

## Why MBaaS Now

A mobile back end as a service platform should be part of an organization's digital transformation roadmap to ensure holistic and consistent integration of the mobile channel across all consumer touchpoints.

### Executive Summary

Digital transformation is fueling the growth of enterprises today – connecting customers and enterprises across countless channels and providing new brand experiences and forms of customer engagement. As a result, enterprises across industries are investing more heavily in creating effective and meaningful omni-channel experiences.

The mobile channel is the crown jewel of digital consumer interaction. Over the past three years, consumer adoption of the mobile channel has grown remarkably, compelling organizations to enable mainstream commercial functionality to mobile apps and mobile broadband platforms.<sup>1</sup> Throughout 2014, mobile technology continued to penetrate the consumer market, delivering a growing number of engaging user experiences and forcing organizations to significantly increase their investments in apps that deliver digital marketing services. This has given rise to the emergence of better products and integration mechanisms, such as mobile back end as a service (MBaaS), to manage mobile services offered

by IT departments. These offerings are part of a larger global back end as a service (BaaS) market, which TechNavio Analysts predict will grow at a compound annual rate of almost 101.88% from 2014 through 2019.<sup>2</sup>

Figure 1 on the next page depicts the enterprise mobile model, a structure comprising two service areas – one focused primarily on uplifting consumer mobile interactions, and the other on right-sizing enterprise information to the mobile consumer.

To fuel mobile interactions and transactions, organizations historically adopted mobile application development platforms (MADPs). While MADPs are effective as an entry point into the world of mobile apps, many enterprises are fast transitioning from MADPs to mobile-based integration platforms (i.e., MBaaS) to enhance IT service management. They provide a great way for enterprises to empower and federate mobile development to the lines of businesses interested in building their own styles of native, Web or hybrid apps while centralizing access to these apps via a common integration platform.



## Enterprise Mobile IT Model

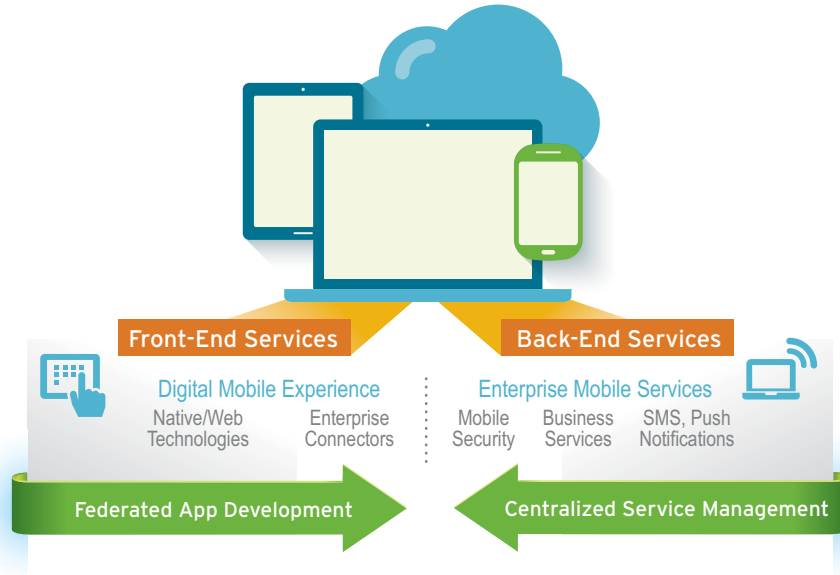


Figure 1

Traditional enterprise middleware solutions are managed by the enterprise service bus (ESB), service oriented architecture (SOA) and API management products that serve larger integration needs but are not necessarily optimized for mobile apps. MBaaS addresses mobile-specific integration needs and fills an important gap by providing a centralized mobile cloud platform for all developers across the enterprise. It provides an ecosystem to write scalable mobile-specific business logic, enables a relevant enterprise mobile security model and provides analytic services to assess user behavior accessing the app. It also serves as a single channel for other value-added services to provide mobile storage and push notifications within the same MBaaS cloud platform.

