

Date: 7/31/2024



CYBERQ CONSULTING PVT LTD

**Application Security Testing Report
(Final Audit)**

Call Center Solution

Web Application Security Test Report of Call Center Solution

Report Release Date	31-07-2024
Type of Audit	Web Application Security
Type of Audit Report	Follow up Audit Report (Final Report)
Period	01-04-2024 to 31-07-2024

Document Control

Document Preparation	
Document Title	Web Application Security Test Report of Call Center Solution
Document ID	CQ/A-TS-SANS-24-195/I/03
Document Version	V1.0
Prepared by	Mr. Sushil Tomar
Reviewed by	Mr. Nikhil Rastogi
Approved by	Mr. Hemant Tiwari
Released by	Mr. Sushil Tomar
Release date	31/07/2024

Document Change History		
Version	Date	Remarks / Reason of change
V1.0	31/07/2024	Final Audit

Document Distribution List			
Name	Organization	Designation	Email Id
Bhupesh Kumar	SAN Softwares Pvt Ltd	Support Engineer	bhupesh.kumar@sansoftwares.com
Deepak Kumar	SAN Softwares Pvt Ltd	-	deepak.kumar@sansoftwares.com
Anil Mehta	SAN Softwares Pvt Ltd	-	anil.mehta@sansoftwares.com
Tarun Verma	SAN Softwares Pvt Ltd	-	tarun.verma@sansoftwares.com
Pramod Kumar Pant	CyberQ Consulting Pvt. Ltd.	Head (Information Security)	pramod.pant@cyberqindia.com
Sujeet Kumar	CyberQ Consulting Pvt. Ltd.	Principal Consultant	sujeet.kumar@cyberqindia.com
Hemant Tiwari	CyberQ Consulting Pvt. Ltd.	Team Lead	hemant.tiwari@cyberqindia.com

Contents

Introduction..... 4

Purpose 4

Scope 4

Engagement Scope..... 5

Details of the Auditing team 6

Audit Activities and Timelines..... 7

Audit Methodology and Criteria / Standard referred for audit 8

Methodology 8

Application Security Observations based on OWASP framework for “Call Center Solution” 9

Tools/ Software used 10

Executive Summary 11

Detailed Observations 23

Appendices 67

Introduction

Purpose

CyberQ was asked to conduct a Web Application Security Test on the application provided by **SAN Softwares Pvt Ltd**. Details were provided to the extent mentioned in “Scope of Work”. The testing was carried out from **CyberQ Consulting Pvt. Ltd. J-1917, Chittaranjan Park, New Delhi-110019**. The objective of this testing was to ensure the security of the network and web server from external threats through the web application.

Scope

Call Center Solution Web site was hosted on **<https://vaptcrm.sanssoftwares.com/crm/caller/>** was tested. This was a Level-2 testing. Vulnerabilities reported by us throughout the web application have been closed by the client during the Level-1 audit. The Website will be hosted on this URL **<https://vaptcrm.sanssoftwares.com/crm/caller/>**.

Engagement Scope

S. No	Asset Description	Criticality of Asset	Internal IP Addresses	URL	Public IP Addresses	Location	Hash Value (in case of applications)	Version (in case of applications)	Other details such as make and model in case of network devices or security devices.
1.	Call Center Solution Web Application	NA	NA	https://va ptcrm.sa nsoftware s.com/cr m/caller/	NA	NA	E0E4E16C1EA3A6B0 394D47DC5172CBB7 A2322A5DAF3919A9 BCB42C125F5C2BE8 E21D734E4F9EA5D0 798FAFF4CA385446 E6780A1FFD9471B05 98ADF7E1080545B	-	NA

Date up to which the list has been updated: 28/03/2024

Details of the Auditing team

S. No	Name	Designation	Email Id	Professional Qualifications/ Certifications	Whether the resource has been listed in the Snapshot information published on CERT-In's website (Yes/No)
1.	Mr. Nikhil Rastogi	Information Security Consultant	nikhil.rastogi@cyberqindia.com	B. Tech, CEH	No
2.	Mr. Sushil Tomar	Information Security Consultant	sushil.tomar@cyberqindia.com	B. Tech, CEH	No

Audit Activities and Timelines

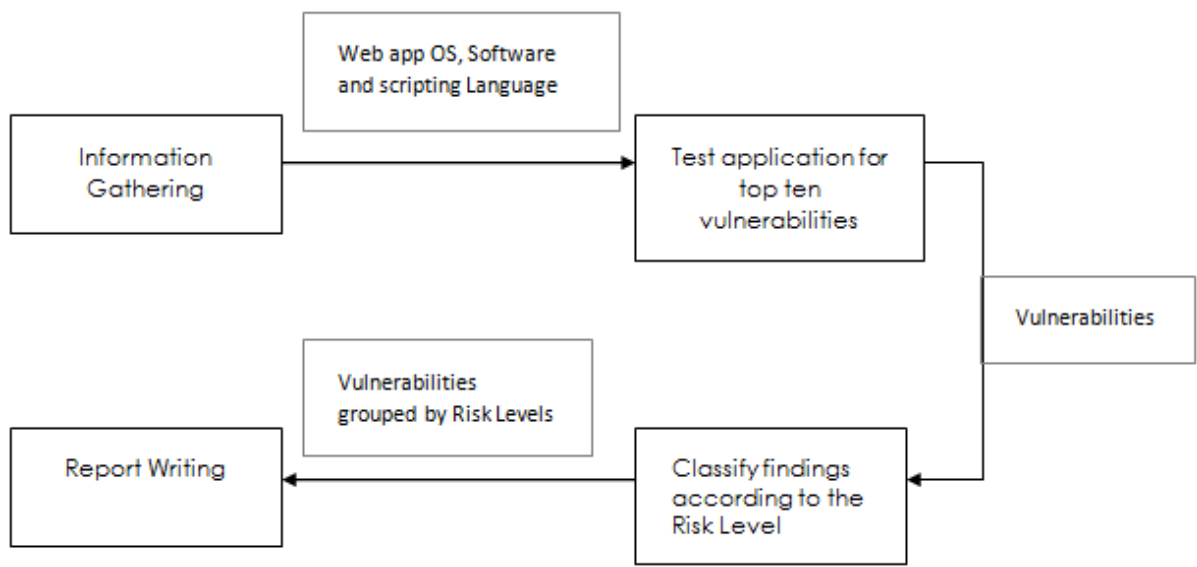
Application Testing Conducted On (Final Audit):

01-04-2024 to 31-07-2024

Audit Methodology and Criteria / Standard referred for audit

Methodology

The methodology applied in Web Application Security Testing is explained in the diagram below:



Information Gathering: One of the first steps of this test is to identify the Web application environment, including the scripting language and Web server software in use, and the operating system of the target server. However, this step is generally omitted if the testing is limited to just the web application and not the host.

Test Application: While testing the application, we follow but are not limited to the OWASP standards. The OWASP framework vulnerabilities are tested for static and dynamic websites. Our testing is done manually as well as using tools. An indicative list of tools is given in the section below.

After an exhaustive testing, the findings are compiled and classified according to a Risk Level of High, Medium or Low depending on the harm they may cause to the Web Application, server or to the network.

Application Security Observations based on OWASP framework for “Call Center Solution”.

Open Web Applications Security Project (OWASP) has included the different vulnerabilities in its OWASP, list found in web applications worldwide. The table shows how the application stacks up with respect to the OWASP framework.

S. No.	OWASP 2021 Vulnerabilities
1.	Broken Access Control
2.	Cryptographic Failures
3.	Injection
4.	Insecure Design
5.	Security Misconfiguration
6.	Vulnerable and Outdated Components
7.	Identification and Authentication Failures
8.	Software and Data Integrity Failures
9.	Security Logging and Monitoring Failures
10.	Server-Side Request Forgery
OWASP 2013 Vulnerabilities	
11.	Cross-Site Request Forgery (CSRF)
OWASP 2010 Vulnerabilities	
12.	Malicious File Execution
13.	Denial Of Service

Tools/ Software used

S. No	Name of Tool/Software used	Version of the tool /Software used	Open Source/Licensed
1.	Burp Suite	11.1.2	Licensed
2.	SQLmap	3.0.1	Open Source
3.	NMAP	7.90	Open Source

Executive Summary

S. No	Affected Asset i.e. IP/URL/Application etc.	Observation/ Vulnerability title (Detailed observation)	CVE/CWE	Control Objective #	Control Name #	Audit Requirement #	Severity	Recommendation	Reference	New or Repeat observation	Current Status
1.	Call Center Solution Web Application	It is possible to upload malicious files in the application.	CWE-434	NA	NA	NA	Critical	Following things should be implemented in file upload module: • Inspect the content of uploaded files, and enforce a white list of accepted, non-executable content types. Additionally, enforce a blacklist of common executable formats, to hinder hybrid file attacks. • Enforce a white list of accepted, non-executable file extensions. • If uploaded files are downloaded by users, supply an accurate non-generic Content-type header, and also a Content-disposition header which specifies that browsers should handle the file as an attachment. • Enforce a size limit on uploaded files (max 8-10 MB); this can be implemented both within application code and in the web server's configuration. • Reject attempts to upload archive formats such as ZIP. • Multiple file extension like test.pdf.txt.php.jif.jpg should not be allowed for upload. • Proper checks to be put on Content type and MIME type as well. Validation at the server end must be	https://cwe-mitres.org/data/definitions/434.html, https://owasp.org/www-community/vulnerabilities/Unrestricted_File_Upload		Closed

								mandatory			
2.	Call Center Solution Web Application	Cross Site scripting attack (XSS) is possible in the application.	CWE-79	NA	NA	NA	High	Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory. been configured as tight as possible, if the path is set to the root directory "/" then it can be vulnerable to less secure applications on the same server.	https://cwe.mitre.org/data/definitions/79.html, https://www.acunetix.com/websites/security/cross-site-scripting/	-	Closed
3.	Call Center Solution Web Application	HTML injection attack is possible in the application.	CWE-80	NA	NA	NA	High	Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory.	https://cwe.mitre.org/data/definitions/80.html, https://www.invicti.com/learn/html-injection/	-	Closed
4.	Call Center Solution Web Application	I-Frame injection attack is possible in the application.	CWE-1021	NA	NA	NA	High	Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory.	https://cwe.mitre.org/data/definitions/1021.html, https://www.invicti.com/web-vulnerability-scanner/vulnerabilities/frame-injection/	-	Closed
5.	Call Center Solution Web Application	Pass the hash (Password Replay) attack is possible in the application.	CWE-836	NA	NA	NA	High	SHA-256 Salted Hashing technique "authentication or logging module" should be implemented. The requisite to this is that the backend database stores a SHA-256 orngcomput	https://cwe.mitre.org/data/definitions/836.html, https://www.bleepincomput	New	Closed

