

DNMIS



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1 Introduction

DNIS stands for Dialed Number Identification Service. It is a service offered by the telecom network provider that helps the call receiver to identify the number that the caller dialed. It works by transmitting the [dual tone multi frequency digits](#) that the caller dialed to the destination where a special mechanism will decode the signals and either display them or make them available for use by devices at the receiving end. This is especially useful for contact centers, where a PBX often receives calls dialed to different 800 or 900 numbers on the same port. The DNIS data would contain the dialed number, thus enabling the PBX to track the call.

Integrating call processing and call routing with the associated data drastically improves the possibility for first call resolution and consequent customer satisfaction. Combining technology and business processes is a key factor that determines the competitive edge of a contact center among its peers. Effective use of DNIS data enables contact centers to develop call handling, call routing and monitoring processes based on the number dialed by the caller.

2 Technology

DNIS is a service offered by the PSTN carriers in which the touch tone digits are passed to the destination PBX prior to connecting the call. DNIS is similar to a Direct Inward Dial (DID) service, but primarily works over toll-free lines, thus enabling the PBX to identify the toll-free number that was dialed. DNIS service provided by toll-free lines such as 800 or 900 lines allows the contact center to use one trunk group for multiple applications, thereby supporting more 800 or 900 lines with fewer physical phone lines. Thus DNIS allows contact centers to optimize the cost of the technology infrastructure without compromising on key operational and customer service metrics.

This finds several practical applications ranging from the [ability to route calls to a specific agent](#) or agent group to measuring the effectiveness of billboard ads. (Different ads can carry different toll free numbers, thus offering the ability to measure the response rate for each type of ad). In contact centers which typically service multiple clients, unique toll-free numbers assigned to each client or client group helps to route calls effectively.

If the telephone switches can provide the DNIS information, then VoiceXML based applications can access the number dialed by the caller using the **session.connection.local.uri** variable.

It must be noted that DNIS numbers are location dependent as the location of the contact center determines whether the caller would dial a country code, or an area code to reach the service line.

3 DNIS as a Means to Improve Call Center Metrics

DNIS helps to improve call center metrics such as agent performance, first call resolution rates and customer satisfaction by allowing calls to be more accurately routed. For example, in a contact center handling credit cards, DNIS can be used to classify calls based on the caller priority. The most valued customers may even be assigned personal agents who handle all their transaction requests.

The targets for KPIs such as call hold time and FCRs can be different for different classes of customers and the number of agents and technology infrastructure earmarked for each group of customers can be based on the desired service level. This helps to reduce the possibility of over investment in technology and agents, without having to compromise on the desired service levels. DNIS can then be used to route calls to the relevant agent group. Thus, contact center costs can be optimized by introducing DNIS.

DNIS along with caller identification also helps to return abandoned calls (where the call is disconnected before an agent answers the call) more effectively, by giving the agent an initial indication of the kind of service request the caller had.

DNIS may also be used to effectively segregate specific transaction requests. For example, a credit card company may have a dedicated toll free number for reporting lost cards. The DNIS will help to identify the number the customer has called, and then route the call to the lost cards department along with the respective customer file for faster processing. DNIS can also be used to improve collection efforts by allocating different call back numbers depending on the 'aging' of the dues. Thus if an agent is unable to reach a customer, a message can be left with a call back number. When the customer calls back, the relevant file can be retrieved and routed to different groups of agents who may employ different collection tactics (soft tactics to hard tactics based on how delinquent the account is). This kind of a focused approach towards collection is bound to increase the collection efficiency of the agents.

Contact center agents need to be provided with information that would help them handle each call better, so as to effectively manage the large volume of calls that they handle daily. DNIS data can be used to empower agents by providing them with the right solutions to enhance customer service and increase productivity. With DNIS information, agents can be provided with the right kind of support information (of a specific product or service) to enable a more meaningful

transaction with the caller. The transaction will take less time as agents do not need to spend time obtaining that information from callers and callers in turn are more satisfied when they have to answer lesser number of redundant questions. This results in a better relationship between the caller and the agent and boosts overall satisfaction levels of both agents and customers.

