IMPACT OF HOSTED SPEECH TECHNOLOGY
FOR HEALTH CARE SERVICE PROVIDERS THROUGH CALL CENTERS

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Abstract

Are the patients (customers) getting connected with the right medical center (people) within the organizations every time they contact? Are call center agents equipped to resolve calls on the first interaction? How do patients (customers) perceive the call center in the service proverdiers' marketplace; are call center perceived as "easy to do business with"? What is preventing the call center from making every interaction count? Every interaction is an opportunity to wow patients and improve relationships. How interactions are handled is just as important as who handles them. Interactive can help the call center to deliver a superior and reliable customer experience. Whether on premise or in the cloud (hosted), Interactive believers' of speech technology and expertise to maximize the value of every interaction. Interactive core Technologies include contact center, attendant console, IVR and call recording solutions that support any telephony environment. The market for hosted speech solutions is still less than half that of on premise, but it's growing at a much faster rate. This past recession hasn't been good for anyone, but it has forced technology buyers to consider options caller may have passed on when budgets weren't as lean. The pricing model of hosted solutions, combined with real improvements in flexibility, reliability, and scalability have conspired to boost hosted speech up the adoption chain for many large companies. This article focuses on the economic benefits of rent versus buy and hosted solutions offer health care service call centers, the flexibility of plugging in point solutions, creating hybrid on premise/hosted solutions that extend the life of previous investments, and the ability to improve the patient (customer) experience to more than just the voice channel.

Keywords: Call Center, Hosted Speech Technology, Health care service providers, Speech Recognition

I   Introduction : Hosted Speech Technology for the a Health care service providers of Call Center Enterprise Market, will fetch a great overview of how hosted speech can help a call center improve customer service and lower costs, available online for customer self-service and call routing offer companies flexibility, reliability, scalability and access to the latest technologies with unprecedented ease and cost efficiencies. Hosted Speech Technology and Outbound IVR Services-Strategic Focus-(June 2008). Speech and natural language understanding are the key technologies that will have the most impact in the next 15 years. Bill Gates (2004).

2.0.   Review of Literature   : There are some significant ways to gain a Competitive Advantage with Hosted Speech technology in a call centers Following are some ways identified to support this article, focus to gain a competitive advantage with a hosted speech technology and multichannel self-service solution.

1.   Focus on the Customer Experience: Today's standards-based hosting solutions enable companies to provide user-friendly, speech-enabled customer self-service without large upfront investments. Caller also reduce pressure on IT staff and allow resources to be redirected toward enhancing the customer experience rather than managing the complexities of building, maintaining and regularly upgrading the underlying infrastructure. For companies stuck with old, end-of-life IVR (Interactive Voice Response) systems, High Availability Applications Hosting (2014), speech provides an affordable way to take advantage of advanced functionality like personalization and actionable analytics that help identify opportunities to enhance customer service, Interactive Voice Response Solutions (2014)

2.   Improve operational efficiency for profitable growth: Hosted speech helps companies balance the need to deliver great service with the need to control costs. Hosting eliminates the expense and frustration of managing telecom resources and equipment, while simplifying access to capabilities that improve the success of automated systems. It also positions companies to efficiently address expanding customer communication preferences, including text, mobile web and social channels. The low capital expenditure (CAPEX) model enables companies to deliver new customer-focused services and initiatives faster, without the significant upfront investment and risk,

Capex vs Opex: Five Must-dos Before You Take the Leap (2013)

3.   **Scale fast and expand globally:** A hosted solution provides the ability to get up and running with little front-end cost, low IT overhead, and the scalability needed to grow on demand to meet changing business requirements. If a company's level of growth is undetermined, it's critical to identify a provider with a standards-based solution architected to deliver performance advantages, coupled with the ability to increase core platform capacity by simply adding gateway and server components to the existing system. To accommodate global expansion, select a hosting provider that offers a common platform anywhere in the world and one virtualized view of our solution, making it easier to manage capacity and leverage available resources. Hosting also offers instant, lower-cost access to multiple speech recognition and text-to speech (TTS) languages to support the expanding business, Tactical TeleSolutions (2014)