								hash of the password. (SHA-256 hash is a cryptographic technique in which the actual value can never be recovered). Here is how the salted hash technique works: When a client requests the login page, the server generates a random number, the salt, and sends it to the client along with the page. A JavaScript code on the client computes the (SHA-256) hash of the password entered by the user. It then concatenates the salt to the hash and re-computes the (SHA-256) hash. This result is then sent to the server. The server picks the hash of the password from its database, concatenates the salt and computes the (SHA-256) hash. If the user entered the correct password these two hashes should match. The server compares the two and if they match, the user is authenticated. Please note that every time a new “salt” value must be generated at the call of login page at the server end. As this “salt” is used it should be expired & deleted at the server end. If it is not used for login for more than a standard time (say 5 minutes), the “salt” value again should be expired & deleted. The SALT value should be properly implemented such that it meets the following conditions: • SALT value should not be visible in the POST request. • SALT value should be alphanumeric and minimum of 16 characters. • SALT value should not be generated on the client side but always on the server.com/news/ security/pass-the-hash-attacks-and-how-to-prevent-them-in-windows-domains/		
--	--	--	--	--	--	--	--	---	--	--

								server side.			
6.	Call Center Solution Web Application	Session Hijacking is possible in the application due to the cookie settings being misconfigured in the application.	CAP is EC-593, CWE-384	NA	NA	NA	High	1. Add a new cookie that randomly changes for each login attempt. Generate different session id before and after authentication. Also, every request after the successful authentication should be associated with any extra auth cookie: It is possible to view the sensitive information by fetching the page from the cache option of the browser. session identifier cookie which also randomly changes and expires when user logs out from the application or closes the browser. For example, Cookie: AUTHCookie=69BK7F0D8KL; ASP.NET_SessionId=JNHG7H0LKJ57CF4; Cookie: AUTHCookie=5A0KN5F9ER5; ASP.NET_SessionId=JNHG7H0LKJ57CF4; Cookie: AUTHCookie=CG4K8L3T5H; ASP.NET_SessionId=JNHG7H0LKJ57CF4; Cookie: AUTHCookie=L6D3G0JA3S; ASP.NET_SessionId=JNHG7H0LKJ57CF4. 2. SSL should be implemented.	https://capec.mitre.org/data/definition/s/593.html, https://owasp.org/www-community/attacks/Session_hijacking_attack, https://www.malware.com/blog/session-hijacking/	New	Closed
7.	Call Center Solution Web Application	Cross Site Request Forgery (CSRF) attack is possible which forces a logged-on victim's browser to send a request to a vulnerable web application, which then performs the chosen action on behalf of the victim.	CWE-352	NA	NA	NA	High	Here the problem is sharing of Cookie values across different instances of the same browser for the same host page. The application should implement the following techniques to prevent the CSRF attack: Insert custom random tokens into every form (page) – • Such that to validate each request a random token is generated for that request on the server side with the server response to the previous request.	-https://cwe.mitre.org/data/definitions/352.html, https://cheatsheets.owasp.org/cheatsheets/Cross-Site_Request_Forgery_Prevention_Cheat_Sheet.html	New	Closed

								<ul style="list-style-type: none">• These tokens will not be shared across different instances of the same browser accessing the same host page. Thus, these tokens will not be automatically submitted by the browser.• Validate the submitted token at the server end.• If the request doesn't contain the token or if the submitted token is incorrect then don't address the request.• Token value should change on each and every request.• Token value should be implemented on Page body.• Token value should be alphanumeric and minimum 32 characters.• Token should also be implemented on logout button. <p>For example: It is recommended the token value should change at each page load event and should be validated on the server side before addressing the request. Also, make sure that server does not address the request if the CSRF token contains previously used values.</p>			
8.	Call Center Solution Web Application	SQL injection (SQLi) refers to an injection attack wherein an attacker can execute malicious SQL statements that control a web application's database server.	CWE-89	NA	NA	NA	High	Use parameterized queries when dealing with SQL queries that contain user input. Parameterized queries allow the database to understand which parts of the SQL query should be considered as user input, therefore solving SQL injection.	https://cwe.mitre.org/data/definitions/89.html	New	Closed
9.	Call Center Solution Web Application	The passwords are shown in Clear Text to the end user.	CWE-256	NA	NA	NA	Medium	It is recommended that passwords should not be displayed in cleartext to end users by default and should be masked when being displayed with an option to temporarily	https://cwe.mitre.org/data/definitions/256.html , https://www.securecodewar	-	Closed

								remove the masking when needed.	prior.com/article/coders-conquer-security-infrastructure-as-codesensitive-data-storage-plaintext-storage-of-passwords		
10.	Call Center Solution Web Application	Sensitive File disclosure occurring in the application	CWE-200	NA	NA	NA	Medium	Access should be restricted to sensitive files in the application. Only authorized personnel should be able to access sensitive files and proper access control should be maintained/configured to control that.	https://cwe.mitre.org/data/definitions/200.html	New	Closed
11.	Call Center Solution Web Application	One or more configuration files are publicly accessible in this application.	CWE-200	NA	NA	NA	Medium	Remove or restrict access to all configuration files accessible from internet.	https://cwe.mitre.org/data/definitions/200.html	New	Closed
12.	Call Center Solution Web Application	Clickjacking attack is possible in application.	CWE-1021	NA	NA	NA	Medium	The server-side header "X-frame Options" can permit or forbid displaying the page inside a frame. Thus, the application will not be able to open in any third-party application.	https://cwe.mitre.org/data/definitions/1021.html, https://www.pingid.com/en/resources/cybersecurity-fundamentals/threats/clickjacking.html	-	Closed
13.	Call Center Solution Web Application	Banner grabbing (application is displaying Server name/version and web technology which may help attacker to learn more about his target) is possible in the application.	CWE-200	NA	NA	NA	Medium	Server and Web technology version should not be displayed to the end user.	https://cwe.mitre.org/data/definitions/200.html, https://support.smartec.com/support/solutions/articles/9000203049-banner-grabbing-vulnerabilities-and-	-	Closed

									solutions		
14.	Call Center Solution Web Application	All HTTP Security Headers are missing at some pages in the application.	CWE-693	NA	NA	NA	Medium	HTTP security headers are a fundamental part of website security. Upon implementation, they protect you against the types of attacks that your site is most likely to come across. These headers protect against XSS, code injection, clickjacking, etc. The following headers should be implemented. <ul style="list-style-type: none">• Cross Site Scripting Protection (X-XSS)• Content Security Policy (CSP)• HTTP Strict Transport Security (HSTS)• X-Frame-Option• X-Content-Type-Options	https://cwe.mitre.org/data/definitions/693.html , https://chatsheetsseries.org/chatsheets/CSS_headers_Cheat_Sheet.html		Closed
15.	Call Center Solution Web Application	There is no limit on number of incorrect passwords retries while trying to login. This may lead to Brute force attack.	CWE-307	NA	NA	NA	Medium	Users should be restricted to a defined number of login attempts per unit of time. After that defined number of login attempt, application should block that user account or CAPTCHA can be implemented at login page. This way automated attempt to login can be checked and brute force attacks can be prevented. CAPTCHA should follow the following condition: a) The combination of alphanumeric value. b) Combination of Upper case and lower-case letters. c) Case-Sensitive d) Its length should be minimum 6 characters. e) Should not be a third-party CAPTCHA: f) Should be Random and not follow a pattern. g) Example: Ab73jy, PT34h8, Hos3t3, nic23n etc.	https://cwe.mitre.org/data/definitions/757.html , https://owasp.org/www-community/controls/Blocking_Brute_Force_Attacks		Closed
16.	Call Center Solution Web Application	HTTP Methods are enabled in the application.	CWE-650	NA	NA	NA	Medium	HTTP methods should be disabled in the application which may prevent the application from security breach. Only GET and POST	https://cwe.mitre.org/data/definitions/650.html , https://do		Closed

								method should be enabled in the application.	cs.fluidattacks.com/criteria/vulnerabilities/044/		
17.	Call Center Solution Web Application	Old and Vulnerable version of libraries and environment are being used in the application.	CWE-1104	NA	NA	NA	Medium	It is recommended to use latest and stable version for more secured application.	https://cwe.mitre.org/data/definitions/1104.html		Closed
18.	Call Center Solution Web Application	Client-side desync (CSD) vulnerabilities occur when a web server fails to correctly process the Content-Length of POST requests. By exploiting this behavior, an attacker can force a victim's browser to desynchronize its connection with the website, typically leading to XSS.	CWE-444	NA	NA	NA	Low	This vulnerability can be resolved by patching the server so that it either processes POST requests correctly or closes the connection after handling them. You could also disable connection reuse entirely, but this may reduce performance. You can also resolve this issue by enabling HTTP/2	https://cwe.mitre.org/data/definitions/444.html	New	Closed
19.	Call Center Solution Web Application	Password History is not maintained in the application.	CWE-262	NA	NA	NA	Low	Users should be prevented from reusing their current or previous 3 passwords. Password history should ideally be 3.	https://cwe.mitre.org/data/definitions/262.html		Closed
20.	Call Center Solution Web Application	Password Complexity is not implemented properly in the application	CWE-521	NA	NA	NA	Low	Password should be complex	https://cwe.mitre.org/data/definitions/521.html		Closed
21.	Call Center Solution Web Application	Multiple Ports are open in the application.	CWE-1125	NA	NA	NA	Low	Only port 443 must be open in the application, all other remaining ports must be closed.	https://cwe.mitre.org/data/definitions/1125.html, https://blog.netwrix.com/2022/08/16/open-network-ports/		Closed
22.	Call Center Solution Web Application	Input validations not implemented properly in the application.	CWE-20	NA	NA	NA	Low	Input validations should be properly implemented in the application.	https://cwe.mitre.org/data/definitions/20.html		Closed
23.	Call Center Solution Web	Path is set to default root i.e. '/'.	CWE-41	NA	NA	NA	Low	Verify that the path attribute, just as the Domain attribute, has not been set too	https://cwe.mitre.org/data/definitions/4		Closed