The fundamental requirement for effective use of DNIS is to determine how to segment the callers into groups, so as to assign a different toll-free number to each group and then define the call center operations that are customized for each group. Callers can be segmented based on geography, product line, transaction request or a combination of these factors.

4 Practical Applications

Dialled Number Identification Service offers several advantages to corporations, specifically those handling a large volume of inbound calls. The telephone company sends a DNIS number (typically 4 to 10 digits long) to the receiving phone network prior to connecting the call. This number is then used to effectively route the incoming calls, define different priority settings and response times based on the DNIS number or to customize greetings and announcements.

4.1 Enhanced Customer Service

From a customer service perspective, DNIS can be used for the following scenarios:

Multiple Product Lines: A contact center handling a highly technical industry may have different toll-free numbers for each product line. The PBX switch that receives the call analyzes the DNIS and provides that information to the IVR system which can play the appropriate recorded message as a greeting and offer a customized interaction with the caller by collecting the relevant information. Thus calls to multiple numbers may be connected to the same IVR system but the IVR system can be programmed to offer a different script for each number. The DNIS helps to distinguish between these lines and the IVR will then know how to service calls from each line differently. Thus one toll-free number may be an information line while the other may be a self service line for transactions. If necessary, the call can then be routed to the agent group with the right skill set to handle the call.

Multilingual Customer Support: A contact center handling multiple geographies may use DNIS to route calls based on the language requirements, by offering a different toll-free number for each language.

Advertisement Effectiveness: Different telephone numbers can be listed in different ads and the response rates and conversion rates can be tracked based on which number the user dialed. It can also be used to measure channel effectiveness by using different toll free numbers in different channels – the website can have a call back number, the product catalog can have

another number and yet another number can be assigned to billboards. A VoiceXML application can then be used to track the DNIS information and update a counter on a data mining server.

Multi-Client Support by a Single Agent: If a contact center agent is assigned to handle multiple client accounts or multiple product lines from a single account, DNIS can be useful to broadly classify the call purpose, by setting different toll-free numbers for different accounts and/or products. When a caller dials a toll-free number the DNIS system can then use the information to play back the right IVR script for the caller and retrieve the relevant information for the agent. For example, if a contact center is handling multiple accounts of airlines, then the agent can answer “Good Morning, XYZ Airlines” depending on the number that was dialed by the caller. This personalization of service helps to enhance the perception of good customer service among callers.

4.2 Streamlined Operations

From a contact center operations perspective, DNIS information along with other call characteristics can be used for the following purposes:

Call processing: DNIS data can be used to customize the various elements of call processing by defining how calls are routed and handled on the basis of the dialed number. Customizations can be made to the following elements of a call based on DNIS data:

1. Providing different menu options for different call groups
2. Providing callers with different self-service transactions and automated information retrieval.
3. Providing information on expected wait time and queue position.
4. Providing customized greetings and hold music

Call Routing: Call routing comprises of routing callers to specific destinations (agents or self-service options), placing callers in queues based on skill-set requirements or other parameters, and connecting callers to specific agents within the initial queue. Each of these steps is a decision making point and DNIS data can be used as a key parameter in the rule base for these decisions. For example, based on DNIS, the call center server can decide whether to queue the call to a live agent or connect to an IVR self service menu. DNIS can also be used to determine the skill-sets needed to serve the call and the call priority which then decide on which queue and in what position is the call placed.

