Market White Paper

Natural Language Engines for Advanced Customer Interaction

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Overview

Discerning on-line customers are calling the shots and they aren't very forgiving when a web site promises better service through snazzy technology but can't keep its word. Software vendors that deliver real innovations in customer interaction have an excellent opportunity to solve this problem, thereby providing their customers with significant value. At the crux of the issue is a communication gap between software applications and people. Software traditionally requires structured data in order to effectively process information and generate results. In contrast, human communication is informal, ambiguous, imperfect and constantly changing, making it difficult for computers to read, understand and take appropriate action.

Natural language processing can bridge that gap by offering intelligent software and applications that enable enterprises to build better customer relationships, get more value out of unstructured information, and work smarter. This paper describes why Customer Relationship Management (CRM) applications in particular are enhanced significantly by natural language processing; the attributes required in order to make these advanced applications successful, and how enabling technology can help application providers solve real customer problems in a variety of solution categories within CRM. To illustrate by way of an example, this paper will focus primarily on the challenge of delivering intelligent on-line customer care, where companies must handle unprecedented volumes of unstructured multi-channel customer interactions in a timely, accurate and efficient manner in order to maintain and improve customer satisfaction.

Why The Customer Interaction Market Needs a Natural Language Engine

Consumers are demanding better on-line customer service

On-line customer interaction channels such as e-mail response, web-based self-service, and chat promise both consumers and companies alike an effective supplement to telephone-based call centers. However, as with any new technology, there have been some challenges concerning actual implementation and adoption. The *Industry Standard's Year in Review* reports, "The quality of on-line service is getting worse, in part because of automation. It's slow, impersonal, and inaccurate. This is no way to build loyalty among discerning on-line customers."

Customer surveys indicate that expectations continue to outpace companies' ability to deliver satisfactory service. A recent Jupiter study[1] of the top 125 web sites found that 55% of customers expect accurate responses to e-mail within 6 hours, yet only 20% of companies are meeting their expectations. Forty-two percent of the sites never responded to the e-mails, took more than five days to respond to the questions, or had no e-mail address listed on their site. These companies are turning a blind eye to an on-line communication channel that is critical to their customers. By ignoring their clients in this way these companies are opening the door for customer defection, and allowing their competitors the opportunity to raise the bar of consumer expectations.

Clients like convenience and want more service options

Despite on-line customer care's shortcomings, customers like the ease of web-based service when their inquiries are accurately and appropriately answered anytime, anywhere. Whether, it is on-line or in person consumers want access to professionally managed customer service. Additionally, people want to ask questions in free-form natural language queries and not be forced

to conform to structured fixed formats. In a best practice scenario, a company uses technology to shoulder many of the tasks involved in shopping and customer service, relieving the burden of on the customer.[2] And finally, consumers expect to be understood and recognized regardless of the communications channel.

Actual customer contact adoption shows that all channels are growing, but e-mail response and web-based self-service will experience exponential growth in the next five years. The relative importance of e-mail response is highlighted by the fact that over 74% of on-line customers consider it an indispensable service capability[3]. This is followed closely by web-based self-service at 50% and chat at over 20%. According to Forrester Research[4] companies that offer customer relationship management solutions report the following mix of service inquiries: 54% use the telephone, 9% submit e-mail inquiries, and 37% employ web search. However, in the near future, Forrester projects over 80% of consumers will use the web to answer their questions. In essence, consumers are demanding knowledge ATMs that provide instants answers.

In spite of the hype and fallout from the last few years – providing superior on-line customer service is still a significant opportunity

Achieving competitive advantage by providing superior customer service at a reduced cost is the proverbial Holy Grail for businesses, and it is a core concept driving the adoption of on-line customer care. The single biggest expense in contact centers is labor. Technologies that can effectively divert even a small percentage of inquiries to automated channels that previously required extensive manual handling represent a huge a return on investment (ROI) with short paybacks. Forrester Research[5] points out the following average costs per customer inquiry average – $33 per telephone call, $9.99 for an e-mail inquiry, and only $1.17 per self-service web search.