4.   **Achieve higher reliability at a lower cost:** Hosted speech provides a level of mission critical reliability that is difficult and expensive to achieve in-house. Hosting providers invest heavily in the expertise, network and tools needed to ensure high performance and 24x7 availability. Choose a provider with a redundant, geographically distributed architecture, backed by a written service-level agreement (SLA) with commitments to incident responsiveness and monetary penalties when levels are not met Companies also can deploy IVR on premises while taking advantage of failover to a hosted solution. The approach eliminates the expense of over-provisioning hardware and capacity to handle bursts in call volume and simplifies business continuity planning.

Searchcrm-Techtarget (2014),

5.   **Get proactive:** Hosted speech is ideal for proactive outbound customer service. The ability to quickly and cost-effectively send time-sensitive emergency notifications, status updates and reminders helps companies maximize port usage and keep agents focused on higher value tasks. In many industries, interactive speech-driven outbound introduces new process efficiencies in the form of streamlined collections, reduced service shut-offs and improved scheduling. And, when it comes to enhancing the customer experience, interactive outbound speech and text is a way for companies to increase customer interaction and loyalty without increasing costs. Call Center Helper (Dec 2, 2012)

6.   **Access the latest technologies and new capabilities instantly.** Hosting offers low cost access to advanced capabilities, including multi-channel self-service, multilingual speech recognition, encrypted call recording, voice biometrics, and location based services and more. Improvements and new functionality are immediately available – without managing upgrades

or installing additional hardware. Select a hosting provider with a commitment to continual innovation for low-cost access to business differentiating technologies.

Microsoft Case Studies (Nov 2, 2009)

7.   Improve security and protect customer data. A standards-based offering enables companies to retain sensitive data and applications on their premises while using a hosting outsourcer for the IVR infrastructure. The leading hosted speech providers have intensely focused on having the expertise, processes and systems in place to ensure security and data privacy. Some hosting providers also offer the option of shared or dedicated environments, including Payment Card Industry Data Security Standard (PCI DSS) compliant environments suitable for deploying applications that handle cardholder information.

PCI ComplianceGuide.org (2014)

3.0.   Methodology

3.1.   An improved ROI Model

Fig 1.0 shows an ROI (return on investment) model suggested for speech systems for a call center or any technology purchase, need to be customized for each investment, as the savings will vary by site even within organizations. Dr. R. Manoharan, Dr. K. Vivekanandan, (28th May 2011)
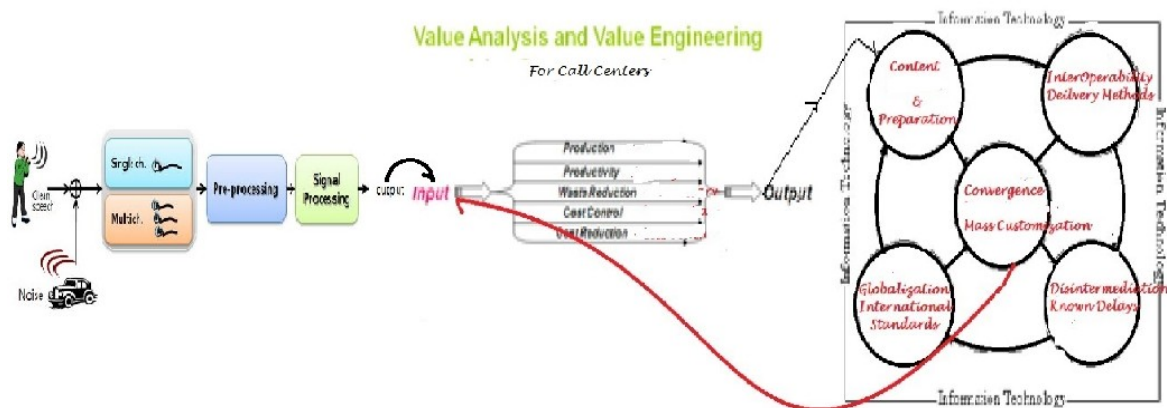
Fig: 1 Improved ROI Model for a Call Center hosted with Speech Technology