Skill Based Routing: In skill based routing, instead of queuing calls against an agent, calls are presented to available agents who have the necessary skill sets to service a call. The caller requirements can be identified from one or more of the following parameters:

- Calling party information or who the caller is: Data pertaining to this can be obtained from CLID, ANI, NPA/NXX or trunk route

- Called party information or the number that the caller dialed can be obtained from DNIS
- Time of the call: Date or time of the call can be a way to group calls requiring a specific skill set
- Caller inputs: Information obtained from the caller either through menu options or as punched-in information (such as account number or invoice number) can be used for skills based routing
- Queue parameters such as the current queue length, agent status, duration for which agent was free since the last call etc are parameters that determine which agent among the skill group answers the call.

Customized Call Scripting: Call scripting is a set of call processing instructions based on a combination of one or more factors such as caller id, dialed number, and time of call. Call scripts can be used to route calls to the right agents as well as to initiate different call treatment options and management reporting templates. For example, the kind of metrics that would be tracked for a 'sales' call would be very different from the kind of metrics that would be tracked for a 'services' call. Call scripts may also be used to trigger a set of call processing instructions based on the call profile. DNIS information can be used to create customized call scripts based on the dialed number.

Customized Data Retrieval: Customized data retrieval based on call characteristics is achieved through Computer Telephony Integration (CTI) where the call center IT systems are functionally integrated with the PBX infrastructure. In an inbound contact center, the CLID and DNIS data from an incoming call can be used to retrieve data – customer data and product/campaign data respectively – from the relevant databases and pop it up on the agent's screen even before the call is answered by the agent.

Call Prioritization and Queuing: Connecting a call to an agent, also known as call presentation, is dependent on the caller's requirements and the agent's abilities or skill sets. There are primarily two sets of priorities that impact call presentation. The first one is the priority with which an agent is assigned a skill set and the second is the priority with which a call is queued to a skill set. Calls are prioritized primarily to provide specialized handling for different types of calls and/or caller profiles. Thus calls with greater priority would be answered first by agents even though a call with a lower priority may have entered the queue earlier. This is useful for handling different classes of customers for whom the contact center may have different service level agreements with the business. Depending on the service levels agreed upon, the contact center can offer different levels of service to different groups of customers each of whom may have a different DNIS number.

Selective Call Recording and Quality Monitoring: DNIS data can be used for selective recording of calls. For example, if a specific toll free number is used for a business in a highly regulated

industry, then the contact center may want to record all calls to that number, while not recording calls to other numbers. Contact centers can also define other criteria for call recording and assign different toll free numbers for calls based on these criteria, so as to enable selective call recording. DNIS information can also be used to determine the quality monitoring requirements in the contact center. For example, calls from high priority customers or platinum customers may need to be monitored 100% for quality purposes whereas calls with lower priority can be monitored on a sample basis.

In short, DNIS can be used in multiple ways depending on the contact center's requirements in order to get a preliminary knowledge of the callers and their requirements. This knowledge combined with other information can be effectively used for enhancing customer service and optimizing the contact center operations.

5 Effective Use of DNIS

One of the key questions to answer prior to opting for DNIS technology is "What Numbers will Callers Dial to Reach the Contact Center?" if customers will dial only one telephone number to reach the contact center, regardless of their requirements, then DNIS is not necessary. However, even a mid-sized contact center would typically handle multiple accounts or multiple products (in the case of a captive contact center) or at least multiple transactions (service requests, complaints) for the same product. In order to handle these effectively, it is ideal to segregate them into different groups with differing call routing strategies. In such a scenario, the contact center would assign different toll-free numbers to different groups and DNIS would enable to identify which group the call belongs to. This will not only enable efficient call routing, but also help in offering superior customer service by matching the right skills and data to the call being received.

