strategy before selecting technology. Customer journey mapping informed by voice of the customer/employee (VoC/VoE) or mystery shopping approaches can help to identify systemic sources of friction or broken processes that aggravate the customer. Once a coherent strategy is in place, it will be much easier to decide whether to add on to existing CRM applications and extend them into CEPs or replace them with CEP. In either case the likelihood is that organizational changes will be required to develop a deeper customer orientation. Speed matters, and there is a huge price to pay for being slow to adapt. Developing a platform fit for customers is a strategic decision and the CEO ultimately owns the challenge.

Recommendations for vendors

One of the biggest challenges facing vendors is to know when to sell a CEP or a module. A decision to invest in a CEP is strategic not tactical. It is transformational and to avoid fear of lock-in, the vendor must earn the trust of the enterprise customer. These customers will require guidance and support from vendors and their partners, working together. This is an emerging field and vendor support, especially in the early stages will be critical to success. A consultative and knowledgeable sales approach will be essential for any transformational investment in a CEP. This requires people with the broader vision who can understand the entire picture and help the enterprise customer navigate the changes required.

As far as technology developments are concerned, data management allied to AI is a critical enabler of a more dynamic and real-time orchestration of the customer experience. Next best action and departmental use cases are a good start but going beyond these "localized" use cases requires a more connected AI environment. Figure 2 highlights the AI maturity from simple to more complex use cases. To really differentiate and succeed in this competitive environment, the winners must aim for dynamic orchestration, as customers will come to expect it.

The ideal CEP consists of eight technology layers

Definition and characteristics

An enterprise CEP enables interactive engagement with customers across any channel or combination of channels customers choose to use, digital and physical, by delivering a contextually relevant and rewarding experience, consistently and securely, to achieve their desired outcomes.

From a technology perspective, the aim is to orchestrate relevance throughout every customer journey. Today, this is a work in progress, but that is the aim in the long run. The eight layers consist of the underlying supporting technologies that culminate in the ability to dynamically orchestrate relevance throughout each customer journey.

Figure 1: Customer engagement platform layers

Layer	Core elements	Building blocks
Orchestration layer	Real-time dynamic experience orchestration & outcome management	Data, context intelligence, triggers and automation provided by supporting layers
Supporting layers	Functional support for front line – marketing, sales, service, commerce and subscription billing, and extensions	Functional modules, third-party add-ins, microservices extensions, mixed reality
	Industry-specific versions – templates, data models, processes, UX, business rules, and related third-party extensions	Industry focused functional support
	Enterprise content and digital asset management tools	ICMS, DAM
	Customer interaction intelligence and automation tools	Connected ML, NLP, automated workflows, RPA, customer journey analytics, IoT sensors
	Security, compliance and permission-based mechanisms and access controls	Security and compliance policies and customer data redaction support on need to know basis, blockchain
	Unified customer data management and dynamic profiling	Real-time big data and streaming technologies, enterprise-customer data platform, in-memory, edge, DaaS
	Cloud Infrastructure – IaaS, PaaS, SaaS, CPaaS, and integration via APIs to back-office, third-party applications, third-party data sources	Core cloud infrastructure and communications network access

Source: Ovum

Cloud and mobile communications infrastructure

Working from the bottom up, a CEP will need to be hosted and provisioned via cloud services. These include infrastructure-as-a-service, (IaaS) platform-as-a-service (PaaS), software-as-a-service (SaaS), and communications platform-as-a-service (CPaaS) to support mobile communications across multiple networks. APIs are the normal mechanism for connecting to adjacent or third-party vendor data sources and applications.

Unified customer data management and dynamic profiling

Before any machine learning (ML) or other AI algorithm can add value, they must be fueled with accurate and reliable data. Customer data is generally fragmented across multiple systems in the enterprise, such as finance, ERP, logistics, store systems, and others. Managing customer data in large enterprise environments is a major challenge. Data can be structured, unstructured, or semi-structured and big data technologies may also be required to support real-time streaming.

Different database types may be required

Relational databases are efficient and reliable for storing transactional data, such as accounts, names, addresses, but as around 80% of data within the enterprise is unstructured, other types of database are required. A variety of NoSQL databases have emerged within the last decade to support unstructured data and are schema-agnostic which allows for massive variety of data types. Data warehouses that store traditional transactional data have been complemented with data lakes that can store structured and unstructured. Good meta data management practices are essential to ensure that data lakes don't deteriorate into data swamps.

In high-volume interaction environments, real-time streaming of interaction data and in-memory computing is essential to support real-time responses at massive scale. The CEP may contain many of these big data components or invoke them via APIs.

Unified customer profiles

Customer profiles must be dynamically kept up to date. The systems must be able to conduct deterministic and probabilistic matching, essential for creating a unified customer profile. The

emergence of graph databases such as Neo4J and Amazon Neptune might be used to identify and track complex relationships between customers within an account (B2B) or family, a group of friends, or a network of influencers (B2C), for example, subject to permissions and regulations. Customer profiles may also be enriched with third-party data from data-as-a-service vendors. In B2B account-based marketing (ABM) environments, third-party data sources are used to augment what is known about individuals within the account, or as event triggers to inform sales people of a new opportunity, that otherwise would have been missed.

CDPs

Customer data platforms (CDPs) have emerged in recent years to support this critical layer. Many of them, however are limited in scope as part of the marketing campaign management stack. What is required is an enterprise-level CDP that can pool data from back-office sources as well as front office or other interaction sources.

Security, compliance and permission-based mechanisms, and access controls

This layer provides the security and governance measures and business tools necessary to protect sensitive customer data, particularly important in multitenant environments, and ensure compliance with any local, regional, or industry-specific regulations. Examples of regional and local regulations include the EU's General Data Protection Regulation and the California Consumer Privacy Act of 2018. Trust is fundamental to any customer relationship, and an array of cyber-security measures will need to be in place. For more detail on developing the right strategies see Ovum's *Cybersecurity Accelerator – Succeed in a complex and transitioning market*.

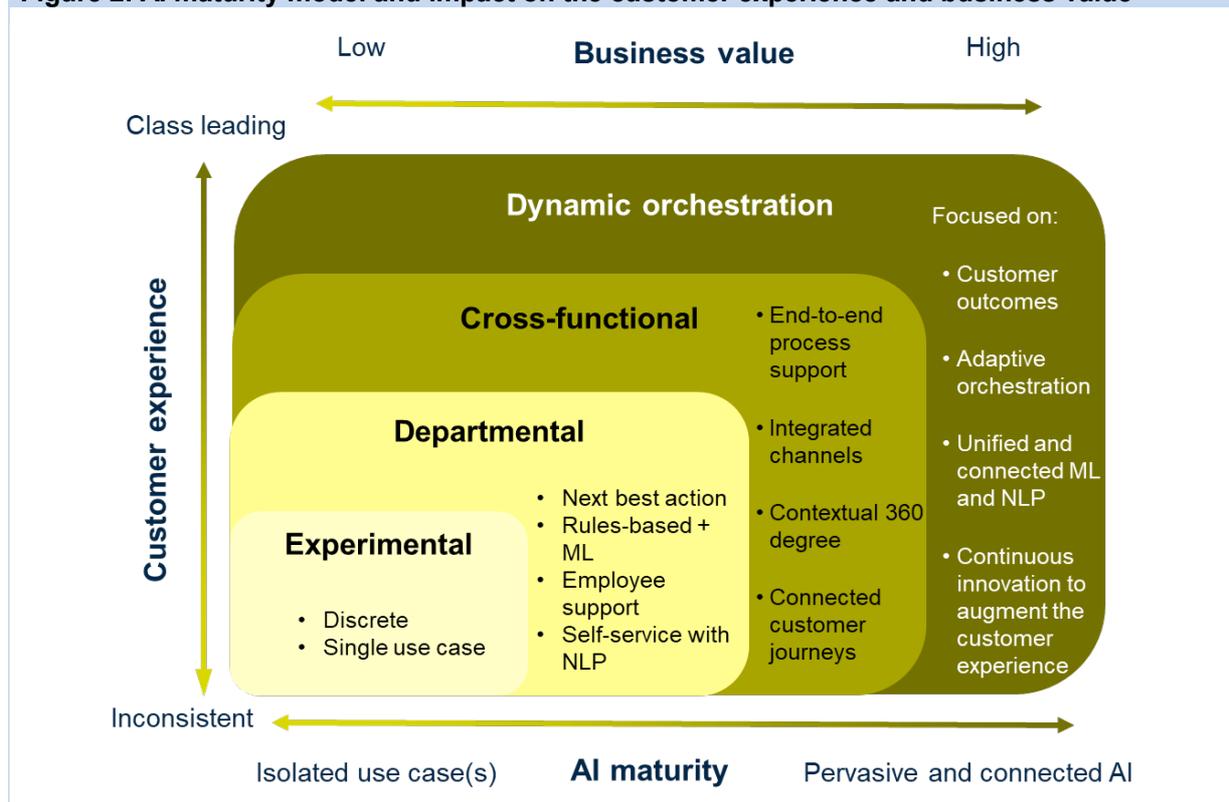
Customer interaction intelligence and automation tools

AI and automation technologies are essential components to trigger the most appropriate response, often in real-time. Customer journeys are more unpredictable than many planners would like. Customer journey management tools can help by visualizing common journeys and designing business rules and workflows to trigger a response that is most likely to be appropriate. Designers might adopt a Pareto 80–20% strategy, to focus on the most common journeys and apply business rules that are most likely to work based on experience. The limitation of this approach is that customer journeys are not static, and who is to say that a most valuable customer might adopt a different path and as a result experience frustration or unnecessary friction, potentially leading to a lost customer?

The AI development journey of most of the CEP vendors has followed a pattern of supporting common departmental use cases, for example opportunity prioritization based on propensity to buy, or routing a complex inquiry to the agent with the most relevant expertise or predicting and displaying relevant products and offers based on what is known about the individual customer. While these use cases provide some value, at the other end of the spectrum is a far more complex challenge, Ovum refers to as dynamic orchestration of the customer journey. This requires a connected network or neural network of AI algorithms and well place sensing mechanisms, so that whatever route the customer takes along their journey the relevant algorithms fire up and their outputs feed other algorithms based on the emerging customer journey pattern.

Figure 2 provides an AI maturity perspective and how Ovum thinks it will develop from simple to more complex uses cases.

Figure 2: AI maturity model and impact on the customer experience and business value



Source: Ovum

Enterprise content and digital asset management tools

Most large enterprises will already have some form of content storage and digital asset management capability. If these are in place, then the CEP must be connected to them via APIs and perform the content orchestration role to provide customers with the most relevant content. Some of the vendors included in this report have sophisticated content management applications and use AI extensively to enable visual searches or to trigger the most relevant content and ensure that it is rendered correctly on the device the customer is using, such as a mobile phone or tablet.

Industry-specific versions

Most of the vendors have some industry component to their CEPs, to support specific industries. These may provide templates, specific data models for an industry, common processes and industry compliant business rules. Some vendors rely more on 3rd party partners to provide the industry specific capabilities.

Functional support for front-line

All the vendors provide some level of application support for front-line employees, either directly or through their own partner market places. The most common areas are as follows:

- Marketing automation
- Sales force automation and management and CPQ
- Service automation including field service
- Commerce
- Subscription billing

- Extensions from third-party independent software vendors (ISVs) and system integrators (SIs)

The scope of functional support is included in the individual vendor sections.

Real-time dynamic experience orchestration and outcome management

This is still a work in progress, as outlined in Figure 2. Each of the supporting layers contribute to this ultimate orchestration layer. Individual vendor capabilities and developments are discussed in the vendor section of this report.

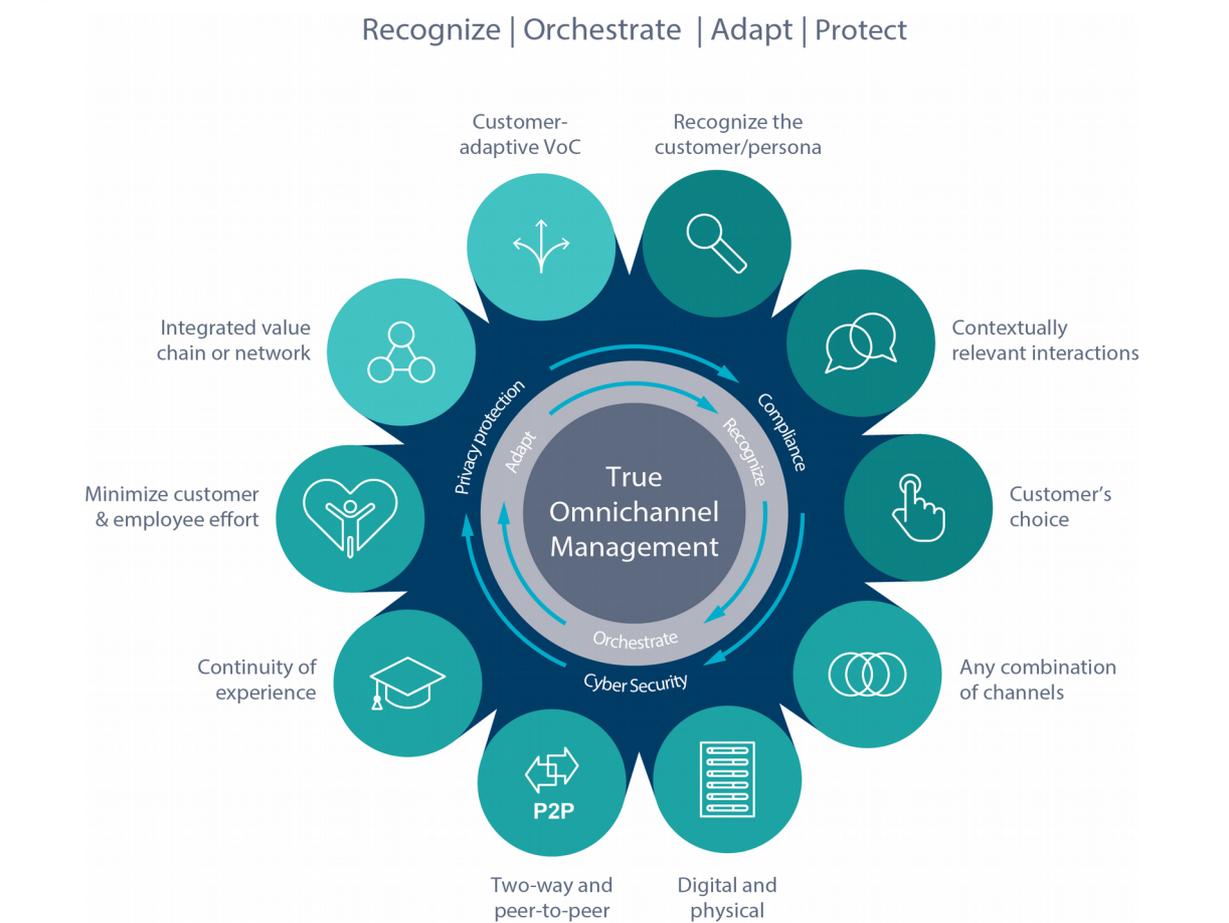
Get your customer engagement strategy in place first before selecting technology

Four core capabilities must underpin an enterprise customer engagement strategy

Ovum has identified four core capabilities supported by 12 attributes that need to be enabled if customers are to enjoy a relevant and rewarding experience consistently throughout every journey (see Figure 3). While there is some variation between B2B and B2C these core capabilities are essential.

- Recognize customers or personas when they interact.
- Orchestrate the experience to help the customer achieve the desired outcome.
- Adapt to behavioral or preference changes.
- Protect the customer throughout all interactions and secure customer data.

Figure 3: The four core capabilities and 12 attributes for omnichannel delivery



Source: Ovum

Recognize customers or personas when they engage

Recognizing the customer as an individual is vital to delivering a personalized experience and can be achieved through authentication, using a unique identifier such as a mobile phone number, login details, token, or biometric means, depending on the nature of the business and the level of security required.

Personas, however, are typically recognized by their patterns of behavior. Where behavioral patterns match those of an archetypical persona, the relevant response can be triggered and resulting outcomes monitored through both real-time analytics and ML.

Customer recognition goes deeper than simple identity, it also must include insight into each customer's context and implied intent, derived from the customer's interactions allied to what is already known about the individual. This enables contextually relevant and personalized interactions with individual customers (the second attribute). Finally, customer choice (the third attribute) recognizes that customers today decide what combination of channels they wish to use (the fourth attribute) and omnichannel strategy needs to support customer recognition in any channel, including physical channels such as a store (the fifth attribute).

Orchestrate the experience

Orchestration of the customer experience at scale goes to the heart of omnichannel and is the most complex challenge, akin to air traffic control at a busy international airport, except that customers do

not file flight plans. Customer journey mapping (CJM) can help plan for the most common interaction journeys but at best only provides a proxy for reality. It is also a slow process, although a great place to start to foster cross-departmental collaboration, which is essential and helps break down organizational silos. Input from voice-of-the-customer studies can certainly help identify where common processes cause frustration and CJM can bring key weaknesses to the collective attention of the cross-departmental steering group or team (see *Electrocomponents' VoC/VoE-driven approach improves the customer experience*).

Omnichannel strategy must also recognize that the customer is often the initiator of any interaction journey and may also seek advice and guidance from peers or fellow customers (the sixth attribute, peer-to-peer [P2P]). Making it easy for customers to reference each other helps create a sense of community and belonging. It also provides an influential platform for customer advocacy, transparency, and trust.

Dynamic orchestration of content, knowledge, responses, and timing requires intelligent automation based on predictive analytics and demands a high level of customer data integration of historic transactional information from CRM and back-office systems, as well as contextual data gleaned from customer interactions in real time and augmented with relevant third-party data. To trigger the right response and deliver continuity and consistency of experience (the seventh attribute), customer interaction data must persist across all the channels customers use during their many and diverse customer journeys. The processes must also be designed from the perspective of the customer to minimize friction and customer effort (the eighth attribute).

The entire value chain (the ninth attribute), particularly billing, fulfillment, and logistics, must also be integrated and connected to fulfill customers' orders and, if necessary, allow customers to reschedule delivery at a time and place that suits them. The availability of self-service channels supported by intelligent virtual assistants is also helpful.

Adapt continuously to remain relevant

To ensure adaptation is continuous and relevant, two types of closed loops are required: external and internal. ML provides continuous, closed-loop automated learning and journey optimization support, linked to customers' behaviors, needs, and preferences and based on outcomes. It is simple in concept; however, as we shall see, there are varying degrees of ML sophistication and even among the most advanced CEPs this is still a work in progress.

Concerning internal feedback loops, performance must be monitored, and a broad array of customer experience metrics and internal closed-loop mechanisms must be in place to drive continuous optimization. Customer-adaptive VoC (the 10th attribute) involves provision of continuous feedback loops throughout the customer journey to trigger the most relevant responses and identify any systemic weaknesses that require attention. The external continuous feedback loop should also drive the internal feedback loops to enable the organization to sense, respond, and adapt to ensure that experiences for all customers are continuously improved and remain relevant. The VoE should be part of this mix to capture improvement suggestions from all employees as well as identify any issues preventing them from delivering a positive customer experience.

Protect the customer

Trust is essential for relationships and a fundamental responsibility for every enterprise is to protect the customer's data from misuse. The cyberthreat landscape is morphing and evolving at a rapid rate, and as growth in online buying and other transactions continues to accelerate, the opportunity for

cyberattack is magnified. Together with cybersecurity is the need to protect customer privacy and to comply with local and regional regulations such as the EU's General Data Protection Regulation and the California Consumer Privacy Act of 2018. Industries like financial services and utilities also have specific regulations that impact how business is conducted. Any or all of these may apply and must be a central concern in any omnichannel strategy. Trust is hard won and easily destroyed, so cybersecurity and privacy, (11th and 12th attributes), must form part of any omnichannel digital transformation strategy.

Customer engagement platforms play a critical role

The CEP market is not mature, it is evolving. The vendors included in this report have a strong underlying CRM heritage. While in the early days of CRM functional support for the triumvirate of sales, marketing, and service were deemed enough, today's demanding customers do not want to be managed and in many cases, do not want a relationship with an organization. They have no interest in the underlying organizational structure or its hunger for customer data. What they want and expect is a positive experience and on their terms. CEPs provide the foundation for this experience as the means to orchestrate relevance throughout the customer's near-infinite and often chaotic customer journeys. This is a mammoth ask for any vendor or enterprise, but the eight vendors included in this report are headed in this direction. Some are more suitable for mid-market B2B, while others can scale their real-time capabilities to reflect the needs of the largest B2C businesses. AI in the form of ML and NLP allied to good data management and automation capabilities, provides the essential mechanism for orchestration. Vendors are at different stages in their evolution, but the direction is clear – to dynamically orchestrate customer engagement to yield positive experiences for customers and a productive environment for employees. In the next section of this report, we highlight the progress and advances made by each of the vendors.

