Call Routing in Contact Center

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Abstract— Now a day companies uses the contact center to provide service to customer. One of the important challenges of today contact center solution is to align the customer to the most appropriate agent within the time constrain. Call routing is used to for the alignment of customer with agent. Call routing in the contact center also play an important role in customer relationship management. In this paper we discuss the various routing concept and we propose an advancement to the skill based routing concept called as advanced skill based routing.

Keywords- routing, queue based routing, skill based routing, advanced skill based routing.

I. INTRODUCTION

Call center or contact center have become very popular in the service industry. In a service organization with the responsibility of customer service, marketing and corporate management, the call center acts as a bridge to connect the company with its clients.[3] Contact center has become an essential part for more and more service company to service and participate in the market completion.

In today's competitive environment, every customer is unique and the contact centers must provide better service with limited resource. With the majority of first-time customer interactions with its contact center via the phone, assigning the right customer to the right resource at the right time is very important. In the contact center interaction must begin with an intimate knowledge of each customer's unique identity, motivations and value. With this knowledge, interactions can then be routed to the most effective and available agent to maximize business outcomes. Routing enables accurate and effective matching of customer requirements to agent skills and availability.

Call routing—the ability to move callers from the phone queue to the next available agent—has developed as a core competency within the telecommunications industry over the last two decades.[1] Routing enables accurate and effective matching of customer requirements to agent skills and availability. By implementing Routing, companies are taking the first and most essential step in evolving the contact center to meet individual customer service requirements and enterprise revenue generation goals.

An automatic call distributor (ACD) is a specialized router that is designed to route calls to individual agents at the contact center. Automatic call distribution is a 30-year-old technology designed on the assumption that all customers call for the same reason—and that all agents are trained with the same skills. ACD is adequate for companies that receive only one type of call, or have relatively low call volume and static needs.[6] But most businesses now receive customer calls for many purposes, from warranty claims to product inquiries, billing questions to order placement, service requests to complaints—at highly variable, hard-to-forecast volumes.

Only a few years ago, the concept of workforce management was just that a concept. Forecasting and scheduling weren't even mentioned in the same breath. Over the last decade, however, workforce management has become more widely appreciated. In fact, workforce management is already changing the face of the call center. And now its capabilities are being enhanced by call routing technology, which is beginning to move beyond the conceptual stage itself.

In this paper after analyzing the existing routing concept in the contact center we propose an advancement to the skill based routing and we call this concept as an Advanced Skill Based routing. This advanced Skill based routing overcomes the shortcoming of the previous routing concept like skill based or queue based routing. The reminder of this paper is organized as follows. In section 2, we explain about the key routing strategies in contact center. In section 3 we proposed routing called as advanced skill based routing. Section 4 deals with the system architecture. In section 5 we describe the functional architecture of the advanced skill based routing system.

II. TYPE OF ROUTING

A key component of Routing is its unique approach to maximizing agent capabilities and skills. The various type of routing is as follow.

- Queue based routing
- Service Level Routing

- Skill based routing
- Workforce Routing

Queue based routing is the traditional Automatic Call Distributor routing, where calls are delivered to the next available agent in that queue on a first–come, first-served basis.[4]

Service level routing is the common routing strategies. Many companies today segment their customers based on value to the enterprise, offering greater levels of service to those customers perceived as higher value. For example, gold and silver tier customers might be routed to a live agent, whereas bronze customers are routed first to the IVR. Similarly, a rule can be established that will transfer gold or silver customers waiting in the queue for a minute to an alternate pool of agents.

Workforce Routing is a unique capability that combines the power of routing with Workforce Management solution. Through this combination, call centers are able to leverage agent schedule information when making a routing decision. For example, interactions will be sent to an agent only if this agent is scheduled to work in this activity in a time period or if the interaction won't negatively affect the agents' schedule such as a planned break or training activity.

Skill based routing is the advancement of simple queue based routing. In a skill-based routing system, agents are no longer assigned to queues; they are assigned to answer calls according to their abilities or skill set. Skill sets are defined by a business based upon who their callers are and the reasons for their calls. Agents can be assigned to answer calls for up to 50 different skill sets or call types. Each agent can be assigned a priority within each skill set, and all these assignments can be easily changed whenever needed.[2]

In the skill based routing the customer or caller are delivered to the agent who has specialization in the field for which customer had made a call. For example all agents will be specialized in some field or the other. Some agent will be specialized in credit card, some on billing problem and some on call. So when a customer makes a call like he has bill problem so this customer will be routed to the agent specialization in billing problem and not to credit card agent.

