



The Seven Characteristics of a Successful RCS Solution

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Executive Summary

The messaging marketplace has gone through substantial changes in the last several years. The introduction and rising popularity of over-the-top (OTT) apps are contributing to a decline of Mobile Network Operator (MNO) messaging revenue. According to Infinite Convergence's 2013 Social Messaging Applications Insights Study, 43 percent of U.S. smartphone owners who prefer using OTT apps over mobile operator-provided messaging services say they prefer them because they have more enhanced features¹. Cost also matters – 34 percent of U.S. smartphone owners prefer OTTs because they are free or cheaper.

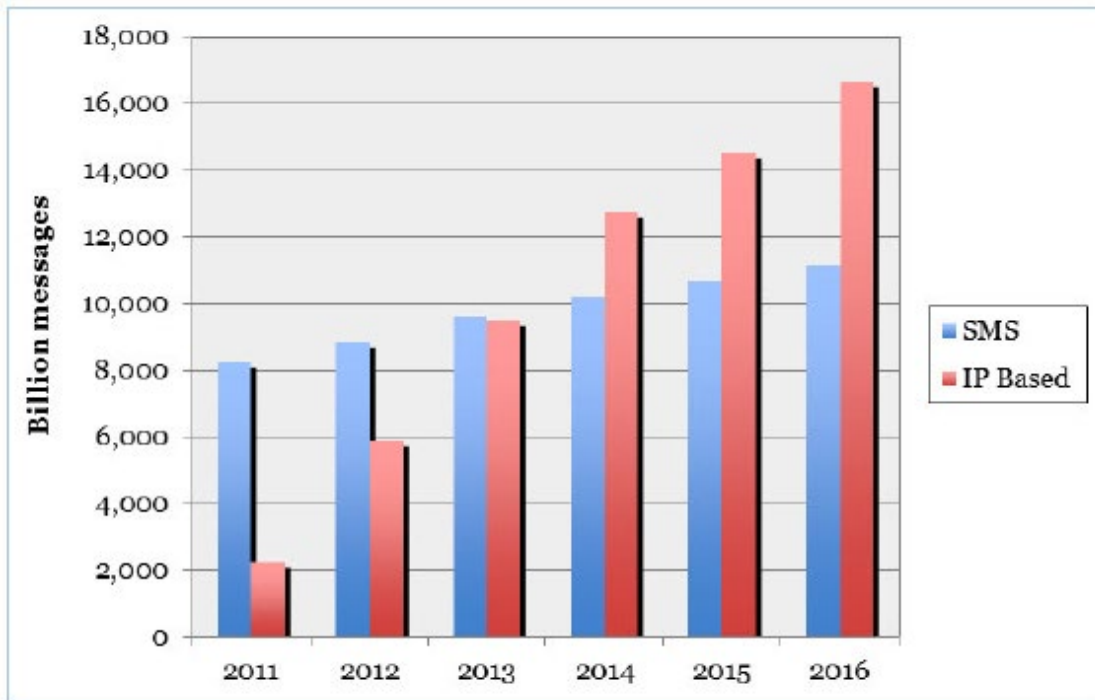
To regain their revenue share and customer base, MNOs need to launch a Rich Communication Suite (RCS) solution as the core foundation to their messaging strategy.

To be successful, an RCS solution must provide a rich feature set, go-anywhere availability, universal connectivity and APIs that will enable the MNOs to leverage the developer community to provide value-added services to consumers. With so much at stake riding on RCS, MNOs must work with an experienced, proven vendor that can provide the telco-grade quality that subscribers expect, including high performance, reliability, availability and scalability.

¹ Infinite Convergence: <http://www.globenewswire.com/news-release/2013/10/28/583864/10054573/en/Study-Consumers-Look-for-Mobile-Operators-to-Deliver-Innovative-Messaging-Features-and-Pricing-Majority-of-Smartphone-Users-Continue-to-Prefer-Mobile-Operator-Provided-Messaging-Se.html>

Changes in the Messaging Marketplace

According to TechHive.com, “in 2011, mobile operators worldwide saw a 9 percent drop in messaging revenue². That trend is expected to continue.” By Informa’s estimates, 41 billion OTT messages will be sent every day by the end of 2013, compared with an average of 19.5 billion P2P SMS messages³.



Many consumers expect an enhanced, richer way to connect with their friends and family. Operators are ready to launch RCS as the core foundation around which their next-generation messaging services will be built. According to GSMA, “9 out of top 10 handset manufacturers <are> already committed,” and the organization provides the following forecast⁴:



What should operators be looking for when selecting an RCS platform?