This white paper demystifies the MBaaS ecosystem and offers insight into the important role it plays in the larger enterprise's IT digital strategy. It also offers a proven methodology to apply MBaaS technology to implement mobile apps that are tightly integrated with enterprise core IT services. Lastly, it delves into key MBaaS technology components such as micro services and enterprise integration features that, if properly embraced, can provide seamless access to back-end enterprise services.

### MBaaS Strategy for Enterprise Mobile Apps

Standardized ways of developing enterprise mobile apps have hit a wall. Many of the early adopters of standard cross-environment mobile development platforms are ill-suited for today's more dynamic, omni-channel times. A new pattern is developing in which mobile apps are required to work within a larger enterprise framework that provides consumable and consistent digital experiences across all consumer touch-points. Delivering mobile digital experiences that leverage enterprise information to convey brand-aligned user interactions and personalized experiences is paramount to companies that seek to lead in the new digital age. To do this, we believe, companies must distill and apply meaning from the intersections of digital data that surround people, processes, organizations and devices – a concept we call Code Halo™ thinking.<sup>3</sup> In this context, the refreshed mobile strategy should create a unified enterprise experience rather than disconnected line-of-business-centric app experiences, which to date has been the rule rather than the exception.

We recently spoke with the CEOs of leading MBaaS vendors such as Kinvey, FeedHenry and AnyPresence to share their product outlook and market adoption. All of the CEOs with whom we interacted expressed a common sentiment:

MBaaS is playing a critical role in digital transformation. What follows are excerpts from our conversations.

**FeedHenry CEO, Cathal McGloin**, told us: *“The core challenge facing enterprise IT is how to facilitate a two-track approach where they focus on the slower-paced critical tasks of business continuity, security, data integrity and stability of core systems whilst the rest of the organization can rapidly build the mobile applications that they need. MBaaS is the tool that can successfully deliver on two-track IT.”*

**AnyPresence CEO, Anirban Chakrabarti**, noted: *“As we enter the fascinating world of connected devices everywhere, with apps running on non-traditional end points such as appliances, automobiles and personal clothing, it is imperative for enterprises to enable their developer ecosystems to build solutions that leverage these modern interaction paradigms such as MBaaS.”*

**Sravish Sridhar, CEO of Kinvey**, revealed: *“MBaaS enables a modern mobile platform fitting both business and IT. While the lines of business gain the flexibility to use any tools and resources to deliver apps they need quickly, IT gains a platform that allows them to have a consistent and compliant approach to building apps across their organization. Customers like Johnson & Johnson, Schneider Electric and VMware have exactly done that.”*

MBaaS is becoming more relevant for delivering consistent enterprise data to customers. It is fast becoming the smart enterprise plug-in that provides customers with relevant data from the cloud. Rather than standardize mobile devel-

opment, enterprises are standardizing mobile services. For example, “scan and deposit” mobile service has become the most used feature among digital banking consumers. A “digital insurance card” issued by auto insurers has emerged as an important document that consumers can store offline in their mobile wallets. These key services are now enabled as micro services<sup>4</sup> that can be leveraged by mobile apps of any platform of choice or the mobile Web.

Embedding an MBaaS layer within the enterprise reference architecture has become a key strategic decision that can advance enterprise mobile initiatives. The larger enterprise strategy for building a digital framework should have MBaaS as an integral component.

In this regard, enterprises are following two broad approaches within their larger digital transformation programs. In the first approach, the executive leadership team articulates a digital transformational vision for all or part of the business, built on the SMAC Stack™ (i.e., social, mobile, analytics and cloud technologies), which provides an IT foundation required to operationalize Code Halo thinking. In the second approach, enterprises are putting in place a digital infrastructure and wrapping it with a fabric built around MBaaS, on top of which various user interfaces can be built by different business units.

### MBaaS-Based Mobile Application Architecture

Figure 2 depicts how the MBaaS platform fits within a standard enterprise architecture to deliver a compelling and consistent digital user experience.

