



Sistel

Call center System

Ver. 2.x

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System Overview

This interview describes the Sistel Call Center system and shows its components and its requirements needed to be installed and work properly.

1 What is Sistel

Sistel Call Center is a complete call processing and routing system that provides a full control of the telephony call process either the outbound or the inbound, and a full control of the incoming calls routing and distribution.

The control of the telephony call process is achieved by applying/checking agent's state at the time of the call, and his COS (class of service) assigned to him that provides many constraints determining the call allowance/duration/termination.

The routing and distribution of the inbound calls are done through the IVR (Interactive Voice Response) module that answers the call, asking the user for destination/service required through multi level of pre-recorded messages and transfers the user to either a single destination or a group of destinations.

2 System Components

Sistel Call Center System consists mainly of the following components:

- IVR/Recording Ports
- System Engine (Windows Service Component).
- System Manager (Windows application).
- System Configurator (Windows application).
- Agent/Supervisor Terminal (Windows application).

IVR/Recording Port(s)

These ports may be hard or soft ports depending on your PBX. In case of hard ports, the system uses an intelligent Voice Processing Cards, each card expandable from 8 to 16 ports for IVR and from 8 to 24 ports for Recording.

System Engine

This is the main part of the Call Center in which all call processing and routing are done. This engine works as a windows service so it works automatically with the machine start up without a need to windows login.

System Manager

This is a windows application that controls the System Engine Service (start or stop), and monitors/controls the call process operations online.

System Configurator

This is a windows application where all system configurations, parameters and settings be done and is mainly used by system administrator.

Agent/Supervisor terminal

This is an interactive windows application that enables its user (agent/supervisor) to have a visual interface to easily interact with the system and enables him to do the following activities:

Agent:

- Set ready state, in order to tell the system if the agent is ready/not ready to receive call.
- Forwards incoming call to agent's own mailbox, and determines the type of forward mode (e.g. all calls, busy, not answered or busy/not answered).
- Get notification about the current call(s), and be able to control the call from the PC instead of the telephone set (e.g. answer, end, hold and transfer).
- The popup screen for the current call(s) shows the call information and allows the agent to add comment for this call that can be seen by other agents and supervisors.
- For the caller ID that is not existed in the system's database, the agent can add him as a new customer, or the current call's number can be assigned to an existing customer.
- Visually manage/monitor agent's own mailbox and easily handle/transfer messages to another mailboxes.
- Monitor agent's own queue list and be able to handle the calls in the queue (reject, transfer to another agent, extension or UCD group).
- Notified for missed calls, and be able to callback these callers again.
- See the agent's performance for the current day and see all his answered and abundant calls.
- View agent's call log and create, save or extract custom reports.
- Can view, add and edit customers' information data.

Supervisor:

Have all the features of the agent terminal plus the following features:

- Monitor/manage the status of all his child agents and groups.
- Monitor/manage the queue list for all his agents/groups, and can break the call in queue and manually retransfer it to any destination.
- Monitor/manage the mailboxes for all his agents/groups and free mailboxes.
- View the statistics performance for each agent/group including the call performance and status log history for any specified period.

3 System Requirements

To work properly, Sistel Call Center requires the following specifications and equipments:

Software Requirements

1Engine/Manager Modules:

- Microsoft Windows XP (SP2) or above.
- SQL Server 2000 or above.

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3Configurator Module:

- Microsoft Windows XP (SP2) or above

4Reporter Module:

- Microsoft Windows XP (SP2) or above

5Agent/Supervisor Module:

- Microsoft Windows XP (SP2) or above

Hardware Requirements

6Engine/Manager Module:

- Intel P4 processor 1.7 or higher
- 1 GB-Ram, higher is recommended
- 40 GB free hard disk space or higher

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8Configurator Module:

- Intel P4 processor 1.7 or higher.
- 128 MB RAM.

9Reporter Module:

- Intel P4 processor 1.7 or higher.
- 512 MB RAM, higher is recommended.

10Agent/Supervisor Module:

- Intel P4 processor 1.7 higher.
- 128 MB RAM.

System Features

Sistel Call Center System is a powerful integrated system with many features that denotes a full control of calls and messages handling, and provides a wide range of flexibility to serve for different demands according to customers needs. These features can be classified as the following main categories:

4 System Operating Features

These features are the main building blocks of the application that determines the system overall working flow, and how the system is customized to the customers' needs.