In a nutshell, the interrelations among five info trends is deeply rooted and mutually reinforcing. The quest for more perfect product or content manufactured using speech technologies drives interoperability. Interoperability drives disintermediation. Disintermediation leads to globalization and globalization fosters convergence. And to close the loop, convergence stimulates the IT-literacy and IT-non-literacy that drives the demand for content. This mutual reinforcement suggests that the strategic importance of those trends using natural languages for business processing will swell exponentially, for both IT buyers

and sellers. Barriers such as lack of standardization, IT literacy and regulatory myopia, however intimidating, are being dismantled by those users and suppliers who wants to "go for IT with speech technologies.

The primary reason why this technology is expected to be one of the top market performers is that speech is the most ubiquitous form of communication in and out of the World, making speech recognition the most preferred form of self-service. Donna Fluss (March 2003)

3.2.   Vision, Strategies and Tactics for delighting Patients with Innovative Speech Recognition

3.2.1   Strategies for Inbound call handing utilizing speech recognition to delight patients and impact the bottom line.

For any company, answering and accurately transferring calls in a high quality consistent manner and transferring to the intended person, department, or information cost effectively is critical. Statistics from drvoip.com indicate that less that 30% of phone calls to businesses are from clients or prospects and most are from friends and family, other employees, or outside vendors tying up live operators. So an effective way to provide "high touch" personal attention to the company's clients is to deploy a high quality speech enabled automated attendant (SEAA) to quickly and reliably connect inbound calls. Enterprises deploy SEAA solutions to create a consistent highly polished customer call experience, improve internal employee-to employee communications, and create an option to free up live operators for "high touch" customer calls. SEAA also enables a "Numberless Enterprise" allowing employees to be highly mobile yet completely reachable through the SEAA.

Ensure continuous improvement and SLA: Recognition rates can decline over time due to employee churn yet very high recognition rates above 95% are essential to the successful use of SEAA within a thriving business. It is critical that any 'problem names" for the SEAA be detected automatically and routed to a linguistic programmer for tuning and next day correction. Superior SEAA solutions come with an SLA that measures recognition performance ensuring continuous improvement

Share the knowledge with multi-tenant: When name phonetic definitions are shared among SEAA customer tenants in a 'master dictionary' as new definitions are added to one system caller become available to all other tenants. Knowledge is shared across the cloud for maximum user satisfaction. Tasks such as failed recognition analysis and names tuning in multiple languages require sophisticated tools and deep linguistics expertise. A cloud-based SEAA allows all name recognition improvements to be shared among all tenants daily

through a 'master dictionary' allowing customers to benefit each other's recognition performance. Thus, sophisticated centralized and automated utterance characterization and distributed multi language linguistics tuning are available to even the smallest customer at an affordable price.

Look to the Cloud: A speech recognition solution hosted in the cloud offers significant advantages. Companies can leverage state-of-the-art technologies without major investments in hardware and infrastructure. In addition, concentrating expensive speech recognition technology resources and expertise and making them available on an "as-needed" basis is a perfect model for the resources and skills needed to deliver and maintain a high quality SEAA. These efficiencies are improved when add the cost of redundancy and fail over.

3.2,2. Tactics for humanizing the caller experience for the benefit of patients (customers) and business

It's all about, whether it's from a 4 year old, a 24 year old or a 74 year old. The customers think this, and more importantly caller expect call centers to respond by catering to their individual needs. This is no more apparent than in customer service, where putting the customer first is paramount to the organization. The following are some tactics on what call centers should be looking at to put customers first, and how to automate processes and increase customer satisfaction at the same time.