## Embedding MBaaS into the Digital Architecture

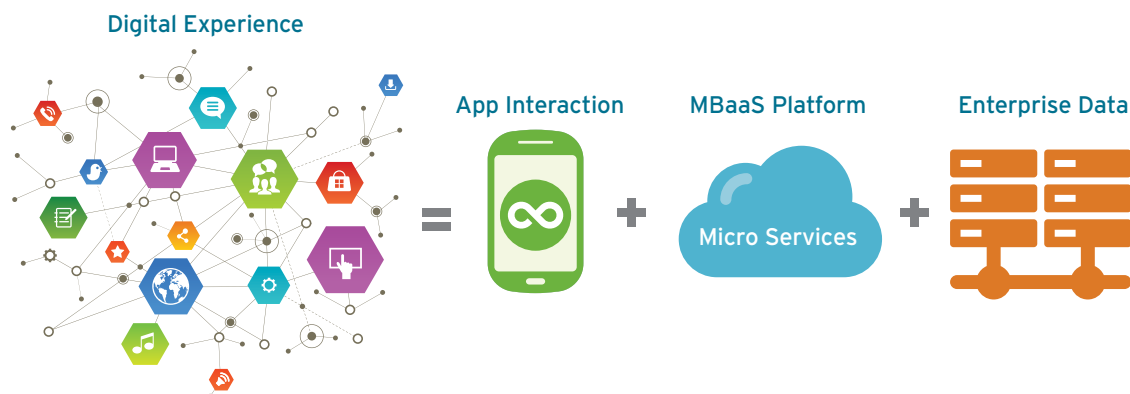


Figure 2

## MBaaS: Working in Synchronicity

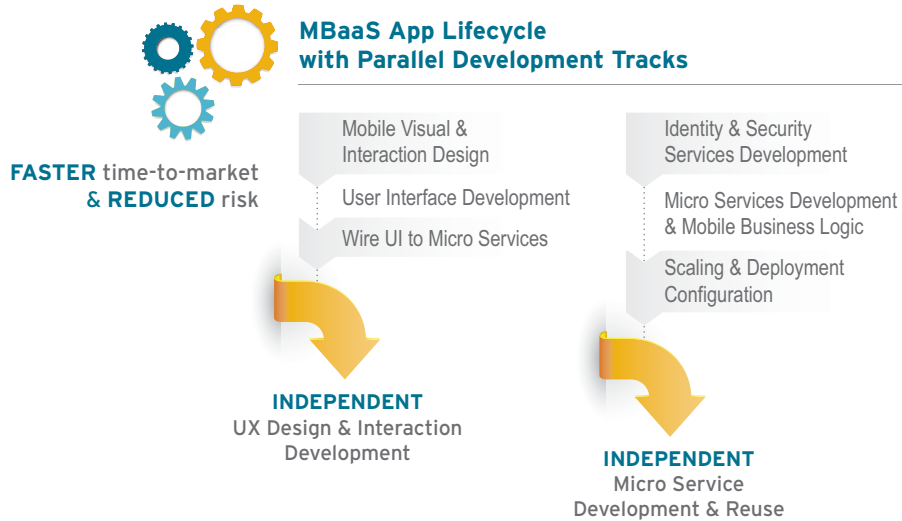


Figure 3

The anatomy of a mobile app in an MBaaS environment consists of two layers – one for the mobile thin client, and the other for the MBaaS platform.

- **Thin mobile client layer:** The thinness of the mobile client is focused mainly on user interactions, built with lightweight architecture based on the model view controller (MVC). The MVC architecture contains the preferred user experiences, tied to the associated service actions, using controller logic. As a best practice, the controller logic is kept light by having the business-related logic stored in the MBaaS platform.
- **MBaaS platform:** The platform contains the necessary modules to optimally connect with existing enterprise applications and data. They can be further classified as follows:
  - **Cloud-based server app:** The Node.js-based app provides a single scalable interaction point for managing client requests to backend micro services. Since it resides on the cloud and is distributed, this app server becomes a central mechanism for managing data across multiple client-side apps requesting services via multiple channels and regions.
  - **Micro services:** These components are adaptors that service each mobile function request and that respond with the appropriate (and granular) enterprise service data. As part of service fulfillment, the user information, context and location are stored for later channel analysis. Once the layers are built,

various touch points are integrated and configured to complete the app assembly. The layered approach provides the flexibility to enable the micro services layer to function as a plug-in that can serve many mobile apps based on their functional requirements.