For example, a contact center could easily realize an estimated annual operating cost saving of $4 million due to the successful diversion of traffic away from the phone contact center. The $4 million savings are based on the typical costs of a 500-seat contact center where the annual costs per agent (including training and recruiting) comes to $80,000. By putting an effective web-based self-service product on a web site a company could divert at least 10% of their calls away from contact center. These figures are arrived at by multiplying the cost of 500 agents times $80,000 equaling $40 million a year in total labor costs; so a 10% diversion comes to a labor cost savings of $4 million a year. These calculations are not unrealistic given the fact that typically 80% of the customers are asking questions about the same 20% of the corporate universe of answers. Surely, there is an opportunity for automation efficiencies.

A recent New York Times article[6] expands on this point, “When they were not promoting the now-laughable myth of ‘first mover advantage’, early e-commerce proponents proffered the idea that self-service web sites could essentially run themselves, with little or no overhead. That notion has long since given way to huge technology budgets, sprawling fulfillment operations and legions of customer service representatives (CSR) typing e-mail replies to patrons of web sites or talking them through transactions by phone. But now, as many of the first movers circle the drain, improvements in customer service technology are helping survivors come much closer to the early

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[1] Jupiter Communications. “E-mail Customer Service: Taking Control of Rising Customer Demand. 2000.
[2] Harvard Business Review. “Exploding the Self-Service Myth.” Moon, Youngme and Frei, Frances. May June 2000.
[3] Jupiter Communications. “E-mail Customer Service: Taking Control of Rising Customer Demand. 2000.
[4] Forrester Research. “Tier Zero Customer Support” December 1999.
[5] Forrester Research. “Tier Zero Customer Support” December 1999.
[6] New York Times, “E-Commerce Report: Taking Customer Service Seriously” March 19, 2001, Tedeschi, Bob

self-service ideal. For instance, Internet executives and analysts cite the growing efficiency and popularity of technologies that help web sites compile large storehouses of frequently asked questions and their answers. Those technologies take sites beyond the static and frequently useless FAQ pages, allowing customers to type in precise questions and get detailed responses without having to wait for live help."

In spite of the burst in the Dot.com bubble, businesses are investing heavily in on-line initiatives. "Forrester Research has pegged electronic commerce to hit $6.8 trillion in 2004, with 90% of that coming from business-to-business sales, said Forrester Research. About 80% of Cisco Systems' orders are taken on-line, about $5 billion last quarter – saving the networking giant $760 million in annual operating costs. IDC reports companies will spend $10.2 billion to store and share their employees' knowledge over the Net by 2004. Electronics manufacturer Siemens has spent $7.8 million to create a web site for employees to share expertise to help win contracts. The result: new sales of $122 million. META Group believes corporations will spend $12.2 billion by 2004 on linking customers, sales, and marketing over the web. Lands' End converts more than 10% of its web visitors to buyers – compared with the average 4.9% – in part because it offers live chat and other customer service extras."[7]

Managing customer interactions across multiple channels is a major challenge

As the e-Business application market evolves, managing all customer interactions seamlessly across multiple communication channels such as e-mail, self-help, live chat, and telephone will be necessary to provide complete, integrated solutions that enable companies to meet consumer's expectations for 24x7 quality service. Many believe that a company's web site will become the focal point for customer interaction activity. In fact, Gartner Group estimated that by the end of 2001, 25% of all customer interactions would take place via the Internet.[8]

Recent studies by industry analysts further corroborate this increased focus on web-enabled call centers.

- In a Forrester study, seventy percent of Fortune 2000 firms claim that a web-enabled contact center is critical, yet only twenty six percent of these firms have one.
- Jupiter interviewed 30 executives from travel, financial services, and retail sites, and 77 percent of the executives said they intend to increase their investments in e-mail routing and processing systems.
- Gartner reports that by 2005, 70 percent of call centers in geographic areas with high Internet adoption rates, such as North America and parts of Europe will support integrated live web contacts and/or e-mail response management systems.