	Application							loosely. Even if the Domain attribute has been configured as tight as possible, if the path is set to the root directory "/" then it can be vulnerable to less secure applications on the same server.	1.html		
24.	Call Center Solution Web Application	Cookie is displaying without SECURE flag.	CWE-614	NA	NA	NA	Low	Secure flag should be "True" in website's configuration file.	https://cwe.mitre.org/data/definitions/614.html		Closed
25.	Call Center Solution Web Application	HTTPOnly flag is not set properly in the application.	CWE-1004	NA	NA	NA	Low	HTTPOnly flag should be set to "True" in website's configuration file.	https://cwe.mitre.org/data/definitions/1004.html		Closed
26.	Call Center Solution Web Application	Same Site attribute set to none.	CWE-1275	NA	NA	NA	Low	Same Site attribute should be set to "LAX" or "STRICT".	https://cwe.mitre.org/data/definitions/1275.html, https://probably.com/vulnerabilities/cookie-with-samesite-attribute-set-to-none		Closed
27.	Call Center Solution Web Application	There is no forgot password option available for the user.	CWE-620	NA	NA	NA	Low	Users may be required to retrieve their password. Users should be provided with a "forgot password" option through which user will retrieve their password whenever required. Forgot password should be enabled with the users email address. There are following conditions that should be met in the forget password function: 1. A reset link should be sent to the user registered email address instead of password directly. 2. Reset Password link should expire in 24 hours. 3. Reset Password link should not be reused again once the link is used for resetting password. 4. In the Reset	https://cwe.mitre.org/data/definitions/620.html		Closed

								Password page, Mandatory fields i.e. new password, Confirm Password and CAPTCHA field must present and should be validated at the client end. Server end validations are also mandatory. However, if the password retrieval is internal in the application, then it is recommended to implement a hyperlink on login page resulting to a static page containing a message. "Please contact your site administrator at mail_id[at]domain[dot]com". Please note that the email address in the message should not be a hyperlink			
28.	Call Center Solution Web Application	Session termination due to user inactivity is not properly configured in the application.	CWE-613	NA	NA	NA	Low	In case of session termination by the application due to inactivity of the user within his session for more than 15 minutes, application must terminate session completely and login page must be loaded in the main window instead of in a child frame of the window.	https://cwe.mitre.org/data/definitions/613.html	New	Closed
29.	Call Center Solution Web Application	Email spamming is possible in the application.	CWE-799	NA	NA	NA	Low	The application should properly customize the email addresses while posting on the website as: 1. Email addresses should be posted as an image not as a hyperlink. Alternatively, instead of @symbol, [at] should be used. Similarly, the dot character (.) should be replaced by [dot]. So abc@nic.in should be written as abc[at]nic[dot]in. 2. High privilege email addresses should not be posted on the website.	https://cwe.mitre.org/data/definitions/799.html	New	Closed
30.	Call Center Solution Web	Autofill is enabled in forms	CWE-200	NA	NA	NA	Low	Application should not have the option to remember information entered by the user as	https://poc-tortswigger.net/kb/issues/0050		Closed

	Application							this may cause unavailability of services to valid users. AutoComplete option should be turned off by the application so as to override any settings by the user from the browser.	0800_password-field-with-autocomple-https://cwe.mitre.org/data/definitions/200.html		
31.	Call Center Solution Web Application	Old TLS versions are still being used in the application.	CWE-757	NA	NA	NA	Low	TLS v1.2 or higher should be used. All other TLS versions should be removed.	https://cwe.mitre.org/data/definitions/757.html		Closed
32.	Call Center Solution Web Application	The application may be vulnerable to DOM-based open redirection. Data is read from location.href and passed to xhr.open .	CWE-757	NA	NA	NA	Low	The most effective way to avoid DOM-based open redirection vulnerabilities is not to dynamically set redirection targets using data that originated from any untrusted source. If the desired functionality of the application means that this behavior is unavoidable, then defenses must be implemented within the client-side code to prevent malicious data from introducing an arbitrary URL as a redirection target. In general, this is best achieved by using a whitelist of URLs that are permitted redirection targets, and strictly validating the target against this list before performing the redirection.	https://cwe.mitre.org/data/definitions/757.html	New	Closed
33.	Call Center Solution Web Application	OTP masking is not implemented in the application.	CWE-549	NA	NA	NA	Low	OTP should be masked and should not be viewable in clear text to end user or an option should be provided to unmask, if needed.	https://cwe.mitre.org/data/definitions/549.html	New	Closed
34.	Call Center Solution Web Application	Cleartext submission of password	CWE-549	NA	NA	NA	Low	OTP should be masked and should not be viewable in clear text to end user or an option should be provided to unmask, if needed.	https://cwe.mitre.org/data/definitions/549.html	New	Closed
35.	Call Center Solution	The application does not maintain audit	CWE-778	NA	NA	NA	Observation	An Audit trail should be incorporated in the application admin	https://cwe.mitre.org/data/de		Closed

	Web Application	trail properly where all user activities must be logged. In case a malicious user tries to attack the application; the application will not be able to trace the attacker.						module, where all user activities must be logged.	initions/778.html		
--	-----------------	--	--	--	--	--	--	---	-------------------	--	--

Applicable in case of compliance Audits such as ISO/IEC 27001 Audit, PCI DSS audit, audit as per regulatory requirements / directions or any other such audit which checks compliance against standards/guidelines/directions mandated/recommended by a regulator or government agency.

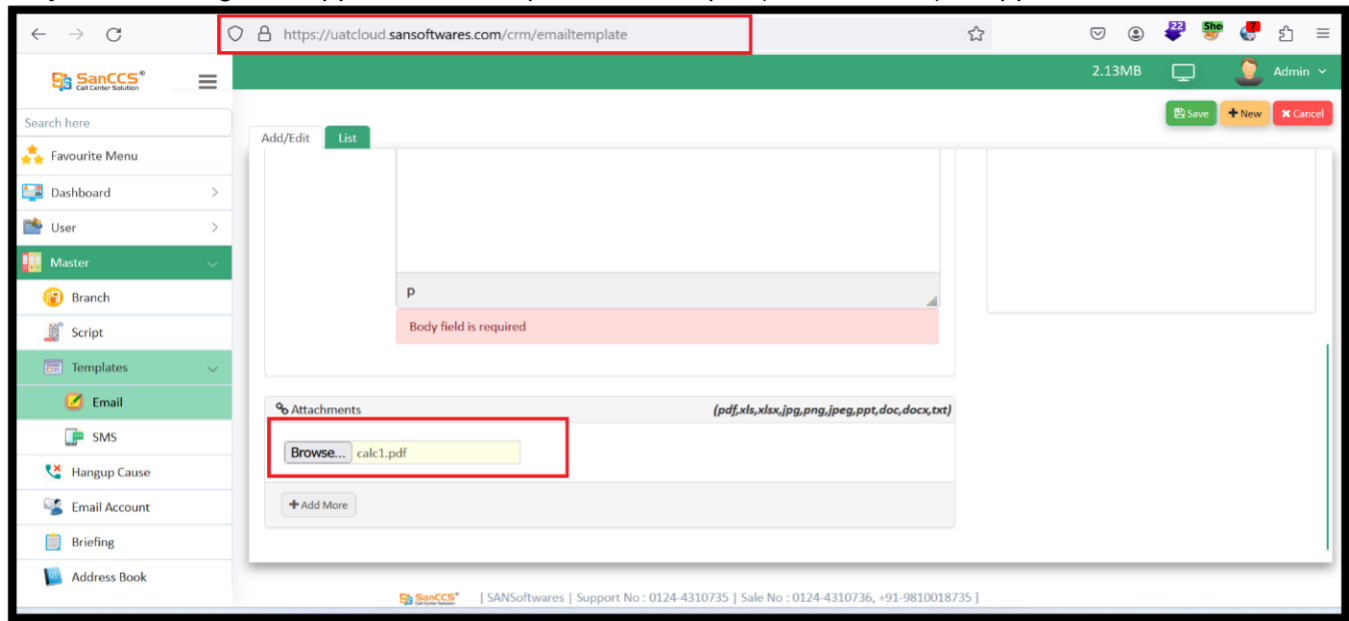
Detailed Observations

Finding No. 1

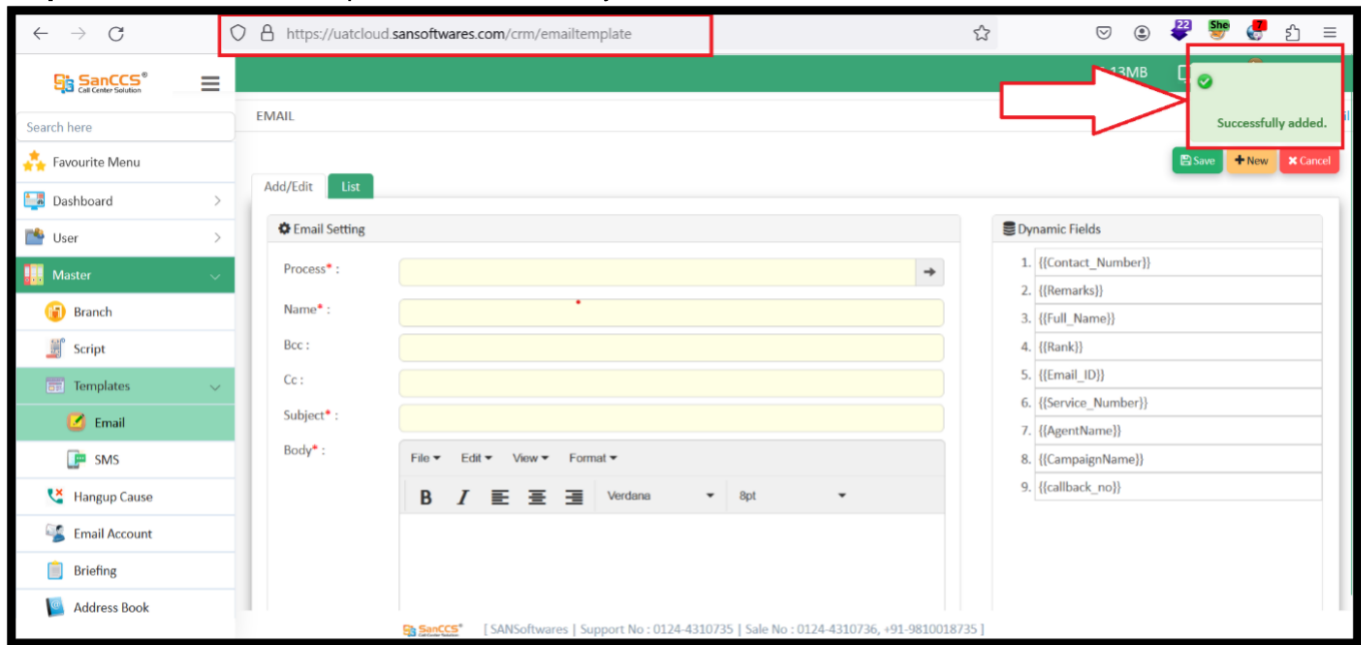
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Unrestricted Upload of File with Dangerous Type.
- iii) **Detailed observation / Vulnerable point:** It is possible to upload malicious files in the application.
- iv) **CVE/CWE:** CWE-434
- v) **Severity:** Critical
- vi) **Recommendation:** Following things should be implemented in file upload module:
 - Inspect the content of uploaded files, and enforce a white list of accepted, non-executable content types. Additionally, enforce a blacklist of common executable formats, to hinder hybrid file attacks.
 - Enforce a white list of accepted, non-executable file extensions.
 - If uploaded files are downloaded by users, supply an accurate non-generic Content-type header, and also a Content-disposition header which specifies that browsers should handle the file as an attachment.
 - Enforce a size limit on uploaded files (max 8-10 MB); this can be implemented both within application code and in the web server's configuration.
 - Reject attempts to upload archive formats such as ZIP.
 - Multiple file extension like test.pdf.txt.php.jif.jpg should not be allowed for upload.
 - Proper checks to be put on Content type and MIME type as well. Validation at the server end must be mandatory.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/434.html>,
https://owasp.org/www-community/vulnerabilities/Unrestricted_File_Upload