Adobe Experience Platform – a scalable CEP for the enterprise

Summary

Catalyst

Customer experience, once considered either a service or a marketing problem, has become a mainstream concern for an increasing number of enterprises that recognize it as a critical strategic element of their digital business transformations. The experience does not begin and end with personalization of offers but consists of every moment customers interact with the organization both on and offline. The customer experience is not simply a front-office concern. Fulfilment, logistics and even supply all shape the experience and perceptions of customers. This is driving a unified approach to customers, and it is where enterprise CEPs play a central orchestration role. This goes far beyond the remit of simplistic CRM systems designed for 20th century challenges, not those of today.

Ovum view

Adobe has made considerable progress in the development of Adobe Experience Platform over the last year or so. What is most gratifying to see, is that it has moved out of its comfort zone – the marketing department. Adobe seeks to help enterprises develop a unified and holistic approach to

their customers, that fundamentally spans the value chain and goes way beyond offer personalization to experience personalization. A host of fundamental capabilities are enabled from ingestion of data from any source, creating and managing a dynamic customer profile, event streaming in milliseconds and applying AI every step of the way, to create a live feedback loop between the enterprise and its customers, to drive persistent relevance at every touch. Adobe Experience Platform is customer-adaptive by design. What it lacks in frontline functionality, most notably sales and service, it makes up, with the depth of its strategic partnerships, particularly with Microsoft and more recently ServiceNow. Adobe Experience Platform is well on the path to intelligent and dynamic orchestration of the customer experience at potentially massive scale.

Key messages

- Adobe Experience Platform provides a unified environment for customer engagement at scale.
- The acquisitions of Magento and Marketo expand Adobe's customer engagement capabilities.
- Adobe's strategic partnerships with Microsoft and ServiceNow extend the relevance of Experience Platform.
- More AI and easier orchestration are on the horizon.

Recommendations

Recommendations for enterprises

Adobe has massively expanded its capabilities beyond the marketing department. While it still maintains a leadership position in creative marketing, Experience Platform is shaping up to act as the orchestration brain for delivery of relevant and personalized omnichannel experiences irrespective of the department that might be touched in the course of the customer journey. Adobe's deep strategic alliance with Microsoft enables it to take advantage of Microsoft Azure Cloud Services technologies, ensuring that Experience Platform can handle big data sets in real-time, including out to the edge. Longer term the partnership between Adobe, Microsoft, and SAP through the Open Data Initiative (ODI) announced in September 2018, promises greater interoperability between their respective systems. Adobe also supports integration with other leading CRM and ERP applications, making it a highly flexible platform for mixed environments.

Recommendations for Adobe

Experience Platform has great potential to act as the foundation for an enterprise-wide customer engagement platform. While Adobe positions it as the customer experience system of record, this undersells its potential. It also acts as the experience *brain*, able to push out commands to adjacent systems of engagement. To our mind Experience Platform is a hybrid experience system of record and engagement.

The goal should be to dynamically orchestrate the customer experience in real-time and at massive scale. The architecture of Experience Platform offers considerable promise to this level of reliable and dynamic orchestration. We still think this is a few years off for the leading CEP vendors, but the combination of XDM allied to AI in the form of ML and NLP, as well as ODI, offers a promising route to this experience nirvana.

Delivering a unified customer engagement platform is a strategic imperative and a priority for any enterprise hoping to become persistently relevant to keep customers coming back for more. This

represents a major and complex digital business transformation, and this should be led by the CEO, and not limited in scope to personalized offers and the marketing department. This means Adobe must position itself effectively, not just to marketers but to the entire C-suite. For some of its sales personnel, this will be unfamiliar territory, but with careful positioning, Adobe should be able to overcome this potential blind spot.

Adobe Experience Platform provides a unified environment for customer engagement at scale

Adobe Experience Platform provides the foundation for Customer Experience Management (CXM)

At Adobe's annual summit in March 2019, president and CEO Shantanu Narayen, reiterated the vendor's mission: *to change the world through digital experiences*. Adobe's three clouds are fundamental to enabling this mission:

- **Creative Cloud**, which provides a class leading toolset for creatives to create imaginative and compelling digital experiences on websites and devices.
- **Document Cloud** to develop secure digital documents and forms including e-signatures.
- **Experience Cloud** to orchestrate relevant and timely digital experiences.

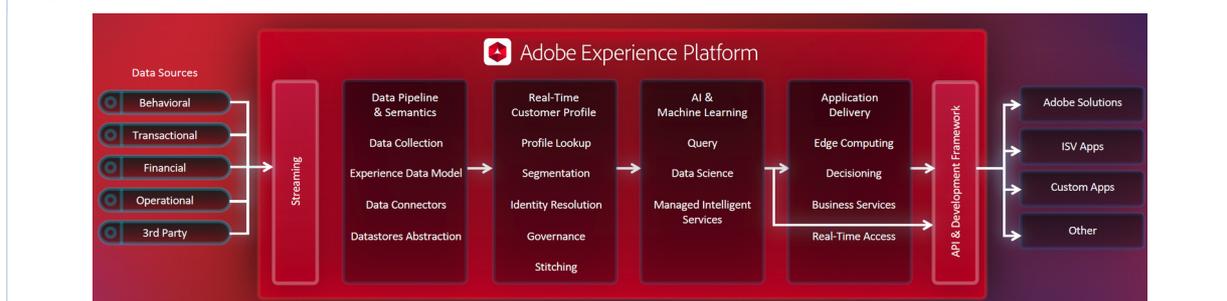
The focus is on helping enterprises transform their businesses with the customer at the center of the transformation.

Adobe has undergone a major transformation changing both its business model from boxed software sold through distributors, to a data driven operating model (DDOM) based on subscriptions, resulting in direct customer engagement and accelerated innovation (see Ovum report: *Adobe's Business Transformation: A Lesson for Those with Digital Service Provider Aspirations*).

Adobe uses Experience Platform to run its own business and senior managers have weekly meetings and monitor a consistent set of KPIs to assess the health of the company across the five critical customer journey areas of: *discover, try, buy, use, and renew*.

To generate personalized and relevant messages, guidance or actions throughout the journey, Adobe Experience Platform creates a customer profile that enables increased levels of personalization as the customer moves from unknown at the start through to known. Each iteration adds further color and context around the customer. Adobe Sensei and Microsoft Power BI provide the intelligent sensing capabilities that convert data into relevant action. Figure 1 outlines the architecture of Adobe Experience Platform and shows how customer data management supported by AI can then trigger the most contextually relevant action. Adobe's sophisticated functional support applications can take full advantage of Experience Platform, such as Adobe Advertising Cloud for programmatic omnichannel advertising, Adobe Analytics Cloud for intelligent insights and data management, Adobe Marketing Cloud, for marketing automation and campaign management, Marketo Engage for B2B and ABM marketing, and Adobe Commerce Cloud (built on Magento Commerce). Third party applications can also take advantage of Experience Platform which acts as the chief orchestration mechanism. We will now examine Experience Platform in more detail to understand its capabilities and value in an omnichannel customer experience and engagement environment.

Figure 4: Adobe Experience Platform architecture



Source: Adobe

Five pillars support Experience Platform

The five pillars underlying that provide the core capabilities of Experience Platform are as follows:

A unified profile of each customer from initial unknown status to known is created and enhanced through successive interactions. A unique Adobe ID is provided that connected systems can leverage. Behavioral, transactional, and operational data are blended together to create the unique customer profile. Data can be ingested in real time via API connectors at massive scale to support large enterprises with vast interaction volumes. Built on the Microsoft Azure Cloud technology stack, Adobe takes full advantage of underlying Azure storage infrastructure to surface many-to-many associative relationships. These can then be analyzed again in real time using both Adobe Sensei and Microsoft Power BI. Time-series analytics also surfaces behavioral trends that can be used to continuously optimize the customer experience and detect important behavioral changes. Customer data can be stored in a data lake or in global distributed environments requiring low latency and to orchestrate real-time experiences at the edge. This provides Experience Platform with centralized customer data from disparate back and front office applications, where AI can be applied to trigger the most contextually relevant action or content throughout the customer's journey. Adobe Marketing Cloud and Adobe Advertising Cloud take full advantage of this granular customer data through Adobe Audience Manager, to target micro-segments or segments based on similar behavioral traits.

Experience Data Model (XDM) facilitates orchestration

This is enabled through a combination of standard data models in XDM and AI that selects the most appropriate 'treatment' based on the customer profile. XDM provides a standardized interpretation of customer data which can include, the customer's identity, information about the channels they use including offline, preferences and products they have used or are interested in. XDM is an open standard and available on GitHub. It also integrates with Microsoft Common Data Model (CDM) and can be accessed by all applications connected via Experience Platform. Currently there are around 50 customer experience schemas published and many more under development by Adobe, its partners and the broader developer community on GitHub.

The Open Data Initiative will help in heterogenous environments

The Open Data Initiative (ODI) started by Adobe, Microsoft and SAP in September 2018, adds to the XDM drive by Adobe, by developing the basis for interoperability between their systems through a standard data model. Data will be reliably ingested into the Azure Cloud, from Adobe Experience Platform, SAP C/4HANA and Dynamics 365, where it can then be used by AI to enhance the sense-and-respond capabilities of the enterprise. Dynamic orchestration of the customer experience in real-

time is still a few years off, but a combination of XDM and ODI offers considerable promise for the future.

Adobe provides tools to manage content across all sites and channels with automated tools and templates. This includes authenticated websites with Single Sign-On (SSO). Adobe also has a leading position in the creative industries and its broad Creative Cloud portfolio and Document Cloud can be used to create content and provide online forms without interrupting the customer journey. Adobe's CMS combines the efficiency of headed, template-driven authoring with the flexibility of headless delivery so that content can be delivered through any channel and on any device. It allows for create once, use multiple times in total or in part to create new content quickly.

Adobe Experience Manager offers a Digital Asset Management (DAM) that enables enterprises to store, search and reuse digital assets and in combination provide a critical pillar within Experience Platform. Visual search is supported and in Marketo Engage, Sensei helps to find and recommend digital assets or fragments for use by experience delivery applications, such as commerce.

Value and relevance are delivered by Experience Platform through orchestrating content, guidance or next best actions. The real-time customer profile and XDM models supported by Adobe Sensei and/or Power BI are essential enablers for omnichannel delivery. Adobe Experience Platform Location Service senses the physical location of the customer (subject to permissions) and acts as an important trigger for contextually relevant location-based interactions. It also supports orchestration at the edge to minimize latency.

AI is integral to delivery of the real-time and contextually relevant customer experience. Data provides the foundation and the three pillars starting with the customer profile, content and asset management, XDM models all supported by AI culminate in the relevant and always-on experience. Ultimately to deliver relevance across any combination of channels and through insights to understand the intent of the customer at every step and across almost infinite customer journey permutations, AI must be embedded and connected. This is a tall order for any single vendor and large enterprises with their own data scientists may seek to focus on high priority customer journeys, whether that be defined by the most common, or based on the importance of the customer or a combination of attributes. To help data scientists, Adobe offers a Data Science Workspace that enables data scientists to operate against data in Experience Platform, rather than having to extract or manipulate data prior to developing and testing new ML or NLP algorithms. This became generally available in June 2019. Meanwhile Adobe continues to expand its AI capabilities.

Adobe, like other major CEP vendors, has an extensive ecosystem of specialist partners from major systems integrators to specialist boutique agencies and ISVs. The move by Adobe to enlist the support of the GitHub developer community to develop XDM models together with the Open Data Initiative, promises accelerated innovation for Experience Platform and the potential for XDM to become a recognized and essential standard for customer experience data management.

The acquisitions of Magento and Marketo expand Adobe's customer engagement capabilities

Magento expands Adobe's directly addressable market into online commerce

Magento Commerce, acquired in June 2018, signaled Adobe's strategic intent to go beyond the confines of the marketing department. Commerce applications have shown consistently higher growth than most other enterprise applications in Ovum's Enterprise Applications Software forecasts, the

latest, published in July 2019, showing a CAGR of 18.6% for the period 2018 – 2023. This compares with customer service automation at a CAGR of 16.5%, marketing automation at a CAGR of 15.2%.

The selection of Magento also gives Adobe access to both B2B and B2C commerce opportunities and enterprises trading in both environments. Like Adobe, Magento is also highly extensible and brings a wealth of ISV partners to bear. The Magento platform also supports microservices allowing the application to be rapidly extended or adapted, an essential feature in a competitive environment where rapid adaptation is required.

The commerce platform can be configured for international enterprises to provide a high degree of standardization where that makes sense and at the same time allow for local taxation and governance rules to support local market conditions. The commerce platform is also suitable for start-ups and growing businesses that need a commerce platform that can grow with them, broadening Adobe's reach to mid-market and emerging commerce companies.

Real-time personalization of offers or content of interest is supported through Magento's deep integration with Experience Platform.

Marketo Engage adds B2B and ABM/ABX capability

The acquisition of Marketo Engage (formerly Marketo Engagement Platform) greatly increases Adobe's relevance to major B2B organizations. The rise in account-based marketing adoption by large B2B enterprises in recent years made this a very timely acquisition. Ovum predicts this will extend to account-based engagement (ABE) and this is in line with Adobe's thinking around account-based experience (ABX).

Adobe Experience Cloud has combined existing resources with the integration of the Marketo solution to create a single customer experience management platform to manage accounts, orchestrate cross-channel campaigns and evaluate success metrics, combining the abilities to plan, engage, and measure both sales and marketing efforts.

AI-based intent and fit data, from Marketo's Account Profiling and native integrations with Bombora, helps companies view which of their target accounts are a good fit to be on their target accounts lists and which target accounts are currently active, signaling buying intent on certain topics. Predictive account ranks, engagement scores, and propensity scores are utilized to decide which target accounts should be prioritized. Account-level campaigns are then powered by the target account lists along with advanced account-level triggers that listen for behavior across channels and then act on it for ad targeting, web personalization, mobile push, in-app and SMS messaging, email, intelligent multistream nurture programs, and custom event interactions.

In terms of advanced content management, Marketo has add-on modules tailored for B2B and ABM use cases. Using Web Personalization, customers can customize the content on their web channel. Using rules, they can decide which placements and assets they want to dynamically update in real time to personalize the web and mobile web experience for certain strategic target accounts. And Adobe offers Predictive Content, which uses AI and ML to learn and automatically decide which piece of content to show based on which is converting the best.

For integration into existing CRM platforms, Adobe Experience Cloud can bring Salesforce Data Cloud or Microsoft Dynamics 365 accounts into Marketo and create Marketo named accounts. Marketo can display multiple visualizations in the form of graphs, charts, rankings, scores, and custom imagery. Marketers can view data for all target accounts, a list of target accounts, or even a single

target account to gain insight into the specific engagements and their efficacy with a variety of filtering and segmenting capabilities. Additionally, Bizible by Marketo provides basic and advanced attribution to let marketers see the full impact of their account-based experiences, helping them understand and justify the ROI of combined sales and marketing efforts.

Adobe's strategic partnerships with Microsoft, SAP, and ServiceNow extend the relevance of Experience Platform

Beyond the underlying technology, Adobe's strategic partnerships extend the reach of Experience Platform

Microsoft Dynamics 365 can be exposed to Experience Platform. Dynamics 365 includes ERP and CRM applications. By being able to seamlessly ingest back office and supply side data into Experience Platform, Adobe now has sight of the end-to-end customer journey, including the experience of the customer that relates to a purchase being fulfilled. Ovum has long held the view that true omnichannel must include the delivery of the product not just the promise of the brand. While Adobe can ingest data from other ERP applications through APIs, it has a much deeper relationship with Microsoft at the software engineering level, and as part of the ODI collaboration the two vendors aim to make interoperability considerably easier.

As part of the ODI, SAP joined the initiative to enable deeper interoperability between their enterprise applications by sharing SAP customer data via the standard data models.

The latest strategic partnership announced in March 2019 at Adobe Summit in Las Vegas, is between Adobe and ServiceNow. The companies have come together to bring customer support data sets from ServiceNow's Customer Service Management (CSM) solutions to Adobe Experience Platform to enable real time customer profiles to deliver consistent consumer experiences across both companies' systems.

This will allow seamless integration of digital workflows, knowledge management and service catalogs and Experience Platform to create personalized experiences and services for customers. This will also give Adobe deeper insight into the challenges facing service agents for further development of Experience Platform and XDM models.

Additionally, they are working to enable better integration between ServiceNow CSM and Adobe Marketing Cloud.

More AI and easier orchestration are on the horizon

Continuous development will widen the appeal of Experience Platform

Over the coming months, Adobe's focus is on ever tighter integration and easier intelligent orchestration to dynamically deliver relevance at every interaction. In the second half of 2019, we can expect an increasingly consistent segmentation workflow across all connected solutions. The provision of tool-based profile and segment activation with pre-built connectivity to common channels will also make it easier for connected solutions to take advantage of Experience Platform's key attributes.

From an AI standpoint in 2019, Adobe announced the availability of Experience Platform Query Service and Data Science Workspace which provides hooks into Tableau and Power BI analytics and decisioning services and is intended to streamline the entire data science workflow, from gathering

data to authoring models to deploying intelligent service in Adobe Experience Platform. Data scientists can use Adobe Sensei pre-built models, bring their own models or create new ones in Experience Platform. Datasets stored in Experience Platform's cloud data lake can be analyzed by data scientists to develop deeper insights into the customer experience. This includes all behavioral data and data ingested from POS and CRM applications, among other sources.

In 2020 Adobe will make it easier to deliver personalization out at the edge, based on data in the platform, and to route it where it needs to go. Further architecture rationalization will also speed up deployment and shorten time to value.

We can also expect to see the fruits of ODI coming to market in 2020 and further XDMs to meet industry specific environments.

bpm'online evolves from CRM to a CEP

Summary

Catalyst

Enterprises of any size must learn to adapt and march to the customer's tune, if they are to survive and thrive in this era of accelerating change and rising customer expectations. Mid-market B2B companies have less choice than the larger enterprises to advance their business transformations. With fewer financial and IT resources and limited access to digital transformation expertise, they must lean more heavily on vendors that can offer practical and cost-effective solutions that can be implemented quickly and are intuitive to use and adapt. Bpm'online directly, and through its increasing network of partners, provides such a proposition.

Ovum view

To succeed in any digital business transformation a fundamental requirement is to create a foundation for rapid adaptation and support for customers that allows them to engage on their terms with minimal friction. The old CRM solutions paradigm providing support for frontline departments is not the answer. Every firm irrespective of size or industry must create a platform for customer engagement, connected to the value chain and back-office systems that supports a fluid omnichannel customer experience. Bpm'online now positions its software as an intelligent BPM platform that underpins a unified CRM platform comprising marketing, sales, service and business apps. CEP's are still relatively new as a concept, while CRM is a more recognizable term. However, it is in the interests of businesses to understand that CEPs are the natural evolution of CRM but have the potential to solve the omnichannel customer engagement challenge by providing a unified environment. The advances bpm'online has made over the last year and its near-term development plans, are less CRM and more CEP, and its positioning ought to reflect that vision.

In the last year the vendor has focused its developments on embedding AI in the form of ML and is adding NLP to provide more self-service support. Bpm'online has also latched on to the need for greater self-reliance in businesses, to take control of the platform and adapt or extend it without the need for IT developers. This low-code/no-code approach will appeal to resource constrained mid-market businesses and as the bpm'online Marketplace expands, out-of-the box extensions promise more agile adaptability.

Key messages

- Bpm'online is evolving into an adaptive CEP for mid-market enterprises.
- A no-code/low-code developer approach enables business people to adapt the platform easily.
- The most important advances over the last year and the near-term are with AI.
- An expanded ecosystem makes bpm'online more compelling.

Recommendations

Recommendations for enterprises

Bpm'online is particularly well-suited for mid-market B2B enterprises, although it is also having some success in specific departmental areas of large enterprises that do not have the real-time high volume and big data streaming needs found in online retailers, and commerce companies. As the platform is underpinned by BPM Studio, the solution is very flexible to suit the specific working routines of the organization. The vendor has improved the UX and endowed the platform with more AI capabilities in the form of ML. Near term enhancements will include NLP for sentiment analysis and self-service.

Recommendations for bpm'online

The mid-market is relatively underserved as major vendors focus their developments and attention on large enterprises. Bpm'online is well placed in the B2B mid-market arena and should exploit its strengths rather than try to go after large enterprises, especially in high volume B2C that typically require big data storage, real-time streaming, and a range of databases from relational to graph. Bpm'online should expand its geographical footprint in Asia, where it currently has one office in Singapore. The ABM opportunity is growing fast in B2B markets, and bpm'online will need to develop strategic partnerships with ABM specialists who track B2B enterprise movements and capture external signals to surface opportunities. The *Ovum Market Radar: Account-Based Marketing*, evaluated the top 10 ABM specialists and is a good place to start.

