

BBN Call Director™ Case Study

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Description of client: The client is a full-service Internet and data provider for residential and small business customers. They deliver high-speed Internet access such as DSL, as well as other services such as web hosting and email for business customers.

Challenge: *Improving customer satisfaction and reducing costs in the client's call centers.* In 2001 the client used skills-based routing and had a diverse agent pool, which required that their customers navigate many touch-tone menu layers. In addition, they had a rapidly increasing call volume (climbing from 15 to 20M in one year), and no CTI. The result was a high misroute rate, frustrated customers, and escalating agent costs.

Strategy: *Improve routing by replacing in-the-network touch-tone menus with onsite, speech-enabled IVRs.* To reap the full benefit of the speech technology, also deploy CTI to perform load balancing across centers and agent queues, as well as to provide screen-pops so that the agents can better handle the call.

Results: *Significant improvements in routing, account number capture and automation.* Implementing BBN's Call Director system led to a significant reduction in AHT and improved customer satisfaction. 81% of the benefit comes from increased routing accuracy.

Agent handling time reduction: 34 seconds/call
Cost savings: \$5.2M/year

Understanding the Problems with BBN's Call Center IVR Assessment

With a rapidly growing subscriber base, and a tremendous increase in call volume, the client realized that they needed to do something dramatic to both service their customers and to get costs under control. They contacted BBN Technologies, A Verizon Company, to perform a Call Center Automation Assessment. Using patent-pending methods, BBN looked at the problem from the callers' perspective, recording thousands of end-to-end calls in the process. Both the caller-IVR and caller-agent interactions were examined to develop a complete picture of the caller experience, which enabled BBN to recommend improvements for the touch-tone system that could be easily implemented as well as to build the business case for deploying speech recognition technology. BBN projected a reduction in AHT of 34.8 seconds, of which 34 seconds

was realized in the deployed system. To fully benefit from the speech technology (by providing screen pops and load-balancing across centers) a Genesys CTI solution was also recommended. The Call Center Automation Assessment also served as a discovery phase leading to an optimal design for the speech interface.

Recommended Solution: BBN Call Director™

The speech solution recommended was to use BBN Call Director, which allows callers to express the reason for the call in their own words, as shown in Figure 1, rather than having to wade through touch-tone menus. BBN's Call Director speech interface represents a unique and comprehensive solution to improving customer satisfaction and reducing costs in call centers. The application can be designed so that callers can also enter data such as telephone or PIN numbers using speech, and any number of sub-dialogues can be developed to further automate the call. Leveraging 30 years of speech and language processing experience at BBN, Call Director shortens the time it takes customers to get their problems resolved, improving customer satisfaction. Call Director also dramatically improves call routing accuracy and overall automation, resulting in a more efficient use of call center resources and reduced operating expense.

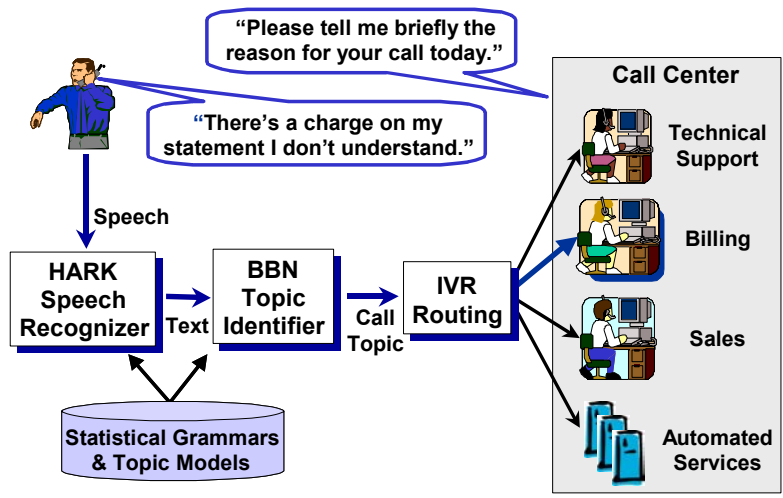


Figure 1: Call Director Functional Architecture.

BBN Call Director provides benefits by increasing:

- IVR throughput rates (more callers are willing to stay in the IVR), and
- The number of callers delivered to agents with useful information.

The key to Call Director’s success is the use of statistical speech recognition and topic identification models that enable a caller to freely describe the reason for their call. The speech recognition engine transcribes the speech into text, then the topic identifier uses language understanding technology to determine the reason for the call so that it can be routed to the correct agent or self-service option.

Speech Deployment

The deployment was characterized by two phases: a pilot phase to design, implement and tune the system while exposing it to a small percentage of callers, and a rollout of the complete system handling all production traffic. The overall timeline is shown in Figure 2. The benefit of the speech system was also established with the pilot system prior to committing to the full rollout.