ix) **References to evidences / Proof of Concept:**

Step#1: After login an application and upload a calc1.pdf (malicious file) in application.



Step#2: We can see it is uploaded successfully.

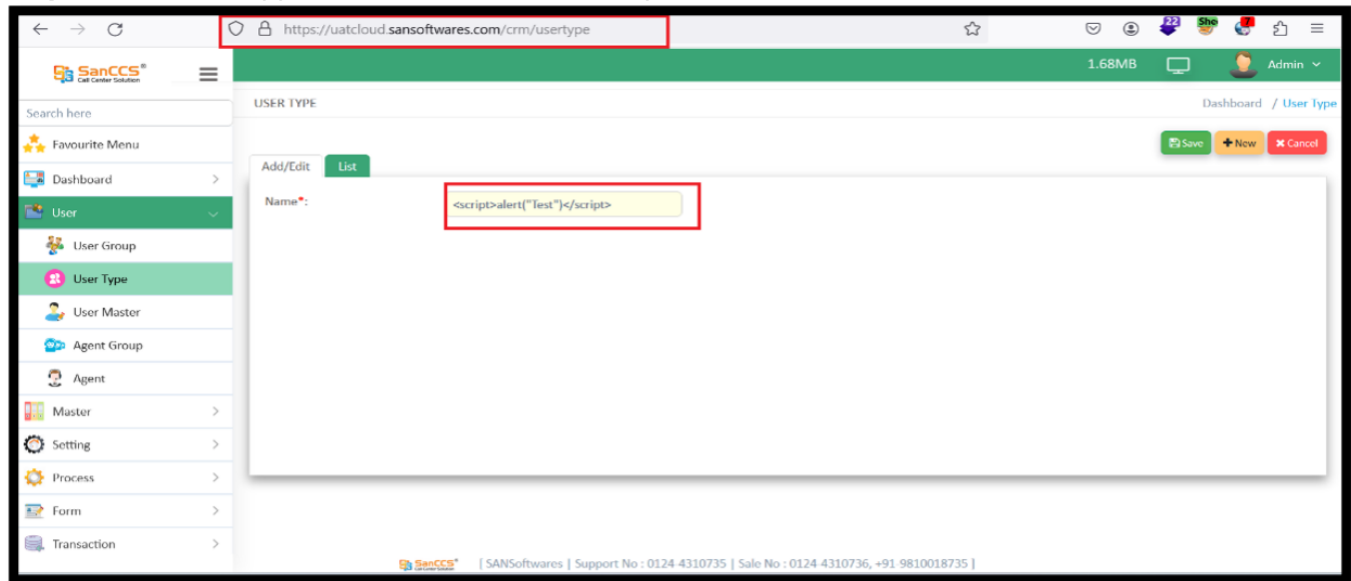


Finding No. 2

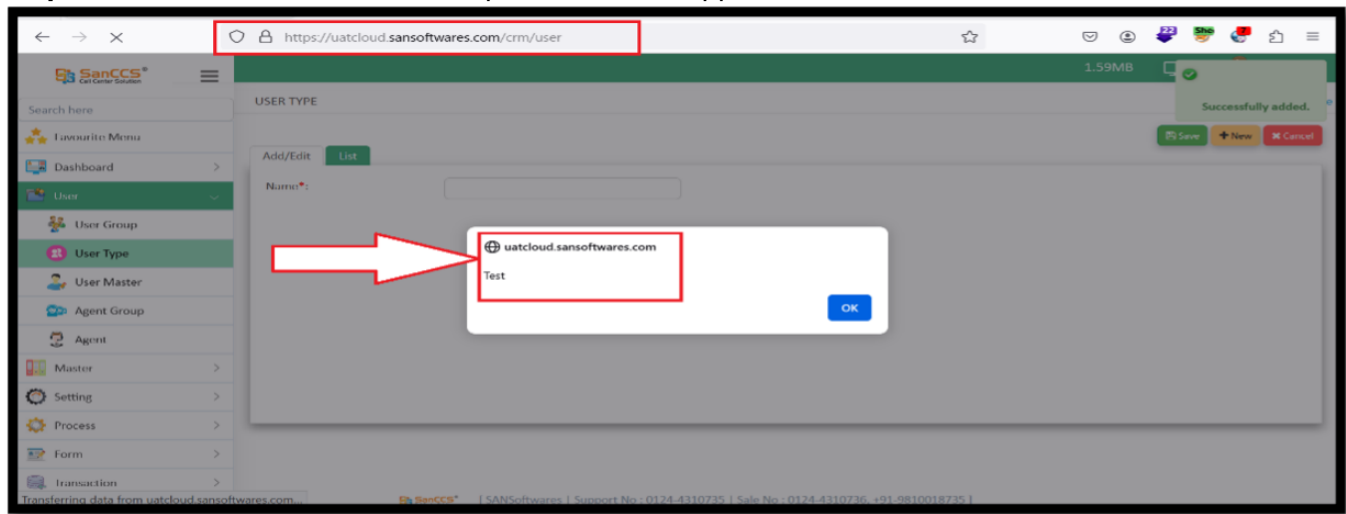
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Improper Neutralization of Input During Web Page Generation.
- iii) **Detailed observation / Vulnerable point:** Cross Site scripting attack (XSS) is possible in the application.
- iv) **CVE/CWE:** CWE-79
- v) **Severity:** High
- vi) **Recommendation:** Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory.
- vii) **Current Status:** Closed
- viii) **Reference:**
<https://cwe.mitre.org/data/definitions/79.html>,<https://www.acunetix.com/websitesecurity/cross-site-scripting/>

ix) **References to evidences / Proof of Concept:**

Step#1: Go to an application and enter data in input field.



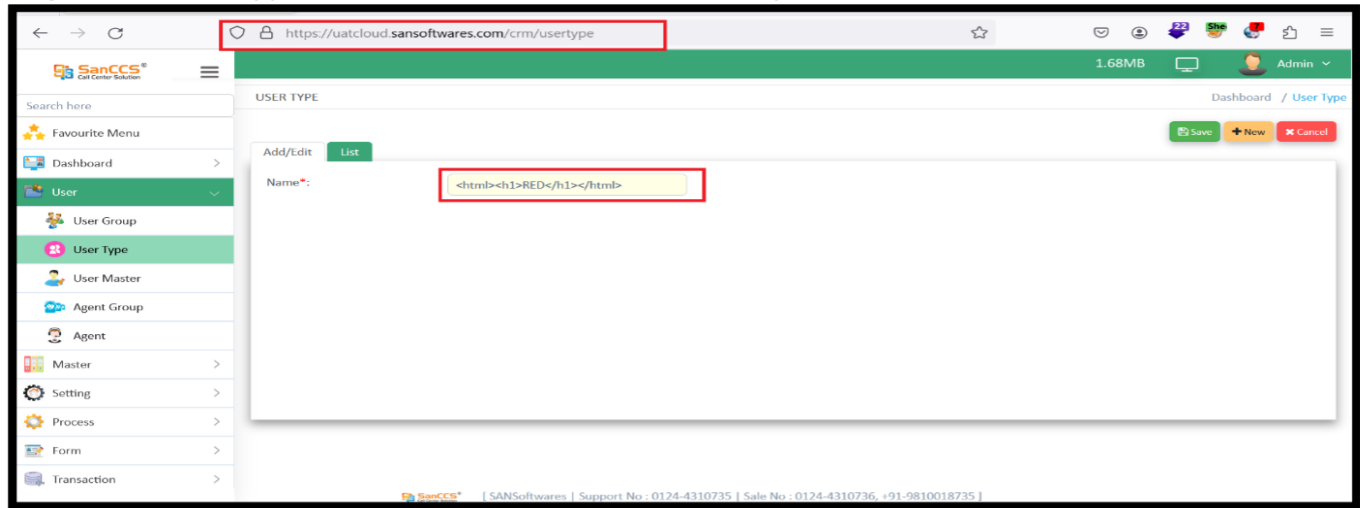
Step#2: And we can see the XSS is possible in this application.