III. ADVANCED SKILL BASED ROUTING

However, today's competitive worlds require more sophisticated and flexible routing strategies that support the orchestration of compelling end-to-end customer experiences. We call that next level of capability advanced skills-based routing. Advanced skills-based routing brings a much higher level of sophistication to basic call routing by incorporating multiple conditions into the routing decision.

Contacts can be routed based not only on the agent specialization and customer problem domain but it also looks for the customer priority (i.e. diamond, gold, silver) and also makes the best effort to transfer the call to the agent who has last time serve the customer. Agent and Customer attributes, such as languages spoken and even gender, can be analyzed and matched to further optimize the customer experience. To implement advanced skill based routing the agent need to be specialization in more than one domain.

IV. SYSTEM ARCHITECTURE

The advanced skill based routing can be implemented on an existing infrastructure of the contact center. The existing infrastructure of the contact center as shown in figure 1, like PBX, ACD, CTI, IVR, Server etc do not need to be change and can be used continuously as before. [5] The basic information of the customer can be extracted from the customer data server, agent information from the agent data server and that information can be used by the application server to route the call to the appropriate agent.

The advanced skill based routing systems consist of two main modules: the Call Control Server and the application server. The call control server has the capability of identifying customer, agent and route them effectively. Multiple call control server can run in parallel in the system, and both the agent local and remotes can be connected to the system. The Application server can be subdivided into several layers, which are as follow: system service layer, data service layer, API interface layer and system application layer. The architecture of advanced skill based routing is shown in Figure 2.
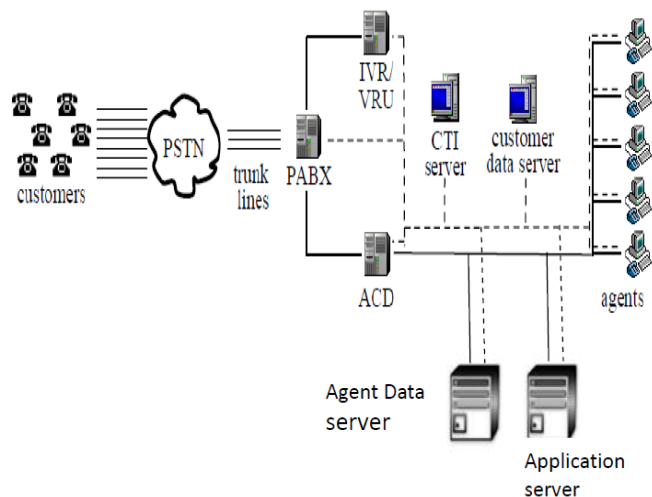

Figure 1: Architecture of contact center implementing advanced skill based routing
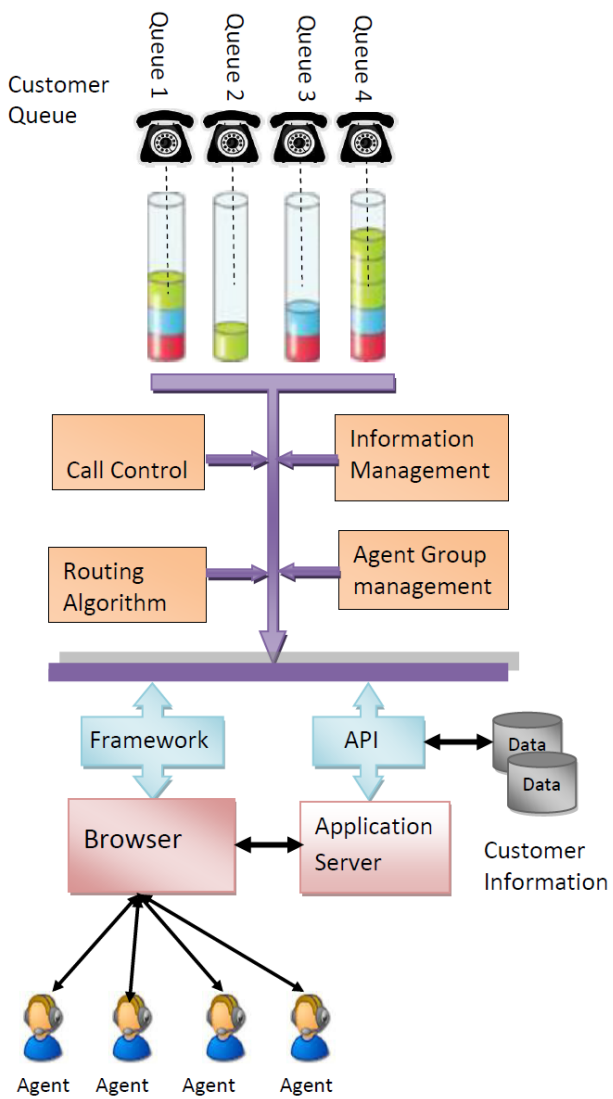
Call Control is used to manage the customer queue. It is the task of the call control to select the customer from the customer queue and depending on the routing algorithm, assign the best suited agent to it.