A multitude of software applications and technologies such as Automatic Call Distribution (ACD), Computer Telephony Integration (CTI), Voice-over-Internet Protocol (VoIP), call center, sales automation, marketing automation, workforce management, e-mail response, web-based self-help, chat/co-browse, etc. are just some of the components required to deliver on the promise of the multi-channel web-enabled call center. The market demand for all this functionality and integration work will be explosive in the coming years. This change in human behavior is creating many interesting opportunities and difficult challenges for e-Business software application developers.

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[7] Pg.128, BusinessWeek, "E-Biz: Down But Hardly Out." March26, 2001.
[8] Gartner. "E-mail Response Management Systems Market Analysis." December 1999.

Organizations find themselves in a "Catch-22" situation where their customers are demanding more access, instant recognition regardless of the purchasing or service channel, 24x7 support, and the increased convenience of e-Service. At the same time these customers are less tolerant of poor response time, inaccurate answers, or worst of all – non-responsiveness. To avoid alienating customers, some companies have elected to delay offering new communication channels, causing them to turn their back on customers by limiting access to their services. As previously noted, this is a dangerous alternative that foreshadows potentially disastrous consequences. The result – most companies are aggressively pursuing web-enabling contact center strategies and other e-commerce projects.

E-Commerce is still going strong as corporations expand the ways they use the web, and those e-Business projects remain high priorities. AMR Research indicates that 87% of companies are still sticking to sales and customer service initiatives. Forrester Research surveyed major corporations and found the following results[9]:

	HAVE IT ALREADY	STARTING IT NOW	CONSIDERING	NO PLANS YET
SELLING ON-LINE	35 %	30 %	16 %	19 %
CUSTOMER SERVICE	21 %	34 %	28 %	18 %
CAPTURING WORKER KNOWLEDGE	15 %	32 %	27 %	27 %

High volumes of unstructured messages present a barrier to better on-line service

While web-enabled customer contact centers are viewed as essential, companies are finding it difficult to support the deluge of daily inquiries in a coordinated manner across both new and existing communication channels. Gartner Group estimates that more than 90% of enterprises are not adequately prepared to handle customer on-line inquiry volumes. But timely response is only expected to become more difficult, since Gartner Group also estimates that the volume of e-mails for customer support is expected to increase from 30 to 100% annually in the next two years. Forrester Research projects similar dramatic growth of both web and e-mail customer contact volumes over the next three years.

"Data is growing exponentially," said Armando Garcia, IBM's vice president of content management solutions. "The amount of digital data is going to cross analog data in about 2006 and then exceed it." This rise in digital data is not just an ivory tower proclamation from the data gurus at IBM. It is taking hold in practically every company on Earth, with very real implications for business success. "Every corporation that touches its customers or supply chain with what used to be paper forms, telephone conversations, and faxes," Garcia says, "is now capturing that data digitally, on-line, because that's what they need to be more responsive and improve customer service and lower their costs." The issue is not only how businesses cope with this data overload,

[9] Pg.130, BusinessWeek, "E-Biz: Down But Hardly Out." March26, 2001.

because merely coping is quite like chasing one's digital tail, while a smarter competitor races ahead.[10]

Despite organizational attempts to force structured communication with mechanisms, such as web forms and Interactive Voice Response (IVR) scripts, people inevitably prefer to communicate using natural language instead of being forced to learn a technical syntax. Customers feel confined when they are forced to adhere to predefined fields; they get frustrated when they need to fill out multiple forms for related requests. Instead, they prefer to ask questions that allow one to express themselves in free-form mediums such as e-mail and natural language query engines. Unfortunately, for business these desirable communication types generate unstructured data that contains no metadata to describe its content.