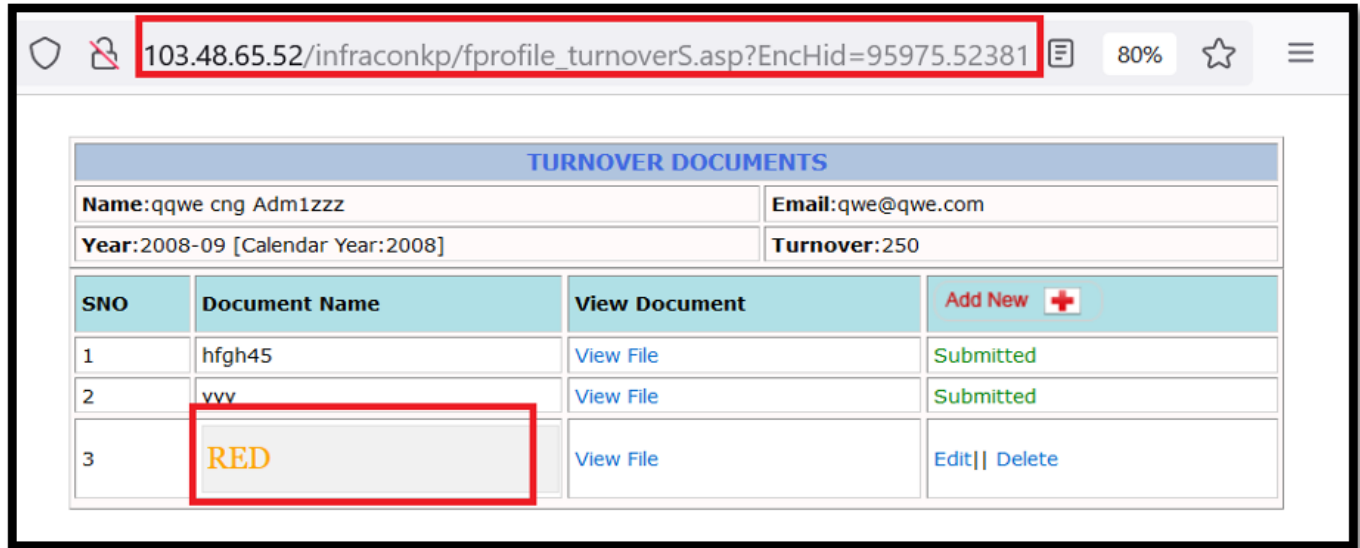
Finding No. 3

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Improper Neutralization of Script-Related HTML Tags in a Web Page.
- iii) **Detailed observation /vulnerable point:** HTML injection attack is possible in the application.
- iv) **CVE/CWE:** CWE-80
- v) **Severity:** High
- vi) **Recommendation:** Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/80.html>, <https://www.invicti.com/learn/html-injection/>

ix) **References to evidences / Proof of Concept:**
Step#1: Go to an application and enter data in document input field.

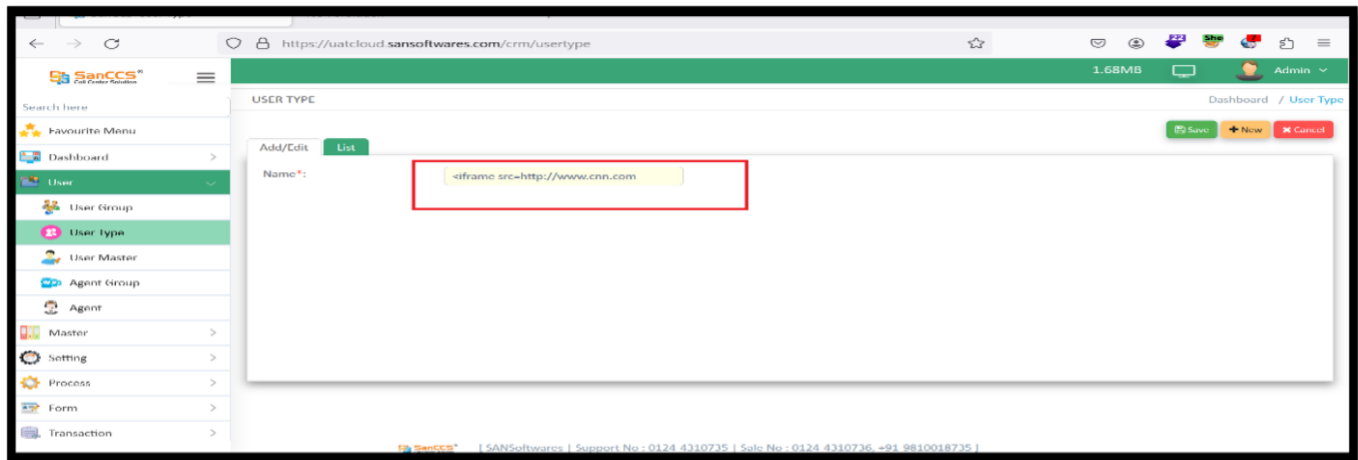


Step#2: And we can see that HTML injection is possible in this application.

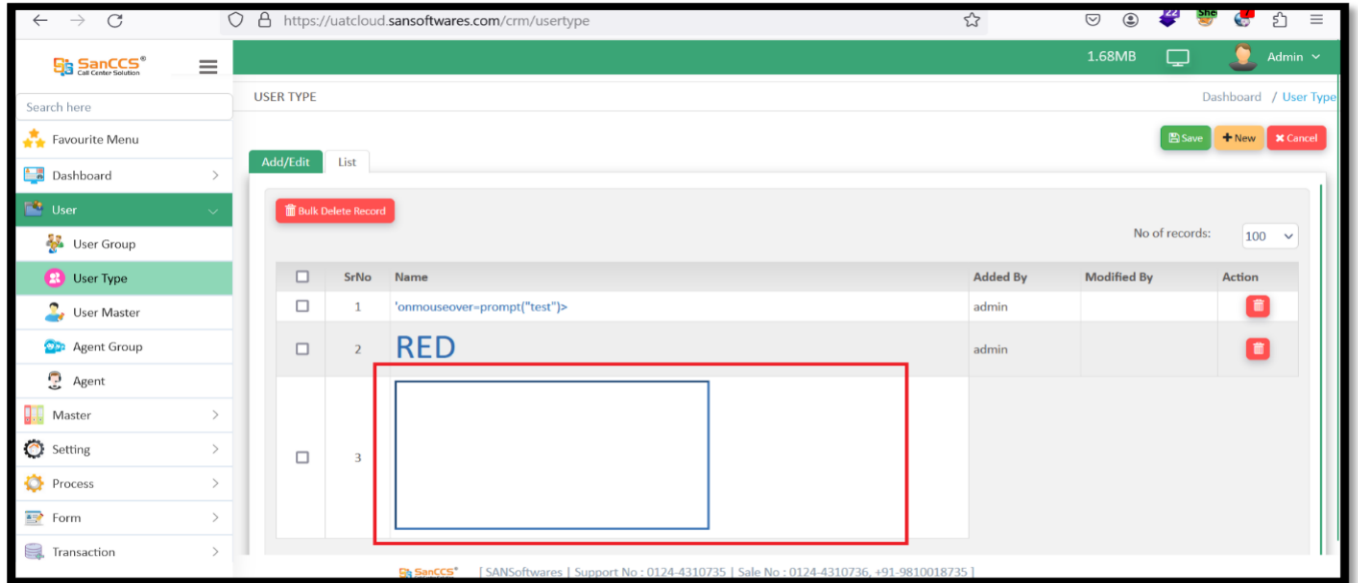


Finding No. 4

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
 - ii) **Observation/ Vulnerability title:** Improper Restriction of Rendered UI Layers or Frames
 - iii) **Detailed observation /vulnerable point:** I-Frame injection attack is possible in the application.
 - iv) **CVE/CWE:** CWE-1021
 - v) **Severity:** High
 - vi) **Recommendation:** Implement whitelisting and html encoding for every input field present in the application. Also, output encoding should be implemented. The input data should be validated for special characters both in value fields and in URL. Application should not save scripts in the database. Validation at the server end is mandatory.
 - vii) **Current Status:** Closed
 - viii) **Reference:** <https://cwe.mitre.org/data/definitions/1021.html>, <https://www.invicti.com/web-vulnerability-scanner/vulnerabilities/frame-injection/>
 - ix) **References to evidences / Proof of Concept:**
- Step#1:** Go to an application and enter data in document input field and capture the request.



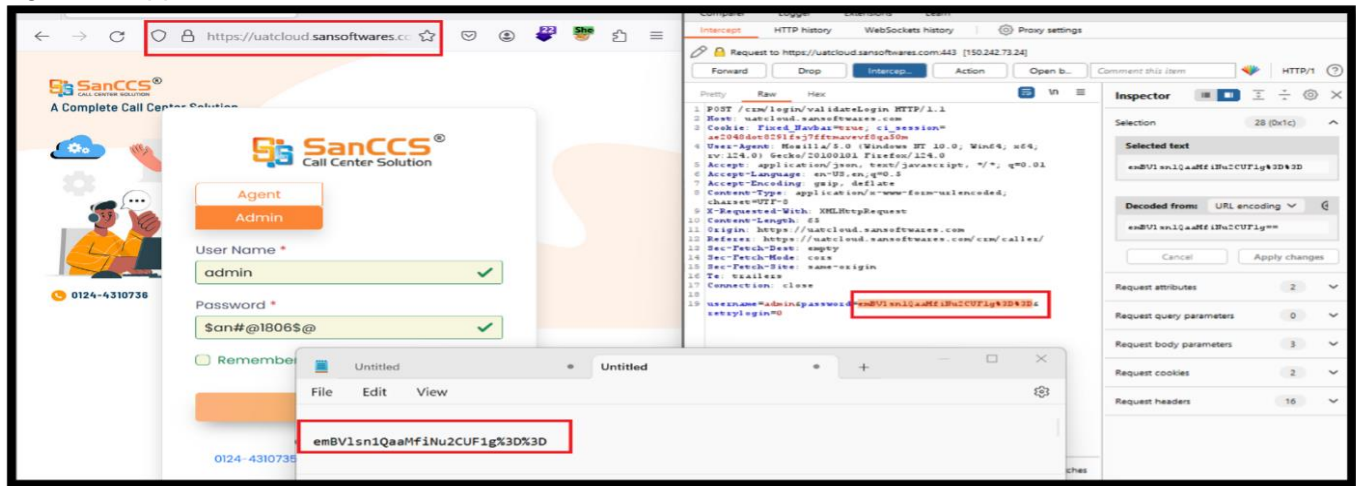
Step#2: As we can see the result in given, I Frame Injection is possible in this application.