The main operation building blocks are:

- Incoming call Handling Process
- Voice mail service
- Call recording service
- Predictive dialer service (ADS module)

4.1 Incoming call Handling Process

The incoming call handling process is a major process in any call center system, and in case of our system (Sistel) it has a great attention and is handled by a collection of many services to perform intelligent and flexible handling that can be completely customized by the user (system admin) to be suited for a wide range of customers' needs.

The services composing the Incoming Call Handling are:

- IVR Service (IVR)
- Automated Attendant Service (AA)
- Queue Handling Service (Queue)

4.1.1 IVR Service (IVR)

IVR service is the first step in the incoming call handling process, and it's done by IVR ports. These ports may be hard ports (using advanced voice cards) or soft ports according to the PBX that the Sistel integrated with.

The IVR service does the followings:

1. Answer the call:

The answering step is done as soon as the port detects the caller ID (CID) or after the predefined rings count.

2. Play pre-recorded message(s) and get the caller's digits:

The building block of the IVR is called *Custom Service*, where each service consists of a recorded voice message and a reader to get the DTMF digit(s) pressed by the caller. According to the DTMF received, the Custom service can pass the call to another Custom Service, which also can pass the call to another Custom Service and so on, that enables the system admin to construct a tree of messages/paths to simulate the company's structure and detect the caller purpose and destination so the system can perform the desired action on the call.

3. According to the caller selection in the previous step, the IVR service may:

- a. Pass the call to the Automated Attendant service (AA) to transfer it.
- b. Pass the call to the Voice Mail service (VM) to enable the caller to leave a message either to an agent/group mailbox or to a public mailbox.
- c. Continue with the call and integrating with external database to do some action/query and notify the caller with the completeness or failure of his order, and then terminate the call.

4.1.2 Automated Attendant Service (AA)

The automated attendant service (AA) is the service responsible for call routing and distribution to agent or a group of agents.

Transfer to agent:

- Check first if the agent is login, in ready state and is idle. If check is false, the transfer rejected with busy state, and the agent's *Busy Mode* is applied. If check is true, the transfer is started.
- After the transfer is started, the system waits for answer for the specified *answer time*. If answered within this time, the transfer is completed and the IVR port is released. If not, the agent's *No Answer Mode* is applied.

Transfer to Group:

- The system gets the groups' members and orders them according the group hunting type (UCD ordered by the most

idle agents, Normal ordered by the agents order in the group).

- The agents of logout, not ready or not idle state are excluded from the list.
- The call is transferred to the first agent, and waits for answer for the groups' answer time. If answered within this time, the transfer is completed and the IVR port is release. If not, the system tries with the next agent, and so on until the call is answered or the list is overflowed.
- If the group is overflowed, then if all members are busy, the groups' *Busy Mode* is applied; else the groups' *No Answer Mode* is applied.

The Busy Mode or No Answer Mode can contain one of the following options:

Default:

Tell the caller about the result (busy or not answered) and let him select from a pre-defined options and apply his selection.

To Agent:

Transfer the call to the specified agent.

To Group:

Transfer the call to the specified group.

To Mailbox:

Pass the call to the Voice Mail service (VM).

To Service:

Pass the call to the IVR service specified.

Hold:

Pass the call to the Queue service.

Call End:

Terminate the call.

4.1.3 Queue Handling Service (QUE)

When the agent/group is busy, and the caller is to wait for the destination to be available either by his selection or by the system, the call is passed from its current handling service to the Queue handling service.

In the Queue handling service, each destination has its own queue list, which is configured by the system admin with the following options:

Queue Length:

The maximum number of calls that can be concurrently join queue, the extra calls are prevented to join the queue and fed back to its previous handling service to re-handle it.

Queue Time:

The maxim time allowed for each call to wait in the queue list. If the destination becomes idle during this time, the call is

removed from the queue and passed back to the Automated Attendant service (AA) to be transferred. If this time is elapsed for a call, then the Queue Time Out Mode is applied.

Time out Mode:

Determines what happened to the call when the queue time is elapsed before the call is answered, this mode contains the same options as the *Busy Mode* or the *No Answer Mode*.

Queue Played File:

Specifies the audio file played to the caller while waiting in this queue. So that each destination can have a specific media in his owns' queue's list.

4.2 Voice mail service

The voice mail service allows the caller to leave a voice message either to specific destination (agent or group) in his own mailbox which can be handled by this destination or to a system level mailbox which can be handled by authorized users.