To process unstructured data – content that does not fit neatly into the rows and columns of databases, such as e-mail correspondence and web based self-service inquiries – organizations must either rely on human beings to interpret meaning or take advantage of automation. "IBM estimates that 85% of the data on the World Wide Web is unstructured. Relational databases are rarely appropriate for storing or retrieving vast amounts of unstructured data or text. Textual materials are too variable – in length, in type of information, in types of queries performed, or in layout – to fit a strict relational database management system (RDBMS) model."[11]

The world's rapid adoption of new communication media has created a mounting glut of "unstructured information" and has made manual handling problematic. In addition, the world's limited supply of knowledge workers has grown at a very slow pace. Other limitations include: inconsistent quality, recurring training costs, difficulty leveraging gained knowledge across multiple channels, a need for staff to understand and respond in multiple languages, and the costs of simply finding information. IDC points out that the, "Time spent in finding information is a growing concern for knowledge workers and their employers. Recent studies have shown that knowledge workers spend 50% of their work time just finding information."[12] The human-to-human support model, while appropriate at specific levels, can't feasibly scale in a 24x7 high volume, one-to-many, multi-channel customer service operation.

Advanced customer interaction is needed to retain customers and shrink costs

Closing the on-line service gap is driving organizations to search for ways to automate elements of their unstructured interactions with people wherever possible. Addressing the issue of too much unstructured content and too few people requires systems that can understand natural language and take appropriate action. Natural language engines, also known as smart engines, can automate tasks such as reading and responding to e-mail, filing news articles and retrieving them easily later, and answering questions posed by people browsing on web sites in a timely, accurate and consistent manner.

Automated response provides e-mail auto reply and web-based self-service functionality that allows customers to become a part of an organization's support system. Intelligent automated response solves problems employees used to resolve. Customers who are getting adequate service are more than willing to take advantage of this added convenience of not waiting in a queue. In most cases, while these new channels do not represent substitutions for live phone agents, they do

[10] Pg. 46, Liautaud, Bernard and Hammond, Mark. *Turning Information Into Knowledge Into Profit e-Business Intelligence*. New York, McGraw Hill. 2001.
[11] IDC, Document and Content Management Technologies Forecast 2000-2004, Susan Feldman and Steve McClure, 2000.
[12] IDC, Document and Content Management Technologies Forecast 2000-2004, Susan Feldman and Steve McClure, 2000.

offer a means to expand service access channels 24x7 and significantly lower costs per transaction while improving customer retention rates.

Companies can utilize natural language processing to automate the processing of live customer interactions such as text chat and voice categorization. A real-time chat offering can utilize a smart engine to interpret a customer's textual communication as it appears and suggests relevant responses to an agent. This intelligent automation allows CSRs to process more inquiries by significantly reducing the time needed to research answers.

Speech applications include training the smart engine to categorize voice messages by intent for purposes of training call center agents and identifying categories of commonly asked questions. This type of classification allows companies to identify problems in service and focus resources on fixing those issues. To facilitate this type of application requires a smart engine to analyze the output from a speech to text conversion process. Natural language engines will enhance the efficiency of processing large volumes of unstructured voice communications, and enable vendors to provide a capability that was previously impractical to deliver.

The value of natural language engine automation can be illustrated by the following cost comparison study. In this case, a Giga Information Group study[13] provides a data point detailing the following customer assistance costs per transaction across multiple channels: phone – $5, live chat – $2.50, agent based e-mail response – $2.25, automated e-mail response – $0.75, and web site self-help – $0.05. Clearly, a smart engine that provides assisted and automated response to automatically deliver answers or take appropriate actions with little or no assistance from agents with a "lights out" system offers businesses significant cost savings. While the actual cost projections vary between studies, the costs of human assisted channels remain substantially more expensive than automated alternatives.