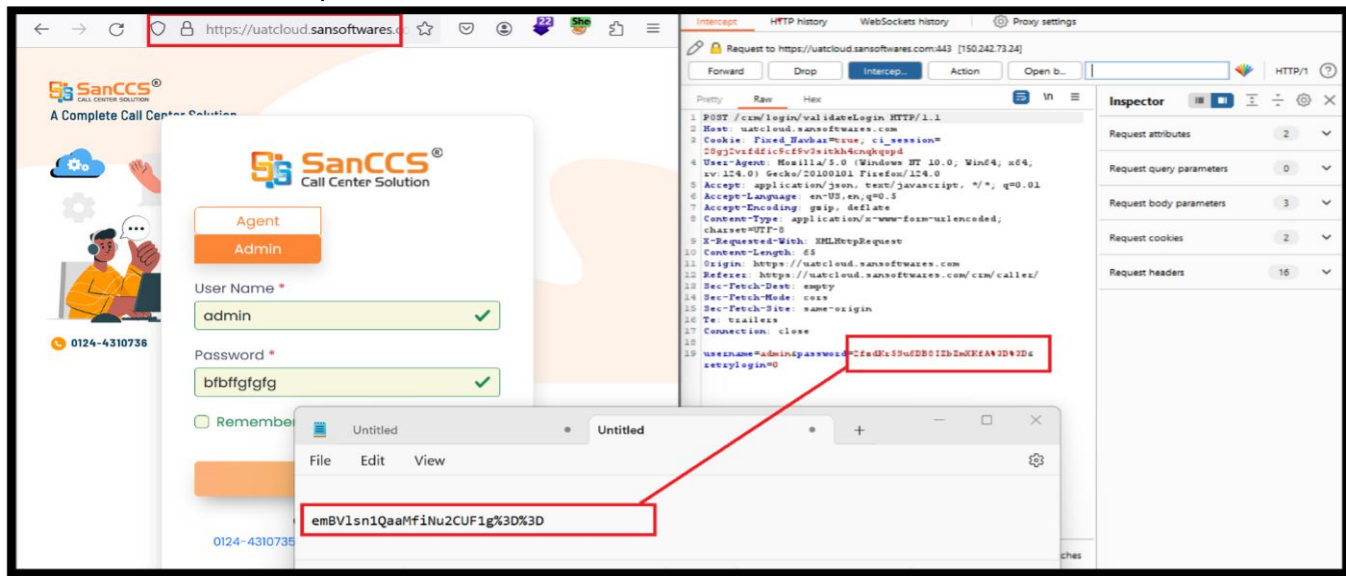
Finding No. 5

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Use of Password Hash Instead of Password for Authentication.
- iii) **Detailed observation / Vulnerable point:** Pass the hash (Password Replay) attack is possible in the application.
- iv) **CVE/CWE:** CWE-836
- v) **Severity:** High
- vi) **Recommendation:** SHA-256 Salted Hashing technique in “authentication or login module” should be implemented. The pre-requisite to this is that the backend database stores a SHA-256 or hash of the password. (SHA-256 hash is a cryptographic technique in which the actual value can never be recovered). Here is how the salted hash technique works: When a client requests for the login page, the server generates a random number, the salt, and sends it to the client along with the page. A JavaScript code on the client computes the (SHA-256) hash of the password entered by the user. It then concatenates the salt to the hash and re-computes the (SHA-256) hash. This result is then sent to the server. The server picks the hash of the password from its database, concatenates the salt and computes the (SHA-256) hash. If the user entered the correct password these two hashes should match. The server compares the two and if they match, the user is authenticated. Please note that every time a new “salt” value must be generated at the call of login page at the server end. As this “salt” is used it should be expired & deleted at the server end. If it is not used for login for more than a standard time (say 5 minutes), the “salt” value again should be expired & deleted. The SALT value should be properly implemented such that it meets the following conditions: • SALT value should not be visible in the POST request. • SALT value should be alphanumeric and minimum of 16 characters. • SALT value should not be generated on the client side but always on the server side.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/836.html>, <https://www.bleepingcomputer.com/news/security/pass-the-hash-attacks-and-how-to-prevent-them-in-windows-domains/>

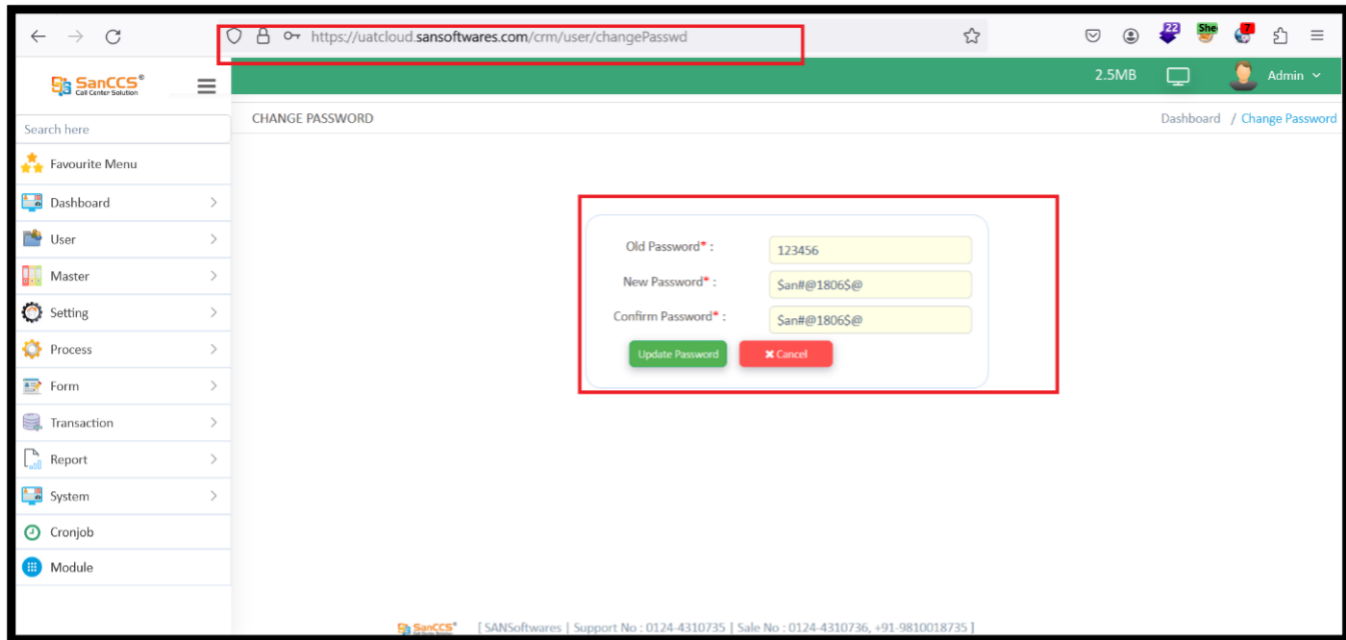
- ix) **References to evidences / Proof of Concept:**
Step#1: Login in Web Application with correct User ID and Password and Capture the login request in Burp Suite, copy the password hash, and paste it into a notepad. Afterwards, disable the proxy and logout an application.



Step#2: Attempt to log in with an incorrect password and capture the corresponding request using a proxy and, In the request, paste the previously copied request from Notepad into the password hash field, and forward the request.



Step#3: In the request, paste the previously copied request from Notepad into the password hash field, and forward the request.



Finding No. 6

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** Session Hijacking is possible in the application due to the cookie settings being misconfigured in the application
- iv) **CVE/CWE:** CAPEC-593, CWE-384
- v) **Severity:** High
- vi) **Recommendation:** 1. Add a new cookie that randomly changes for each login attempt. Generate different session id before and after authentication. Also, every request after the successful authentication should be associated with an extra auth cookie: It is possible to view the sensitive information by fetching the page from the cache option of the browser. session identifier cookie which also randomly changes and expires when user logs out from the application or closes the browser.
For example,
Cookie: AUTHCookie=69BK7F0D8KL; ASP.NET_SessionId= JNHG7H0LKJ57CF4;
Cookie: AUTHCookie=5A0KN5F9ER5; ASP.NET_SessionId= JNHG7H0LKJ57CF4;
Cookie: AUTHCookie=CG4K8L3T5H; ASP.NET_SessionId= JNHG7H0LKJ57CF4;
Cookie: AUTHCookie=L6D3G0JA3S; ASP.NET_SessionId= JNHG7H0LKJ57CF4.
2. SSL should be implemented.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://capec.mitre.org/data/definitions/593.html>,
https://owasp.org/www-community/attacks/Session_hijacking_attack,
<https://www.malcare.com/blog/session-hijacking/>
- ix) **References to evidences / Proof of Concept:** N/A

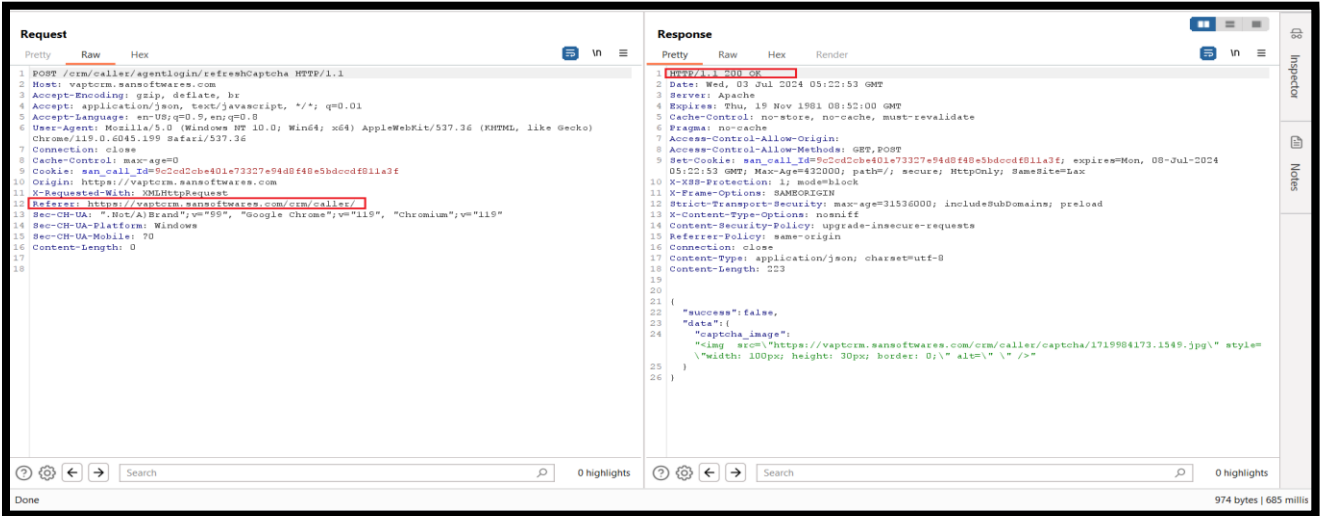
Finding No. 7

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** Cross Site Request Forgery (CSRF) attack is possible which forces a logged-on victim's browser to send a request to a vulnerable web application, which then performs the chosen action on behalf of the victim.
- iv) **CVE/CWE:** CWE-352
- v) **Severity:** High
- vi) **Recommendation:** Here the problem is - sharing of Cookie values across different instances of the same browser for the same host page. The application should implement the following techniques to prevent the CSRF attack: Insert custom random tokens into every form (page)