Routing algorithm is the heart of the contact center. Routing algorithm is different for different contact center or in other words it is dependent on the business strategies. Here the routing algorithm is based on the advanced skill strategy which is explained in section 5.

Agent group management is used to manage the individual agent and agent group. The agents are managed by putting the agents into groups and each group is assigned to the particular job. All agents belonging to an agent group can log on to this job and can perform the task. When an agent group is assigned multiple jobs, the agent can select freely any one job to execute. Agent group management gives the agent the privilege to manually control the frequency of receiving the calls and can adjust the way of receiving it. Agent can also perform the post processing of the call data during a conversation or after the talk. Each agent can have different privileges in different groups.

Information management is used to generate the various type of report such as agent report, inbound call report, dialing result report, and abandon call report. In addition to it, the systems allow the user to define a variety of report according to its need. Apart from the report generation it is used to perform the following tasks like, customer data generation, customer data import, customer data export, data processor and agent interface generation. All the data in the database can be statistically analyzed and can be used to generate report and statistical chart.

V. FUNCTIONAL ARCHITECTURE

Advanced skills based call routing offers a more comprehensive approach to the call distribution problem, taking the concept of skill based call routing to the next level. Advanced skill based call routing employs a 4-step process to ensure the most appropriate contact center agents handle calls received from customers. The 4 steps are as explained below. Figure 3 represent the step of advanced skill based routing. First, for each call, the software builds a composite customer classification based on private data (such as prior transaction history) and public data (such as the caller's location). Then the pool of available agents is evaluated based not just on skill set, but also on real-time performance. Using a combination of the agent evaluation, the composite customer classification, and business rules defined by the contact center, the caller is then matched with the most capable agent. Finally, the caller is connected to the agent along with a real-time screen-pop containing the relevant customer information. Figure 4 represent the flow chart of advanced skill based call routing.

Figure 2: Architecture of advanced skill based routing.

System Service layer provides the functionality of recording service, core call routing algorithm, reporting service, call control system, and dialing system. Data service layer implement storage of operational data, customer information, agent groups and execution information. API Interface layer allow the application to access a variety of functions provided by System Service layer. In the System application layer the agent can operate the system and execute different kind or work.

Customer Queue is the queue of the incoming call to the contact center. Each queue represents the number of customer waiting to interact with the agent.