"Demand for this is definitely picking up," said Paul Hagen, an analyst with Forrester Research, the Internet consulting firm. "A year ago, it wasn't even on people's radar screen. But it is now, because companies are past the 'I've got to get the site up and running' phase, and they're thinking about how to do it well."[14]

Smart engines can provide advanced customer interaction capabilities for many CRM related applications

As we stated at the outset, Natural language engines can be applied to a multitude of other CRM applications beyond customer service. For example, e-mail marketing solutions need to effectively manage the unstructured, free-form returned responses resulting from each outbound marketing campaign. Processing the high volume of responses is manual and cost prohibitive in terms of human resource. Many outbound e-mail providers are forced to ignore these messages, particularly when there is an increase in volume, and they are therefore at risk of violating "unsubscribe" privacy policies. Additionally, up-sell/cross-sell opportunities are being missed, or worse customers who are expecting a response are being overlooked.

A smart engine enables e-mail marketing applications to provide highly accurate automated and assisted responses and to leverage the information contained in these messages. E-mail messages can take on many different forms. Promptly recognizing and removing people who express a

[13] Giga Information Group. "E-Commerce Web Sites and Self-Service Will Never Completely Replace Customer Contact Centers" December 1999.

[14] New York Times, "E-Commerce Report: Taking Customer Service Seriously" March 19, 2001, Tedeschi, Bob

desire to unsubscribe is a sensitive issue. This is currently being done by most outbound marketing companies by instructing recipients to reply with an "unsubscribe" in the subject field and searching and sorting these messages for automatic handling. The reality is, people unsubscribe in many different ways. They may bury their unsubscribe in the body of a message, include spelling errors, or request "take me off this list." A marketing automation solution powered by a natural language engine allows people to break the rules in free-form ways and still receive the appropriate response.

A natural language engine can automatically route messages from individuals whose inquiry intent indicates a predisposition to buy to a sales force automation application. Or it could enable sales representatives and other users to query the knowledge base of sales and marketing materials in natural language to find relevant information quickly.

Additionally, wireless technology can use a natural language processing engine to parse a text inquiry and return a pertinent answer – anytime, anywhere. Information access and delivery applications abound that require a high-performance natural language engine. The automation efficiencies delivered by a smart engine are absolutely essential for retaining customers, growing sales, and solving widespread and growing service level gaps between customer expectations and company performance caused by the exploding volume of unstructured customer interaction content. Other examples include sales force automation, field force support, and customer case management, where the basic principles of helping employees manage unstructured customer interaction – descriptions of interests or issues – apply as well.

Attributes Every Natural Language Engine Offering Must Have To Deliver High Performance Customer Interactions

To effectively meet the growing needs and demanding requirements of the customer interaction market, every natural language engine must have the following characteristics:

- Deliver a complete understanding of free-form, imperfect, complex, constantly changing content common to customer interactions
- Adapt to variations and change in real-world communications by providing real-time feedback to improve accuracy over time
- Achieve high accuracy with minimal configuration and maintenance load
- Enable fast and easy implementation in days and weeks versus months to facilitate exceptional ROI
- Provide multi-lingual capabilities without requiring new releases
- Supply proven technology that is scalable in the highest volume on-line environments
- Experienced in working through unstructured customer interaction channels
- Make available cross channel capture and aggregation of customer interactions
- Embed easily into enterprise applications providing fast time to market and enhanced revenue generation

Deliver a complete understanding of free-form, imperfect, complex, constantly changing content common to customer interactions

Enabling enterprise solutions to understand human communication presents unique challenges. Next generation systems, deployed in customer interaction applications must handle effectively a

unique combination of content attributes specific to customer interactions. These capabilities include being able to deliver accurate responses in spite of:

- Variations, ambiguity, and errors in expression, i.e., the kinds of natural spelling, grammar, and semantic heterogeneity people introduce when they communicate in the more informal channels normally used for customer service ("what's my account balance?" vs. "how much money do I have left?").
- Continual change in the nature and the mix of the content being communicated, as business propositions or policies and customer issues evolve naturally over time, both within the business (e.g., new products and services, web site upgrades) and external to a company (e.g., recalls, publicity, fads).
- Noisy, informal, free-form communications such as slang, new product names, new lines of business, misspellings, new jargon, footers/headers, symbols, emoticons, etc.
- Multiple intents and concepts from a single inquiry.