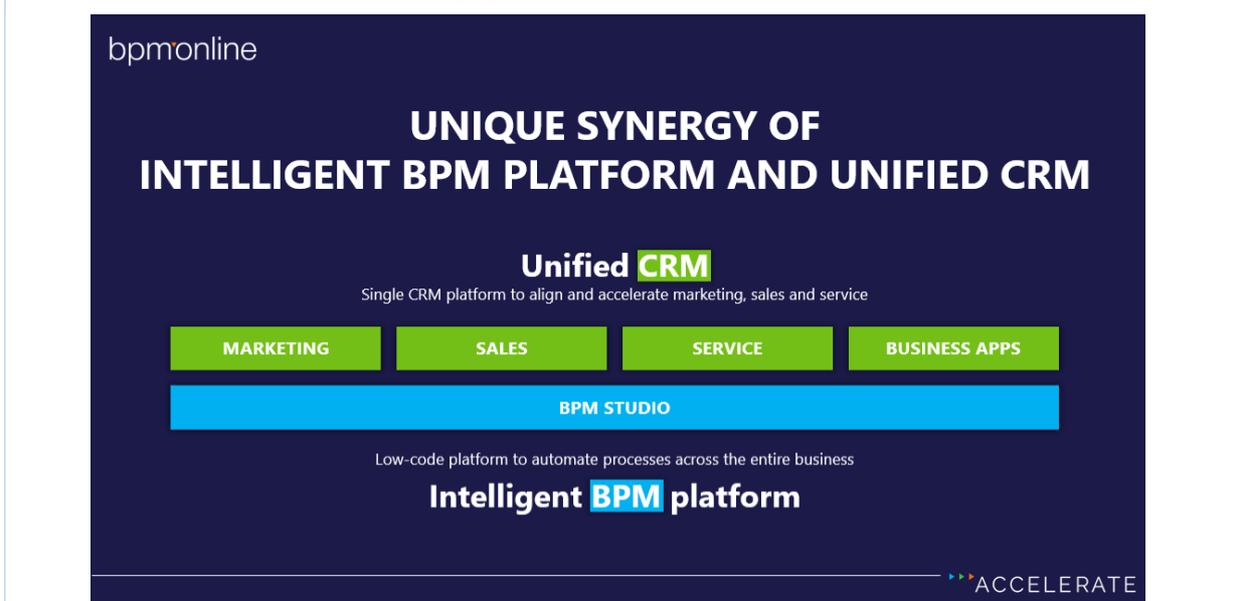
Bpm'online must expand its AI capabilities to increase its value, not just to users, but also in support of a better customer experience by its enterprise customers' customers.

bpm'online is evolving into an adaptive CEP for mid-market enterprises

Process automation provides the foundation for accelerated transformation

Each of the three core CRM modules, marketing, sales, and service – as well as a fourth, business applications – that can be added, are underpinned with BPM Studio, which provides a means to automate workflows. Figure 5 provides a simple overview. What isn't explicit in the diagram, is how bpm'online also creates a unified customer data environment, that each application can access and contribute.

Figure 5: bpm'online Customer Engagement Platform



Source: bpm'online

BPM Studio and standard modular functionality supports faster transformation

Business analysts can use BPM Studio to create new processes that span departments. If firms take an outside-in approach to process design starting with the customer, they can use BPM Studio to replace siloed processes, and create a more coherent and unified environment to meet customer expectations. Standard out-of-the-box functionality from the three modules will meet the needs of the majority of B2B customers and will support the new processes. If there is a need to extend the functionality, this can be done by using extensions and connectors provided by the bpm'online marketplace. Currently there are over 300 ready-to-use connectors and applications. Around half of bpm'online's customers take this route. This does not require any complex systems integration.

A modern UX supported by in-context intelligence promotes adoption

Bpm'online has revamped its UX over the last year to provide an intuitive interface and experience for the user. The vendor's AI developments (more later), have helped by providing context-sensitive and in application guidance. This accelerates familiarity with the applications and boosts adoption.

The underlying BPM Studio provides cross-functional orchestration

Any major transformational change requires the support of employees and a willingness to work in new ways. BPM Studio provides the cross-organizational 'glue' to ensure teams from different departments work in a more coherent and collaborative fashion. BPM Studio process maps are easy to understand and adapt, to support any underlying changes based on changing demands of customers.

The functional applications are well-suited to the needs of mid-market enterprises

Marketing

Bpm'online provides a good B2B marketing automation application that offers a unified view of the customer including history, segmentation, marketing resource, and campaign management, email

marketing, some ABM support through integration with sales, lead management, and scoring, event management, and analytics.

Sales

The sales force automation module provides good support for territory management, pipeline management, mobile field sales support, contract management, and the ability to manage orders and invoices.

Service

For enterprises that do not need sophisticated contact centers, the service module provides case management, omnichannel communications, a self-service portal for customers, knowledge management and service level management, and the ability to track and manage outstanding or complex service issues.

Deployment options provide choice

Bpm'online can be deployed on-premise or via Amazon Web Services or Microsoft Azure Cloud Services. This provides choice for customers in how they consume or deploy the platform.

A no-code/low-code developer approach enables business people to adapt the platform easily

The no-code/low-code platform makes it easier for businesses to adapt without calling on specialist software developers

Speed to capability is an essential requirement to ensure persistent customer relevance in an environment of accelerated change and increased market volatility. The simple drag and drop approach within BPM Studio and the ability to extend the platform via pre-configured applications from the Marketplace, enables rapid adaptation. Good visualizations provided by BPM Studio makes it easier to assess the impact of process changes on the customer experience. Bottlenecks or areas of friction can be identified, and remedial action taken to optimize the process.

Extend easily without being a developer

A broad range of customizable process templates provide a good starting point for new process development. Pre-built connectors via APIs are available to connect to the most common back-office systems. Industry extensions are also available for banking, logistics, real-estate agencies and developer, law firms, pharmaceutical companies, and travel agents, among others.

The most important advances over the last year and the near-term are with AI

A CEP needs AI to trigger the right response across customer journeys

Bpm'online has made several enhancements to the platform over the last year, including UX improvements, the addition of gamification for sales and improvements in the underlying infrastructure such as support for Redis Server, PostgreSQL Open Source object database and .net Framework version support. The most important from a customer engagement perspective are in the AI field. Propensity models help sales people focus on the most promising opportunities.

In addition to enhancements to each of the applications and the underlying BPM platform, AI has been introduced over the last year in the form of ML to provide automated triggers and to provide predictive

analytics. It is still early days, but any object within the system can be used to train scoring models. In the coming year, more ML will be provided and a no-code ML design console to help business users develop their own models or point existing models at relevant objects to trigger more automation. Such models, for example, can predictively score prospects, find the best next action, automatically categorize cases, predicting how likely a team is to close a deal and achieve KPI, for example. Intelligent routing of cases to the most relevant support agent or expert will be available in early 2020. New ML algorithms will provide recommendations for service process improvements. Increased use of NLP is also expected to provide sentiment analysis to support improved levels of personalization.

An expanded ecosystem makes bpm'online more compelling

Bpm'online expands its ecosystem in three areas

In addition to its five regional offices in Europe, the US, Asia and Australia, bpm'online continues to expand its ecosystem of partners and ISVs.

Bpm'online marketplace

Already around half of all the vendors customers are using applications, templates or connectors from its marketplace. Internet of Things (IoT) capabilities will be provided from the marketplace soon, to provide real-time and proactive service for machines and devices. We can also expect augmented/virtual reality or potentially blockchain support to be sourced via the marketplace.

Bpm'online academy

To speed new customer on-boarding, bpm'online has established its own academy. This provides a mix of self-paced online learning, video tutorials, certification, user and developer guides, and a full-function trial platform for practice. Guided learning and corporate training from bpm'online experts can also be tailored to suit the individual organization.

Bpm'online community

The growing community forum provides a crowd-sourced knowledge base, user groups, product expert blogs, and a community loyalty program.

Microsoft is well positioned for real-time customer engagement at massive scale

Summary

Catalyst

In high volume transaction and customer interaction environments, determining customer intent and acting upon it in real-time is a big data, AI, and automation challenge that requires live streaming of vast amounts of structured and unstructured data, as well as advanced ML and supporting workflows, to trigger a contextually relevant reaction. While the need for this is acute in large B2C environments such as automotive, commerce, communications, energy, media, retail and CPG businesses with direct-to-consumer relationships, the dramatic rise in data volumes from IoT devices is creating similar big data challenges in many B2B environments. Almost every industry is heading in this direction, and

large enterprises with digital transformation initiatives must take this growing demand into account as they seek to develop adaptive capabilities to cope with accelerating change.

This calls for a modern array of dynamically scalable infrastructure technologies including data lakes, in-memory computing, data streaming, a variety of databases from the familiar relational to the more exotic graph databases to surface many-to-many relationships and to understand the nuances between them. It also demands advanced connected AI and functional capabilities across end-to-end processes to trigger the most relevant response.

Microsoft Dynamics 365 is built on such a technology stack and in this report, Ovum highlights the major advances Microsoft has made within the last year or so that have significantly boosted its real-time customer engagement capabilities and how it is evolving into a highly intelligent and responsive customer engagement platform (CEP).

Ovum view

In the days of CRM solutions most vendors competed on features, functions, and price. Today enterprises need to think about future-proof platforms that support organizational coherence, sense-and-respond at massive scale and developing an environment for rapid adaptation.

Microsoft under CEO Satya Nadella's leadership has successfully positioned the company for the realities of big data, ubiquitous connectivity, real-time response and agile adaptability that are the essential components for digital businesses and the digital transformation challenges facing every enterprise. At its heart, Microsoft is a software technology company and every layer and component of technology has been refreshed from Azure Cloud IaaS, Microsoft Power BI, industry leading analytics platform big data, and streaming technologies all the way up to business applications portfolio that has evolved into a unified platform – Microsoft Dynamics 365, released on November 1, 2016. Dynamics 365 has progressively been able to take advantage of the underlying enabling technology developments, and like its more serious competitors, has substantially evolved from a traditional CRM solution into an intelligent CEP.

Under Nadella, Microsoft enterprise applications are now part of a coherent mission, to "empower every person and every organization on the planet to achieve more". While that mission may seem abstract, it is now visible and given substance in the way Dynamics 365 is evolving. All Microsoft technologies are swimming in the same direction. The Microsoft renaissance lends weight to this assertion.

Key messages

- Azure Cloud Services provide several advantages to Dynamics 365.
- Dynamics 365 Customer Insights – a foundation for intelligent and relevant personalization.
- The unified environment makes omnichannel service real for agents and field service engineers.
- Sales force automation gets the AI and Power BI boost, collaborative selling, and mixed reality support.
- Two types of marketing are provided – simple or ultra-scalable.

Recommendations

Recommendations for enterprises

Microsoft Dynamics 365 offers a unified platform for digital transformation. While many enterprises will use ERP and back office systems from other vendors, the customer engagement capabilities provided by Dynamics 365 and Azure Cloud Services, offer a highly agile and forward-looking portfolio of integrated capabilities. Under Nadella's leadership there is considerable cross-fertilization of capabilities and technologies across product groups, for example LiveOps rapid development capabilities come from the gaming product teams. Azure Cloud Services and the Power Platform provide the foundation for many of the advanced capabilities within Dynamics 365. Microsoft Teams provides the collaborative environment to help employees deliver a better service to customers as well as accelerating sales. While still a nascent opportunity for most businesses, Microsoft's mixed reality can also be brought to bear to augment the customer experience and add new opportunities to develop engaging experiences with customers.

Microsoft's partnerships with ISVs, resellers, and systems integrators provide a rich source of opportunities to extend the capabilities of the platform. The acquisition of GitHub brings potentially 36 million developers into the fold. Industry accelerators in automotive, education, media, and nonprofit with associated data models and templates supports faster deployment and increases the relevance of the platform for enterprises in those industries.

Recommendations for Microsoft

The focus for Microsoft has consistently been to help individuals within businesses deliver their best. The Power Platform on Azure has injected intelligence and life into Dynamics 365. So far, the AI use cases provide what can be considered localized value. They provide insight for individuals that are relevant to their jobs and the tasks in hand, whether that be in service, sales or marketing. There is however a much bigger prize to be won, and that is around the customer experience itself, and across any channel that customers choose to traverse. The big prize will be the ability to dynamically orchestrate relevance at every interaction. This is a massively complex task and will involve potentially tens of thousands of always-on ML algorithms working in harmony to trigger relevance at every opportunity. It will be a few years before this becomes a reality, but Microsoft should explore such possibilities that are akin to the challenge of autonomous vehicles. The customer experience will never be fully autonomous as people must always be a part of the experience equation. We can, however, anticipate significant strides towards a richer and more compelling customer experience delivered by a mix of acute sensing capabilities allied to intelligent and empathetic human involvement.

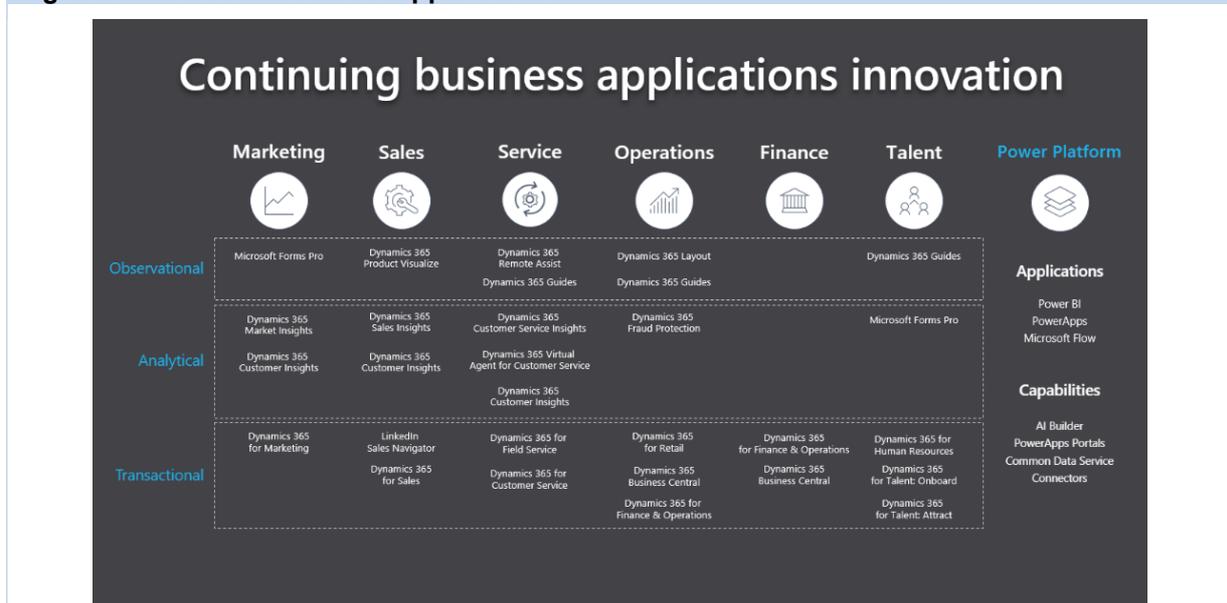
Azure Cloud Services provide several advantages to Dynamics 365

Dynamics 365 provides a unified business environment

Before getting into the detail, it is worth providing an overview of the entire Dynamics 365 platform. The purpose of the platform is to provide a unified environment for the enterprise. While ERP, HR and CRM are all provided, enterprises can select the modules they need. However, by creating a unified environment on a common technology stack, the overall platform can take advantage of new Microsoft technologies and adapt much faster than would be possible with technology components or

modules sourced from multiple vendors. Figure 6 outlines the Microsoft Business Applications portfolio including the Dynamics 365 applications, as well as the Power Platform.

Figure 6: Microsoft Business Applications



Source: Microsoft

From a business perspective, we have consistently argued that any digital transformation worth its salt must at a minimum be purposeful, coherent and break down organizational silos. The Dynamics 365 platform supports that unified and coherent environment, that is essential for omnichannel customer engagement. Customer data held in finance, ERP or logistics systems must be available at the point of interaction to support customers from initial search or contact through to delivery and any subsequent help that the customer might require. Customer journeys may span multiple departments, so it is essential that a unified environment is in place and whoever interacts with the customer has a complete picture of their journey and any history with the enterprise. This is what an effective CEP supports.

Azure Cloud Services turns CRM into an intelligent and scalable CEP

From a customer engagement perspective, the triumvirate of sales, marketing, and service provide the front-line functional support that is like that provided by Dynamics 365, but with significant enhancements as a result of being developed to take advantage of Azure Cloud Services.

At its most basic, in high volume interaction environments, whether people, devices or connected machines, the CEP must support real-time data streaming, capture and synthesis to feed ML algorithms and to trigger the most relevant response. Azure Cloud Services provide Dynamics 365 with several notable technologies:

- **Azure SQL Hyperscale databases.** To support massive transaction environments.
- **Azure SQL Data Warehouse.** For petabyte-scale storage and analytics (Power BI & SQL DW)
- **Azure Data Lake Storage Gen2.** For big data storage including unstructured data.
- **Azure Event Hubs and Live Streaming.** Enabling millions of event messages per second to be streamed and to trigger alerts or events, including IoT feeds from machinery or devices.

- **Common Data Service.** To store and secure data used by enterprise applications. Data is stored within a set of entities. Standard entities are provided but these can be extended to suit the needs of the business. Applications can be developed to extend Dynamics 365 and role-based security can be provided at the entity level.
- **Common Data Model .** Providing a single metadata definition of enterprise data that can be customized, making it easier to build reports, create new apps, and connect business entities.

The Power Platform provides the intelligent automation and adaptive underpinning for Dynamics 365

Microsoft Power Platform imbues Dynamics 365 with several critical capabilities:

- **Power B I .** Converts data into insights through compelling and intuitive visualizations. AI support includes ML, NLP, object detection, and voice recognition. It also extends the skills of business analysts with tools that simplify the creation of interactive dashboards that combine data from different applications (regardless of software vendor) putting data-driven decision making at the center of customer interactions and available on any device.
- **Microsoft Flow.** To link applications and generate automated routines with no code. Microsoft provides many templates for common routines like creating approvals for expense claims, or automatic reminders. Alerts can be set up including new opportunity alerts for sales teams that make it easier to stay on top of priorities. AI Builder currently in "preview" supports intelligent automation to increase response velocity. AI Builder will also be available to support applications developed in PowerApps. Microsoft Flow helps to increase productivity without the need for application development, although when that is required to extend Dynamics 365, Power Apps, the third component, is the tool to use.
- **PowerApps .** Provides a comprehensive set of tools and templates for business analysts and developers to extend existing enterprise applications. Both model-driven and canvas apps are supported. Speed to capability is a major requirement as customer expectations rise at an increasing pace. Developing the 'last mile' app can be the difference between delivering a frictionless customer experience or losing the customer. In October 2018, Microsoft acquired GitHub, a developer community of around 36m independent developers. It is highly likely that anyone seeking to develop an app using Power Apps, will find fellow enthusiasts who may have already tackled the specific challenge. Microsoft has always prided itself on the extensibility of Dynamics 365. Through PowerApps and the Power Platform, Dynamics 365 extensibility has been massively increased and will allow enterprises to differentiate their capabilities at a much faster pace.
- **Common Data Service.** Provides a secure and cloud-based option for data. Role based-security provides control of access to the data. Dynamics 365 data is stored using the common data service. The CDM, business rules and workflows can be consistently applied to ensure good data quality. Data is continuously pushed into the Azure Data Lake or if customers prefer, they can push data into their own data lakes.
- **CDM .** The CDM provides a single metadata definition of your enterprise data that can be customized, making it easier to build reports, create new apps, and connect business entities like marketing, sales, service, finance, operations, and commerce.
- **Aggregation of large result sets.** Enables petabyte-sized datasets to be analyzed through Power BI with near instant response times, unlocking massive datasets for analysis and

insight. This is very helpful for high volume customer interaction traffic and pain point analysis, to understand where the customer experience is suboptimal or where further intelligent automation would eliminate friction.

- **Data Connectors.** Microsoft has a library of data connectors to hook in data from third-party systems.
- **Open Data Initiative.** Announced in September 2018, this is a collaboration between Adobe, Microsoft, and SAP to develop the basis for interoperability between their systems by developing common data standards. Data will be reliably ingested into the Azure Cloud, from Adobe Experience Platform, SAP C/4HANA, and Dynamics 365, where it can then be used by AI to enhance the sense-and-respond capabilities of the enterprise.
- **Azure SQL Data Warehouse .** Your data queries can finish in seconds instead of minutes, hours, or days, which enable you to run analytics at massive scale compared to traditional database systems.
- **Azure Cosmos DB.** A low latency distributed multi-model database for enterprises operating globally and needing millisecond response times. The Cosmos database allows access to data held within multiple regional databases. This will be relevant to global organizations dealing with high volumes of data and requiring near instantaneous response times, such as commerce companies, financial services, airlines, and transportation enterprises. Cosmos DB guarantees less than 10ms latencies for both reads (indexed) and writes at the 99th percentile, all around the world, making this an extremely reliable solution.

