

# FUSION OF CLOUD COMPUTING AND WEARABLES: CHANGE IN THE ERA OF HEALTH CARE

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**Abstract**—It has been an era marked with Pessimism about the future of cloud with wearable. Today there are an overwhelming number of trending wearables, but not all of them are capable of measuring or telling us something about our health.

**Index Terms**—Health, Smart watches, Wearables, Cloud Computing, Health care

## I. INTRODUCTION

As far as we concerned about our needs, how many times do we think to resolve the hurdles in the completion of our needs.

1. How many times have we felt that our application requires a higher system profile?
2. How many times have we have experienced trouble with change in software versions used by us and another person?
3. How many times have we felt to be stuck with data on a system back home?

No matter if you browse through a PC, Mobile or Wearable...the important thing is access from any system to the “Cloud of Information” through the internet.

The information must be on servers, programs that currently operate and are installed on our computer, operating through the internet, are installed on servers and that implementation of the “Cloud Applications” is completely online, and can access the information and application from any terminal with internet access.

## II. CLOUD COMPUTING

Cloud computing world is no longer demoted to grubby data centers and otherworldly bandwidths. After digital fitness bands to smart watches, it become a point of SaaS-infused fashion for many users. As we quickly transition into the IOT, cloud providers and consumers are finding new wearable gears to access personal data from anyplace.

For businesses, these tools further enhance the ability to collect pertinent customer data – As an example, in hospitals patient health record. A simple digital fit band or watch can become a real-time connection between the consumer and the cloud – and provide companies with even more data from consumers.

As far as we concerned there seems to be many definitions of cloud computing around.

A study by McKinsey (the global management consulting firm) found that there are 22 possible separate definitions of cloud computing. In fact, no common standard or definition for cloud computing seems to exist (Grossman, 2009 and Voas and Zhang, 2009). A more commonly used definition describes it as clusters of distributed computers (largely vast data centers and server farms) which provide on-demand resources and services over a networked medium (usually the Internet).

The term “cloud” was probably inspired by IT text book’s illustrations which depicted remote environments (e.g., the Internet) as cloud images in order to conceal the complexity that lies behind them.

## III. SMART GLASSES AND WATCHES DOMINATING THE WORLD

Smart glasses: Perhaps the most widely-known and marketed wearable cloud device, driven by Google Glass and its ability to overlay real-time information generated from the cloud. Google has generally promoted the Glass device toward consumers, but there are several enterprise-level benefits as well.

Suppose, a doctor having real-time information about a patient’s details within a pair of smart glasses, and being notified when something goes wrong. Philips Healthcare is partnering with Google to develop this concept. When combined with speedy access to patient electronic health records (EHR), the chances with Glass for health care providers is huge.

Certain IT Solution providers have already take initiation joined the smart glasses bandwagon. Fiberlink, a cloud-based agility management provider, has allowed access to its MaaS360 platform via Google Glass. Using Google’s Glass Mirror API, Fiberlink was able to add Glass-enabled IT monitoring functionality to its environment.

**Smart watches:** This is a new section of the wearable cloud computing area aims to supplement the massive BYOD-infused influx of tablets and smartphones into the enterprise market. Consumers can buy these watches and be notified of email and other messages, which are then opened on their smartphones.

## IV. ASSOCIATION OF CLOUD COMPUTING AND INDUSTRY OPERATIONS

Wearables are providing significant possibilities for businesses, though they further advance the confidentiality concerns that have determined BYOD and cloud computing for years. IT managers should update their BYOD policies in advance to account for these smart devices, which can effortlessly send large user information into the era of cloud. Wearable technology is the experimental one, but Are you ready to take that chance with your business’ data and transactions?

Although wearable cloud computing technology has largely been focused towards consumers, the chances for enterprise businesses remain highly strong. However, as is the case with all new technologies in the cloud computing era, the initial implementation hurdles and confidentiality concerns can stand up with extensive adoption.

“Although the root cause of this particular issue was a resource contention issue between instances, things like that are going to continue to happen. There may now be a fix for this particular edge case, but there are undoubtedly others that will crop up over time. The real failure here was a failure of monitoring, and a failure of transparency.”

Oren Michels, the CEO of Mashery, regarding Amazon’s EC2 outage, points out the need for application-specific Fault, Configuration, Accounting, Performance and Security (FCAPS) measurement, management and optimization.