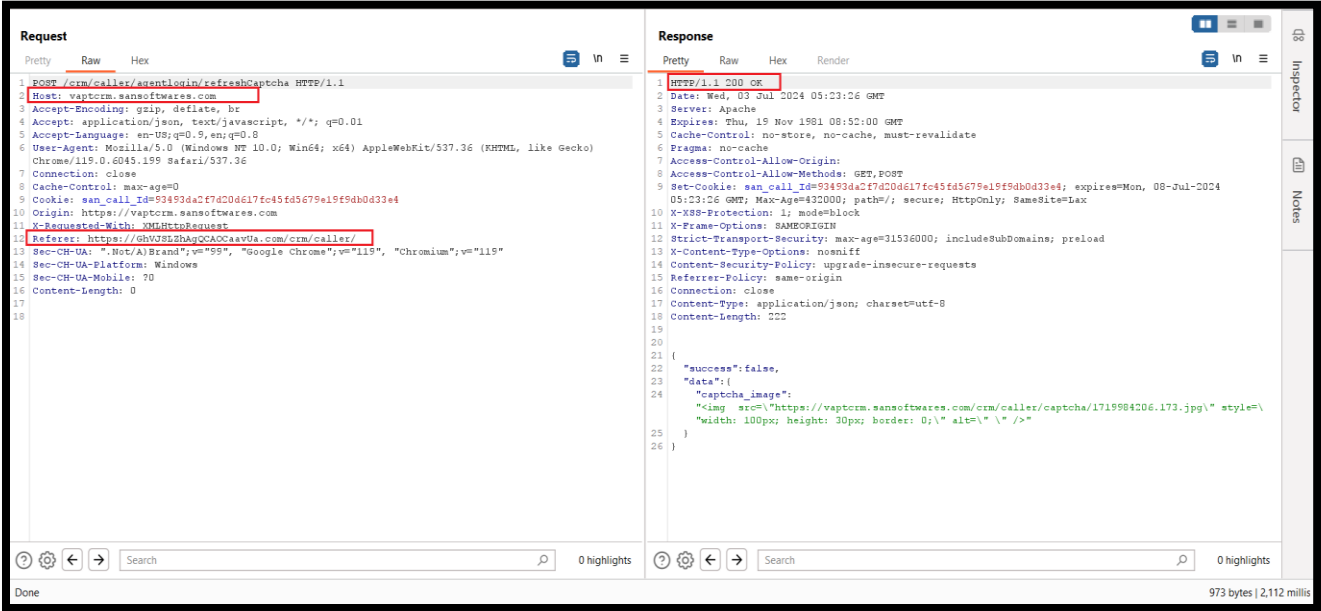
- Such that to validate each request a random token is generated for that request on the server side with the server response to the previous request.
- These tokens will not be shared across different instances of the same browser accessing the same host page. Thus, these tokens will not be automatically submitted by the browser.
- Validate the submitted token at the server end.
- If the request doesn't contain the token or if the submitted token is incorrect then don't address the request.
- Token value should change on each and every request.
- Token value should be implemented on Page body.
- Token value should be alphanumeric and minimum 32 characters.
- Token should also be implemented on logout button.

For example: It is recommended the token value should change at each page load event and should be validated on the server side before addressing the request. Also, make sure that server does not address the request if the CSRF token contains previously used values.

- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/352.html>, https://cheatsheetseries.owasp.org/cheatsheets/Cross-Site_Request_Forgery_Prevention_Cheat_Sheet.html
- ix) **References to evidences / Proof of Concept:**
Step#1: Open the URL, login with valid credentials of user, and capture the request on Burp Suite.
Step#2: Change the Referrer



Step#3: observe from the screenshot below, request is 200 OK, CSRF is possible.



Finding No. 8

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Improper Neutralization of Special Elements.
- iii) **Detailed observation /vulnerable point:** SQL injection (SQLi) refers to an injection attack wherein an attacker can execute malicious SQL statements that control a web application's database server.
- iv) **CVE/CWE:** CWE-89
- v) **Severity:** Medium
- vi) **Recommendation:** Use parameterized queries when dealing with SQL queries that contain user input. Parameterized queries allow the database to understand which parts of the SQL query should be considered as user input, therefore solving SQL injection.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/256.html>,
<https://www.securecodewarrior.com/article/coders-conquer-security-infrastructure-as-codesensitive-data-storage-plaintext-storage-of-passwords>

ix) **References to evidences / Proof of Concept:**

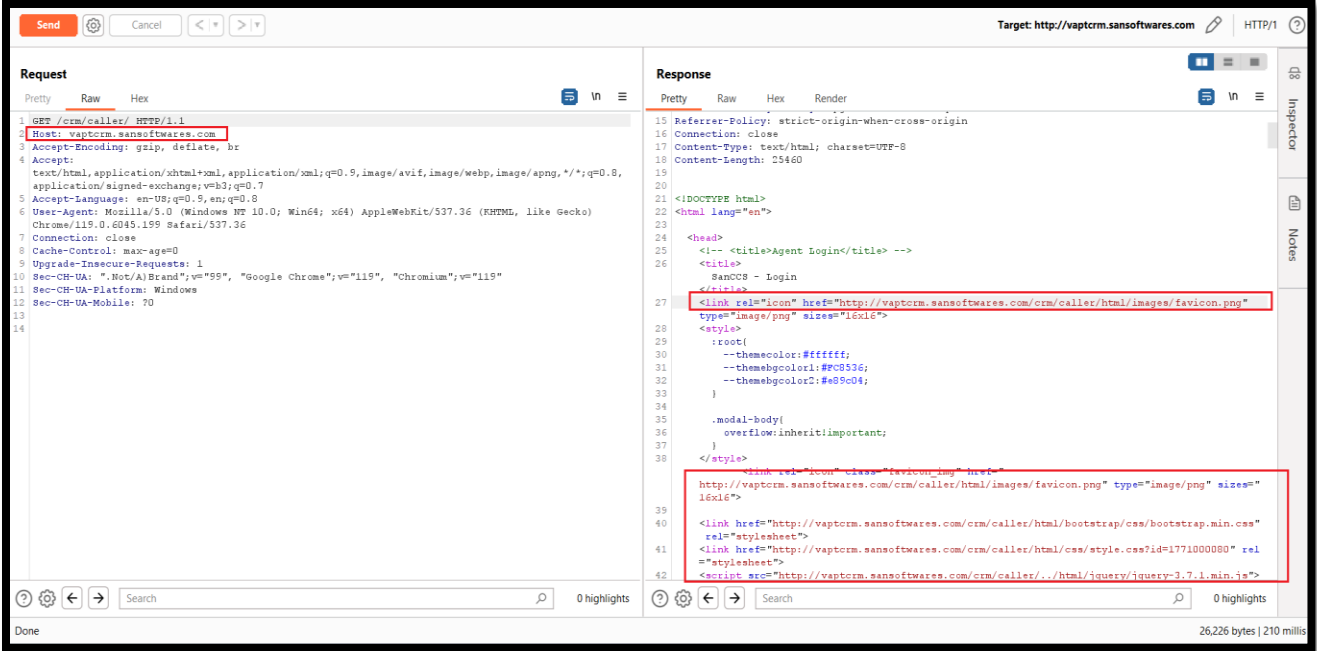
Step#1: Observed from the screenshot below, URL encoded POST input registered_agent was set to 1Â\$Â¢%2527%2522.



Finding No. 9

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** The sensitive information is shown in Clear Text to the end user.
- iv) **CVE/CWE:** CWE-256
- v) **Severity:** Medium
- vi) **Recommendation:** It is recommended that data should not be displayed in cleartext to end users by default and should be masked when being displayed with an option to temporarily remove the masking when needed.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/256.html>,
<https://www.securecodewarrior.com/article/coders-conquer-security-infrastructure-as-codesensitive-data-storage-plaintext-storage-of-passwords>
- ix) **References to evidences / Proof of Concept:**

Step#1: Observed from the screenshot below, Sensitive information displayed in the application in the clear text.

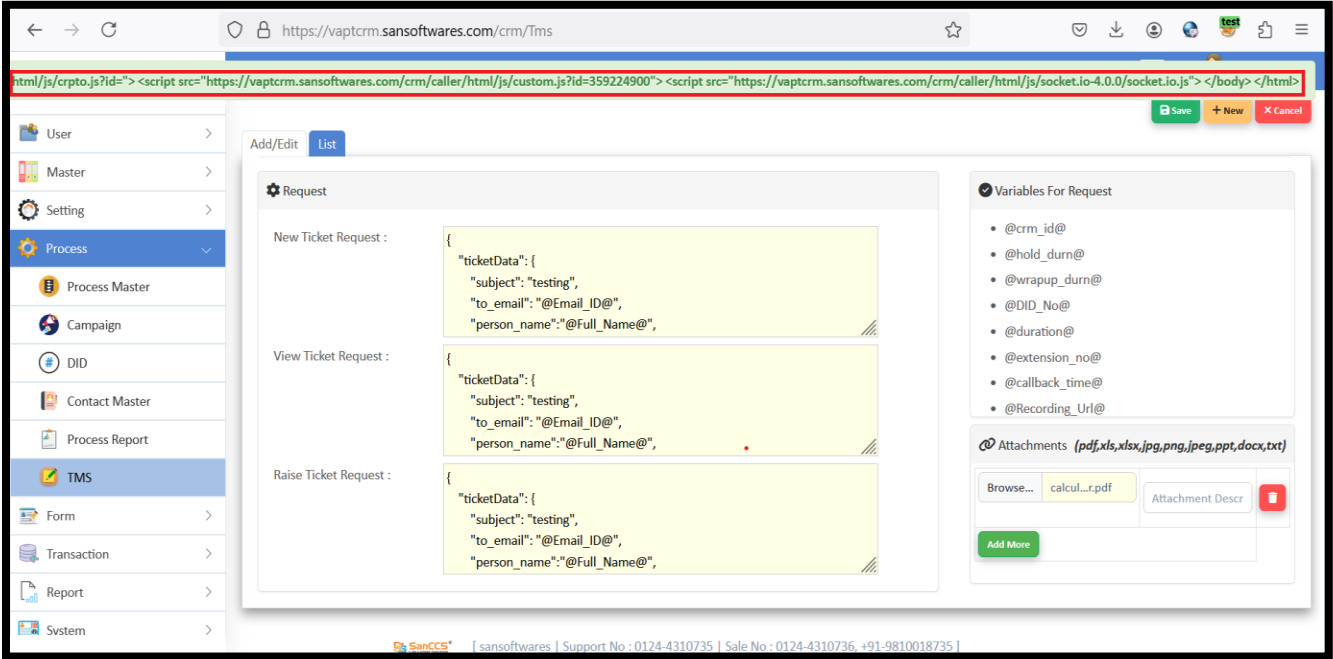


Finding No. 10

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** Sensitive File disclosure is occurring in the application.
- iv) **CVE/CWE:** CWE-200
- v) **Severity:** Medium
- vi) **Recommendation:** Access should be restricted to sensitive files in the application. Only authorized personnel should be able to access sensitive files and proper access control should be maintained/configured to control that.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/200.html>