Personalize the interaction: Wherever possible, use all available data about the callers to drive an intelligent interaction with them. Imagine an IVR system that starts the call by saying, "Welcome to <company>. I see you placed an order yesterday. Is that what you're calling about?" This system has used available data, and made an intelligent assumption that it then verifies with the caller. 90% of the time, the system has made the right assumption, and instantly gains the trust of the caller, enabling automation to work. The other 10% of the time, the caller simply says "No," and moves on.

Just as a human being in a store might remember someone who was in earlier that day making a large purchase, an intelligent IVR system should be able to treat a caller differently when it makes sense, based on what the system knows about that caller.

Listen to the callers: The customers ultimately decide whether IVR system is successful or not, and call centers will provide the most useful data the call centers have about how to improve that IVR. And by "listening" we don't just mean caller surveys about how callers liked their interaction with the IVR. While these types of surveys can provide one important view of caller satisfaction, quantitative reporting data about how callers are using the IVR

and qualitative data from listening to recorded IVR calls can uncover which specific improvements are needed. If the call centers have the right type of analytics can see exactly where the callers are having issues in the call flow. These problem spots will be indicated by a high level of people leaving the IVR to get to an agent, or high levels of "no match" errors (the IVR asked a question and didn't understand the response or "no input" errors (the IVR asked a question and the caller did not respond.) The end result is visibility into the caller experience as a predictive indicator of both customer loyalty and total cost per call.

Iterative, Analyze, Repeat: One of the biggest issues companies have when deploying an IVR system is provider test the system, launch it, and then walk away. Call centers will never be able to test for every scenario that a customer may throw at the IVR. Call centers need to plan to make changes within a day, a week, a month, 6 months, a year and beyond. Leading edge companies are using BI (business intelligence) analytics to examine voice interactions holistically, including the experience prior to reaching an agent and the experience of callers who self-serve. This is what a call center need to do after launching a new IVR. Look at call reports on a regular basis –especially after launching a new IVR or making changes. The right reports give the actionable data. Find places that have high a percentage of errors (like the no match/no input mentioned earlier), and correlate these with places that a have high number of hits – i.e. a cross reference of the spots that have the highest amount of callers, and higher than should be expected error rate. Focus efforts on these top "offending" spots in the call flow – listen to calls that hit those spots and adjust things like grammars / prompting / use of data. Then retest. And then, of course, start this process over to look at what the impact of change(s) was.

In this day and age, has never been truer because technology allows this mentality. In reality the company should be able to cater to the customers' needs. But, as evidenced in the tactics above, call centers have to be able to move fast, which is why an on-demand, cloud-based provider of these solutions is key. Putting the caller (customer) first is a business problem that can be solved if call centers go into it with the right mentality and right solution.

3.2.3.   Vision: The Future if customer care is in the Clouds

How the Cloud can extend like Natural Experiences to IVR: Consumers today demand and deserve an 'effortless' service experience. Whether calling an IVR, using a mobile app or the Web, the customers have a simple desire: to engage in intelligent conversations that provide immediate outcomes. Popular smartphone apps such as to Go! are setting the bar, making consumers comfortable asking a device—rather than a live agent—for information in a very

intelligent, conversational way. So, what kind of impact can this type of experience have on a contact center?

First, speech is a powerful tool for getting answers. Consumers expect natural, personalized self-service and now that same like experience can be extended to the IVR with natural language. Not only do callers prefer it, it also improves call centers economics. Natural language reduces the Burlington, Mass (May 8, 2013) number of prompts that callers must respond to. Nuance data shows that for every prompt a company can eliminate, call centers add about three percent in self-service potential. And, since callers can spend nearly 90 percent of their time listening in the IVR—all the while making judgments about organization's brand, it's critical to provide an experience that leaves the right impression. Natural sounding audio and great design can reduce task completion time by as much as 50 percent.