- **Mobile data objects:** In the typical desktop computing paradigm, data in databases requires time to be converted into and represented as objects in a middle tier, and again converted to UI classes for viewing. This two-staged conversion process can impede performance, which creates delays and delivers a suboptimal user experience. Hence, the MBaaS platform implements mobile information as mobile data objects from the micro services to mobile devices and does not perform conversion during the exchange of data between the layers. Another performance attribute involves the management of non-volatile client data. MBaaS provides a cache facility, with refresh limits, to satisfy client-side requests directly from MBaaS rather than fetching it every time from the enterprise data layer. Such rules should be established in MBaaS to ensure high performance.

### MBaaS App Development Model

Mobile apps are typically developed using an Agile model, allowing for iterative refinements and parallel development. As shown in Figure 3, MBaaS allows parallel development by allowing the layer of independence between a mobile ser-

vice developer and a mobile app developer. This independence provides the flexibility of a UX designer and front-end developer to focus on the customer experience needs, while the mobile service developer focuses on the granularity of the information that needs to be plumbed from the enterprise and created as mobile services based on representational state transfer (REST).

The mobile service developer can choose to create either mobile-specific data sets from the “systems of record” or an “API gateway” and create the necessary transactional or informational endpoints that could be enabled in the MBaaS layer. These services can be created independent of app requirements and can be made part of a larger line of business functional needs. In time, these services can be standardized to become a published mobile service catalog for the enterprise.

As the customer experience changes over time, mobile services can be rewired to deliver better mobile experiences. In terms of time-to-market, reusing mobile services can provide significant reduction in development time. Parallel development would also remove dependencies between the service developer and app interface developer, saving more time to get the app to market faster.

## MBaaS Platform Characteristics

A recent Forrester Research report titled “The Engagement Platform’s Aggregation Tier” lists technology choices based on three key mobile development categories in which the “engagement platform” category reveals a subset of the MBaaS vendors serving the marketplace (see Figure 4).

The primary goal of the MBaaS platform is to create a successful mobile integration layer to operate a mobile channel in the enterprise seamlessly with other channels. MBaaS platform vendors differ in their feature offerings. In fact, many vendors extend their current cloud stack or middleware stack to MBaaS – which may not work for all enterprises. Each enterprise must evaluate the MBaaS vendor for its key capabilities and vet out-of-the-box capabilities vs. necessary add-on capabilities. For example, many MBaaS vendors do not offer powerful data synchronization or encryption capabilities.

Figure 6 (page 7) depicts the MBaaS platform features needed for successful mobile channel integration within the enterprise.

## Modern Engagement Platform Choices

	Data Integrators	Middleware	Engagement Platforms
<b>Description</b>	Provides API access to back-end data.	End-to-end mobile integration and development solution built on existing platform.	Encapsulate API access with mobile development libraries (both native and Web).
<b>Example Vendors</b>	<ul style="list-style-type: none"> <li>• Intel/Mashery</li> <li>• CA Technologies/ Layer 7 Technologies</li> <li>• MuleSoft</li> <li>• Apigee</li> <li>• IBM Cast Iron Systems</li> </ul>	<ul style="list-style-type: none"> <li>• IBM Mobile First</li> <li>• Kony</li> <li>• SAP Mobile Platform</li> </ul>	<ul style="list-style-type: none"> <li>• salesforce.com</li> <li>• AnyPresence</li> <li>• Appcelerator</li> <li>• Kinvey</li> <li>• FeedHenry</li> <li>• KidoZen</li> <li>• OutSystems</li> </ul>
<b>Advantage</b>	Expedites development by providing a consistent, consumable access layer.	Trusted in the enterprise, solution includes development tooling.	Built from the cloud down, allows for best-of-breed tooling and services integration.