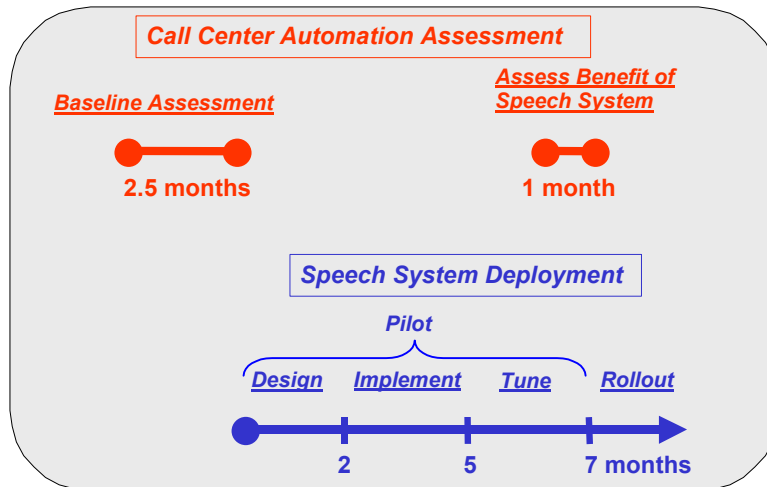


Figure 2: Typical Implementation Including Automation Assessment

The major components of the pilot phase were call flow design, development of the speech application software including “bootstrap” speech models, and collection of data to tune the speech interface. BBN human factors engineers worked closely with the client to design the speech interface, relying on information gathered during the baseline assessment. BBN speech experts then developed the speech application software, including the database and CTI interfaces, for the Nortel Periphonics IVR platform.

The BBN Call Director solution allows people to speak freely at an open-ended prompt, and is configured using a data-driven approach that begins with gathering thousands of examples of the customer answers to the open-ended prompt. The speech application captures the customer telephone number and the reason for the call, then routes them using a total of 28 different call topics. The only automation currently performed by the system is to play outage messages to the callers to deflect calls from the center when there are widespread service outages. Future automation will include readout of account information, payment arrangements, and DSL pre-qualification.

The initial data for the deployment was based on data from previous Call Director efforts in the telecommunications vertical. The consumer data was modified to reflect the fact that callers would be calling about such things as “having trouble connecting to the internet” rather than “having trouble with their phone.” Statistical models for both the speech recognition and topic identification models were trained on the data.

With the trained models in-place, a small percentage of the production traffic was routed through the speech system to collect data for tuning the application. The caller utterances were

transcribed word-for-word and annotated with the true reason for the call, then fed into the model trainers along with the acoustic waveforms to develop the new statistical models. We also listened to end-to-end calls and fine-tuned the call-flows to optimize performance of the speech interface.

Benefits of BBN Call Director

Once the system was tuned, BBN evaluated the benefit of the speech system using the automation assessment methodology. The results are shown in Figure 3. We found that the speech application delivers the following benefits for the call center:

- 77% increase in overall IVR benefit
- 60% improvement in routing
- 75% accurate telephone number capture to power CTI
- \$5.2M in agent-labor savings based on saving 34 seconds per call

We also found that customers overwhelmingly prefer Call Director to touch-tone menus:

- 68% prefer describing the reason for calling in their own words versus using a keypad
- 90% rated the ease of use of the speech system as satisfactory to outstanding
- 88% rated the speed of the system a satisfactory to outstanding

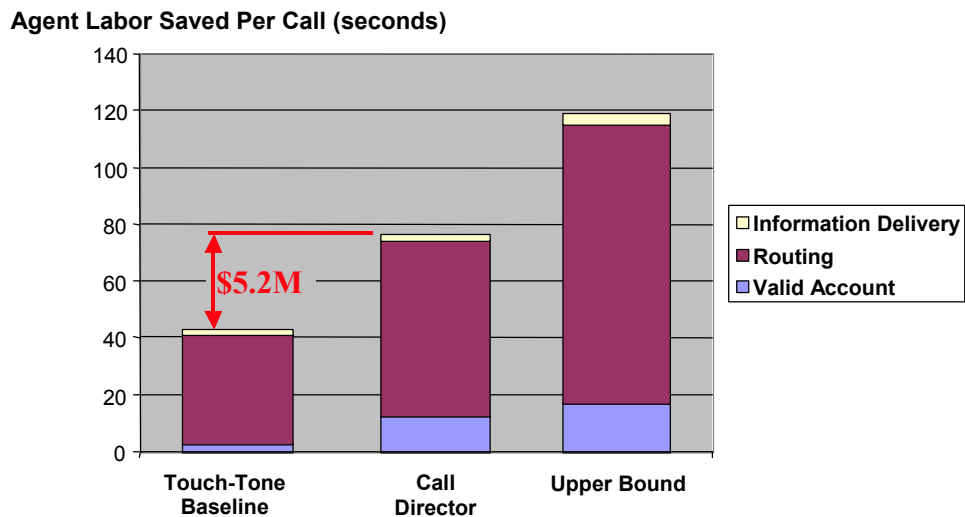


Figure 3. Agent-labor savings provided by Call Director total \$5.2M, 81% of which can be attributed to more accurate call routing.