² TechHive.com: <http://www.techhive.com/article/2025980/texting-supremacy-crown-passes-to-ip-as-numbers-for-sms-messages-decline.html>

³ Informa: <http://blogs.informatandm.com/12861/news-release-ott-messaging-traffic-will-be-twice-the-volume-of-p2p-sms-traffic-by-end-2013/>

⁴ GSMA: http://www.gsma.com/rcs/wp-content/uploads/2013/06/How_big_is_the_rcs_market_opportunity1.pdf



The Seven Characteristics of a Successful RCS Solution

1. Offers a rich feature set
2. Provides go-anywhere availability
3. Enables universal reach to all subscribers and messaging communities
4. Supports GSMA OneAPIs
5. Supplies peak performance
6. Incorporates availability and reliability
7. Leverages a proven vendor!

Characteristic #1: Offers a rich feature set

User features:

If service providers aren't offering new and exciting user experiences, users will go elsewhere.

This seems like a pretty simple concept, but service providers are late responding to this need. OTT applications are now the incumbents. To unseat them, operators must offer new and exciting user experiences that go beyond today's MNO-based messaging services and OTT experiences. Features like group chat, multi-media file transfer and presence have become commonplace. The RCS solution should offer premium features like location sharing, video sharing and multi-device support with synchronization of messages across devices in order to build excitement and draw subscribers back to MNO-branded messaging services.

The ability to access and coordinate various social media and messaging (e.g., SMS, MMS, RCS) in one combined messaging solution is another premium feature that will create exciting user experiences. By further making the messaging solution the default client on the device, it becomes the one-stop shop for all the subscriber's communication needs.

Service provider features:

Service providers also need compelling reasons to adopt the RCS solution.

It's not enough that the RCS platform offers end-user compelling features. It must also offer the MNOs features that will enable them to offer standard carrier-grade service, such as prepaid, billing, O&M and statistics. RCS solutions need to have a diverse offering of platform capabilities for the service provider.



In addition to RCS in the IMS Core, RCS-in-a-box and hybrid solutions provide the service provider with flexibility in deploying the solution. RCS-in-a-box allows for a solution to be deployed without a dependency on the IMS Core or a fully deployed core. Platforms that can be hosted in the cloud as well as in network also provide additional flexibility.

European carriers have already deployed RCS-e, while North American carriers are adopting RCS 5.1. Platforms which support both RCS 5.1 and RCS-e allow the operator to support any RCS client and inter-operate with other carriers around the world.

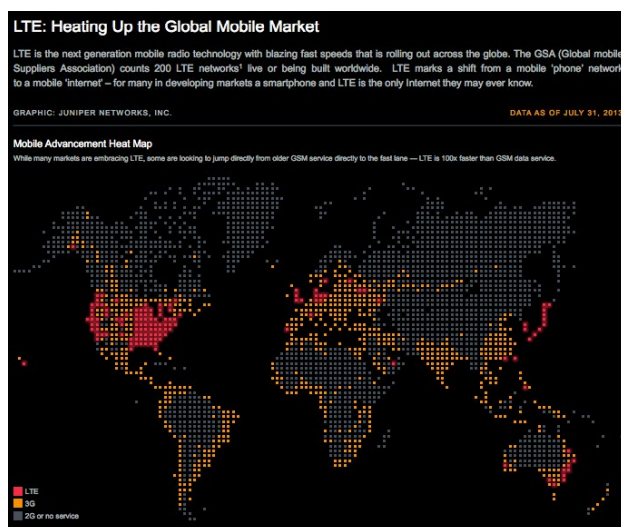
Characteristic #2: Provides go-anywhere availability

If subscribers can't access a service, they can't and won't use it.

Subscribers want a messaging service that will work everywhere and be reasonably priced. Whether they are at the beach house, camp ground or overseas, subscribers would like a reliable means to communicate with their friends and family.

The RCS-in-a-box solution can extend the coverage beyond traditional radio access to internet and Wi-Fi access. RCS solutions with Wi-Fi support and the ability to switch between Wi-Fi and the cellular network are essential to provide the availability and convenience that customers expect.

According to GigaOm, LTE coverage is still limited. These are areas where Wi-Fi and other data networks (e.g., 3G, 1x) need to fill in the gaps⁵.



⁵ GigaOm: <http://gigaom.com/2013/09/20/mapping-out-the-worlds-lte-coverage-its-in-fewer-places-than-you-think/screenshot-2013-09-20-at-1-23-06-pm/>



Today's subscribers typically have multiple devices. RCS solutions need to be extended beyond just mobile phones to also include other devices, such as tablets. Further, multi-device synchronization needs to be available to unify the subscriber's messaging experience across all devices.