Source: Forrester Research, “The Engagement Platform’s Aggregation Tier: A Closer Look At The Heart Of Modern Enterprise Architecture,” May 2014.

Figure 4

## Quick Take

### How MBaaS Can Power Enterprise Digital Transformation at a Large Insurer

One of our large U.S. insurance clients sought a digital strategy to deliver a more engaged customer experience via its Web and mobile channels. As a key partner in this carrier's digital transformation initiative, we created a roadmap by assessing API services, responsive Web and mobile app adoption.

We first showed this client that the company's enterprise information services were designed to share large information chunks on customer policies and products and were not granular within a customer context. These large information chunks will throttle the mobile bandwidth and provide a suboptimal user experience.

In fact, we demonstrated that its enterprise service bus was primarily focused on an internal exchange of information between systems of record and Web portals, and hence was heavy-weight in nature. Analytics was not baked into the service platform and thus did not track the nature of the service usage. There were no mechanisms

to provide alerts to customers about upcoming due dates of policy expiry, even though the insurance company generated business events covering these developments.

Addressing the above issues, a digital reference architecture based on an MBaaS solution was developed and contextualized for the enterprise. As part of our recommendation, an MBaaS platform was chosen by evaluating the leading vendors in the market. Key business use cases such as policy administration for customer self-service were chosen as a pilot to prove the value proposition. The MBaaS platform will be integrated as part of the company's larger cloud-based ecosystem for consumer-facing solutions. MBaaS provided an obvious choice as the platform to provide service integration, security and analytics in a single solution. As part of its digital architecture roadmap, the insurer has begun to implement MBaaS for its consumer self-service app, a project that is planned to go live by summer 2015.