All mailboxes are equal in specification and are handled in the system by the same manner, but according to their usage they can be classified as:

Personal mailbox:

This mailbox is assigned directly to one or more destination (agent/group), and the mailbox owner(s) can access the mailbox and deal with its contents of messages. Either the owner or the system can control call passed to the mailbox.

Public mailbox:

This mailbox is not assigned directly to any destination, so they can be considered a system level mailbox. Only the system can pass a call to this mailbox, and any user knows the mailbox's password can access this mailbox and handle its contents of messages.

When user login to mailbox, system prompts guide him to deal with the messages to either play, review or delete. User also can forward any message(s) to another mailbox(s).

The mailbox can be integrated with the e-mail system by assigning e-mail address(s) to the mailbox and let the mailbox send an e-mail message for each new message containing the call info and the recorded message itself.

Any user that has a mailbox can access this mailbox and use and manage this mailbox's features through internal or external phone calls. This process gives the subscriber the following features:

Mailbox Message Handling

Subscriber can log in to his mailbox and play, review or delete messages left for him. The subscriber extension can be notified with new message by system programming.

Mailbox Personal Greeting Recording

Each mailbox has its own personal greeting message which played to the caller when enter the mailbox to leave a message. There is one separate message for busy, not answered and after hour modes. Subscriber can record these messages or the default messages will be used automatically.

Mailbox Password Assignment

This password is used to prevent unauthorized mailbox access. And in the case of making outgoing calls according extension number, this password is used to make the call.

Call forward Status Assignment

Subscriber can forward his incoming calls directly to his own mailbox according to the call status (all calls, busy, not answered or busy/not answered).

Mailbox Message Transfer

Subscriber can transfer any message in his mailbox to other mailbox(s). The transferred message is copied to the other mailbox(s) and still exists in the original mailbox.

4.3 **Call recording service**

Call recording service is responsible for recording the phone calls both incoming and outgoing, and in specific situations the internal calls too.

The call recording can be controlled automatically by the system, or can be controlled by the agent/supervisor for each call according to the system configurations assigned.

System can record in WAVE or MP3 format, and the recorded file can be plain format or encrypted. The encrypted files can't be played outside the system's application terminals.

While the call is active and the recording is started, the authorized supervisor can silently listen to the call through his supervisor module.

4.4 Predictive dialer service (ADS module)

The predictive dialer service is the service that enables the system to automatically call a pre-defined list of customers. This service is mainly used in marketing and advertisement, so in the Sistel system it's called the Advertisement Module (ADS).

The advertisement session is created by the system admin, with the following items that can be adjusted:

Date period:

The start and end dates of the advertisement.

Time period:

The time of the day during the date period to run the session.

Number of trials:

How many times the system tries to call each customer phone number before stopping the trial to this customer.

Playing message:

The ads media file that is played to the customer.

Also after the audio file is played, the customer may be allowed to leave a voice message if he has a query need to be followed, or may be transferred directly to pre-defined agent(s) to manually complete the call handling.

During or after the ADS period, admin can get a report about the progress of the ADS, representing how many customers are handled and how many customers waiting to be handled, and for the handled ones, if they leave messages or transferred to an agent.

5 System Management Features

These features are not the main building blocks of the system but they affect on all the main parts of the system and have some control of how they work. These features are:

- Time Table
- Holidays
- CID Pattern
- Customer List
- Class Of Service (COS)

5.1 Time Table

The time table is a weekly table for the seven days of the week. The system divides each day into 3 time shift modes, day, night and lunch. Administrator can activate one or more of these time shift modes on each day, and determines the time of start and end of each mode.