out which agent has handled the calling customer in the previous call to contact center. If the match is found customer call is transferred to the respective agent else the agent who has served the caller in the previous call are assigned.
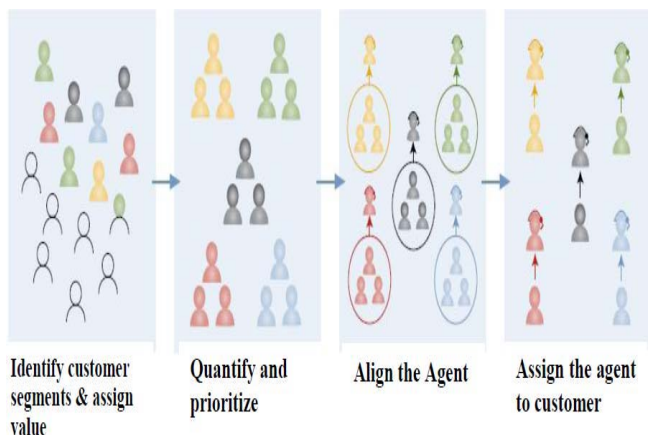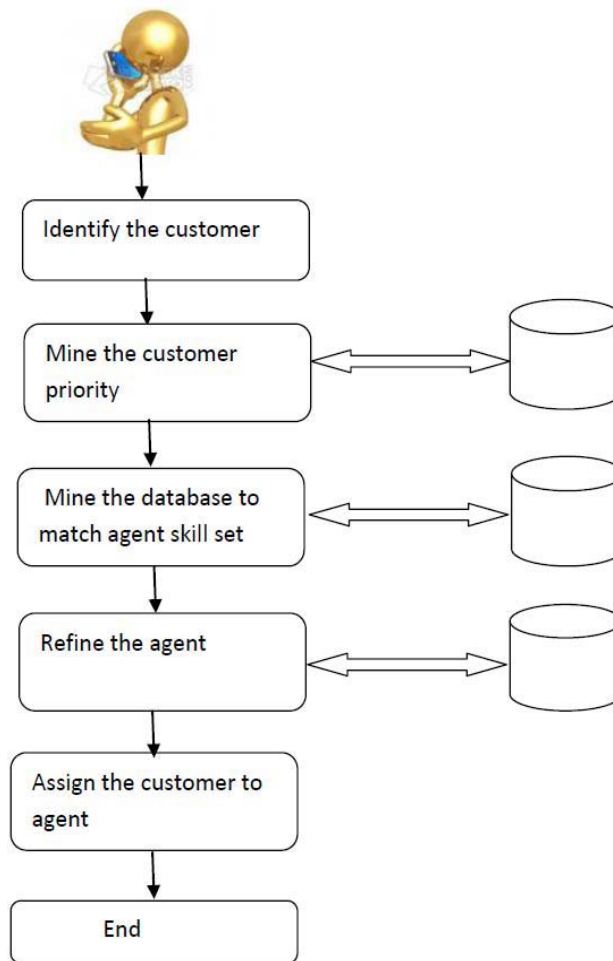

Figure 3: step in advanced skill based routing.

- Identify customer segments and assign customer value
- Quantify and prioritize interactions
- Align the Agent
- Assign the agent to customer

The first step in advanced skills-based routing begins with identifying the customer and creating segments based on its priority. Prioritizing or valuing customers requires the application of the well-known Pareto Principle: focus majority of resources on the 20% of customers that represent 80% of your revenue. In other words, define high-value customers and always handle these contacts as a priority.

Priority is done to customer by putting the customer in diamond, gold and silver categories. Customers are put in diamond categories if those customers produce very high revenue. Customer who generate less revenue than diamonds are put in gold categories and customer with very less revenue are put in silver categories. For example priority in Phone Company, the customer having more than 20 connections is the diamond, customer having 10 connections is gold and customer having 5 connections is the silver.

Once customer segments and value have been determined, we must consider the value of the interaction itself. The customer with highest priority will be delivered to the agent first then the customer with the low priority value.

Once customers have been valued and interaction types have been prioritized, they must be matched to agent skill sets to deliver the best experience. This requires reviewing the agents in the organization and assigning skill and competency levels for the types of interactions identified.

Once the agent skill has been identified and it is matched with the customer, the agent should be further refined to find

Figure 4: Flow chart of advanced skill based routing.

VI. DEVELOPMENT TOOL

The tools used for the development of the advanced skill based routing are as follow: .Net framework, asp.net 2005 as a front end, sql server 2005 for database and sql server management studio for database management.

VII. CONCLUSION

In this paper we have discussed about the existing various type of call routing present in the contact center and we have proposed a new routing concept which will further enhance the customer, agent interaction effectively resulting in more customer satisfaction. As a result of that the customer will turn in to a brand ambassador of the company resulting in the revenue gain. The goal of the proposing this

concept is to reduce the frustration of the customer, when a customer is aligned with the agent of different skill set when a customer makes a call to the contact center.

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