Characteristic #3: Enables universal reach to all subscribers and messaging communities

RCS delivers a superset of OTT capabilities with the ubiquity of universal access.

OTTs are fragmented and closed subscriber communities with a lack of interoperability, thereby limiting reachability. According to the 2013 Social Messaging Applications Insights Study, smartphone owners dislike the walled gardens that OTTs put up. Thirty-five percent of U.S. smartphone owners say the inability to chat with people who aren't using the app is their least favorite aspect of OTTs. Additionally, survey respondents say they dislike that social messaging applications can't work together, indicating too many applications on their phones is extremely frustrating.

RCS solutions have several advantages over OTTs upon which operators can capitalize to bring subscribers back to their branded services. These advantages include:

- Access to any mobile device that is associated with a phone number
- Inter-carrier interoperability with global reach
- Always available carrier-grade service
- Legacy system compatibility (SMS, MMS)

RCS' reach can be enhanced further via legacy messaging and social media interworking.

For complete connectivity, RCS solutions should provide interworking with legacy SMS and MMS services. While RCS services are preferred to take advantage of their advanced capabilities, fall-back to legacy SMS and MMS is needed to reach clients that have yet to be upgraded to RCS.

A robust RCS solution will include a social media gateway, enabling RCS solutions reaching beyond the borders of the MNO and into social networks to unify all of the fragmented subscriber communities and social applications. This universal reach has the potential to make the MNO-branded communication service the center of a user's communication world, further improving the MNO's brand loyalty.



Characteristic #4: Supports GSMA OneAPIs

Value-added service interfaces (RCS APIs) bring additional opportunities for enhanced user experiences and ARPU-generating features with minimal, or no, service provider investment required.

One of the biggest factors driving the success of iPhone and Android mobile devices has been the availability of applications created by a global community of independent developers. RCS solutions can also leverage the global development community to create additional value for their subscribers with open access to their RCS solution via the GSMA OneAPIs. These APIs open up a hugely attractive market for application developers, enabling them to take advantage of the MNO's network services to create innovative user experiences that can reach millions of customers. This market dynamic fundamentally drives more rapid innovation, leading to more loyal subscribers and more revenue for both the service provider and application developer. Additional opportunities for MNOs to create branded ARPU-enhancing services are also enabled. Applications like Gaming, Social Media, Conference Calling, Advertising and Customer Services will open a plethora of revenue-generating opportunities to the MNOs with minimal investment on their side.

The GSMA APIs enable both client-based applications and network-based services to use the service provider's RCS solution to enhance their applications and services. This provides enhanced subscriber experiences only available with RCS solutions. Unique application and service support keeps subscribers using the service and driving additional revenue for the service provider. Having the newest, most trendy applications available on the RCS-based clients promotes subscriber loyalty to the service provider and increases ARPU. An RCS solution with global reach opens up a large and broad subscriber base that will drive application developers and other service providers to implement new capabilities, keeping RCS fresh and relevant.

The GSMA OneAPIs support access to both Presence and IM services such as: Chat, File Transfer, Social Presence, Capability Discovery, Geo-location, VCard, Store and Forward, Message Synchronization, End User Confirmation Requests, Video Sharing and more.

Per OMA, the list of companies endorsing the OMA API approach (that OneAPIs are based on) is growing⁶:

- [Aepona](#)
- [Alcatel-Lucent](#)
- [AT&T](#)
- [Bell Mobility](#)
- [Birdstep Technology](#)
- [Cambridge Silicon Radio, Ltd](#)
- [China Mobile](#)
- [China Unicom](#)
- [China Telecom](#)
- [Comverse](#)
- [Deutsche Telekom AG](#)
- [Ericsson](#)
- [ETRI](#)
- [GSM Association \(GSMA\)](#)
- [Hansol Inticube](#)
- [HTC](#)
- [Huawei Technologies](#)
- [Interop Technologies](#)
- [NEC Corporation](#)
- [Nokia Siemens Networks](#)
- [Neustar](#)
- [Oracle](#)
- [Orange SA](#)
- [Red Bend Software](#)
- [Smith Micro Software, Inc.](#)
- [Songdo Telecom, Inc.](#)
- [Telecom Italia](#)
- [Telenor ASA](#)
- [TeliaSonera](#)
- [U.S. Cellular](#)
- [ZTE Corporation](#)

⁶ OMA: http://technical.openmobilealliance.org/api/APIInformation.aspx?page=news#news_2



Characteristic #5: Supplies peak performance

Service providers need to engineer for high volume loads to avoid outages and delays.