Personalization can also have an impact on caller satisfaction and economics. Predicting what a customer is calling about and using that information to more intelligently interact with them can further shorten call durations and increase customer satisfaction. According to Nuance usability studies, callers whose interactions were personalized (even as simple as greeting a caller by name) found those systems to be 'more helpful' than those that didn't—a perspective that can again positively improve self-service results and brand power. On demand keeping a step ahead: Nuance (2014), Having access to the latest and greatest personalization, natural speech and audio technologies is critical when it comes to delivering a next-generation IVR experience—and there's no better way to do that than through the cloud. The benefits that apply to cloud services are vast: from freeing up staff and moving IVR to a pay-as you-use OpEx model, Call Center Helper (Dec 2, 2012) to providing a continuous improvement environment that delivers more innovative applications Nuance On Demand is poised to help the call centers reap all these benefits by seamlessly adding natural language to IVR *and* extending that same intelligence to the mobile apps and customer Web site searches—all in a single cloud-based platform. Delivering modern conversational IVR to more than 2 billion callers annually, Nuance On Demand is the biggest natural language platform, with the most advanced technology.

Imagine being able to provide the callers the smoothest dynamic audio for a better sounding IVR or adding voice biometrics across IVR and mobile apps to add convenience and security? How about advanced ACD and CTI functionality, Automatic call distributor (2014), for integrated agent routing or outbound voice or SMS notifications that are integrated into

inbound IVR? Or using a natural language understanding engine to drive SMS auto-response and Web or mobile-based FAQ apps? It's all possible because the Nuance On Demand platform automatically makes every new speech advancement available to its customers. With easy accessibility to the most advanced technologies, enterprises are more likely to improve self-service, often 12 months in advance of Innovation alone doesn't guarantee success or deliver business results though. With Nuance's market-leading experience, Paul Ricci (2014), gained from over 8,000 deployments, Nuance On Demand customers recognize 20 to 30 percent performance improvement over other hosted systems. In fact, more than half of Nuance On Demand customers have migrated from other hosted services and are now getting bigger savings (and a better customer experience)!

Burlington MA (July 27. 2010)

Every day, for every interaction, Nuance On Demand leverages the most advanced infrastructure, technology, tools and services that translate into innovation, savings and a great customer experience**.**

4.0.   Findings

A query sample screen shots are given below using hosted speech technology in a call center which facilitates the process of operating time faster.
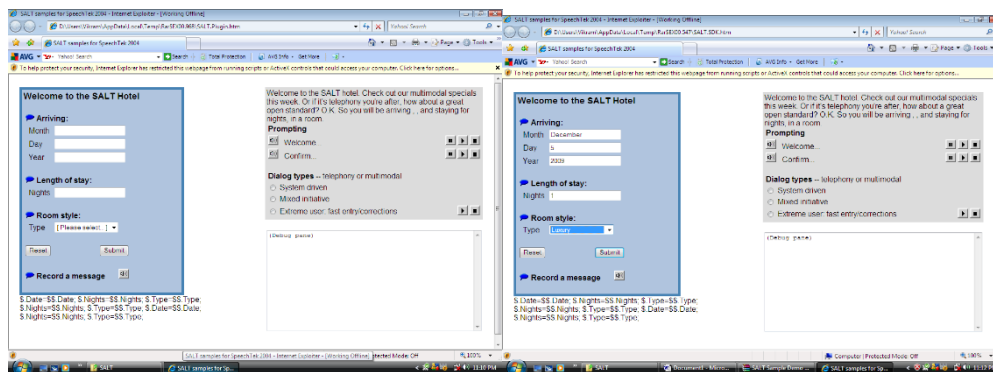

Fig.2 Request to from a customer   Fig.3 .Automatic response from the

service provider

4.1.   Proactive reach with outbound Interactive Voice Recognition – IVR

In order to create efficient communication channels while maintaining a high level of personalized care, a tight integration of voice self-service and virtual agents is needed. Requirements include:

• *Skill base routing*—both inbound & response to outbound calls can be transferred to medical staff that are patient questions. Healthcare providers can focus on hiring qualified staff regardless of their location.