DNIS data is rarely used in isolation. Typically, information from other sources such as CTI, IVR etc are clubbed together with DNIS data and fed to the call-routing and data retrieval rule bases. A contact center administrator must follow the following steps to obtain the maximum benefits out of a DNIS service:

5.1 Selecting a Routing Scheme

Information from multiple sources such as ANI, CTI, IVR and DNIS can be used to determine the routing scheme in the contact center. The information can be used in varying combinations and priorities to arrive at different routing strategies. It is necessary to determine the optimal routing scheme for the contact center based on factors such as the number of accounts being handled, call volumes, skill profile of agents, targets for key contact center metrics, demographic profile of the callers, nature of transactions being handled and so on. If a contact center requires calls to be

routed individually for each caller, or routed based on a caller's previous call transaction behavior, then ANI based routing is necessary along with DNIS routing. If the requirement is to only populate agent screens with caller transaction data, and if all calls can be handled by all agents, then ANI and DNIS based routing is not necessary and only a matching of the ANI to the ANI data held in the call center is necessary to retrieve the corresponding customer data from the CRM and transaction database. However, if calls need to be routed based on which number the caller has dialed, then DNIS based routing is essential. Sometimes, more than one of these requirements may co-exist in the contact center and in such cases a combination of ANI routing, ANI matching and DNIS routing shall be used.

Once the routing scheme is determined, it would form a key input to the overall call center architecture and it would also determine the role of DNIS in the routing model.

5.2 Selecting the Routing Data

Once the routing scheme is defined, the routing data requirements and the source from which each data would be obtained can be identified.

5.3 Configuring the Rule Base

After finalizing the routing scheme and the routing data, the rule base can be configured in the various applications and hardware systems. Typically, the routing scheme is configured on the CTI server and enabled at the ACD level. It is also necessary to determine what actions would be taken in the event of any of the routing data being absent. Vendors of hardware would provide detailed configuration guides and implementation support to enable data from various sources to be pooled seamlessly to retrieve data from different database systems and to initiate various actions in the multiple applications in the contact center. Therefore, it is essential to design a call center architecture and implement it using components that can be easily interfaced with each other.

5.4 Monitoring and Tweaking

Even though, routing rules, data retrieval mechanisms and scripts and process behaviours for different DNIS numbers are designed and implemented, it is essential to constantly monitor their real life performance and make the necessary tweaking, in order to generate the best possible benefits from the DNIS system. For example, the demographic profile of the callers or the caller needs may vary from time to time resulting in varying call volumes and call durations. Unless the contact center is constantly monitoring the various KPIs which were meant to be optimized with the help of DNIS and other technology investments, it may find it difficult to respond quickly to customer requirements.

6 DNIS on the Cloud

As contact centers increasingly rely on cloud based solutions for their technology and communications solutions, vendors have started providing advanced features on cloud based contact center solutions. Opting for a comprehensive cloud based solution will provide better flexibility and improve efficiency of the call center operations. Cloud based contact center solutions with web interfaces allow managers to monitor and report on call center operations even remotely from any device – a laptop, tablet or even a smartphone. The other advantages of opting for a cloud based solution include faster deployment, painless maintenance and upgrades, reduced total cost of ownership and better business continuity. Earlier cloud based solutions did not offer advanced contact center capabilities based on DNIS. However, newer solutions provide the ability to use DNIS data efficiently. Thus, cloud solutions have the capability to deliver customized call whispers based on DNIS data, dynamically prioritize calls based upon DNIS and even the ability to generate customized automated greetings for different DNIS numbers. Thus, if all other factors point to selecting a cloud based solution rather than an on-premise solution, then contact centers must look for comprehensive solutions with advanced capabilities that can provide all the features of a traditional solution, including handling DNIS data.

7 Conclusion

Today, businesses are trying to optimize the cost of customer service and exploring newer and more cost effective channels of communication with the customer. As a result, contact centers are actively encouraging customers to move their transactions from the phone to the web. However features such as ANI and DNIS would not be available on the web. Instead newer technologies that aid where the transaction originated from shall be used to segment the web based interactions and respond accordingly. Therefore, prior to investing in DNIS and related telephony technology, it is necessary to have a futuristic view of the split of revenue from the various communication channels and invest accordingly. The paradigm shift in technology has opened several possibilities to enhance customer service, improve the agent work environment and control costs. Effective use of DNIS requires adequate planning and integration with other information and processing elements in the contact center.

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