Adapt to variations and change in real-world communications by providing real-time feedback to improve accuracy over time

Normal business events such as changing promotions, new products, new pricing, acquisitions, etc. create new types of communications containing new concepts that confuse first generation systems. Static keyword, rules-only and statistical systems ignore the new intents introduced by these ever changing customer interactions, and need to be re-programmed or re-trained. These systems often fail in cases where inquiries are introduced with the same intent but are worded in a different way. In an attempt to keep up with this growing complexity, companies are required to embark on a daunting, expensive agenda of manually retraining, rewriting and testing an ever-increasing labyrinth of new rules or statistical models. Meanwhile, the static "snapshot in time" nature of these systems causes customer satisfaction to suffer because their systems are providing the wrong answers or launching the wrong workflow. The efficiency they once delivered crumbles over time in these new complex environments.

Maintaining these systems gets more cumbersome and expensive as time goes on. If the rules are not well documented the system can be made useless by the departure of a key individual. Statistical systems are based on static algorithms. One must assume change, decay or erosion of accuracy is inevitable. Simply put, to deliver on consumer's expectations for quality service and evolve an e-Business at Internet speed, these systems must do more.

A natural language engine should have the ability to learn from real-time feedback, automatically by watching a business' experts working on real problems (avoiding the need to pull them off-line to engage in a long, labor-intensive system implementation project) making these systems easy to deploy and maintain as change occurs. A learning system provides real-time feedback to insure that training continues with each new message processed by the engine. Lab tests and high-volume, real-world deployments of smart engines in customer interaction environments have indicated that the ability to handle these characteristics well can mean the difference between an effective solution and a lost investment.

Achieve high accuracy with minimal configuration and maintenance load

Understandably, consumers want accurate answers to their questions or satisfaction of their requests. A vendor that can offer an engine that consistently delivers 90% verses 60% accuracy is delivering significant value in terms of less worker involvement (e.g., research, reworks, etc.) and

more immediate customer satisfaction (e.g., preventing customer frustration when receiving the wrong answer). Accuracy will become even more critical in providing companies competitive advantage as the volume of inquiries continues to grow across channels. A Yankee Group Report[15] found that over 49% of e-mail inquiries were answered incorrectly or the responses caused the individual to contact customer service via the more expensive telephone channel. The negative impact on a business' ability to retain customers will surely be affected by this lapse in service, as well as, influence the likelihood that they will adopt lower cost on-line service channel options in the future.

A system should be able to accurately identify the intent of the following example:

> *"Hello there, I just transferred $100.00 from my Savings account into my Visa account to make a payment to my Visa. When I went back to my account balances screen, there was no change to my Visa, but my Savings account had gone down by $100.00. I haven't received a Visa statement yet, but I wanted to make a payment while I had some extra money in my account. Is that $100 going to show up on my Visa as a payment or did I just somehow lose $100? The confirmation number from the transfer I just did is: 5138 if you need that to check into it. Could somebody please let me know as soon as possible? I would appreciate it very much."*

In order for a natural language engine to be effective it should be able to understand that the above question is not a Visa Card question, but rather a balance transfer question. First generation systems can not deliver the accuracy necessary to be effective with these types of real-world inquiries. Next generation technology must address these challenges of complexity, noisy, imperfect content and continual change, and it has been proven in both lab tests and high-volume production environments to meet those challenges with higher accuracy and greater ease of use than any alternative.

Enable fast and easy implementation in days and weeks versus months to facilitate exceptional ROI

As with most large-scale enterprise software projects, an on-line customer care implementation requires a significant commitment of resources – people, time, and budget. The plethora of innovative technologies (e.g., personalization, e-mail marketing, analytics, e-commerce servers, wireless devices, etc.) has forced companies to carefully pick and choose initiatives that promise the maximum return on their investment. If the intelligent auto response technology is too resource intensive to implement it is unlikely to get carried out, or worse yet, started and abandoned.