While Dynamics 365 can be licensed for on-premise the extended value that Azure Cloud Services bring to the platform, would make that an odd choice. Microsoft currently has 52 secure data centers around the world so reasons for the on-premise options are rapidly diminishing. Potential insights buried in massive datasets that many large B2C enterprises have in their data warehouses or data lakes can be surfaced and acted upon to drive continuous improvement in the quality of customer experiences delivered. The Power Platform and Azure Cloud Services are integral to the rapidly growing value that can be derived from the Dynamics 365 platform.

Dynamics 365 Customer Insights: a foundation for intelligent and relevant personalization

Dynamic personalization is built on good customer data

Traditional CRM applications promised to create a 360-degree view of the customer, but this proved to be more of a unicorn than a reality, even when CRM systems were connected to back office systems, at best enterprises received a transactional view of the customer. That is no longer acceptable, and what differentiates an effective CEP over a traditional CRM application, is that it goes beyond the transactional to support real-time engagement throughout every customer journey.

To do that it is essential to develop much more than a transactional view of the customer. Observational and behavioral data must be captured and synthesized, to feed ML algorithms and to trigger the most relevant action. This is what Dynamics 365 Customer Insights delivers and it forms the foundation for personalized and relevant interactions.

Data can be ingested from any source from first-party data in internal systems, second-party data contributed by ecosystem partners, and third-party data. It can then be mapped, matched, and

merged to create unified customer identities. Microsoft provides a range of connectors to enable ingestion of data from third-party systems.

The unified environment makes omnichannel service real for agents

Dynamics 365 Customer Service omnichannel capabilities provide a unified environment for customer service agents

Available from July 2019, omnichannel engagement within Customer Service provides a unified desktop experience for the service agent and supervisor enabling them to see the interaction journey of each customer together with relevant historic information, so that the customer's context can be understood. Chats and messaging can be automatically routed to the right agent, and if the engagement is complex requiring expertise from wherever it resides in the enterprise, AI provides help to identify the relevant expert or team of experts and Microsoft Teams can be used for collaboration. Relevant knowledge articles and recommended actions can also be triggered by AI. In-application guidance supports rapid onboarding, so in environments where there is typically a high attrition rate or the need to meet seasonal peaks, new agents can be rapidly onboarded.

A variety of communications methods including SMS (currently in preview) and Facebook Messenger (coming in 4Q19) are available so that customers can be reached through the medium that makes most contextual sense and in line with their preferences.

A raft of intelligent automation tools is available to enhance service levels

- Dynamics 365 Virtual Agent for Customer Service and the Microsoft Bot Framework allow virtual agents and chatbots to be embedded as chat widgets within web pages to support customer self-service. The no-code or low-code approach to virtual agents and chatbots makes it easy to add and train them.
- Escalation between a chatbot and live agent, ensures a customer's inquiry is sent to the best-fit agent and transfer of the full customer conversation context to the live agent provides a seamless link from self-service to agent assisted service.
- Microsoft Forms Pro can be used to generate post call surveys, and Power BI NLP capabilities enable positive, negative or neutral sentiment analysis that can be monitored by the supervisor for all agents.
- IoT data can also be ingested to support proactive service such as preventative maintenance.

Field service also benefits from connectivity

Dynamics 365 for Field Service provides an efficient solution for optimizing field service personnel including visual scheduling support for the dispatcher and mobile support and route optimization with GPS support. Field Service engineers also have access to back office information via mobile and can update call reports immediately after a site visit using voice-to-text capabilities to notify the dispatcher of their availability as well as update service records.

Power BI analytics provides field service operations with information to identify any performance issues and to take remedial action.

What makes Dynamics 365 for Field Service stand out is the introduction of mixed reality capabilities for the more complex service situation. Via a tablet or the HoloLens 2 headset remote expert

guidance can be used to help the engineer tackle complex technical repairs or unfamiliar maintenance requirements.

IoT integration via Azure IoT, can also be used to preempt downtime or schedule a site visit to replace a part with a high probability of failure before it disrupts plant and machinery, that the customer's production may depend on.

Sales force automation gets the AI and analytics boost, collaborative selling, and mixed reality support

AI makes sales more productive and relevant

Dynamics 365 for Sales takes full advantage of AI and predictive analytics enabling sales to focus on the high potential opportunities. A variety of guidance and support is provided including:

- Predictive lead and opportunity scoring.
- Warm introductions from colleagues already engaged.
- Risk detection to focus on most important opportunities and to ensure they do not grow cold through inactivity.
- AI-guided selling to improve the standard of selling across the sales team including in-context playbooks to provide timely guidance and next best action recommendations.
- Integration with LinkedIn Sales Navigator provides a source of leads and the ability to identify key members of a buyer group, and a live organization chart.
- Account relationship health analysis can indicate potential churn or inform strategies to improve the relationship health of the account.
- Sales insights for management delivers improved insights into individual sales performance and coaching opportunities to increase the skills levels of sales people as well as uncovering strategic business insights around conversation keywords and competitors.
- Sentiment analysis for inside sales conversations, highlights their strengths and weaknesses and provides opportunities for coaching by managers.

Microsoft Teams integration creates a collaborative environment for team selling

Microsoft Teams can be integrated with Dynamics 365 for Sales enabling account teams to easily collaborate and keep up to date on important opportunities. Virtual team meetings can be arranged to share ideas, highlight strategies that work or provide guidance from the collective wisdom on tackling tough sales challenges. Managers can use Teams for regular catch-ups and to foster a culture of collaboration and support. Conversational threads between team members are maintained and obviate the need to generate productivity-sapping email clutter. Without disrupting workflow, sellers can use the full power of Dynamics 365 directly from Teams.

Mixed reality support adds a new dimension to sales

Microsoft's mixed reality capabilities through Dynamics 365 Product Visualize can also be used by field sales to help customers visualize new products, plan customizations, or see how major items such as plant, machinery, or equipment might look in their environment. Customers can rotate the item on a tablet to see it from all angles and any concerns or changes can be annotated by the sales person and sent to product managers or engineers to make the necessary changes or provide

guidance on price movement as a result of the design changes. The image of the product can be automatically scaled to render a realistic view of how the item would fit into the customer's environment. It is early days for mixed reality in sales, but we can anticipate this proving useful especially if it is integrated with configure, price, and quote (CPQ) capabilities to provide dynamic pricing and ordering by the customer.

Two types of marketing are provided – simple or ultra-scalable **Dynamics 365 for Marketing provides a comprehensive campaign toolset**

A host of marketing automation capabilities are supported by Dynamics 365 for Marketing including: buyers journey designer, templates, and reusable content blocks to create emails, landing pages, surveys to run multi-channel campaigns, marketing calendars, Integration with Dynamics 365 Customer Insights for segmentation, automated workflows for lead management, email marketing with A/B testing, lead scoring, ABM support, event management, web site personalization, integration with LinkedIn Lead Gen forms, and AI based capabilities to find optimal email send times, spam score, and identify look alike segments.

The unified Dynamics environment helps align sales and marketing with common information and connected business processes. Dashboards and Power BI content packs provide a high degree of insight on buyer interactions and campaign performance. This level of marketing automation is enough for most B2B organizations without large-scale marketing operations and that do not require the more sophisticated B2C capabilities provided by Adobe Marketing Cloud.

Adobe provides the most sophisticated marketing capabilities integrated with Dynamics 365

Microsoft and Adobe have had a strategic partnership for several years. Software engineers from both vendors have worked together to ensure that customers seeking the most sophisticated marketing capabilities provided by Adobe Marketing Cloud can leverage customer data in Dynamics 365 and take advantage of AI tools from both companies. Adobe's Experience Manager provides a complete omnichannel customer journey support capability, delivering relevant content along the way.

The platform provides identity resolution capabilities and develops a rich profile as consumers move from unknown to known customers. This draws on behavioral data to elicit intent, and data ingested from Dynamics 365 to generate a holistic view of the customer, and to trigger the most relevant content or action throughout the customer's journey

Fueled by data, Oracle advances towards dynamic orchestration of the customer experience

Summary

Catalyst

Customers expect every interaction throughout any journey and from any starting point to be connected and fluid. There is however a substantial and growing gap between their expectations and what too often they receive from around 80% of enterprises (source: *Ovum ICT Enterprise Insights 2019/20*). If operational and data silos persist and enterprises continue to see customers as the

product of their value chains, this gap is only going to grow wider. Of all the digital transformation initiatives, from operational excellence to modern working environment and digital skills development, creating a fluid and relevant environment for customers remains the hardest to achieve, yet growth and survival depend on it.

Most enterprises recognize the need, but lack insight on how to create such an environment. This is driving demand for intelligent, data-driven CEPs as the enterprise foundation for this fluid, relevant and infinitely adaptive customer environment. Oracle CX Cloud is one such platform and over the last year has seen several significant advances in its development.

Ovum view

At the Oracle Modern Customer Experience conference in March 2019, one of the most encouraging signals that the vendor is aiming to deliver a dynamically orchestrated customer experience, came from the observation made by Rob Tarkoff, executive vice president and general manager at Oracle CX Cloud, who said: "For too long the technology industry has focused on the idea of a static and predictable customer journey. That must change if we are going to truly understand the customer experience. That change starts with recognizing that customer interactions are unpredictable and that there is no such thing as a fixed, 360-degree view of the customer. Today's consumers are fickle and nomadic and, as a result, data and insights are constantly in motion. That's why we are taking a unique, data-first approach that can help brands eliminate their blind spots and make every customer interaction matter."

This observation recognizes the natural chaos associated with the customer experience and underlines the need to be able to dynamically orchestrate every response to every step of the customer journey, triggered by deepening insight into each individual customer, as they seek to accomplish their agenda whatever it might be. It is not just about selling more stuff to customers but earning the right to help throughout every entire customer journey. It is a symbiotic and collaborative relationship that creates mutual benefit and longevity. Naked self-interest destroys trust.

As we will see, Oracle CX Cloud is becoming one of the most advanced CEPs and this is founded on such observations which provide the purpose for developments, allied to Oracle's data and deep industry heritage.

Key messages

- The Oracle CX Cloud has the potential to support dynamic orchestration with a complete combination of integrated technology layers.
- Oracle's data advantage provides a point of differentiation in combination with AI.
- A broad array of AI and intelligent automation capabilities support employees and customers.

Recommendations

Recommendations for enterprises

Enterprises that have prioritized customer experience and recognize the criticality of taking a holistic and unified approach to customers, enabling true omnichannel support for any customer journey, will need to develop a customer engagement platform. They must think beyond traditional CRM solutions and understand how the leading vendors, such as Oracle, have moved beyond CRM to omnichannel customer engagement.

Oracle CX Cloud supports B2B/B2C/B2B2C environments. It is a unified environment that leverages data, AI, functional capabilities across marketing, commerce, sales, and service to provide an effective CEP for all front-line employees, including a modern UI to enhance the experience of the user. Over the last year, Oracle CX Cloud has continued to develop, and a wide range of industry variants are available, built on a common platform. While each of the main modules can be purchased separately and integrated into the existing enterprise applications landscape through open APIs, it is as a unified CEP that most value will be derived.

Recommendations for Oracle

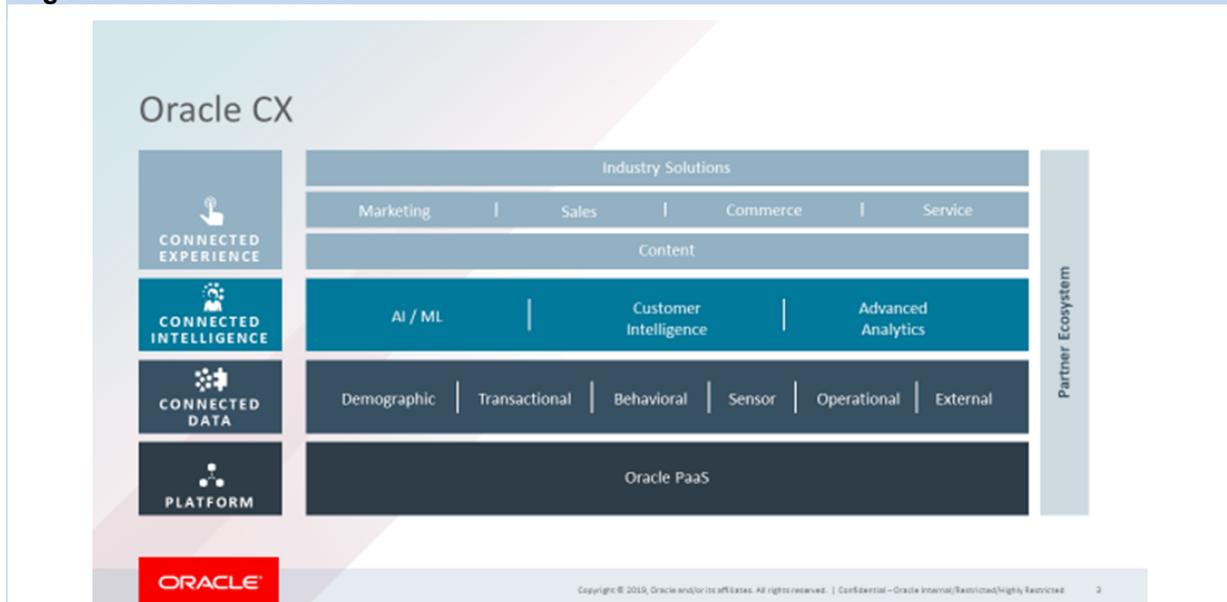
Continue to advance the platform through a common lens of the customer. While each cloud application provides value for individual departments, the bigger picture of omnichannel customer engagement and the natural chaos of customer journeys, calls for a wide-angled view. Adaptive Intelligent Apps must be connected across the CX Cloud to dynamically deliver relevance and insight throughout all customer interactions and journeys. Developers, data experts, and data scientists need to keep one eye on this bigger picture and work towards dynamic orchestration of the customer experience.

There is a natural tendency among all vendors, to focus attention on the more obvious benefits to the enterprise, which leads to localized value and does not consider that the biggest prize – increased lifetime value and genuine loyalty – is based on a symbiotic balance of value that starts with the customer; a "give to get" relationship.

The Oracle CX Cloud has the potential to support dynamic orchestration with an integrated CEP

Every layer in the Oracle CX Cloud platform is fully integrated and data allied to AI, provides the fuel to orchestrate relevance

From the Oracle Cloud Platform to connected data, intelligence and functional support for front line employees and in various industry guises, Oracle CX Cloud provides a comprehensive CEP. Figure 7 outlines the main technology layers, all of which are fully integrated. While the platform has benefitted from several major acquisitions over the years, Oracle has made considerable progress in forging them into a unified platform, albeit different elements can be subscribed to separately.

Figure 7: Oracle CX Cloud

Source: Oracle

Oracle's Cloud Platform provides a modern, open, and secure environment for CX Cloud

Oracle CX Cloud is a SaaS solution that sits on top of the Oracle Cloud Platform that has several attributes which create a flexible and secure environment to host and manage enterprise applications:

- Open standards to support integration with other applications from Oracle and other vendors through Oracle Integration Cloud. This is essential to deliver a true omnichannel experience. While many vendors claim support for omnichannel, unless back office and logistics systems are connected, brand promise will be impossible to fulfil.
- Oracle Integration Cloud provides the tools to manage API connections to adjacent enterprise applications as well as a selection of pre-built process end-to-end recipes.
- It also supports hybrid environments with a mix of on-premises legacy systems and customer-facing cloud platforms.
- The Oracle Cloud Platform provides IaaS and Oracle's autonomous database that removes the need for administrative tasks, is self-healing and provides significantly faster response times than first-generation databases.
- Oracle PaaS is also used to support extensions or modifications to the CX Cloud including microservices, IoT devices, and blockchain connected via APIs.
- On June 5, 2019, Oracle and Microsoft announced a cloud interoperability partnership enabling enterprises that use Oracle and Microsoft applications to share workloads across the Microsoft Azure and Oracle Cloud Platform. This partnership is also intended to facilitate more rapid digital transformation moving from legacy on-premise monolithic environments to more modern, agile and adaptable capabilities.

Connected data – any volume/any source

Oracle's data management pedigree comes to the fore in the customer experience arena. This is discussed in more detail in the next section as it offers a significant point of differentiation beyond the

marketing technology hype surrounding data management platforms (DMPs) and CDPs. While Oracle does provide very well for marketing professionals in both B2B (Eloqua) and B2C (Responsys) environments, it has rightly eschewed the CDP hype, as customer experience is a much broader challenge than timely personalized offers and customer acquisition. Oracle Data Cloud also extends the reach of data to third party sources.

Connected intelligence and automation throughout Oracle CX Cloud

The intelligence and automation layer within the Oracle CX Cloud stack continues to evolve beyond simple departmental use cases. AI in the form of ML and NLP is pervasive throughout the functional application layer and embedded to support specific industry use cases in the industry solutions layer. These developments are examined in more detail in a later section.

Connected experience through Oracle Content and Experience Cloud and the functional applications clouds and industry variants

Oracle Content and Experience Cloud

Content and Experience Cloud has evolved to support an omnichannel customer experience. Oracle has made significant progress from design through to delivery and management of content assets. Content can be documents, images and videos and is deliverable across any channel. The Content Cloud provides a universal store for all digital content assets and it can be disseminated and rendered to suit any device as it is headless. To foster reuse content can be both intelligently tagged making it easier to find, but also fragmented allowing real-time interactive assembly everywhere. Elastic and visual search capabilities make it easier to find suitable image assets for reuse. Third-party API connectors are also available for Adobe Creative Cloud, Google Analytics and Microsoft Dynamics 365.

Oracle Marketing Cloud

Oracle Marketing Cloud comes in two forms, one for consumer-focused marketing (formerly Responsys) and the other for business-focused marketing (formerly Eloqua). The latter, when used in combination with Oracle Engagement Cloud, provides the basis for ABM, where typically each key account is seen as a market in its own right and where sales and marketing collaborate to identify and pursue opportunities within individual accounts. As Oracle Engagement Cloud supports a tight link between sales and service teams in high-value accounts, by combining Oracle Marketing Cloud with Oracle Engagement Cloud, a more sophisticated capability – account-based engagement, the logical evolution of ABM – can be supported.

Both marketing platforms support a high degree of personalization and automation, across any channel. As we shall see in more detail in the next section, Oracle continues to advance the capabilities of both marketing solutions, most notably through its customer identity and data management capabilities and embedded and connected Adaptive Intelligent Apps.

Although not explicit in the diagram, Oracle CX Cloud also includes as an option, Oracle Loyalty, an extension to both marketing clouds. Loyalty programs used to be very static and ineffective with shoppers holding cards from multiple retailers in order to get discounts. Today Oracle Loyalty enables a far more valuable and modern approach to consumer loyalty, that automatically manages points, provides gamification support, and supports points conversion for online purchase. The partnering approach enables businesses to create relevant value outside their own product offerings. This

approach is increasing in popularity and is being used by airlines, banks, and a multitude of commerce and retail businesses to add more value and to foster loyalty.

Oracle Sales Cloud (and Oracle CPQ Cloud)

Oracle Sales Cloud provides a comprehensive and AI assisted environment covering high level planning and territory optimization, quota and commission modeling for the chief revenue officer, pipeline forecasting for managers and sales, and guided selling and field sales support automation. Oracle is also well equipped to support a complete ABM or the more advanced ABE strategies through the broader deployment of the CX Cloud, and in partnership with specialist ISVs. The acquisition of DataFox in October 2018 adds substantially to this capability.

Oracle CPQ has now been integrated into Commerce Cloud to allow businesses to configure high value and often more complex products. Already integrated with Engagement Cloud (a bundled sales and service solution), CPQ includes subscription ordering and configuration for products-as-a-service business models.

Oracle Engagement Cloud

Oracle Engagement Cloud is intended for high touch/low volume B2B environments and brings together sales and customer service into a single solution. This enables field sales to monitor progress on service issues. The service support elements are suited to B2B businesses that do not have the volumes or requirement for Oracle Service Cloud. It can be integrated with Oracle CPQ, Oracle DataFox and Oracle Field Service.

Oracle Subscription Management

Announced in October 2018, Oracle Subscription Management supports recurring revenue environments and is integrated to both back office ERP applications and Oracle CX Cloud (as an option), to provide complete traceability and control of subscription services. As the trend towards product rental vs. buying, grows, Oracle Subscription Management sales will increase.