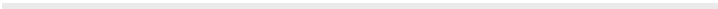
Digital cameras on today's smartphones generate high-resolution pictures and videos that consumers want to share, at their original size, with friends and family. Subscribers would like their friends to be able to view videos the second they press the send button. Low latency and high data throughput are essential to the utility, attraction, flexibility and longevity of a messaging service. RCS solutions need to be able to handle extreme loads, both in terms of high message rate and large message sizes, and transfer them reliably and without failure. Every hardware and software subsystem must be designed in a way that addresses bandwidth, I/O and CPU bottlenecks. To ensure performance is actively managed in a way that delivers instantaneous response with no loss of messages is not a trivial task, especially as you scale to millions of subscribers. This means that all elements of the hardware and software solution are carefully considered to meet the desired subscriber experience.

There are many components of the performance puzzle for the platforms that support messaging services: software, hardware, computer, storage, networking, in-network and hosted. Platform solutions should incorporate server host resources utilizing the latest CPU, memory and networking technologies to support high performance in a small footprint. These technologies will be dictated by the server vendors and their product roadmaps.

Due to the increasing size of the rich media being shared via messaging services, storage performance is increasingly the dominant component of the overall system performance. The design around I/O bottlenecks related to the media needs to be balanced, as it is not an asymmetrical issue. In addition to read access, the media has to be written for persistence and reliability of the service. In addition, not all of the stored data has the same access time demands. The storage should also be designed to address the mix of hot and cold storage needs in the system. At the core of the platform is the high-speed, high-bandwidth networking tying together the compute and storage resources.

All of the hardware should be high performance while being commercial off the shelf in order to achieve the performance needs of the service, while retaining the cost-effectiveness of the solution. It's also best to have a loosely coupled architecture that allows flexibility for upgrades to the hardware to take advantage of advances over time.

Software applications may utilize a virtualized architecture, which gives the vendor and operator





the flexibility to deploy as a Cloud-hosted implementation or as an in-network, private Cloud implementation. Virtualized applications provide a more efficient use of the physical resources that promises improved performance and the ability to be hardware agnostic. The core software architecture may consider using load balancing across multiple local call processing applications to distribute the inbound traffic load across the available call processing application instances. Additional computing resources can be added to a single system to support additional call processing applications as capacity needs grow. This allows a graceful scaling of the system to meet the growth of the RCS solution for the wireless operator.

Several individual Application Servers can be aggregated behind global load balancing to grow the capacity and provide additional local redundancy to spread the traffic load at a single site. This same type of configuration can be replicated using equipment located at two or more sites behind the global load balancing function to increase redundancy and spread the traffic load across additional sites to provide a more consistent handling of the overall RCS messaging traffic as the demand for RCS services grow in a system.

Scalability:

As has been discussed, the RCS solution can be Cloud-hosted or implemented in the form of an in-network solution. The in-network solution provides the operator direct control over its dedicated resources. A loosely coupled physical architecture for the hardware solution allows for additional computing and storage resources to be added.

Cloud-hosted solutions follow a similar scaling model as the in-network solution except the additional resources added to the solution come from a Cloud-hosting provider. This has multiple benefits for the operator. Cloud-hosted solutions reduce the difficulty in deploying this new service for wireless operators. The RCS solution runs at the Cloud-hosting provider's facility, while the operator has access to billing, statistics and subscriber profile configuration data for the service. This solution lowers the CAPEX expenditures for the wireless operator and allows easier scaling of the service over time as demand from the subscriber base grows



Characteristic #6: Incorporates availability and reliability

The system must be accessible at all times.

In January 2013, Deutsche Telekom announced delaying their RCS service due to “complex integration issues” and “lack of stability.” It may be tempting to focus on feature functionality, but if the system crashes, loses messages, is difficult to integrate or is hard to provision, the service will not be received positively in the commercial market. It is important that an RCS vendor has a proven track record of delivering and deploying stable, carrier-grade systems that can accommodate fast subscriber uptake and scale from small initial deployments to large Tier 1 systems. RCS solutions must provide rock-solid availability and reliability to ensure success in the market over less reliable OTT alternatives.

Additionally, RCS solutions that don’t require an IMS Core can ease the service’s introduction into the market and allow for faster and less intrusive market deployments. In fact, for MNOs that wish to extend the reach of their messaging service, it’s imperative that the RCS solution support a hybrid network topology. Therefore, if you are located in an area where there is only Wi-Fi coverage, the MNO’s service is still available. This support for the hybrid network topology should be provided in a single, unified platform to ease OA&M, network integration and deployment.