First generation approaches demand very structured and time-consuming analysis that tries limited resources. Auto response systems require training a corpus. The corpus is a set of messages supplied by a company that have already been classified into appropriate response categories. Statistical systems require a large training set of messages across all topics to get started. In the customer interaction space, unlike document management, the collection of previous questions answered is often small, non-homogenous and tends to change rapidly; therefore, it cannot be assumed that there will be enough data to train these systems. These systems are not well suited for the vagueness, change and noisy nature of real-world communication.

Next generation systems must offer multiple startup alternatives to provide for the nuances of each customer environment. Systems must accommodate for small training sets endemic to the customer interactions, and must learn quickly to accurately answer new or changing inquiries.

[15] Yankee Group, "E-mail Response Systems" 1999

Also, systems need to enable companies that may not have a corpus and still allow them to be able to easily and quickly get started. A smart engine must provide easy and flexible implementation options that enable our customers to be able to leverage its power on the first day of production, and achieve over 90% accuracy in many categories. A fast and easy implementation alternative is an essential attribute of any effective automation solution.

Provide multi-lingual capabilities without requiring new releases

Next-generation systems need to scale from both a business and technical perspective. A recent issue of *Business 2.0*[16] offered the following statistic, "Ninety-one percent of the world's largest companies cannot reply to e-mails written in a foreign language." The globalization of economies illustrates that companies, automated or not, are going to need to be able to respond to customers in multiple languages. Over 50% of web users speak a native language other than English, and these users are four times more likely to purchase from a site that communicates in the customer's language

This represents a significant challenge and opportunity for companies, and will be a necessary feature of intelligent auto response systems. A smart engine needs to improve its own predictive accuracy in multiple languages and evolve with changing communication types in a market characterized by transformation. Adding a new language should be as easy as a simple configuration option, with no need to wait for the next release of the software or to change application code.

Supply proven technology that is scalable in the highest volume on-line environments

Vendors that have not proven their technology in high-volume message environments represent a potential hazard to already overburdened corporate resources. As previously mentioned, the unique characteristics of customer interactions create unique challenges that can affect scalability. The prospect of implementing technology that has never met the unique challenges of processing tens of thousands of customer interactions in a real-world production environment presents a high-stakes risk.

Natural language engines that scale must be able to automatically manage change without extensive human intervention. The increasing rate of change and complexity of customer relationships resulting from customer segmentation, mass product customization, numerous product lines, and multiple sales and service channels reinforces the need for adaptable, flexible attributes to ensure scalability. Managing this rate of change and complexity is key to providing scalability.

Experienced in working through unstructured customer interaction channels

The explosion of customer data of all types (e.g., on-line customer service inquiries, sales transactions, click-stream, third party external data, personalization, text to speech conversion) and multiple channels (e.g., voice, e-mail, web form, web-based self-service, chat, co-browse, collaboration, kiosks, conventional mail) demands technology that eases the integration challenge. To successfully integrate advanced customer interaction features into an application, a supplier of auto response and intelligent routing technology must have hands-on experience building CRM

[16] Source: Worldlingo.com, published in the March 20, 2001 issue of Business 2.0 pg. 46

applications. The importance of practical experience working with customer information flows such as audit trails, "cherry-picking", escalation, skills based routing, hierarchical security, threshold management, etc. becomes a key risk-mitigating factor for decision-makers.

Make available cross channel capture and aggregation of customer interactions

Managing all customer interactions seamlessly across multiple communication channels is a critical need for companies. A natural language engine should have the capability to serve multiple channels out of an integrated knowledge base. For example, knowledge gathered by monitoring chat agents, can be used to make e-mail analysis more accurate. Knowledge that is gathered by monitoring e-mail agents could be used to handle web-based self-service inquiries more accurately. This should be achieved without any manual configuration. In a way this is the original premise of knowledge management – push knowledge from the more human intensive channels to the more automated or unattended channels automatically.