Oracle Commerce cloud

Commerce often provides the front line for first contact following a search of word of mouth recommendation. Oracle Commerce Cloud, which supports B2B/B2C and B2B2C environments, provides advanced search such as 'find more like this' and shoppable content if the first contact is via social media. Content and multimedia items are treated like 'native' elements in commerce layouts and widgets. From a B2B perspective having tight integration with CPQ allows business buyers to configure the more complex product bundles themselves. Collaboration between marketing and commerce teams is also supported to drive traffic to any site. ML plays a big role in surfacing the most relevant content based on a synthesis of behavioral patterns and what is already known about the customer's interests and buying history.

Oracle Service Cloud and Field Service Cloud

Oracle Service Cloud and Oracle Field Service Cloud provide an advanced, integrated, and collaborative environment for service agents and field service engineers. Recent developments over the last year include support for WeChat and Facebook Messenger. Oracle also harnesses AI, robotics process automation (RPA) and AR/VR to support engineers on site to diagnose or to undertake the more complex repair. Oracle Digital Assistant provides intelligent support for agents through NLP. Oracle Policy Automation can also be embedded to ensure compliance with the latest policy changes or new regulations as they emerge as well as deliver smart advice. Several recent

developments provide field service engineers with additional support including the use of Field Service Chatbots. Dynamic scheduling and broadcast of service requests also help ensure that the engineer closest to a request for on-site support can be reached.

Oracle Social Cloud

Oracle Social Cloud is integrated into Oracle Marketing Cloud (both versions) and Oracle Service Cloud and provides the social listening capabilities essential to determine sentiment and to use that as a feedback mechanism for fine tuning product or services features to make them more compelling. Customer audiences can be developed for Facebook and a broad range of social media platforms are supported including WeChat, Instagram, LinkedIn, and Twitter.

Oracle's industry expertise creates a closer fit

Oracle has invested heavily in delivering a platform that fits with the specific needs of different industries, including prebuilt industry-specific data models, end-to-end business processes, user interfaces, integrations with other Oracle and third-party back-end systems, and analytics. The core industries supported in this way consist of, automotive, communications, consumer goods, corporate and retail banking, higher education, high-tech, hospitality, industrial manufacturing, insurance, media, public sector, retail, and utilities.

Oracle's data advantage provides a point of differentiation in combination with AI

Oracle's data management expertise provides support for omnichannel interaction orchestration at any scale

Converting customer journey chaos into real-time engagement orchestration is a complex challenge, especially in high-volume B2C environments, and it starts with data and its ingestion and management, often across a sprawling landscape of applications and databases. Oracle Integration Cloud connects these disparate data sources and applications.

Dynamic orchestration of the customer experience relies on the ability to sense and respond to the customer's context, often in real time. Customer data must include traceability of the live interaction journey and any historic transactional information and stated preferences. Customers expect to choose how they want to interact and across whatever channels, digital or otherwise. They deem appropriate. Subject to permissions, journey data must flow from one interaction point to another. This presents several challenges from recognizing the customer as a customer or, if a new prospect, interpreting the digital exhaust created by their online interactions to predict their intent.

Attempts to meet this challenge through journey mapping exercises, at best creates only a proxy for reality that is further complicated by continuous behavioral changes. Establishing business rules or workflow pathways to replicate such static maps means even if assumptions were correct for a proportion of customers and prospects, the likelihood is that this percentage could deteriorate rapidly.

The fundamental challenge is data combined with intelligence, to deliver an effective sense-and-respond capability. Marketers have tried to solve this challenge through the development of DMPs and more recently CDPs, but at best this provides a myopic view of the customer as someone to whom offers are sent. The total customer experience goes way beyond any single department, however well-intentioned.

Oracle Integration Cloud provides services for data ingestion at any scale

The Oracle Integration Cloud provides support in essential big data areas:

- Data Lake Builder is used to rapidly copy data into a data lake and provide guided setup and governance for data policy compliance. A data catalog is created to make data discoverable for specific uses – for example, by data scientists to surface hidden patterns and create business value.
- Data Preparation simplifies data ingestion.
- Data Pipelines push down extract, transform, and load execution for complex data integration pipelines in a data lake or data warehouse.
- Data Replication provides real-time data integration and replication for data movement, consistency, resiliency, and fault-tolerance.
- Stream Analytics is used for event processing of real-time data streams that ML can use to trigger the most relevant action.

To give some idea of the scale that can be supported, eBay's real-time streaming data platform is built on Oracle GoldenGate, Kafka, Flink, and Kubernetes to handle 200 billion events a day. Oracle GoldenGate is designed to support heterogeneous database environments, monitoring change data by reading transaction logs and distributing these transactions to different target systems in real time.

Oracle Infinity tackles the DMP challenge for marketers, but Oracle CX Unity provides much more than a marketing CDP

Oracle does have a DMP, developed from various acquisitions such as BlueKai and Maxymiser for A/B and multivariate campaign testing and heatmaps to track the online experience. Infinity tracks and unifies real-time customer interaction data and allows marketers to analyze the traffic to determine behavioral segments and to use those insights for omnichannel marketing campaigns. The Oracle ID Graph creates a dynamic customer profile that enables firms to track customers from unknown to known. Oracle Infinity is a key component within Oracle Marketing Cloud, and it is also fully integrated with Oracle CX Unity which tackles the bigger job of gathering, synthesizing and delivering data to each of the functional applications within Oracle CX Cloud.

Oracle CX Unity is more than a "traditional" CDP

Oracle takes a holistic lifecycle view of the customer rather than a narrow marketing automation perspective. Oracle CX Unity, launched at Oracle OpenWorld in October 2018, has been developed to ensure that customer profile data is continuously updated across the omnichannel environment. Oracle positions it as the underlying "Customer Intelligence Platform" to reflect the broader role than is more typical of a CDP. It provides a unified customer profile gleaned from any data source, including: the entire portfolio of connected CX Cloud or third-party applications, digital data streams, back-office application data and second- and third-party data sources. The profile data can be augmented by Oracle Data Cloud, with access to 5 billion anonymized identities from 1,500 data sources, to generate lookalike audiences for marketing purposes, and in a B2B context, from DataFox, acquired by Oracle in October 2018 and now integrated into Oracle CX Cloud.

Oracle CX Unity's primary purpose, however, is to maintain accurate and trusted information (subject to permission) and make this available across all functional areas and to feed ML algorithms to trigger the most relevant action or content throughout each customer's journey, irrespective of where that

person starts or ends up. By synthesizing historic transactional data with real-time behavioral data gleaned throughout each step of the customer journey, and applying ML, the relevance of any response or interaction is significantly enhanced.

Oracle CX Unity is also supported with industry-specific data schemas and will support both B2B and B2C environments, such as account-based marketing (ABM) and high-volume B2C settings.

Oracle Data Cloud provides a broad array of third-party data

Oracle's DaaS capability is extensive. CX Unity customer profiles can be augmented with additional data from Oracle Data Cloud which includes over 1 billion business and 5 billion consumer IDs, 40,000 segments of data from 1,500 sources and curated data from 1,500 data providers. It also enables marketers to find look-alike audiences in third-party data. Some 7.5 trillion data points are collected monthly. Data Cloud also integrates with 99% of media platforms. In all this is a vast source of third-party data that is unmatched by any other CEP vendor.

Oracle DataFox AI data engine provides B2B data, signals and relevant talking points for sales

Using NLP and ML-based automation, Oracle DataFox scans over 3.5 million company websites a month and a variety of other data sources such as, SEC filings, job boards, Twitter posts, blogs, and news sources. Automated multi-factor matching and an automated human-in-the-loop process to sort out anomalies, creates a steady stream of market intelligence to help sales people identify and pursue opportunities. Risk signals are also provided to help sales people avoid contracting with customers that might be at risk of an imminent takeover or worse, liquidation. Currently almost 50 million customer records are updated automatically on a weekly basis. Relevant talking points are also suggested to help sales build rapport or dig deeper for potential opportunities that might otherwise go undetected.

It all adds up to a data advantage for Oracle

Oracle's data management capabilities from individual customer profiles through to third-party data augmentation feeds the Oracle CX Cloud platform and the Adaptive Intelligent Apps that trigger the most relevant action, advice, offers, and content throughout each customer journey.

A broad array of AI and intelligent automation capabilities support employees and customers

Out of the box Adaptive Intelligent Apps

Oracle's integrated CX Cloud is now infused with Adaptive Intelligent Apps, as is Oracle ERP Cloud, Oracle SCM Cloud, and Oracle HCM Cloud. What this does, particularly where the entire value chain is connected, is to provide an intelligence mechanism to trigger the right content, actions, or recommendations based on the inferred intent of customers, from initial search for a product or service all the way through to fulfillment and usage, across any combination of channels they choose to use. Humans still need to develop compelling content and offers, and they still need to get organized in such a way that departmental silos are removed. Oracle's network of Adaptive Intelligent Apps constantly recalibrates based on the actual outcomes achieved. This provides the dynamic linkage between the relevant content, recommendations or guidance developed by employees, and the individual customer.

This provides scale and is a major step towards addressing the challenge of the near infinite permutations of customer interactions.

Support for the data scientist

In May 2018, Oracle acquired DataScience.com, a firm of 50 data scientists who had built a platform to support data exploration, model building, and training and model management and deployment. Providing deep integration with Oracle SaaS, PaaS, and IaaS, it can support extremely large-scale use cases. While most enterprises will rely on Oracle's growing portfolio of connected intelligence, those with their own data scientists will find the data science platform an added advantage.

RPA

Oracle Integration Cloud provides a robotics process automation (RPA) capability with the UiPath RPA solution. This provides the tools to design and build new processes or extend/enhance existing ones, integrate with existing processes, and activate the new process. Rich visualizations are provided to make process automation design intuitive for business analysts and business domain experts.

Oracle CX Cloud is one of the most advanced CEPs

Oracle CX Cloud as an integrated whole and supported with pervasive use of Oracle Adaptive Intelligent Apps for ML and NLP and Oracle's underlying data management expertise, provides one of the most advanced CEPs. Considerable effort in recent years to create a common, modern, adaptable and intelligently guided user experience has been achieved through Oracle Alta UI. Oracle has clearly articulated the challenge for dynamic orchestration to deliver relevance at every micro-moment, and as AI develops further, we can expect Oracle CX Cloud to meet this ultimate experience challenge.

Pega Infinity has an architectural advantage for large-scale, high-volume, and complex environments

Summary

Catalyst

As far as customers are concerned size doesn't matter, except that more blame is attached if the experience is suboptimal and fails to meet their expectations. Major banks, government departments, healthcare organizations, insurance companies and retailers – online or offline struggle to adapt to customers ever rising expectations. The ability to deliver in-context (more of that later), relevance at the point of customer interaction and throughout every customer journey, relies on unified customer data, intelligence and the ability to react in real-time. This is a highly complex challenge in large enterprises where decisions and responses must be delivered in milliseconds. This is also a big data challenge to derive meaningful insights from a torrent of data generated by tens of thousands of customer interactions each second and often 24 hours a day. Pegasystems, with Pega Infinity has evolved to remove this complexity and handle any scale or volume of customer "traffic". In this report we examine how it has done this and what is on the near horizon in its development.

Ovum view

Remarkably, Pegasystems now generates nearly 90% of its revenue from subscriptions, up from 45% in 2015. This transformational move to the cloud was well-timed and offers large enterprises with a choice of IaaS providers including AWS, Azure, Google Cloud, Pega Cloud, and Pivotal to suit the needs or policies of each enterprise. Omnichannel customer engagement is a massively complex challenge for most large enterprises, but, as we will see, Pega Infinity is well-equipped to help organizations transform their capabilities to meet it, through its combination of advanced BPM allied to customer engagement. The unified environment of the Pega customer engagement platform (CEP), aided by an adaptive, forward-looking architecture, aided by pervasive automation and AI, makes this one of the most advanced CEPs available. Pegasystems' cloud average contract value (ACV) has grown 21% over the last year (see Pegasystems' Financial Results for 2Q19), an encouraging sign that it is on the right path to higher growth.

After operational excellence, the next priority for businesses and customer-focused organizations, is to digitally transform their customer engagement capabilities. Pegasystems along with most of its competitors is targeting that priority and has an architectural advantage in a unified technology stack. All interaction and transactional data pass through the Customer Decision Hub, a good environment to detect behavioral patterns and to trigger the most relevant response or next best action (NBA).

Key messages

- Pega Infinity has an architectural advantage to support dynamic orchestration.
- All roads lead to the Customer Decision Hub.
- Pega sets the bar high for real-time contextually relevant customer engagement.

Recommendations

Recommendations for enterprises

For large enterprises with high volumes of customer interactions, such as financial services, insurance, telecommunications, and utilities for example, the ability to deliver a positive customer experience consistently across any and all channels, is a massively complex challenge. Ovum's annual ICT Enterprise Insights research shows that around 75% of similar enterprises are struggling to make substantial progress. Pega Infinity is a future oriented customer engagement platform that can and is being used by many such organizations as the central orchestration hub to deliver on their omnichannel transformation strategies. As you will read, it has several major advantages from its unified architecture to its embedded AI and Customer Decision Hub, and its BPM and CRM heritage works well in complex high-volume environments, where real-time matters to the end customer. Pegasystems positions its platform as the brain underpinning customer engagement, and with some justification.

Recommendations for Pegasystems

Pegasystems must continue to expand the Pega Marketplace and include leading commerce platforms, so that it can broaden its appeal to large B2B and B2C enterprises. The vendor can operate at the extreme end of the market which is a great strength. Its empathy management capability is an industry first, that equips the company to take the moral high-ground in the field of AI. More thought leadership research and case studies around this thorny subject would provide positive market exposure.

Given Pegasystems' success in the large high-volume enterprise environment, especially in financial services, healthcare, insurance, telecoms and utilities, it should consider expanding its focus to large retail organizations, especially those that combine retail stores with commerce.

Ovum is seeing a rise in demand for graph databases such as Neo4J that are well-suited to many-to-many and complex relationships. Dynamic customer profiles are also essential elements for customer engagement, and Pegasystems needs to more clearly articulate how these are provided by Pega Infinity.

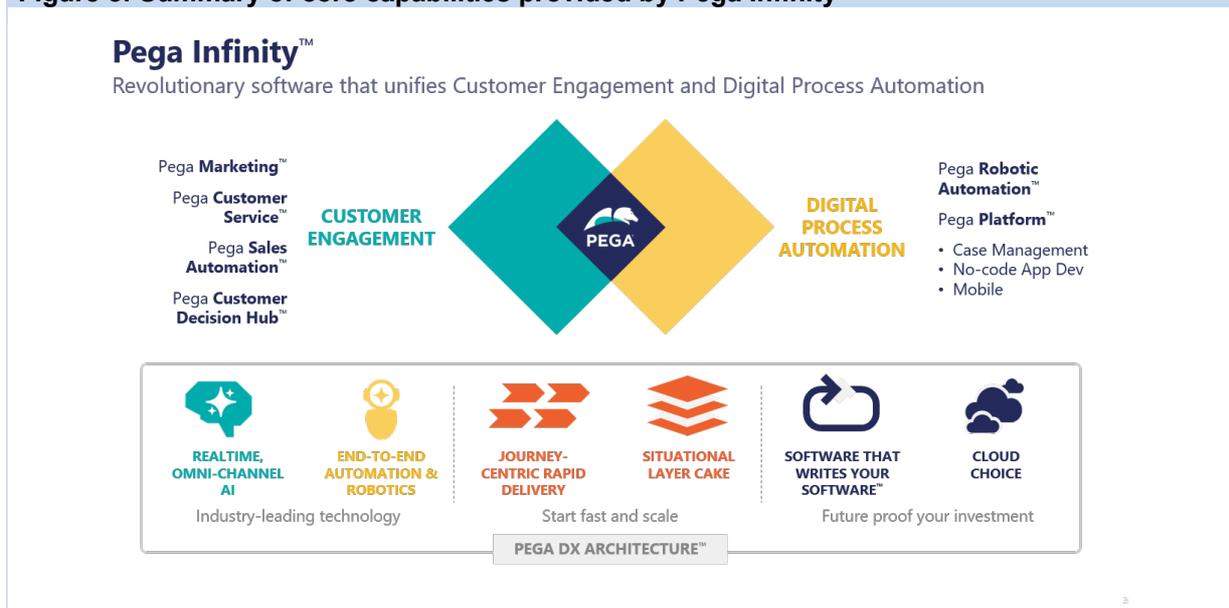
Pega Infinity has an architectural advantage to support dynamic orchestration

An integrated array of capabilities provides an effective mechanism for digital business transformation

The ability to act in a coordinated and joined up manner is an essential attribute in the complex field of omnichannel customer engagement, or as Pegasystems prefers to call it a channel-less environment. The idea of channel-less is to develop an engagement hub to which any channel can be attached, as it is the customer and journey that are important, rather than the channel within which it is consumed. For a long time however, most enterprises have developed channel support capabilities a channel at a time. Even if this covers every permutation of channels, the result is neither coordinated nor coherent, but is a further proliferation of channel silos. When Ovum talks about omnichannel customer engagement, it means enabling customers to interact with an enterprise, irrespective of department or channel, in the way that is simplest and most natural for the customer.

Customer journeys are chaotic by nature and they often span multiple channels both digital and physical, depending on the customer's contextual needs at the time and their location. Pegasystems channel-less perspective is entirely consistent with this essential CEP requirement. It provides an integrated engagement hub that can ingest interaction data from any channel and any stage of the customer journey and then trigger the most relevant response at the moment of contact, irrespective of department that might be involved.

Figure 8: Summary of core capabilities provided by Pega Infinity



Source: Pegasystems

AI assisted BPM and CRM combine to create a fluid engagement environment

As the top half of the diagram illustrates, Pegasystems has brought together its twin heritage of Digital Process Automation (DPA) and customer engagement. Rather than operating in silos, the front office departments can act in a coordinated fashion. Pega Infinity's takes a customer journey-centric approach to customer engagement, where each journey can be designed as a case with its own lifecycle and focused on customer outcomes rather than just tasks.

Pegasystems' strong BPM/DPA heritage combines with its advanced CRM capabilities to create a customer engagement platform that is adaptive and can sit above legacy systems, to orchestrate back-office fulfilment capabilities triggered by customer interaction. An example in finance might be loan origination, where a bank can design the interaction processes to make it as easy as possible for the customer to navigate all the steps required to seek a loan, and back-office underwriting processes can be invoked to provide rapid approval, recommend the most appropriate alternative or, worst case, decline.

While a rules-based approach with DPA could be used to support the customer journey, Pega Infinity also harnesses omnichannel AI and RPA to create a much more adaptive environment, providing real-time support for customer journeys irrespective of the device or channel used.

Three core integrated modules provide the customer engagement support

The three core customer engagement applications are Pega Marketing, Pega Customer Service and Pega Sales Automation, all supported by the Pega Customer Decision Hub, (see next section), and the Pega Cloud Platform that provides the process automation capabilities through DPA, case management and RPA.

The underlying architecture of Pega Infinity is worth examining, as this explains why Pegasystems' CEP is proving valuable in major high-volume enterprises that wish to transform their customer engagement capabilities, as fast as possible, to keep up with rising customer expectations.

Critical architectural elements of the Pega Infinity CEP

Real-time and massively scalable

Scratch beneath the surface and real-time often means a response based on yesterday's data after the nightly ETL upload. Built on the Cassandra data lake and using Apache Kafka distributed streaming capabilities, Pega Infinity can handle extreme interaction volumes and respond in milliseconds. To give some idea of scale, Liberty Global one of the world's largest digital service providers, offering TV, phone, broadband, and mobile services to 22 million customers, operating in 11 countries selected Pega as its digital layer and transformation platform. The Commonwealth Bank of Australia uses Pega Infinity as its customer engagement engine across 20+ channels and uses the platform to deliver contextually relevant needs-based conversations with its customers, to deepen the relationship and foster trust.

Journey-centric approach creates a fluid environment for the customer

Pega Infinity's approach is to take a customer journey-centric approach to customer engagement, where each journey can be designed as a case with its own lifecycle and focused on customer outcomes rather than just tasks. Pega Catalyst, a Design Thinking support service provided by Pegasystems helps enterprises to think more holistically about their customers and take an outside-in approach specific to roles and personas, and data interfaces via Rest APIs to connect to any adjacent systems that might support the customer journey.

The "situational layer cake" facilitates standardization, yet accommodates exceptions

The multidimensional patented architecture that Pegasystems calls the "situational layer cake," allows for standardization across the enterprise. In addition, where exceptions are required, due to local regulations for example, these can be accommodated without interfering with the integrity of the core system. This allows businesses to avoid the complexities that come with duplication of 'similar but different' processes, as often required with other approaches. Here, changes are made once within the hierarchy and then propagate to all impacted areas of the business automatically. For large international companies driving best-in-class standards, but allowing for local exceptions when required, this architectural advantage of Pega Infinity will be welcomed.