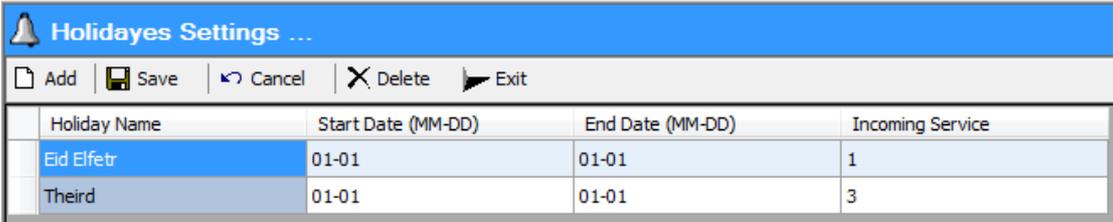


Day of Week	Day Mode	Day Start	Lunch Mode	Lunch Start	Lunch End	Night Mode	Night Start
Sunday	<input checked="" type="checkbox"/>	08:00	<input checked="" type="checkbox"/>	17:00	22:00	<input checked="" type="checkbox"/>	22:00
Monday	<input checked="" type="checkbox"/>	08:05	<input checked="" type="checkbox"/>	17:00	22:00	<input checked="" type="checkbox"/>	22:00
Tuesday	<input checked="" type="checkbox"/>	08:05	<input checked="" type="checkbox"/>	17:00	22:00	<input checked="" type="checkbox"/>	22:00
Wednesday	<input checked="" type="checkbox"/>	08:05	<input checked="" type="checkbox"/>	20:00	22:00	<input type="checkbox"/>	22:00
Thursday	<input checked="" type="checkbox"/>	08:05	<input checked="" type="checkbox"/>	17:00	22:00	<input checked="" type="checkbox"/>	22:00
Friday	<input type="checkbox"/>	08:05	<input type="checkbox"/>	17:00	22:00	<input checked="" type="checkbox"/>	22:00
Saturday	<input type="checkbox"/>	08:05	<input checked="" type="checkbox"/>	10:00	18:00	<input checked="" type="checkbox"/>	18:00

Many system services check for the current time shift mode before doing an action, e.g. Call Routing, IVR and CMS.

5.2 Holidays

As we know, the Incoming call handling service can differ according to the current time shift mode of the day, and these modes are assigned for every day of the week, but what about the holidays?



Holiday Name	Start Date (MM-DD)	End Date (MM-DD)	Incoming Service
Eid Elfetr	01-01	01-01	1
Theird	01-01	01-01	3

During the holidays, a special incoming call handling is required regardless of the current day of the week, so admin can add the holiday to the system and assign the starting and ending date and also the required handling process to it.

5.3 Customer List

For proper call handling and managing, Sistel allows the users/admin to add their customers to the system. Each customer is added with his personal information (e.g. name, address, company, job title,...) and as much as required of his phone numbers. Admin can distinguish each customer to be handled in as specific way when he is calling according to the current time shift mode regardless of the normal call handling path. For example, when the

customer call, he can hear a specific voice message or directly transferred to specific agent/group.

Customer Name	Address	Group	Priority	PIN Code	Day Handling	Day Data	Lunch Handling	Lunch Data	Night Handling	Night Data	Password	SQL PIN
Ahmed Aly		My Second Group	10		SERVICE	3	NONE		NONE			
Mena		My Second Group	10		AGENT	105	NONE		NONE			

Also the agent can be assigned with external ID, this ID is used to query external database to get some customer's info in case of CRM integration service available.

5.4 CID Pattern

This is another way of handling specific incoming call in a special way. For example, the calling numbers start with (03) may be handled different than the numbers start with (012). In this case we don't specify the handling route according to the full caller number, but according to the first digits of the number or what is known as the CID Pattern.

5.5 Class Of Service (COS)

The class of service (COS) is a collection of properties and power that is assigned to each agent to determine his power and allow or disallow some system features that the agent can use. These properties are:

- **Write ICM**
If or not logging the intercom calls to the database.
- **Write INC**
If or not logging the incoming calls to the database.
- **Write OUT**
If or not logging the outgoing calls to the database.
- **Record ICM**
If or not record the intercom calls.
- **Record INC**
If or not record the incoming calls.
- **Record OUT**
If or not record the outgoing calls.
- **Max Duration ICM**
The maximum duration of intercom calls.
- **Max Duration INC**
The maximum duration of incoming call.
- **Max Duration OUT**
The maximum duration of outgoing calls.

- **TRS Level**
Determines the restricted dialed numbers that the agent can't dial or making a call to them (e.g. 012, 00966,...).
- **Busy Mode**
Determines what happens to the call transferred to the agent when this agent is busy. The available options are (hold, transferred to another agent/group, go to another part of the messages tree, leave a message in a mailbox or back to the system to apply the default handling).
- **No Answer Mode**
Determines what happens to the call transferred to the agent when this agent is not answer. The available options are (hold, transferred to another agent/group, go to another part of the messages tree, leave a message in a mailbox or back to the system to apply the default handling).
- **Queue Mode**
Determines what happens to the call in hold for this agent when the queue/hold time expired before the agent become available. The available options are (stay on hold, transferred to another agent/group, go to another part of the messages tree, leave a message in a mailbox or back to the system to apply the default handling).
- **Queue Length**
Determines how many call can stay on hold waiting for the agent to become available.
- **Queue Time**
Determines the maximum time the caller stay in hold for the agent before considering the agent still not available. After that time, the Queue Mode is applied to this call.
- **After Call Work Time**
This is the default time that supplied to the agent after finishing the call to complete any call's related task. During this time the agent is considered not ready to get another call.
- **Forward to Mailbox Mode**
This option determines if the call to this agent is transferred to his own mailbox or not. The available selections are (no, on busy, on no answer or on busy/no answer).

