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DEPLOYING CLOUD COMPUTING IN HEALTH CARE

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ABSTRACT

"The cloud computing is a general term for the delivery of hosted services over the internet. It basically means storing if accessing data and programs over the internal instead of our computer hard drive. It is a type of internal based computing and is a model for enabling on demand access to shared pool of computing resources."

I. INTRODUCTION

The aim if this guide is to provide a practical reference to healthcare industry as they analyze and consider the involvement of cloud computing in their business. This includes guidance and strategies designed to help these decision makers evaluate and compare cloud computing offering in key areas from different cloud providers taking into account difference requirements from various sectors including medical practices, hospitals, research facilities, insurance companies and government. While considering a move to use cloud computing healthcare consumers must have a clear understanding of unique benefits and risks related with cloud computing and set realistic expectations with their clouds provider. Infrastructure as a Service (IAAS) considerations must be given to these models of service delivery as these models brings different requirements and responsibilities. Cloud deployment model will also weigh heavily in strategic decisions.

II CURRENT MARKET DYNAMICS

This section highlights the current state of the cloud computing market for healthcare and how it is expected to solve evolve over the next several years. This section introduces the key factors expected to accelerate adoption of cloud computing in the health care industry along with an overview of the key barriers that must be addressed. It highlights the key considerations for service and deployment models. Cloud computing provides an infrastructure that allows hospitals, medical practices, insurance companies and research facilities to tap improved computing resources as lower initial capital outlays.

Cloud computing caters to key technology requirement of healthcare industry are:

1. It enables on demand access to computing & large storage facilities which are not provided in traditional IT environments.
2. It supports big date sets for electronic health records (EHR), radiology images and genomic data offloading, a burdensome task from hospital IT departments.

3. It facilitates the sharing of HER's among authorized hospitals and physicians in various areas providing more timely access to life serving information and reducing the need for duplicate testing
4. It improves the ability to analyze & track information so that data on treatments, costs, performance & effectiveness studies can be analyzed and acted upon.

III. BENEFITS OF CLOUD COMPUTING FOR HEALTHCARE

Cloud computing offers significant benefits to the healthcare sectors, i.e: doctor's clinics, hospitals & health clinics requires quick access to computing & large storage facilities which are not provided in the traditional settings. Cloud caters to all these requirements thus providing the healthcare organization and incredible opportunity to improve services to their customers, the patients, to share information more easily than even before & improve operational efficiency at the same time.

1. HEALTH INFORMATION EXCHANGE

Health information exchanges help healthcare organizations to share data contained in largely proprietary EHR systems.

2. BIG DATA

Healthcare organizations turn to cloud computing to save on their costs of storing hardware locally. The cloud holds big data sets for HER, radiology images & geonomic data for clinical drug trials

3. ELECTRONIC MEDICAL RECORDS

Hospitals & physicians are starting to see cloud based medical records & medicals images archiving services coming online. The objective is to offload a burdensome task from hospitals IT department & allow them to focus on supporting other imperatives such as EMR adoption & improved clinical support systems.

4. TELEMEDICINE

With the increase in availability of mobile technologies & intelligent medical devices, telemedicine has grown to include not only telephone consultations & telephone surges but also health record exchange, video conferencing & home monitoring. Cloud computing related ease of services deployment & data storage is an enabler for the telemedicine.

5. COLLABORATION SOLUTION

Cloud technology supports collaboration and team based care delivery & the ability to use applications based on business model requirements of commonest of clinical information.

6. CLINICAL RESEARCH

Commercial cloud vendors have developed Pharma specific clinic research cloud offerings with the goal of lowering the cost & development of new drugs. The growing importance of biologics in research process in making cloud based computing an increasingly important aspects.

7. ANALYTICS

Cloud computing facilities practice and population scale information & insight are available in near real time. Information contained within a cloud can also be better analyzed & tracked so that data on treatment, costs per performance and effectiveness studies can be analyzed and acted upon.

IV STRATEGIC RECOMMENDATIONS

It provides healthcare consumers with specific guidance on how best to achieve the benefits of cloud computing while maintaining an acceptable level of risk. Although guidance is provided each organization must perform its own analysis of its need, assess select, engage & oversee the cloud services that can best fulfill those needs. It basically includes:

- UNDERSTAING THE VALUE PROPOSITION FOR CLOUD

Advances in IT are creating exciting value propositions & new opportunities to improve healthcare ecosystems. It is an offer that describes the benefits that cloud is delivery like in mobile health applications for smart phones & health related activities like counting calories, calculating BMI, heart rate monitoring etc.