### Insurance MBaaS Solution

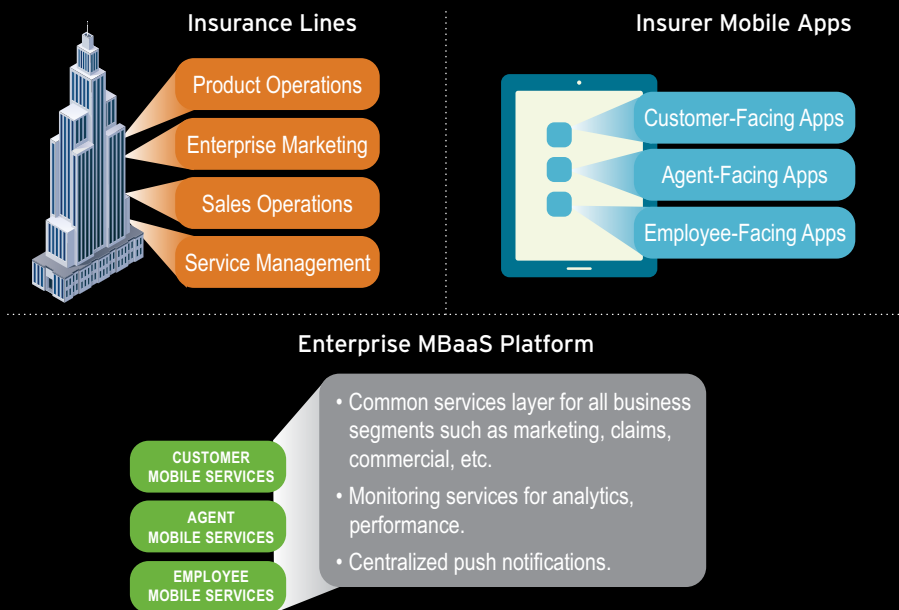


Figure 5

## MBaaS Platform Capabilities

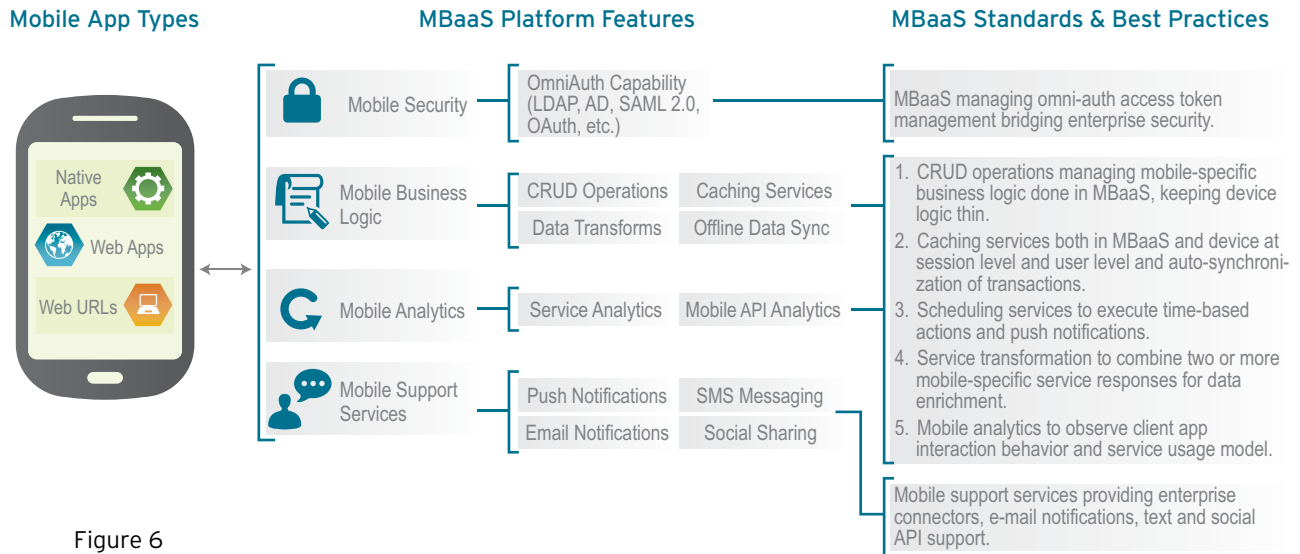


Figure 6

MBaaS capabilities can be broadly classified into four key areas and addressed as follows:

- Mobile security:** Since mobile devices are treated as an untrusted channel, it would be unsafe to store enterprise security tokens for session management. The best practice is for MBaaS to manage the enterprise security tokens for each user and have a separate token management mechanism, with tokens generated from MBaaS. This, in our experience, makes the enterprise security model more secure. MBaaS should have the ability to integrate with any enterprise identity management solution supporting various security protocols such as SAML, OpenID, oAuth, etc. The MBaaS should also be able to manage encryption with data at rest and transmit it to mobile devices.
- Mobile business logic:** In enterprise platforms, the best practice is to develop solutions by using a three-tier architecture that comprises engagement, business and services tiers. In mobile solutions, the business tier usually is stored in the device, which prevents the code from being managed in concert with changing business logic requirements. Since business logic is common across mobile devices, MBaaS provides the capability to house business logic in the MBaaS layer, limiting device code to user engagement.

- Mobile analytics:** MBaaS provides the capability to obtain analytics in two channels. The first channel – client interaction – can help fine-tune the app to enhance user experience. Feedback about the number of page views, usual functions leveraged and abnormal user exits can provide the enterprise clues on where it should focus attention on increasing feature coverage. The second channel – service analysis – can provide insights about the user device and location from which the service is being called, as well as the performance of the service. This can help the organization proactively address its channel challenges and focus on certain regions based on location intelligence. Additionally, it provides plug-ins to connect with third-party analytic tools.
- Mobile support services:** Additional mobile user interactions can be supported by integrating enterprise communication channels with push notifications, triggers for action, cross-channel connects, etc. based on business events applicable to targeted consumers.

### Looking Forward

To fully leverage the virtues of MBaaS as one of our large insurance clients intends to (see sidebar, page 6), we suggest IT organizations factor the following three tenets into their cross-channel enterprise mobile thinking:

- **MBaaS is fast becoming a mobile integration platform** and many enterprises are adopting it to embrace a mobile-first approach to delivering a consumer-centric omni-channel experience (see sidebar).
- **MBaaS can be the service glue to create a successful platform of engagement within the digital infrastructure.** MBaaS seamlessly fits into related cloud technology developments such as scalable content delivery networks (CDNs) and application cloud enablement (ACE).
- **The value-added services enabled by MBaaS, such as mobile analytics, are together proving to be the insight mechanism for channel improvement.** For example, push notifications are being integrated into the enterprise communication medium. These intrinsic values make MBaaS a complementary addition to the evolving digital enterprise backbone.