Platforms need to be designed to be 5 9’s-capable using a highly available, highly reliable architecture, allowing it to survive system failures and ease disaster recovery. Systems should be designed around a core architecture of load balancing to distribute the inbound submission traffic load across multiple application function instances. By aggregating several Application Servers behind load balancers, it provides additional local redundancy, allowing the messaging service to survive a failure and recover any individual call processing application element, and allows the capacity to grow. This type of configuration can be replicated across two or more physical sites behind a load balancing function to increase redundancy and spread the traffic across multiple sites to avoid singular points of failure in the overall RCS service in the network.

For Cloud-hosted RCS solutions, the hosting provider is responsible for following high-availability practices to engineer its cloud to avoid single points of failure in hardware, power and environmental and networking connectivity subsystems. For the in-network solution, each Application Server should have a fully redundant hardware architecture with no single point of failure in a single Application Server system containing compute, storage and networking components.



Platforms should be designed to tolerate the failure of a single hardware or software component. Virtualized environments (e.g., NFV) allow the set of host server equipment to be managed as a computing resource pool available to run any needed function in the system rather than hardware dedicated to a singular task. A loss of any one host can be absorbed by the extra capacity of the additional resources in the pool. A virtualized environment allows the application software functions to be redistributed across the remaining computing resources in the system to keep the service running. Local software functions, such as load balancing, should be redundant so that any failure of an individual call processing functional component does not cause an outage.

Storage equipment for a platform should provide physical redundancy. Storage volumes themselves should be accessible by the application resources and the virtual environment on any host machine. The networking equipment should provide independent network fabrics that can maintain a fully redundant mesh between the computing and storage components of the Application Server in the event of a failure in either fabric.

The RCS solution should support software upgrades and rollbacks without impacting request and transaction processing by deploying equipment and platforms in a redundant configuration. Traffic can be moved off of the upgraded system to the peer systems either locally or at a geographically redundant site, allowing the maintenance work to be performed without impacting the solution's overall processing. The solution should also support backup of subscriber and system configuration databases via automated or manually initiated procedures and allow these databases to be stored offsite and be available for restore in the case of some type of catastrophic event.

Characteristic #7: Leverages a proven vendor!

Lower your risk by selecting vendors with a long history of delivering carrier-grade solutions.

Operators have a lot at stake when deploying RCS as the core to their messaging service offering. It is important for operators to choose a solution provider experienced in deploying carrier-grade products and services in challenging multi-vendor network environments. It is only through the first-hand experience of successfully deploying service platforms in large, complex Tier-1 networks that a supplier can demonstrate its ability to deliver a high-quality, stable experience to an MNO's customer base. This stability is integral to give subscribers the confidence to trust the MNO's service reliability and support scaling as the service's adoption grows across the subscriber base.



Experienced vendors have an advantage of delivering solutions to MNOs with tens of millions of subscribers and understand the demands of a complex environment. These vendors deliver solutions that work in complex IP networks comprised of multiple vendors, and they provide solutions that are resilient to error and overload conditions — therefore keeping the cash register running.

Successful vendors also provide solutions that have a robust OA&M solution. Capabilities such as a trace facility, message log, detailed billing and extensive statistics with GUI reports assist in planning and managing system growth.

A proven vendor should also be a thought leader contributing to key RCS Standards and drive the invention of patented technologies to ensure the success of the technology and the industry.

Make your vendor show their historical statistics – you should be seeking suppliers that have demonstrated 5 9's availability and reliability. Remember that this is one of the differentiators that an MNO brings to their subscribers and demand this of each of your suppliers. A vendor who historically delivers 5 9's reliability and availability designs it into their products from the start.

In this age of viral and social network-based communications, first impressions reach millions of people at the speed of light. Make sure your first impression is one that moves you and your subscribers in the right direction





About Infinite Convergence

Infinite Convergence, formally a part of Motorola Networks, delivers proven messaging solutions that address the issues raised in this paper. With more than 2,000 staff years of engineering experience in delivering carrier-grade 5G's messaging infrastructure solutions, Infinite Convergence is well-armed to deliver the user experience you need to meet your subscriber's needs. Our solutions are built on a Virtual Machine Architecture and are platform agnostic, allowing us to use the most current and efficient compute, switching and RAID array systems. Our solutions scale across the full spectrum of operators and networks, from the very smallest to the very largest. In addition, our system architecture supports the needs of multi-national MNOs with its multi-tenant OA&M features, allowing a centralized private cloud implementation to be shared across multiple MNO properties with each tenant having its own distinct core network elements.

For additional details about the issues associated with choosing the right RCS solution for your network, contact Infinite Convergence at:

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