- EXPLORING CLOUD WORKLOADS AND DEPLOYMENT MODELS

To achieve meaningful use new infrastructure technologies that are facilitated by cloud computing can reduce cost, improve performance & accelerate efforts. Different models offer different benefits, capabilities & risks that should factor into the development of a business strategy & forward looking plan. Eg. Private cloud might be better suited for commodity enterprise workloads and applications like Email, resource planning and financial systems.

- DEVELOPING A PLAN TO MONITOR KEY PERFORMANCE INDICATORS TO VALIDATE BUSINESS BENEFITS

In this first we need to identify the key performance indicators for the given healthcare entity & setting of success criteria goals. The plan will include IT metrics with CC solution. Some factors that relates to cloud computing are cost, security, quality availability, infrastructure use and user satisfaction. These IT metrics are important the KPI's that support the overall health are related goals will ultimately validate the role of cloud based solution.

- DEVELOPING A CLOUD SOLUTION BASED ON VALUE PROPOSITION, WORKLOAD AND THE DEPLOYEMENT MODEL

The basic value proposition is purchasing only the resources that the organization needs to use at the time, they require it & then pay accordingly. Depending on deployment models multiple organization can safely short common infrastructure which reduces cost of infrastructure due to resource sharing. Provisioning new resources workloads or applications now became a faster process and can be controlled through a single IT administered control system. Infrastructure sharing by multiple organization naturally leads to standardization of surrounding IT processes.

- When transitioning to cloud computing healthcare organizations must ensure these

i) System must ne adaptable to various departmental needs & organization and data sources
ii) Architectures must encourage a more open sharing of information & date sources
iii) Technology refreshers can't overburden the already brittle budgetary environments
iv) Security & data protection are paramount
v) Scalability is much as more patients enter the system & more data becomes digitalized
vi) Portability is needed as doctors & patients would benefits from the ability to remotely access systems & date.

V CHALLENGES TO LEVERAGING CLOUD COMPUTING FOR HEALTHCARE

It explains the critical barriers to cloud computing adoption for the health care industry with specific focus on the stringent security & privacy requirements that must be addressed including the impact of Govt & industry regulations

1) DATA PORTABILITY

It is the transition to other cloud vendor or back to the health care organization without disrupting operations or introducing conflicting claims to data. The concern is that if a provider was to suspend its services or refuse access to data, a healthcare organization may suddenly be unable to services it patients or customers. This risk highlights the need for provider agreements that address termination assistance in moving to another provider & cure periods to allow this to be remedied before the provider terminates or suspends the services.

2) INTEGRATION & INTEROPROBABILITY

Delivering an end to end systems that fully integrates all patient information, including emergency & impatient care, pharmacies, billing and more requires standardization & interoperability. Standard Development Organization are developing specifications and standards to support healthcare informatics, info & exchange of system integration.

3) SERVICE RELIABILITY

Despite some well publicized CSP disruptions cloud based services overall have been remarkably reliable. Disaster recovery is a component that focus or processes & technology for resumption of application, date, hardware in case of a disaster. The process of devising a disaster recovery plan starts with identifying & prioritizing applications, services & data & determining for each the amount of downtime that acceptable before there is a significant business impact. The healthcare industry dependence on the availability & reliability of info can be a matter of life & death.

4) PRIVACY & SECUIRYT CHALLENGE

Data maintained in a cloud may contain personal, private or confidential information such as healthcare related information that requires the proper safeguards to prevent misuse, disclosure or compromise. Data protection working party adopted an opinion on cloud computing i.e. the cloud client should be considered as data controller which cloud provider acts as data processor except where the provider processes the personal data for its over purposes. It will be legislation of the country in which client is established rather than where providers are located. HIPAA was another law (health information portability & accountability Act) in US that was designed to protect patient privacy & does so by mandating and enforcing strict privacy & security rules over how material info is collected , handled, used & protected.

VI. CONLCUSION

Throughout this paper, the role that standards play to improve the flexibility, interoperability & portability of cloud computing environments is highlighted. It also identifies areas where future standardization could be effective. To achieve the effectiveness of cloud computing and to achieve efficiencies we expect organizations

to adopt standardized processes & focus on achieving differentiation through collaborative partnerships & use of info. Rapid IT can change how information is used & delivered.

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