## Reference

- Michael Facemire, Jeffrey S. Hammond with Christopher Mines, Dominique Whittaker, Eric Wheeler, "The Engagement Platform's Aggregation Tier: A Closer Look At The Heart Of Modern Enterprise Architecture," Forrester Research, May 2014.

## Footnotes

- <sup>1</sup> "Mobile App Devs Take Note: Five MBaaS Trends Shaping the Future," [http://insights.wired.com/profiles/blogs/mobile-app-developers-pay-attention-five-mbaas-trends-that-will?xg\\_source=activity#axzz3NeTVayDx](http://insights.wired.com/profiles/blogs/mobile-app-developers-pay-attention-five-mbaas-trends-that-will?xg_source=activity#axzz3NeTVayDx).
- <sup>2</sup> <http://www.prnewswire.com/news-releases/global-backend-as-a-service-baas-or-mbaas-market-2015-2019-300017381.html>.
- <sup>3</sup> For more on Code Halos, read the book "Code Halos: How the Digital Lives of People, Things, and Organizations are Changing the Rules of Business," by Malcolm Frank, Paul Roehrig and Ben Pring, published by John Wiley & Sons. April 2014, <http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118862074.html>.
- <sup>4</sup> Micro-services are specially designed mobile-enterprise services that are lightweight and optimized to serve the mobile user.



## About the Authors

*Saikumar Jagannathan is Senior Director of Cognizant's Digital Foundations and Consulting Practice. He is responsible for strategic advisory services that help organizations adopt digital and mobile technologies as successful engagement architectures in their enterprises. Prior to this role, Sai was the CTO for Cognizant's Life Sciences Business Unit, driving next-generation solutions in clinical trial business processes across the molecule-to-market continuum. He can be reached at [Saikumar.Jagannathan@cognizant.com](mailto:Saikumar.Jagannathan@cognizant.com) | [LinkedIn: https://www.linkedin.com/profile/view?id=2663707&trk=nav\\_responsive\\_tab\\_profile](https://www.linkedin.com/profile/view?id=2663707&trk=nav_responsive_tab_profile).*

*Naren Naraharisetty is a Principal Consultant within Cognizant's Digital Foundations and Consulting Practice. He provides strategic advisory and consulting services in niche areas such as enterprise architecture, mobility consulting, IT strategy, digital roadmap and transformation. Prior to this role, Naren was an enterprise architect at Global Technology Services (GTO) of Cognizant. He holds an engineering degree in computer science. Naren can be reached at [Naren.Naraharisetty@cognizant.com](mailto:Naren.Naraharisetty@cognizant.com) | [LinkedIn: http://in.linkedin.com/pub/naren-n/16/924/922](http://in.linkedin.com/pub/naren-n/16/924/922).*

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**Cognizant**

### World Headquarters

500 Frank W. Burr Blvd.  
Teaneck, NJ 07666 USA  
Phone: +1 201 801 0233  
Fax: +1 201 801 0243  
Toll Free: +1 888 937 3277  
Email: [inquiry@cognizant.com](mailto:inquiry@cognizant.com)

### European Headquarters

1 Kingdom Street  
Paddington Central  
London W2 6BD  
Phone: +44 (0) 20 7297 7600  
Fax: +44 (0) 20 7121 0102  
Email: [infouk@cognizant.com](mailto:infouk@cognizant.com)

### India Operations Headquarters

#5/535, Old Mahabalipuram Road  
Okkiyam Pettai, Thoraipakkam  
Chennai, 600 096 India  
Phone: +91 (0) 44 4209 6000  
Fax: +91 (0) 44 4209 6060  
Email: [inquiryindia@cognizant.com](mailto:inquiryindia@cognizant.com)