Software that writes software and support for citizen developers

Any design changes to processes automatically generate the code reflecting these changes, which speeds up delivery. The Admin Studio supports DevOps and continuous release for developers. App Studio is used for developing apps for further differentiation in a no-code/low-code environment that non-technical employees can use.

Cloud choice includes private cloud

In addition to AWS, Google Cloud, Pega Cloud (which accounts for some 60% of cloud deployments in 2019), and Pivotal, enterprises with particularly sensitive customer data compliance policies, can be supported with a private cloud. This allows clients to deploy on the cloud of their choice and have the flexibility to change their mind should changes in market conditions arise.

Pega Marketplace provides extensions

From microservices to add-on applications, a growing portfolio of components, language packs and applications is available to extend the CEP. Of interest is Celebrus which, described loosely as a CDP,

senses customer input via all digital channels. It is always-on and provides clearly defined real-time signals to the Pega Customer Decision Hub, filtering out noise. The Pega Customer Decision Hub immediately determines the next best action based on what it hears and learns, plus the rules it applies. Pega provides content back to the channels and Celebrus instantly feeds back the behavioral outcomes, closing the loop, to drive adaptive and predictive learning in Pega.

This range of mutually supporting architectural features and the Pega Marketplace provide an environment for rapid adaptation. What brings it to life, however, is the Customer Decision Hub at the heart of the platform.

All roads lead to the Customer Decision Hub

The Customer Decision Hub senses, responds, and adapts

The Customer Decision Hub monitors all customer interactions from any source and using AI in the form of ML and NLP and a synthesis of transactional and behavioral interaction data, learns from every customer interaction. This adaptive learning provides a continuous feedback-loop between the customer and the enterprise, constantly recalculating the next best action. From a practical perspective this helps marketers make the most relevant offers at the right time and the right channel, through self-optimizing campaigns. When plugged into commerce and content applications, landing pages can be continuously adjusted to increase relevance by highlighting offers or products that the customer is more likely to buy. Pegasystem's Workforce Intelligence learns from the more seasoned and successful agents to raise the skills levels and optimize best practices.

The same thing happens in Pega Sales Automation, enabling sales people to learn from the successes of their peers, as well as receive timely guidance on next best actions to uncover new opportunities and improve the chances of a successful sale. The continuous stream of data travelling through the Customer Decision Hub provides the sensing capabilities that trigger the most appropriate response, through the right channel and in a timely manner to suit the customer. To avoid the creepy factor, offers are automatically suppressed to avoid annoying ads appearing.

Empathetic AI is not an oxymoron in Pega Infinity

Pegasystems has used AI for many years. In 2017 it developed the T-Switch that controls the transparency of the AI techniques applied across a business' use cases. Given the complexity and diversity of omnichannel interactions, unravelling the reasons why a next best action was triggered can be a cause for concern, especially if there is some bias in the construction of any algorithms. Neural networks of ML algorithms can be opaque and trust in the outputs is important to building confidence that the always-on Customer Decision Hub is making the right calls.

Customer Empathy Advisor

In June 2019, Pegasystems launched its Customer Empathy Advisor. To succeed with customer engagement any enterprise must balance the needs of the customer with that of the business. Customer Empathy Advisor contained within the Customer Decision Hub, uses AI to provide a framework enabling organizations to operationalize empathy at scale. It suggests next best actions that will mutually benefit customers and companies. The advisor helps companies:

- Calculate current empathy levels.
- Showcase gaps between customer-centric vs. product-centric engagement.
- Identify actions that could be perceived as indifferent or unfeeling.

- Highlight empathetic actions to take more often.
- Provide controls that automatically optimize empathy levels.

Pegasystems continues to advance its AI capabilities and to innovate. It strikes a balance between internal AI initiated support and guidance to help the employee, with intelligent automation and self-service capabilities to help the customer throughout their various journeys.

On the horizon

On the horizon, a combination of workforce intelligence and process mining, is planned to act as a diagnosis of the customer journey experience, (currently a manual audit provided by Pegasystems services). This will help enterprises identify any issues or sources of friction that inhibit the customer or lead to poor outcomes. The Pega Contact Widget that can surface when a customer appears to need help, will enable the customer to select their preferred messaging channel, such as Facebook Messenger, Apple iMessage, SMS, Google RCS, or email. AR/VR support for field customer service is in the pipeline. Voice analytics with real-time voice to text linked to sentiment analysis will be able to trigger next best action.

Pega sets the bar high for real-time contextually relevant customer engagement

It starts with empathy of the customer

A common justification for AI supported CEPs is how they can help enterprises generate more sales, improve retention and increase the lifetime value of each customer. Often what is in it for the customer is missing. However, as Ovum has consistently argued, long term growth depends fundamentally on a symbiotic relationship between each customer and the enterprise. Enterprises must first give value in the form of the initial experience all the way through the lifetime of the customer. An essential component of that symbiotic relationship is trust. Pegasystems has illustrated with its Empathy Advisor.

Context requires a lot of triangulation in real-time

Pegasystems has identified five attributes that impact customer context:

- Emotional – how the individual feels in the moment.
- Motivational – their intent or goal, the reason behind their journey.
- Behavioral – what they have done or are now doing.
- Situational – where they stand within their journey.
- Environmental – their physical or digital location, and prevailing conditions informed by, for example GPS.

Pegasystems has found that contextual data is highly variable, usually implicit rather than explicit and must be gathered, synthesized, interpreted and acted upon in milliseconds to deliver a contextually relevant experience. It is this level of thought that enterprises need if they are to create the symbiotic relationship discussed. If firms cannot act in real-time, the opportunities for a positive and symbiotic interaction, will be lost. The developers behind Pega Infinity understand this very well.

Strategic acquisitions and developments boost Salesforce's Digital Transformation credentials

Summary

Catalyst

Enterprises increasingly realize that to survive and thrive they must adapt to stay relevant to the customers they hope to attract, develop and keep. Growth depends on persistent customer relevance and that is a function of the customer experience, and the ability to refresh the value delivered through continuous innovation. A customer-centered mindset and purpose underpin this ability, and this impacts the entire enterprise, including how it organizes around customers. Both customer experience and innovation are major digital transformation priorities and CEOs are seeking to weave these capabilities into the fabric of their enterprises. Therefore platforms, not siloed point solutions, are growing in importance.

Ovum view

Salesforce won the traditional CRM battle for market leadership, but the challenge to keep up with customers' rising expectations, especially for any-channel convenience has changed the basis of competition. CRM systems of record, often deployed to solve departmental challenges, are now being rapidly replaced by CEPs that transcend individual departments. When used wisely, these CEPs create a highly tuned real time sense-and-respond environment that supports customers throughout any online or offline customer journey, by teeing up relevance at every interaction moment. We are still some way from what Ovum refers to as *dynamic orchestration* of the customer experience, but leading CEPs like the Customer 360 Platform are well on their way. Salesforce has strengthened its competitive position and ability to step up to this more complex customer challenge, through judicious acquisitions while organically augmenting existing capabilities in each of its component products. This report highlights the most strategically important developments over the last year and how they have advanced the Customer 360 Platform.

Key messages

- The Customer 360 Platform has evolved into a customer engagement platform.
- The MuleSoft acquisition increases the strategic value of Salesforce's Customer 360 Platform.
- Critical developments in customer data management and AI fuel better outcomes.
- Salesforce's industry focus is bearing fruit and adding greater value.
- myTrailhead emphasizes that a culture of learning is essential for customer success.
- Blockchain finds a home in support of collaborative ecosystems and supply provenance.

Recommendations

Recommendations for enterprises

While the Customer 360 Platform from Salesforce can be consumed a cloud at a time, one of the top priorities across most large enterprises is to address the need to meet customer expectations consistently and positively across the omnichannel environment. The practice of investing in CRM applications a department at a time risks perpetuating organizational silos. One way or another every enterprise must develop a customer engagement platform that ensures consistency and relevance

across all customer journeys. Technologies like the Customer 360 Platform offer a realistic means of delivery. The biggest challenge though is to organize around customers rather than see customers as the destination at the end of the value chain. Salesforce has taken major steps over the last 12 months or so, to increase the value of their platform, and these strategically important steps are highlighted below.

Recommendations for Salesforce

Major vendors like Salesforce are successfully evolving their customer engagement capabilities from the traditional CRM systems of record, to hybrid systems of engagement and record. Salesforce has made significant progress over the last year to increase the value of its platform through both acquisition and organic development. The vendor errs on the side of pragmatism playing to its strengths in sales, marketing, service and commerce. This is reflected in AI use cases which are typically focused on supporting the employees involved or customers through self-service.

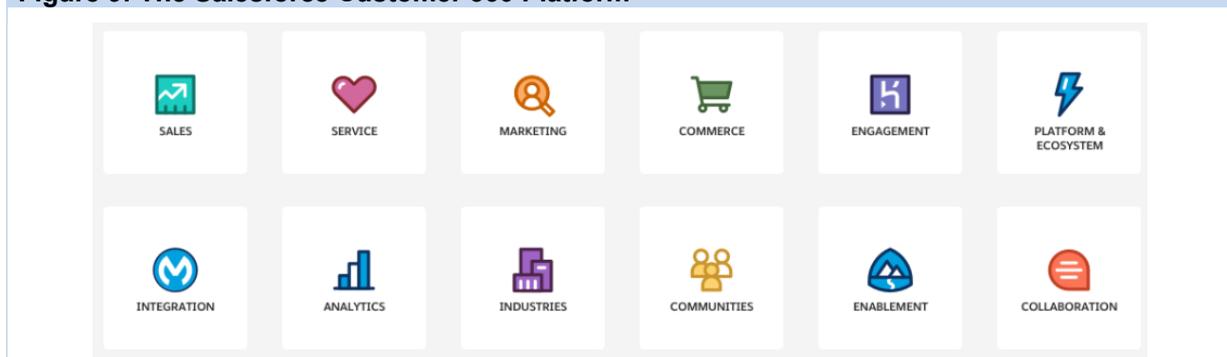
Ultimately the greatest value will come from being able to dynamically react and respond throughout any customer journey and across any channel traversed by the customer – what Ovum refers to as *dynamic orchestration*. To satisfy growing expectations of customers the customer experience needs to be dynamically orchestrated and relevant throughout all interactions, no matter which underlying department may be touched. This challenge is still some way off being addressed but a more holistic view of the customer, and re-imagining and co-innovating with leading edge customers, should provide further impetus to such developments at Salesforce.

The Customer 360 Platform has evolved into a customer engagement platform

The Customer 360 Platform has all the attributes of a CEP

Traditional CRM applications were limited in scope to sales, marketing and service. The Salesforce Customer 360 Platform has evolved way beyond that, as outlined in Figure 9.

Figure 9: The Salesforce Customer 360 Platform



Source: Salesforce

In addition to the CRM triumvirate of sales, service and marketing, the Customer 360 Platform includes commerce for both B2C and B2B environments. In addition, the platform has several applications and tools that support:

- Custom mobile, social, and web apps development – via Heroku and Lightning.
- Collaboration and Productivity – via Quip.
- Internal, customer, and partner portals and forums – via Community Cloud.

- Enablement via Trailhead, a highly engaging training environment for rapid onboarding.

The platform also includes integration via APIs (MuleSoft), real-time and predictive analytics (Einstein) and Customer 360, which is Salesforce's unified data platform. The vendor has developed industry specific variants that along with MuleSoft, Customer 360, AI, and Salesforce blockchain, are examined in more detail in the sections that follow.

The MuleSoft acquisition increases the strategic value of Salesforce's Customer 360 Platform

The acquisition of MuleSoft changes the game for Salesforce

MuleSoft Anypoint Platform is a unified middleware-as-a-service (MWaaS) platform for key hybrid integration use cases. Anypoint Platform is a good example of how API-led integration can be used to meet complex hybrid integration needs.

Without direct access to back office and supply-side and fulfilment systems data and applications, the promise of omnichannel customer engagement and a seamless and frictionless customer experience would remain a pipe-dream. When vendors typically talk about omnichannel their thinking is often related to the narrower and self-serving purpose of making personalized offers and customer acquisition. Today that is not good enough.

Highly relevant customer data is often fragmented and hidden away in many applications and systems. MuleSoft's own 2019 Connectivity Report bears this out. Of the 650 IT leaders surveyed, 53% had over 800 applications and 43% had more than 1,000. This speaks to the scale of the challenge in large enterprises. The MuleSoft Anypoint Platform is a valuable resource for connecting applications and data sources, that can then be used to feed AI and to drive positive customer experiences. The strategic importance of this acquisition to Salesforce should not be underestimated. It connects the Customer 360 Platform to the rest of the enterprise, potentially massively increasing the relevance of responses triggered by customer interactions, as a more complete view of the customer's overall context and intent can be derived.

MuleSoft supports the extended ecosystem, creating new opportunities

The Anypoint Platform supports composable business ecosystems via APIs and templated integrations, that enable enterprises to connect and exchange information securely. Readymade APIs and templates make it easy and quick to connect to multiple clouds, systems and machines. What this means in practice, is new sources of value can be created collaboratively between companies to increase their relevance to customers and generate more positive and compelling experiences. Big Bus, a city site-seeing tour operator uses this approach. With MuleSoft, Big Bus' IT team have developed APIs to enable sales across various digital channels, connect with a global network of partners, and deliver a more seamless customer experience. Big Bus has seen a 26% increase in revenue every year which they attribute to the use of reusable APIs and integrations to streamline and strengthen partner relationships, create a user-friendly digital ticketing experience, and establish an API-enabled direct to system bookings.

Evented APIs can also be used to trigger actions across systems to speed up reaction times and reduce waiting times for the customer. Now that MuleSoft is part of the Salesforce company, engineers across the product teams are exploring new ways to enhance the value of the Customer 360 Platform, and to accelerate digital transformation.

Critical developments in customer data management and AI fuel better outcomes

AI needs good data and Customer 360 is a step in the right direction

AI, particularly in the form of ML is essential to drive relevant customer focused outcomes but it must have access to good quality data in enough volume, or predictions are likely to be wrong. While MuleSoft can be used to integrate multiple data sources and systems, someone within the enterprise must take ownership of the customer data challenge, and until recently, Salesforce relied on partners to reconcile data. Meanwhile, the vendor has developed Customer 360 which includes five key pillars:

- integration (e.g. lightning platform, cross-cloud, MuleSoft, CDP ingestion, DMP keys)
- the customer graph (identity and federation)
- attribute creation (the consumer scale store)
- visualization (via in app reporting & analytics)
- data stewardship and governance (consent, GDPR, security and trust)

It is expected to be available towards the end of 2019 and has been positioned as a customer data platform (CDP), but with the focus initially, on helping reconcile customer identities from multiple Salesforce sources into a unified Salesforce ID and providing a unified data platform across Salesforce products. helping data administrators to reconcile customer data from multiple sources into a unified customer identity. Once done the profile is available to all Salesforce Clouds that make up the Customer 360 Platform. Identifying the customer is the first critical step towards personalization and relevance.

The Customer 360 Platform will provide data administrators with the tools to prepare data, match and resolve any issues, reconcile profile data and manage the customer data quality on a continual basis. In its first iteration, Customer 360 will enable administrators to build up the identity of individual customers based on order, case and marketing response histories. Contact center agents, for example will be able to see the complete commerce history of any consumer without having to import records into a single repository. A GA date for the consumer-grade CDP has yet to be announced, but we can expect to hear more on this at the upcoming Dreamforce conference in November 2019.

It is likely that marketers will be the most obvious beneficiaries in the short term, but Customer 360 will be at the heart of the Customer 360 Platform, and ultimately support the complete customer lifecycle, from initial search or response to a marketing campaign, through to product delivery and any subsequent help or guidance required by the customer. Armed with good data, the increasing value of Salesforce Einstein can be brought to bear.

Salesforce Einstein helps employees and customers

The first iteration of Salesforce Einstein launched in 2016, included use cases in support of each of the Salesforce applications. Almost three years later, the number of daily predictions is around 8 billion and rising. Salesforce has been guided by two principles:

- Make AI easy to leverage for non-technical business users.
- Build trust – one of the vendor's core values, by ensuring any outcome can be readily explained.

Broadly, Einstein has become increasingly adept at surfacing hidden insights, predicting outcomes, recommending relevant actions and increased automation to trigger the most relevant response.

Pragmatic support for employees and customers through intelligent automation

Einstein brings relevant insights, in-context for users. While many customers may have existing data science teams that use other development tools, Einstein has been designed for business people to use, offering a no-code approach where they can derive value from their data. Einstein's AI functionality has continued to expand, from the original "out of the box" approach, to a more customizable set of features that allows admins to build custom predictions. Industry-specific use cases like preventative maintenance in Manufacturing, patient segmentation in Healthcare, and predictive client churn in Financial Services.

Einstein Vision brings image recognition to AI

Einstein Vision was announced in April 2017, a set of APIs to enable developers to embed image recognition throughout Salesforce's applications. It includes pre-trained image classifiers to speed up deployment and developers can also add their own image classifiers if required. User generated images in online communities can be explored to gain insights into products or features that customers prefer. Image search is also available to find products quickly or to check stock availability.

Einstein Language adds NLP capabilities – essential for self-service

Einstein also has NLP capabilities to derive meaning within text or emails or from a customer self-service perspective, increase the probability of finding the most relevant answer or document. This capability also supports sentiment analysis to determine how customers might feel about their experience, based on what they may have posted on social media, for example. By understanding customer sentiment and pain points, businesses can take remedial action to protect their customer bases.

Conversational AI and location-based intelligence for increased accuracy and productivity.

In September 2018, Salesforce announced the addition of conversational AI with Einstein Voice. This allows employees to use voice commands to access or update systems. Updating records after a customer visit has plagued sales people who spend hours updating records and led to an infusion of poor quality or partial customer data. Voice removes this impediment and smart push notifications, including noteworthy news help to keep the focus on priorities and opportunities that have the highest probability to close and provide more context to build customer rapport.

To further strengthen its conversational AI capabilities, Salesforce announced its agreement to acquire Bonobo, in May 2019. Bonobo is a conversational AI platform that enables companies to analyze their communications and produce actionable insights Bonobo can analyze all calls, texts, emails, live chat, among other communication types. As these products become fully absorbed by the Einstein AI family, we can expect even greater contextual support for employees.

Acquisition of Tableau will help employees make sense out of complexity

The proposed acquisition of analytics and data visualization platform, Tableau, announced on June 10, 2019, at a colossal fee of \$15.7bn signifies Salesforce's strategic intent to lead in the analytics arena. While millions of decisions can be automated via a combination of rules-based approaches, robotic process automation, and AI event triggers, the thousands of employees in large enterprises

need to make sense out of the vast streams of data flooding their organizations, and Tableau has made a virtue out of visualizing data in ways that allow employees to extract meaning from it and act. Their judgment calls can make the difference between a customer staying or rushing off to competitors. Salesforce has a good track record of democratizing analytics, and this will be greatly enhanced through the Tableau acquisition, once that is completed and integrated into the Customer 360 Platform.

Einstein Next Best Action, Case Routing, and Quip boost agent productivity

In March 2019, three new capabilities were added to the growing Einstein repertoire that promise to boost productivity and deliver a better customer experience:

- Einstein Next Best Action – using a combination of AI and business rules to recommend the best offer or actions and trigger a flow in Salesforce.
- Einstein Case Routing – using ML to automatically filter cases and route to the agent best able to solve the customer issue.
- In June 2019, enhancements to Einstein Bots were announced at Salesforce's annual user conference, Connections, aimed at marketing, commerce, and service professionals. Einstein Bots can now be deployed on multiple new messaging channels including SMS, Facebook Messenger, WeChat, and WhatsApp, empowering companies to scale their self-service capabilities by responding to customers immediately, automating routine service requests, gathering basic information and seamlessly handing off the conversation to human agents when necessary. The bot setup process was also simplified with a new map view that gives admins a visual guide to help design conversations, ensuring customers won't get stuck in a dead-end during a service interaction. The new exact match capability lets admins quickly create intent models that train Einstein Bots to quickly recognize what customers are asking for and help them instantly. Dynamic routing directs customers to a specific queue based on their conversation, ensuring customers are on the best path to quick resolution with the right agents.

A pragmatic approach to AI but the biggest prize is yet to come

For most enterprises, use of AI is still at the early or experimental stage. What Salesforce has done is to focus on removing friction for users of the Customer 360 Platform, and to provide localized use case support, such as helping sales improve their performance, or enabling marketing to run more sophisticated and personalized campaigns. While these relatively simple use cases provide considerable practical value for the end user and boost productivity, the biggest prize for AI that is still a few years off, is to dynamically orchestrate relevance throughout every customer journey and interaction point. Get this right and the biggest win will be in delivering a true frictionless and relevant omnichannel customer experience that will enable enterprises to out-compete other rivals. That is a massively complex challenge, and in the meantime, Salesforce continues to focus on the pragmatic and transparent use cases. While today such use cases provide some level of differentiation and value, soon they will be business as usual. We would like to see more evidence of the more complex cross-enterprise use cases, particularly those that directly impact the customer experience. Salesforce's industry focus will hold the key to these developments.