• *Back office integration*—Agent access to CRM systems provides a complete view of a patient's medical history. Auto-populated CRM screens let agents skip questions.

• *Seamless voice self-serve* to live agent Eliminate asking for repeated detail by playing a recorded key word or phrase to the agent.

• *Real-time queue management* to minimize caller wait time.

4.2.   Ensure both quality care and compliance

Call plus agent screen recording with a graphical interface delivers caller satisfaction results along with the agent's input for a complete perspective of the entire experience. This feature should include:

• Recording the experience as a single entity.

• Capturing agent screens for the agent's perspective.

• Providing a graphical user interface to easily listen, see and share Wav files.

• Hosted storage of recorded files offering significant capacity with security for healthcare compliance.

4.3.   More flexibility with engaging dialogs

With advanced speech recognition technology, healthcare providers may offer a broader range of interactive voice self-service options without agent assistance. New patent pending Crystal Wave technology enables more accurate and engaging dialogs without using expensive and labor intensive NLU-based systems. Filtering ou**t** extraneous utterances along with recognizing more free form utterances is useful in healthcare where pharmaceutical identification and disambiguating between similar sounding references to medical conditions can be challenging.

4.4.   . Foundation for innovative care

Healthcare service providers leverage an on demand multi-channel contact center to provide superior long term patient care while curbing costs should consider the following characteristics:

•   Failover with redundant hosting facilities.

•   Stability as part of an organization that has achieved long-term success.

•   Evidence of innovation—Speech technology and dialog design proof points such as dynamically   changing dialogs based on personalization along with an ability to successfully automate complex calls.

•   Multi-channel hosting resources including inbound and outbound IVR, SMS messaging, and agent services provided as a unified solution.

• Proof of Performance—Robust testing facilities and call volumes measured in the hundreds of millions per year and beyond point to scale and reliability.

5.0. Conclusion and Discussion

Utilize outbound speech recognition and SMS messaging for Breast Cancer, Glaucoma, and wellness reminders with voice-enabled links to knowledgeable agents. Proactive measures have been identified as a means to improve care while reducing costs. Reaching subscribers with ease of use and automated efficiency will also assist with NCQA (National Committee for Quality Assurance) certification requirements for HEDIS measures.

Telemedicine (remote medical care) is predicted to grow tenfold to over $100 billion by 2015 in the U.S. (according to PwC). Voice self-service can handle many routine calls cost effectively, freeing skilled healthcare agents for higher value interactions

The call centers health care of in general looking for ways to offer more services, applications or just more value to Business VoIP customers but don't have the budget or in-house expertise to make it happen?. Some unique speech enabled auto attendant SEAA designed to be resold by hosted VoIP service providers**,** FreedomIQ (2014) with a SaaS based deployment option that enables call centers to add SEAA to the feature set easily and quickly regardless of current infrastructure, with no equipment to buy, no engineering personnel needed. Call centers do all the setup and sign up the customers. Lyrics Solutions (May 12, 2012) **.**

Hosted speech technology enables call centers of health care or in general, to better compete with innovative service offerings, faster time-to-market and cost advantages. Remember, hosting does not need to be an "All-or-nothing" decision. Understand the options, including the ability to deploy a hybrid solution that combines the benefits of hosting and premise-based solutions **"**9 critical capabilities to demand from your IVR cloud hosting provider" today. Voxeo (2014),

And as Natural Language (NL) speech applications move into the mainstream, chances are the call center enterprise will install the technology during the next 12-18 months. Aaron Fisher, (2009**,** so that enterprise will enjoy the 85% of volume of calls increase and 50% of cost reduction, and there by finding an option for a Killer Apps, may be eliminated, Dr. Kai-Fu-Lee (2014).

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