5.6 Uniform Call Distribution Group (UCD)

The Uniform Call Distribution Group is a collection of agents that represents a logical or a physical call destination that caller can be transferred to it.

When call is routed to UCD group, this call is directed to the group members sequentially. If member is busy, or don't answer the call within the specified time (adjusted by the system administrator), the call is directed to the next member, and so on till the last member in the group.

The order of members in which the call is transferred to is determined according to the group hunting type. There are two types of the hunting as follow:

Normal Hunt:

In this case, every call is directed to the first member of the group member and routed to the next member(s) if first one is busy or not answered till the last member in the group.

UCD Hunt:

In this case, the call is routed to the most idle agent and if not answer or busy the call is routed to the next most idle one and so on, till the last member, and then if the call is not answered, the group is considered overflowed.

UCD group can contain any number of members, and every member can belongs to many UCD group. Administrator and/or supervisor can control the member of each group. Also agent – if allowed – can have the ability of joining/leaving the group.

5.7 Personal settings adjustment

Any agent has private settings associated to it and can be adjusted by the system administrator or by the agent itself. These settings are:

Password:

This password can protect the agent settings from being modified by illegal person, and also used to authenticate the agent when he tries to do some actions (e.g. agent module login, group login/logout...).

Ready State:

Agent can control his ready status in the system so that system know if this agent is available to receive calls or not and prevent call transfer to it if it isn't available.

6 Reporting Features

Sistel Call Center offers a very attractive and powerful set of reports that give the user of the system a complete monitoring of system performance and call flow rate. These reports divided into outgoing calls history, incoming calls history and mailbox's messages history.

Incoming Calls History

This is an interactive page that gives administrator the ability to query the incoming calls filtered by date, time, call status and extension (destination of the call). Each call is displayed with all of its transferred sequences that indicate the call from its start to its end showing all the extensions that the call routed to.

If the call is recorded, the recorded message can easily be played by simply double click the call.

For this incoming calls history, there are a set of reports that can be viewed and printed. These reports are:

Details Reports:

- *Calls & Sub-Calls*
- *Calls*
- *Sub-Calls*
- *Sub-Calls Grouped by Extensions*
- *Sub-Calls Grouped by Agents*
- *Sub-Calls Grouped by Call Status*
- *Sub-Calls Grouped by UCD Groups*

Summary Reports

- *Calls per Status*
- *Sub-Calls per Status*
- *Sub-Calls per Extension*
- *Sub-Calls per Extension per Call Status*
- *Sub-Calls per Extension Group*
- *Sub-Calls per Agent*
- *Sub-Calls per Agent per Call Status*

Outgoing Calls History

This is an interactive page that give administrator the ability to query the outgoing calls filtered by date, time, call status and extension/user account code (source of the call). Each call is displayed with all of its transferred sequences that

indicate the call from its start to its end showing all the extensions that the call routed to.

If the call is recorded, the recorded message can easily be played by simply double click the call.

For this outgoing calls history, there are a set of reports that can be viewed and printed. These reports are:

Details Reports:

- *Calls & Sub-Calls*
- *Calls*
- *Calls Grouped by Account*
- *Sub-Calls*
- *Sub-Calls Grouped by Extensions*
- *Sub-Calls Grouped by Agents*
- *Sub-Calls Grouped by Call Status*

Summary Reports

- *Calls per Status*
- *Calls per Account*
- *Calls per Account per Status*
- *Sub-Calls per Status*
- *Sub-Calls per Extension*
- *Sub-Calls per Extension per Call Status*
- *Sub-Calls per Agent*
- *Sub-Calls per Agent per Call Status*

Mailbox Messages History

This is an interactive page that shows all the messages in all mailboxes. Administrator can filter messages by mailbox, and can play or delete any message(s).