The current definitions of cloud computing are just beginning to incorporate end-to-end management as a basic foundation for cloud IT. Like, Forrester Research Group now defines cloud computing as “A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end customer applications and billed by consumption.” Meanwhile the ITU-T Telecommunication Management Network (TMN) already has a well articulated definition for managed infrastructure in the context of the telecommunications Intelligent Networks for voice services. In this layered model, each layer is responsible for different management functions, while interfacing with underlying and overlying layers, to provide a complete and comprehensive set of management capabilities:

1. The Network Element Layer (NEL) implements logical entities within a device
2. The Element Management Layer (EML), implements device level FCAPS management functions.
3. The Network Management Layer (NML), implements path management, topology Management and fault isolation.
4. The Service Management Layer (SML), implements mechanisms to assure service level agreements and ensure Quality of Service (QoS)
5. The Business Management Layer (BML), implements strategic enterprise management functions, such as budgeting and billing.

As, the above TMNFCAPS framework enables:

1. Accountability management, by detecting and correlating faults in network devices, isolating faults and initiating recovery actions.
2. Pattern management, by providing change pursuing, configuration, installation and delivery of software to all network devices.
3. The capability of accounting management through full network usage reports generated by collecting and analyzing accounting data.
4. Management of Performance is facilitating by real-time access for the monitoring of network presentation (QoS) and resource allocation data.
5. Management of Security is providing granular access control for network resources.

Applying the above framework, we propose a Cloud Computing Reference Model that explicitly incorporates FCAPS management and defines the various roles Of infrastructure, service creation, delivery, and assurance platform providers. These roles can be assumed by a single provider or multiple providers depending on whether the solutions are proprietary or standards-based.

However, history has consistently shown us that proprietary solutions may drive innovation initially but standards will ultimately be required to achieve massive scale by enabling the interoperability of competitive proprietary solutions.

## V. CONCLUSION

In this paper, current trend in cloud computing have been analyzed and compared with the fusion of Cloud Computing and Wearable. The Evolution in the era of Healthcare proposes that ever the risk-averse industry, healthcare is finally beginning to trust cloud for the storage of protected health information. Experts credit better cloud security, dropping costs and the growing need for disparate organizations to share information.

## VI. CASE STUDY: CLOUD LEADS TO COMPETITIVE ADVANTAGE FOR HEALTHCARE FIRM

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Now that these organizations (more or less) have meaningful use under their belts, they’re beginning to invest in other areas, Gaudet says. This desire to invest has coincided with an increased willingness among cloud service providers — including Amazon, Google and Microsoft — to sign HIPAA business associate agreements. Such an agreement outlines how a business associate will protect an organization’s PHI in accordance with HIPAA privacy and security rules.

“We see that as really critical. More and more companies that store PHI in the cloud are starting to do that,” Gaudet says.

Cloud Finally Mature Enough for Healthcare

Meanwhile, the Porter Research study — sponsored by Covisint, the SSO and identity management subsidiary of Compuware — suggests that 58 percent of C-level hospital executives “place a high importance in cloud-based technologies.” This is quite telling, says Porter Research President Cynthia Porter, since roughly 75 percent of hospital communications occur over fax. “There are still a lot of inefficiencies out there,” Porter says.

Healthcare’s increasing willingness to use the cloud comes with a decreasing reluctance to see how other industries are solving problems related to data storage, application hosting and the like. Yes, healthcare remains a risk-averse industry, but organizations are starting to realize that it does in fact mean something if a cloud vendor is “proven” in other industries, Porter says. “Healthcare isn’t afraid any more to look at how problems are solved outside healthcare.”

At the same time, a variety of external factors — meaningful use, the accountable care organization (ACO) model, the ICD-10 switch and the rise of mobile health — push healthcare organizations toward more integrated systems, Porter says.

The maturity of cloud computing makes it the right solution for this type of integration, says Dr. John Haughton, chief medical information officer for Covisint. This maturity comes in three forms, he adds: Technical, in the ability to move information among systems; business, as a means of establishing mire dynamic partnerships with other healthcare facilities, and clinical, in the form of team-based, collaborative care. Achieving true collaboration, though, means going beyond the “island” EHR systems present at many healthcare organizations and making health IT systems interoperable. Cloud brokerage solutions can help, Haughton says.

**News: Box Takes Electronic Health Records to the Cloud**

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The end result, Haughton says, is an ability to drill down into patient registries or outreach lists to better understand how, for example, a care team or even an individual physician is helping a patient who had suffered a heart attack get his or her blood pressure under control. The ensuing performance metrics give an organization insight, he says, into “what makes medical care better.”

## VII. REFERENCES

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