Salesforce's industry focus is bearing fruit and adding greater value

From hands off to hands on, Salesforce has increased its industry focus with the launches of industry variants

In recent years Salesforce has focused its Customer 360 Platform development efforts on providing industry specific variants to provide greater value for enterprise customers. In the early days Salesforce relied heavily on specialist ISVs and SI partners to meet the needs of specific industries, but in the last 18 months or so, Salesforce has developed variants of the Customer 360 Platform to meet the needs of key industries. The vendor provides 20 industry blueprints, updated twice yearly, covering its seven focus industries and major sub-verticals. Salesforce has the following industry products:

- Consumer goods manufacturers – Consumer Goods Cloud (announced September 16, 2019)
- Financial services – Financial Services Cloud
- Healthcare and life sciences – Health Cloud
- Manufacturing – Manufacturing Cloud (announced September 16, 2019)
- Public sector – Government Cloud
- Education – Education Cloud
- Nonprofit – Nonprofit Cloud
- Philanthropy – Philanthropy Cloud

This focus on specific industries has been welcomed by customers and has led to faster growth rates for Salesforce and a ramp up in new customer acquisitions.

ISVs are still vitally important to Salesforce with notable partners including Guidewire, Vlocity, Cerner and IQVIA. Salesforce is also working with major systems integrators and consultants to reimagine industry best practices based on the possibilities delivered by the Customer 360 Platform.

Salesforce myTrailhead emphasizes that a culture of learning is essential to customer success

Trailhead evolves into myTrailhead to empower employees

Trailhead launched in 2014 and provides an engaging online learning environment that's free to anyone who wants to use it. In March 2019, myTrailhead became generally available, enabling companies to leverage the power of Trailhead to create a culture of learning for their employees – customized with their own brand and content. Companies can take advantage of over 550 free Trailhead modules and extend learning with their own organization-specific modules. With the demand for reskilling growing all the time, myTrailhead provides an effective as well as engaging option for enterprises.

Blockchain finds a home in support of collaborative ecosystems and supply provenance

Salesforce adds Blockchain to extend the Customer 360 Platform

Increasingly competition for customers is an ecosystem play. Products and solutions often depend on several participants from initial R&D through to delivery to distributors or direct to consumers. Blockchain has the potential to streamline inter-company data sharing in a highly secure environment. In some industries like Healthcare there is a shift underway from the linear value chain to a network of pharmaceutical and medical equipment companies, physicians, hospitals and local surgeries collaborating to deliver patient outcomes. Highly sensitive patient data must be secured and blockchain offers a mechanism for doing so. IQVIA is collaborating with Salesforce to explore a variety of possible blockchain technology initiatives within this sector. One of those initiatives, using the Salesforce Blockchain, is specific to regulatory information management and drug label processing.

Consumers concerns over slave or subsistence level wages have been surfacing in the fashion trade. Blockchain provides a secure mechanism for proving the ethical provenance of all the materials used in production of the item of clothing. Similarly, blockchain can be used to authenticate the provenance of luxury items such as watches or jewelry and reassure the end consumer that what they have purchased is what it seems.

It is still early days for blockchain for most enterprises, but ethical sourcing, provenance and ecosystem management can all impact on the overall customer experience, so this is a natural extension to the Customer 360 Platform.

SAP C/4HANA is at the vanguard of the Intelligent Enterprise and permission-based CXM

Summary

Catalyst

Customers expect seamless and connected experiences and are unforgiving if enterprises and their brands fail to act in a coherent and coordinated way. They are not interested in the underlying organization structures and expect the employees with whom they interact in the course of their journeys, to recognize them and their previous history with the organization. They also expect their information to be secure and protected from illicit or inappropriate use.

While this is a familiar story, behind the scenes far too many enterprises fail to deliver the experiences customers now expect. Departmental silos, process and operational silos, data silos and application silos thwart attempts to deliver a "joined-up" experience. It is precisely these challenges that SAP C/4HANA suite has been developed to solve.

Ovum view

SAP's C/4HANA announcement at its annual conference SAPPHIRE NOW in June 2018 was more than a rebranding exercise: it is a clear statement of intent to deliver modern solutions and a positive customer (and employee) experience, as well as act as the catalyst for what SAP refers to as the

Intelligent Enterprise. This is SAP's rallying cry and an ambitious moonshot. Right across SAP's extensive portfolio of enterprise applications, this concept has acted as a common goal driving and accelerating development. SAP has made substantial progress in creating a unified data-driven and intelligent platform for customer engagement and effective management of the customer experience.

SAP is intent on marrying operational data, to track what is happening with the customer, their orders and interaction activities, with experience data, to create context and to surface customer intent and a deeper understanding of customer motivations and behaviors. Shrewd acquisitions over the last two years, have greatly increased these capabilities and not just enhanced the ability to recognize the customer throughout any interaction event, but also to build trust through a permission-based approach to the handling, manipulation and storage of customer data. In this report we highlight the main advances since the launch of SAP C/4HANA and key developments going forward. SAP describes the platform as a 'suite' rather than what might be misconstrued as a monolithic platform. It is modular and Open by design, however our view is that its greatest value will be realized as a comprehensive enterprise customer engagement platform (CEP), plugged in to back office and the supply-side of an enterprise, to deliver on the promise of the Intelligent Enterprise. This is in line with Ovum's Customer-Adaptive Enterprise where a coherent organization, focused on the customer can sense, respond and adapt at the right pace to ensure persistent relevance and for a business, growth.

Key messages

- The architecture of SAP C/4HANA underpins a more fluid and adaptive customer experience.
- Shrewd and timely acquisitions significantly boost SAP C/4HANA to create differentiated value.
- SAP's Customer Data Management strategy creates the foundation for the Intelligent Enterprise and permission-based CXM.
- Embedded analytics are powered by SAP Leonardo.
- Developments on the horizon promise further harmonization and increasing value.

Recommendations

Recommendations for enterprises

Optimizing the enterprise for operational excellence, is a common starting point for digital transformation. Despite being challenging, it is arguably considerably easier that creating an environment where the customer experience is consistently harmonious and positive. Part of the difficulty lies in the unholy mix of legacy and new systems and a department-by-department approach. This old approach to automation ensures that silos persist and as a result the customer experience is patchy at best. Given the almost infinite permutations customer journeys can take, a platform approach is essential to gain insight into customers and to orchestrate the most relevant response, content, action or guidance based on the customer's individual context. SAP recognizes this and the SAP C/4HANA suite is an integrated platform built on a foundation of customer data and embedded with AI throughout. From a user perspective the modern and consistent user interface delivered by Fiori 3.0, provides an attractive and supportive environment for front line employees.

Recommendations for SAP

The X and O data story, Qualtrics integration and ODI partnership with Adobe and Microsoft are key messages that will benefit from repetition. It would also be good to hear more on the outputs of the ODI alliance and what progress is being made.

SAP has a very impressive big data story for large enterprises handling customer interactions at massive scale. While major retailers and CPG companies are obvious candidates for this message, we have also seen a marked shift in B2B environments where big data has increased in importance, particularly in the ABM arena. SAP is making progress in this field, but the real prize is account-based engagement (ABE). More needs to be done to communicate SAP's ABE credentials and the complementary capabilities of SAP Data Hub and SAP Analytics Cloud as natural extensions.

Describing SAP C/4HANA as a suite underplays its strengths as a platform. While SAP is careful to position C/4HANA as a suite of integrated applications to which customers can subscribe separately, the real power is in the platform as a whole. Whether it is described as a CXM platform or a CEP is less important.

The architecture of SAP C/4HANA underpins a more fluid and adaptive customer experience

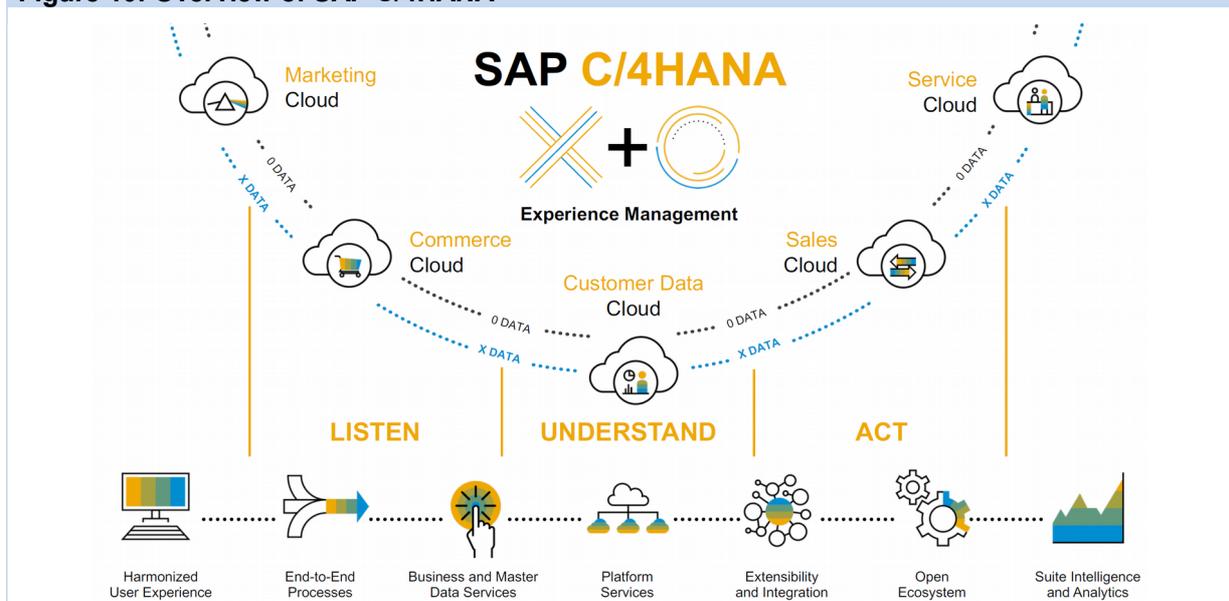
SAP C/4HANA consists of five clouds supported by seven attributes

Figure 10 provides an overview of the SAP C/4HANA suite consisting of four functional support clouds covering, marketing, commerce, sales and service, and a customer data cloud that provides a unified environment for customer data accessible by each of the functional clouds.

The seven attributes (at the foot of the diagram) are purposefully designed to foster a coherent sense-and-respond environment across all clouds, make life much easier for the end user and support business model innovation and rapid adaptability.

The X + O threaded throughout the unified suite, refers to the real-time synthesis of experience data (X) that the customer generates throughout their various journeys or through direct and indirect feedback, and operational data (O) such as transactional information or customer records or the state or stage of tasks being performed. This union of X and O data provides the essential fuel that is then consumed by AI to determine customer intent and to trigger relevance at every interaction.

Figure 10: Overview of SAP C/4HANA



Source: SAP

The four functional support clouds and the unified customer data cloud provide advanced and modern front-office support

The four functional applications – Marketing Cloud, Commerce Cloud, Sales Cloud, and Service Cloud have each been evolving rapidly to take advantage of embedded AI in the form of ML and NLP. While they can be consumed on an individual basis, (the reason SAP positions the portfolio as a suite rather than a platform), it is as a platform that their greatest value can be derived.

SAP HANA in-memory database is at the core of C/4HANA

The SAP HANA in-memory capabilities are common to each of the cloud applications and underpin the modern architecture. This allows for real-time analyses, improved data quality and management, and more efficient data storage. SAP HANA can also be used as a graph store to analyze complex relationships between different nodes. In the customer experience arena this can help to surface relationships between individuals and their relationship strength. Useful in major accounts but also in the consumer environment to understand influencer relationships, for example. Fraud detection is another form of analysis of complex relationship landscapes that can be served through graph analytics.

Cloud choice is supported

The entire cloud stack can be hosted on Amazon Web Services, Google Cloud, Microsoft Azure, and the SAP Cloud Platform. SAP Commerce Cloud runs on Kubernetes using Docker containers to build clusters for easy deployment on all major cloud environments (public and private), including AWS, Microsoft Azure, SAP Cloud Platform, and any other infrastructure-as-a-service that supports Docker/Kubernetes.

On the public cloud, SAP offers Commerce Cloud subscriptions on Azure; however, the strategy is open and multicloud, so customers can (and some do already) run the platform on other public cloud infrastructures (AWS, GCP, Alibaba Cloud).

In terms of recent developments each of the functional clouds has been embedded with greater functionality and more AI, taking advantage of the SAP HANA database for real-time response and to support end users and customers. These are some of the highlights:

SAP Marketing Cloud to support intelligent personalization

- Dynamic consumer profiling, permission-based marketing, frequency, timing and greater relevance.
- Optimized marketing resource management and planning, to drive better use of resources through closed-loop budgeting and multi-touch attribution analytics.
- Track customer behavior; trigger the most relevant communication, offer, or action; and measure results.
- Support for ABE (see Ovum report: *Ovum Market Radar: Account-Based Marketing*) when integrated with SAP Sales and Service Clouds.

SAP Commerce Cloud – connecting customer's needs to relevant products/services

- Single platform for B2B/B2C and B2B2C – enabling businesses to manage and deliver commerce irrespective of their business model, including subscription services for product-as-a-service, for example car rental vs. purchase.
- Embedded AI to power one-to-one personalized stores created for each individual visitor.
- API-based microservices to extend capabilities.

SAP Sales Cloud – providing guidance for sales and the customer through embedded ML/NLP

- Sales performance management and territory optimization.
- Dynamic customer and account profiling – essential for account-based engagement.
- CPQ and customer specific pricing and configuration, including margin optimization through next-best offer.
- In-app guidance and opportunity/activity prioritization.
- Perfect Store for retail sales, enables sellers and merchandisers to optimize product placements, and integration of image recognition to ensure brand and shelf compliance.

SAP Service Cloud – for contact center and field service

- Proactive service through predictive analytics and IoT.
- Crowd Service Marketplace – to extend field service by adding freelancers and real-time dynamic scheduling through AI.
- Self-service supported by NLP, ML and chatbots.

The unified Customer Data Cloud is discussed in more detail in a later section of this report. Suffice to say, it feeds first-party identity and consent data to each of the functional clouds and supporting AI.

Under the covers seven attributes create the coherent and adaptive customer experience

- The harmonized UX is delivered by Fiori 3.0 which means that all major SAP applications have a common look and feel and are much easier and faster to navigate. SAP Co-Pilot

provides in-app conversational support so employees can rapidly acquire the skills to use the applications.

- Organizational and value-chain coherence are supported with an end-to-end process perspective. This means that major processes that span multiple departments and clouds are seamlessly connected to remove operational silos.
- Master data management is supported throughout to ensure data is clean and consistent. The Customer Data Management strategy is discussed in more detail in a later section of this report.
- SAP Cloud Platform Services provide an admin cockpit to manage the clouds and to access other attributes to extend the capabilities of the SAP C/4HANA suite.
- Additive capabilities including but not limited to: IoT connectivity, microservices, third-party extensions from its developer community, blockchain, and APIs for integration with adjacent third-party vendor systems. SAP Cloud Platform Extension Factory takes care of connecting the SAP Cloud applications by collecting metadata on connected applications and makes it easy to deploy and configure open source runtime extensions via serverless functions through the open source project Kyma.
- SAP's burgeoning ISV and partner ecosystem provides further opportunities to differentiate or extend applications to suit the business needs.
- AI is embedded throughout the suite and can be further extended by the enterprise's own data scientists or via SAP Leonardo Intelligent Technologies

SAP heads towards a composable business architecture for CXM with API-based 'building blocks'

If monolithic and microservices are at opposite ends of the spectrum, SAP's enterprise applications building blocks fall somewhere in between. C/4HANA clouds will eventually be consumable as discrete building blocks. This creates new opportunities for customers, and therefore SAP and its partners, to spin up new businesses without the costs associated with monolithic applications. Each building block is a self-contained application that can be consumed and connected via a "consumption layer." This offers SAP partners a new opportunity to develop a highly customized enterprise application layer using the building blocks that are most relevant. Building blocks fall into four categories: C/4HANA, S/4HANA, master data services and partner apps. SAP Digital Business Services may also be used as part of the development team. Each of the building blocks can be connected to SAP Analytics Cloud to monitor performance across the applications blocks.

It is very early days, but this architectural innovation from SAP offers the promise of more rapid adaptation. Combine that with microservices and the permutations are endless, providing a more Lego-like approach to business capability development that will appeal to CEOs that recognize the need for continuous business transformation at a rapid pace.

SAP Customer Data Cloud creates the foundation for C/4HANA and is discussed in more detail in a later section. Before we get into that, it is worth reviewing some key acquisitions that have added significant capability to SAP's CEP.

Shrewd and timely acquisitions significantly boost SAP C/4HANA to create differentiated value

Over the last two years, SAP has made several strategic acquisitions to enrich the C/4HANA suite

SAP has made six key acquisitions in the last two years that have significantly enhanced C/4HANA and transformed its omnichannel customer engagement capabilities.

Recast.AI for intelligent conversational support

Recast.AI, acquired in January 2017, provides a rich AI-based environment that supports SAP's conversational assets such as chatbots, SAP digital assistant Co-Pilot and as a conversational interface to allow customers to procure services through natural language. Recast.AI supports over 20 languages.

Gigya for customer identity, access and consent management

Gigya, acquired in September 2017, provides the core application for customer identity management. It creates a dynamic customer profile and draws from data fragments from all customer interactions, building the profile as customers reveal themselves, from unknown to known. It also provides the authentication where customers sign-on to a service. The advent of GDPR in May 2018, created huge momentum for managing consent and tracking permissions and Gigya provides the controls to ensure permissions and consent are fully compliant with any such legislation. Gigya also helps enterprises holistically address compliance for upcoming consumer data privacy regulations CCPA, LGPD, and others. Gigya is therefore an essential component for ethical as well as legal personalization.

CallidusCloud from territory planning and management to quote-to-cash

CallidusCloud, acquired in June 2018, gave a significant boost to the capabilities of SAP Sales Cloud. Now fully embedded in SAP Sales Cloud, chief revenue officers can now optimize and distribute sales territories. Performance management capabilities allied to sales force automation and CPQ create an effective environment in support of B2B sales.

Coresystems supports crowd service for field service gig economy

Coresystems acquired in June 2018, significantly improves SAP's customer service and support offering in the realm of field service. Now fully embedded in SAP Service Cloud, field service engineers are automatically dispatched through dynamic scheduling supported by ML. In industries where service personnel are freelancers, the system can also identify the nearest available engineer with the relevant credentials and dispatch them dynamically.

Qualtrics provides the X data sensing capability to optimize the customer experience

The acquisition of Qualtrics in January 2019 may prove to be one of the most far-sighted acquisitions in the customer experience space. While enterprises can subscribe to the Qualtrics XM Platform without being customers of the SAP C/4HANA suite, SAP has lost no time in deeply integrating Qualtrics into its enterprise applications portfolio, in pursuit of its Intelligent Enterprise vision. VoC/VoE platforms have been around for a long time but are rarely deeply integrated into the operational fabric of enterprises. Within just a couple of months of the acquisition, Qualtrics was already being integrated in both SAP C/4HANA and SAP S/4HANA, in support of around two dozen common use cases. Qualtrics iQ uses ML to surface hidden patterns and present them in the best way to make

them easy to understand by anyone without the need for deep Excel or SPSS skills. A host of analytics (such as key driver analysis to understand the underlying reasons behind customers' perceptions of their experience) are available to help enterprises focus on what matters to customers, employees, or partners. As with all good customer feedback management systems or platforms, it also provides an action management capability to ensure that the right people in the organization respond in a timely manner to prevent customer defections. Qualtrics is also behind SAP's drive to increase empathy levels among employees that are involved in any customer interaction, irrespective of department. While the price tag of \$8bn seemed high at the time to many analysts, the bigger picture of equipping an enterprise to sense, respond and adapt and thrive in increasingly volatile times, makes this a very strategically significant acquisition. From SAP's perspective, Qualtrics owns the X data space and we can expect it to be deeply embedded throughout SAP's enterprise applications to massively increase the sensitivity of enterprises to changes in customer behaviors and motivations.

Contextor brings robotic process automation to SAP enterprise applications

Acquired around the same time as Qualtrics in November 2018, Contextor, a European leader in RPA design and integration, helps enterprises by automating repetitive and previously manual tasks. This will appeal to enterprises that find too much employee time taken up with manual tasks that are essential but distract employees from higher value adding work.

From a customer experience perspective Gigya and Qualtrics are the most important acquisitions

Each of these acquisitions brings additional capability to the SAP C/4HANA suite, but Gigya is foundational by creating a dynamic customer profile and managing consent, and Qualtrics has injected real insight into SAP and the critical importance of sensitivity to customer (and employee) motivation, and how they feel about their experiences with a brand, company or the enterprise.