A natural language engine can help CRM application providers offer an integrated customer view across communication channels by aggregating unstructured interactions into a common knowledge base. Vendors can leverage this single knowledge base across multiple modes of inbound communications such as e-mail, web forms, chat, and self-service reducing the cost of implementation and maintenance. This sort of system would provide issue escalation to appropriate channels for rapid resolution of customer inquiries. For example, a customer that does not get a satisfactory answer via web-based self-service may automatically escalate that question via e-mail.

The benefits of real-time cross-channel learning are extremely compelling. Imagine a company that begins receiving high volumes of a new type of inquiry. When the support organization recognizes that a new inquiry type exists, they can quickly create a new category and begin manually routing messages to this category. After 5 to 20 messages are assigned to this category, the system will learn to categorize similar messages appropriately. As a result, customers asking this inquiry type through the self-service channel will get accurate responses only a short while after the category was created. Applying the smart engine's learning abilities across multiple channels – so e-mail, chat, self-help, and telephone agent tools can all tap the same knowledge base improvements in real time – is an essential foundation component of next-generation CRM applications.

Embed easily into enterprise applications allowing fast time to market and enhance revenue generation

A provider needs to have extensive experience in applying a natural language engine to deliver advanced customer interaction feature sets. The Software Development Kit (SDK) should be designed to jumpstart third party applications into providing superior functionality such as automated response, assisted response, and intelligent routing. Engine providers need to supply well documented elegant and simple Application Program Interfaces (APIs) that enable developers to link smart engines into their application's customer touchpoints without impacting the user interface, workflow, or data model.

Natural language engines need to easily integrate with an application's workflow to provide developers complete control over every aspect of the classification process by embedding effective natural language processing along with a powerful rules engine for explicitly managing and/or modifying the classification, actions and events associated with any branch or node of a hierarchy. Partners should be able to integrate a smart engine to deliver accurate answers with minimal

integration effort. An easy to embed natural language engine allows CRM application providers to deploy expensive and scarce engineering resources towards advancing feature sets that are core to their domain expertise. Successful providers of advanced customer interaction automation must enhance CRM vendor's ability to generate new sources of revenue.

About Banter

Banter's Natural Language Engine and Related Offerings

Banter has brought to market a next-generation natural language technology that understands human communication and automates appropriate actions. Banter's Relationship Modeling Engine (RME), provides applications the tools required to interpret and act upon natural language with unmatched accuracy. RME core capabilities include classification of unstructured content, real-time learning, language identification and feature extraction. The RME is accompanied by text mining, knowledge base training and configuration tools for rapid deployment.

Banter's current product portfolio includes: the Banter Development Suite, which makes the RME and other core workflow and CRM application services technologies available through a range of APIs and SDKs at multiple levels of functionality, and two complete on-line customer care applications, Banter Reply for web-form and e-mail response, and Banter Self-Help for web-based self-service or FAQ response – both can be private labeled. These applications and enabling technologies make it possible to respond quickly and accurately to the overwhelming free-form information flow generated from on-line customer interactions.

Enterprise software companies are embedding the RME in applications such as answering unstructured questions with high accuracy on web sites, lightening the labor load of responding to customer service e-mail, and automating the classification of large quantities of documents into a taxonomy. Applications driven by the RME have been proven in extensive production operation at companies such as Wells Fargo, ABN AMRO America, and VeriSign. Organizations using Banter have seen as much as 400% improvement in customer service agent productivity.

Contact Us

Banter welcomes the opportunity to discuss the benefits of providing advanced customer interaction functionality to your feature set via our natural language engine. Without exception, our partners and customers who have taken the time to look beyond others' marketing hype and thoroughly evaluate alternative solutions find Banter's performance and ease of use clearly superior. To arrange for a demonstration of any of our products or your own lab test of the Banter Relationship Manager natural language engine, please contact:

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e-mail: sales@banter.com

You may also experience Banter's award-winning technology in action through the Banter Self-Help application at work on http://www.banter.com.