SAP's Customer Data Cloud is the foundation for the Intelligent Enterprise

The goal is to provide trusted customer data and trust in the secure management of that data

Data provides the foundation for the Intelligent Enterprise. In order to deliver relevant and personalized customer experiences customer data must be unified and accessible in real-time by all clouds within SAP C/4HANA.

Customer identity and access management via a unified customer profile

The Gigya acquisition plays a central role within the enterprise customer data platform in creating and supporting a dynamic and unified customer profile. It manages customer identity and access management and supports identity resolution from unknown to known customers or prospective customers. Customer recognition is an essential first step towards delivery of a relevant and personalized customer experience.

Universal Customer Driven Consent

It must also be permission-based to foster trust between the organization and its customers. Consent management is integral to SAP Customer Data Cloud and ensures compliance with regulations such as the EU GDPR, CCPA, and LGPD and to foster trust with customers.

The unified customer profile supports real-time data ingestion, identity resolution, data quality and enrichment tools, the 360-degree view of a customer or persona-based views and real-time extract.

Synthesis of operational and experience data generates context

Structured transactional operational data and unstructured behavioral experience data from customer interactions across any channel, is ingested and synthesized within SAP Customer Data Cloud. Each of the C/4HANA clouds has access to this customer data held within SAP Customer Data Cloud. Additional product attribute data is also available in the common data lake, so that based on what is known about the customer, embedded ML can trigger relevant content about products that are most likely to interest the customer, and on the device and channel being used by the customer.

The CDP also provides an environment to generate customer insights

Data scientists can use AI tools contained within SAP Customer Data Cloud for developing and training their own ML algorithms. The customer data platform therefore, also serves as a customer insights platform.

SAP KOI brings Blockchain to identity management and single sign on

Where identity and data security are especially sensitive such as between a patient and healthcare providers and government organizations, the entire digital identity can be managed and secured through the distributed ledger. Password-less KOI increases security and convenience for the customer who can login via a smartphone to any service provider in the relevant ecosystem. The decentralized identity sign-on can also be used to verify identity offline with minimal disclosure of personal information.

SAP Data Hub and SAP Analytics Cloud extend the reach of data management and BI across the enterprise

For enterprises seeking to harness all their data assets and augment their data from third party sources, SAP Data Hub provides the mechanism for data discovery, refinement, governance and orchestration. SAP Analytics Cloud provides a broad range of AI capabilities to drive insights from corporate data. Containing the SAP Analytics Hub, it enables enterprises to see what data is held within the business, by providing a catalog of sources including third party and both on-premise and cloud sources. SAP's Digital Boardroom provides real-time dashboards to enable management to track and monitor KPIs. Image and video processing, text analytics, event streaming, metadata cataloging, graph processing, and real-time and time-series analytics are all supported by the SAP Data Hub and SAP Analytics Cloud.

Embedded analytics are powered by SAP Leonardo

SAP Leonardo Intelligent Technologies provides intelligent automation and opportunities for business innovation

SAP Leonardo is the umbrella brand for SAP's AI and Automation tools and supporting services. Each Cloud within the C/4HANA suite has embedded AI tools such as ML, NLP, and conversational AI support. This is complemented with RPA and bot development and management capabilities, allowing enterprises to deploy bots and RPA where it makes most sense, and to intelligently automate responses as required.

Design Thinking services to reimagine business models

SAP Leonardo provides complementary services to help enterprises take advantage of intelligent technologies. SAP has used Design Thinking as a process and mindset for innovation for several years. Digital business transformation offers businesses the opportunity to reimagine customer engagement and supporting end-to-end processes to create new forms of value and even new business models. IoT, blockchain and AI supported by big data provide opportunities to innovate and conduct business differently. Developing a customer engagement platform vs. a collection of isolated CRM and back office systems calls for new collaborative disciplines and strategies that intelligent technologies can harness. The increasing trend towards product-as-a-service can be enabled through IoT and intelligent automation. Another trend is co-innovation across an ecosystem of partners to create and deliver new forms of high value to customers. Closed co-innovation partnerships can benefit from technologies like blockchain and KOL, allowing them to collaborate in secret prior to launch of a new innovative offering. Consumers concerned about slavery or counterfeit high value products such as watches or jewelry, or ethical sourcing of gems, are driving the need for proven provenance, and blockchain technologies can provide that level of certainty.

A range of support and innovation services are provided by SAP Digital Business Services

SAP's Leonardo Innovation Services are part of the 25,000 strong SAP Digital Business Services. A broad range of services are provided from traditional support through to innovation services. SAP's industry knowledge has enabled it to develop frameworks and models for how businesses within specific industries can be optimized and take advantage of SAP technologies. While the focus for SAP DBS has been on helping customers take advantage of S/4HANA for operational excellence, we can expect increased focus on C/4HANA and how to accelerate customer-focused digital business transformation.

Developments on the horizon promise further harmonization and increasing value

The focus for development of SAP C/4HANA is increased harmonization of the platform across the value chain

The acquisitions over the last two years have already been integrated into the C/4HANA suite. SAP's development strategy is to deepen intelligent automation at every stage of the customer experience. Increasing the synthesis of experience and operational data. Enabling personalized "in-the-moment" campaigns through intelligent triggers and event streaming. Generating deeper insights into customer behavioral patterns and motivations to enterprises can generate insights into the underlying causes of friction or negative sentiment.

More empathy

By providing greater transparency across the enterprise into the motivations and behavioral triggers, and harnessing X and O data, the relationship quality can be improved, and a consistently positive experience delivered.

SugarCRM goes native and transforms into SugarCloud CEP

Summary

Catalyst

The promise of CRM to deliver a 360-degree view of the customer and help manage customer relationships to drive growth seldom stood up to the light of closer scrutiny. The effort of data collection and input compared with the perceived value to sales people, let alone customers, certainly contributed to flawed data and disappointing results. Data accuracy provides the fuel for insight, and in today's omnichannel environment behavioral data fragments from customer interactions and historic transactional data must not only be accurate, but unified to generate real insight. Insight must then be acted upon as close to real-time as possible and that demands both predictive capabilities to trigger the most relevant response, and functional support at the point of the customer interaction. This is driving the need for customer engagement platforms. SugarCRM has followed this imperative and developed SugarCloud to meet the needs of enterprises in typically, B2B environments.

Ovum view

Since SugarCRM was acquired in August 2018 by investor Accel-KKR, Sugar, its CRM solution, has been completely re-architected. The former CRM application that was available on-premise or as a SaaS application, is highly rated by B2B customers, and saw IBM use it for its 80,000-strong sales force (see Ovum report: *SugarCRM Broadens its Omnichannel Appeal for Large and Mid-Market Enterprises*, 2015). SugarCRM positions its new solution as its intelligent Customer Experience Management (CXM) Platform – consisting of Sugar Sell, Sugar Serve, and Sugar Market.

SugarCloud, is a native cloud platform built on AWS and which not only uses the AWS for hosting, but also combines many of the innovation technologies on that platform. SugarCRM has gone all-in on AWS. As we will see there are other advantages from this strategy, not least more rapid development and the potential for a more composable business architecture based on selected SugarCloud products. This represents a transformational evolution within SugarCRM that its more than 6000 customers ought to embrace, and that will attract new customers seeking a future proof CEP.

In February 2019, Craig Charlton became the CEO of SugarCRM to drive the company's next growth phase, replacing Larry Augustin who became chairman. The early signs are promising. Having led to two quick acquisitions, with more expected to follow, to enhance the SugarCloud CXM portfolio, including repositioning of the vendor to support customer experience and deliver a no touch information management environment to remove the administrative overhead commonly associated with CRM applications.

Key messages

- SugarCRM has a clear development strategy supported by three core pillars.
- SugarCloud becomes the Intelligent CXM Platform through data management and AI.
- No touch information management minimizes the administrative burden of frontline workers.
- From monolithic to modular the total addressable market expands.
- SugarCloud will open the door to B2C with a CDP on the horizon.

Recommendations

Recommendations for enterprises

Enterprises that are already using Sugar Professional or Sugar Enterprise offerings in the cloud should consider migrating to the SugarCloud platform to future-proof their investments and take advantage of a more flexible platform that leverages Amazon Services technologies. B2B enterprises that are new to SugarCRM and looking for a comparatively lean and more cost-effective customer engagement platform, should take a closer look. Under new management and with significant investment allied to a rearchitected platform that takes full advantage of AWS innovations, SugarCRM's developers can accelerate development of SugarCloud, without having to worry about cloud infrastructure development. Any concerns about scalability or extensibility or regional support for large global enterprises, are addressed by SugarCloud on AWS.

Recommendations for SugarCRM

Now that SugarCRM has a native AWS cloud platform that can handle data at massive scale, it must strengthen its ABM credentials, beyond the acquisition of Salesfusion, to increase the platform's value in this high growth B2B area. It also has the potential to expand the ABM remit to the more advanced account-base engagement (ABE), remit to harness all relevant signals and information that impact opportunities and retention (see Ovum Market Radar: Account-Based Marketing, 2019).

The second major trend that SugarCRM must embrace is the growth in commerce applications. The vendor should actively seek to partner with leading commerce vendors and provide deeper support for B2B2C environments.

The vendor should also consider joining the Open Data Initiative, established in 2018, by Adobe, Microsoft and SAP. While still early days, developments on open customer experience data standards to support greater interoperability between systems from different vendors, could prove useful to SugarCloud's ongoing developments.

Other areas for development that are being more deeply explored and deployed by leading B2B organizations are: IoT, blockchain and AR/VR support for field service personnel.

SugarCRM has a clear development strategy supported by three core pillars

Predictive insight, frontline empowerment, and continuous innovation deliver competitive advantage

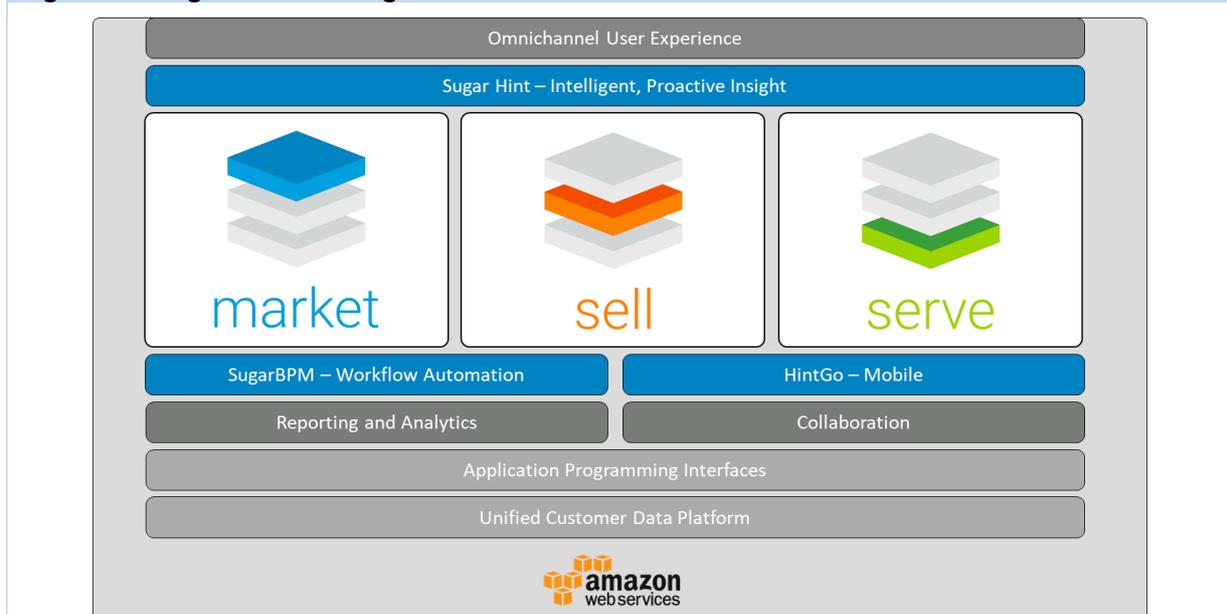
Philosophically, SugarCRM has always thought deeply about customer engagement. Conversations over the years with former CEO, Larry Augustin, demonstrated a clear view that customer engagement was not simply a front office concern of sales, marketing and service, but an enterprise responsibility. All employees with whom the customer interacts need to be empowered to act in the interests of the customer to generate value for the business.

This philosophy has since been amplified by the shift from traditional, often standalone CRM, to the more omnichannel-friendly CEP. All parts of the value chain must be connected so that data can flow to where it is needed, to fuel the most relevant response to any customer interaction. This is essential to deliver a fluid and positive customer experience. It is clear from recent positioning statements, that the current CEO shares this philosophy. The complete rearchitecting of Sugar on AWS to become SugarCloud, speaks to the acceleration in continuous innovation on the new platform.

The three pillars that enable these outcomes of predictive insight, frontline empowerment and continuous innovation to yield competitive advantage are:

- Intelligent Customer Experience Platform (Figure 11).
- No touch information management to remove rebalance the value proposition in the interests of the employee.
- Continuous cloud innovation on AWS, taking advantage of all relevant AWS innovations while leaving SugarCRM developers to focus on the platform.

Figure 11: SugarCloud Intelligent CEP



Source: SugarCRM

Three integrated frontline support applications share common automation and predictive intelligence.

The three core functional modules are: Sugar Market for marketing automation, Sugar Sell for SFA, and Sugar Serve for service automation.

SugarCRM has always been known for its SFA and customer service strengths and has partnered with marketing automation vendors like Marketo to provide support for marketing beyond the tactical or ad hoc campaigns. The acquisition of Salesfusion in May 2019, an Atlanta based B2B marketing automation vendor, fills this capability gap.

SFA has been enhanced through the acquisition of Collabspot in March 2019, that provides integration with Gmail and automatic notifications of incoming emails. Social media contacts can also be imported via this new feature.

Each core application is supported by a set of common enablers.

SugarBPM provides workflow automation across each application. HintGo provides in-context support for field sales and sales agents, from recommended next best actions to task priorities and reminders. Support for reporting, analytics, and collaboration is provided across the applications. APIs and a unified customer data platform provide the connections to adjacent or back office applications and first-, second-, and third-party data ingestion. As already stated, data management is now a critical

requirement for any CEP and SugarCloud provides the modern tools and capabilities to bring it together, including big data and at a massive scale via AWS, including the ability to stream data and trigger real-time responses with AI.

SugarCloud becomes the Intelligent CXM Platform through data management and AI

Unified and time-stamped data ensures synchronization and supports trend analyses

A single customer data model is at the heart of the unified customer data platform (CDP), that includes a time dimension. Data is ingested and aggregated from back front-office and back-office applications and synthesized in the CDP for access by SugarCloud applications and the AI provided by Hint ML and NLP predictive analytics. Customer data can also be augmented with third party data, or in ABM environments, signal data or news feeds that indicate a potential opportunity or that provide further insight into account, personnel and important changes.

Data can be synchronized selectively to support cross-functional use cases. Included in the CDP is an event database that stores only data change events. Each event is time-stamped and sequenced. This allows for ultra-fast performance and delivery of real-time responses.

The time-stamping and sequencing ensures that only the latest information is used. It also supports sophisticated analysis to spot trends or to receive early warnings of outliers or behavioral changes that are impacting performance.

SugarCloud supports a wide range of predictive and trend analysis via Hint

Hint, SugarCloud's increasing portfolio of ML/NLP-based predictive analytics, provides a range of real-time and trend analyses for different situations. This includes:

- Real-time event triggers
 - next best action recommendations
 - anomaly detection and alerts
 - orchestration of ML, statistical and rule-based workloads
- Systemic and performance analyses
 - multi-touch marketing attribution
 - journey behaviors to identify systemic improvements to match customer expectations
 - funnel performance and management
 - target and quota management

A library of analytics is also available for business users.

Extensions are available from partners and AWS

SugarCRM has a range of ISV partners that can be used to extend the SugarCloud platform. These include pre-configured integrations with major enterprise applications, customer journey analytics and IBM Watson Analytics Win/Loss Expert Storybook for Sugar. Content management is provided by Magnolia and includes personalization tools and a content management system to suit large enterprises (see Ovum SWOT assessment: Magnolia Enterprise Edition 5.6.5, Magnolia Cloud, May

2018). A range of other useful extensions such as CPQ, data visualization and analytics or social engagement tools are available in the SugarExchange, partner portal.

Sugar Module Builder enables customization to fit unique requirements

As well as supporting microservices extensions via Amazon services, SugarCloud provides a module builder that developers and administrators can use to create, deploy and export custom modules. Customer file packages can be imported and connected. Custom file packages can range from custom code to a 3rd plug-in party package

AWS provides a wealth of extensions supported by Sugar Cloud

Over 23 AWS technologies are leveraged by Sugar Cloud. The most interesting from a customer engagement perspective, apart from the obvious global scalability and regional datacenters, are some of the services in large enterprise environments:

- Amazon Elasticsearch Service for distributed, multi-tenant full text search.
- Amazon QuickSight for business analytics and data visualization.
- Amazon Kinesis for real-time big data processing.
- Amazon Forecast for ML.
- Amazon Simple Queue Service for microservices message queuing, distributed systems and serverless apps.
- Amazon Elastic Container Services for Kubernetes for management of containerized applications.
- Amazon Aurora – cloud-based MySQL- and PostgreSQL-compatible RDBMS.
- Amazon ElasticCache – fully managed in-memory data store and cache service.
- Amazon Lex – for developing conversational interfaces for voice and text applications.
- Amazon S3 – for scalable object storage.
- AWS Lake Formation – for scalable and secure data lake development.

The perception in the market has often been that SugarCRM is more mid-market than large enterprise. There is no doubt that now on the AWS platform, SugarCloud can scale to any size.

No touch information management minimizes the administrative burden of frontline workers

Rebalance the contract in the favor of the user and customer

SugarCRM has always considered the role of the employee as integral to the delivery of a positive customer relationship. Until recently, even with its best efforts of CRM system developers, there was always an administrative element to any function. In B2B sales environments that burden fell on the sales person, who would have to manually update records after a call or meeting with a customer. This often led to data delinquency and a high degree of resentment by the sales person. To incentivize sales people to enter data, crude attempts to force them through lost commissions were sometimes used. Even if sales people complied, data would be added inconsistently leading to an erosion in the value of data stored.

With the new Sugar UX paradigm, the underlying design principle has been to aim for no touch management of information to free up employees for value add, boost productivity and increase the

accuracy and timeliness of data collection. The acquisition of Collabspot has helped by automatically capturing relevant content from emails, SMS or social media postings.

Hint and voice provide support for no touch information management

As the name suggests, Hint surfaces relevant information automatically at the right time and in context of the work being performed. This helps the user focus on the right priorities. Hint analyzes data from over 70 sources to provide next best action guidance. Interesting customer news alerts can be sent to sales people and with a single click this can be imported into the customer record.

The ingestion of third-party data to augment the customer account profile data can be automated, completely removing the administrative burden.

HintGo, currently being tested within SugarCRM prior to release, provides a mobile guide to guide sales agents and field sales throughout the day, with scheduling, appointment setting, and travel guidance. HintGo will also support voice so after a sales meeting it will be possible to give instructions and updates via voice.

From monolithic to modular the total addressable market expands

SugarCRM avoids 'bloatware' approach to platform development.

One of the most interesting advances in SugarCloud and in plan for the near future, is to allow enterprises to select subsets of key modules and to price accordingly. Examples include demand generation as a subset of SugarMarket; or sales engagement or pipeline management as a subset of SugarSell; or Customer Success or Service and Support as a subset of SugarServe. Hint and HintGo might also be sold as add-ons to other CRM or CEP systems.

This composable architectural approach creates the opportunities for SugarCRM and will broaden the addressable market opportunity. As major enterprise applications vendors coalesce around data standards, this may attract even greater interest.

Appendix

Methodology

The conclusions and guidance contained in this report were informed by primary and secondary research. Primary sources include Ovum's annual ICT Enterprise Insights 2018/19 research and in-person interviews with enterprise clients and CEP vendors.

Further reading

Creating an Enterprise Environment for Augmented Customer Engagement, INT001-000145 (June 2019)

Customer Journey Management's Path to Optimization, INT001-000144, (June 2019)

Ovum Market Radar: Account-Based Marketing, INT001-000141, (June 2019)

The Evolution of Account-Based Marketing to Account-Based Engagement in B2B Enterprises, INT001-000131 (March 2019)

The Critical Role of the Customer Engagement Platform for Growth, INT001-000113 (December 2018)

2019 Trends to Watch: Customer Engagement Platforms, INT001-000106, (November 2018)

A Customer-Adaptive Architectural Approach for Digital Business Transformation, INT001-000040 (April 2018)

The Customer-Adaptive Imperative, IT0020-000091 (March 2015)

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