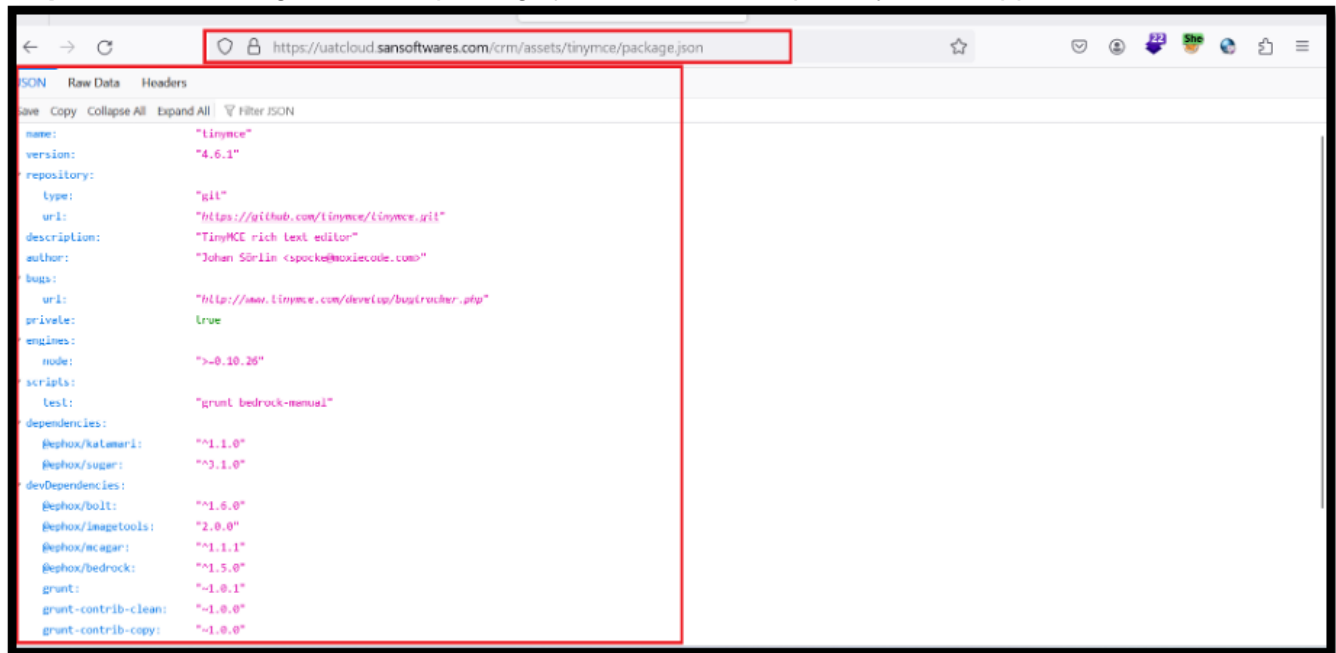
ix) **References to evidences / Proof of Concept:**

Step#1: Observed from the screenshot below, Sensitive file disclosure is occurring in the application.



Finding No. 11

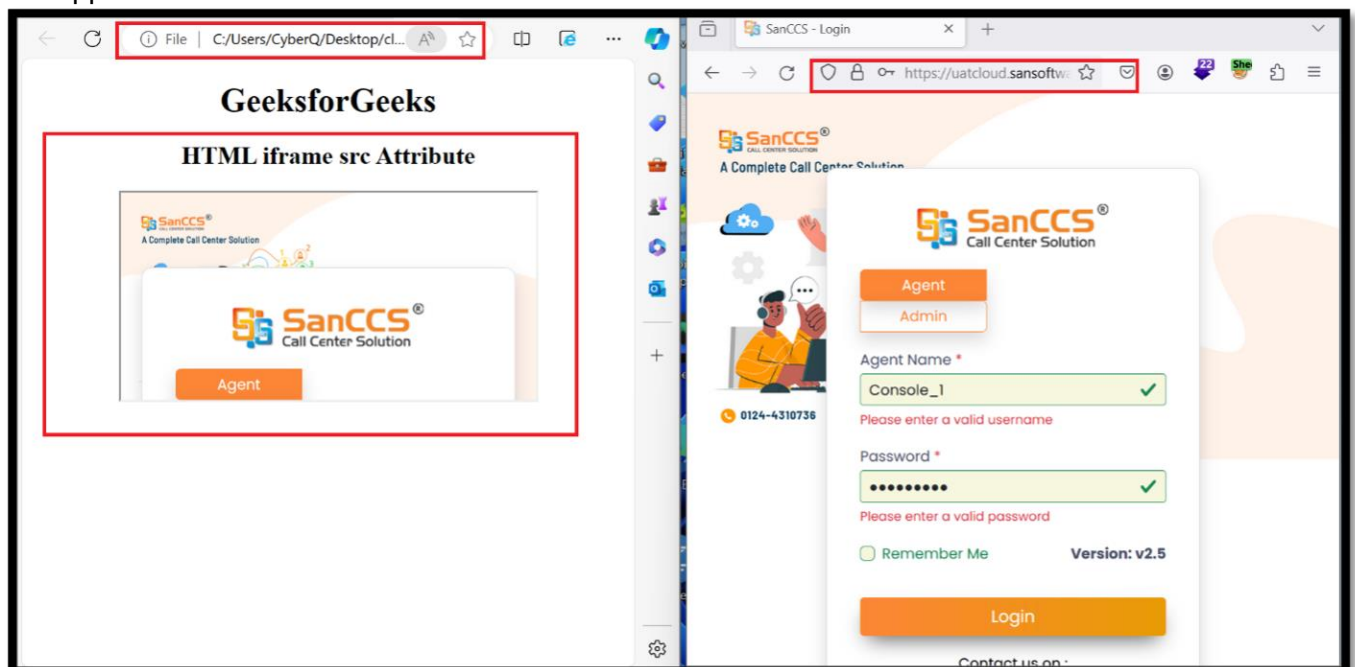
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** One or more configuration files are publicly accessible in this application.
- iv) **CVE/CWE:** CWE-200
- v) **Severity:** Medium
- vi) **Recommendation:** Remove or restrict access to all configuration files accessible from internet.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/200.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: we can see given below package.json file disclosed publicly in this application.



Finding No. 12

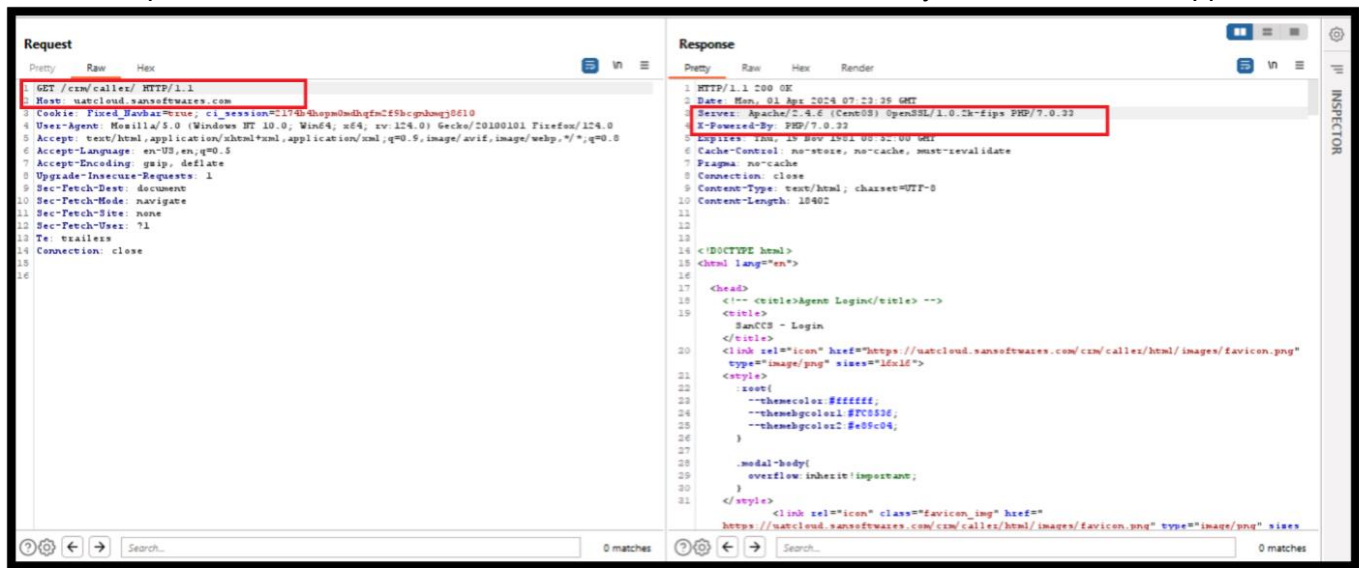
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Improper Restriction of Rendered UI Layers or Frames
- iii) **Detailed observation /vulnerable point:** Clickjacking attack is possible in application.
- iv) **CVE/CWE:** CWE-1021
- v) **Severity:** Medium
- vi) **Recommendation:** The server-side header “X-frame Options” can permit or forbid displaying the page inside a frame. Thus, the application will not be able to open in any third-party application.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/1021.html>,
<https://www.pingidentity.com/en/resources/cybersecurity-fundamentals/threats/clickjacking.html>
- ix) **References to evidences / Proof of Concept:**

Step#1: We can see in below screenshot; application is open in a frame. So, clickjacking possible in this application.



Finding No. 13

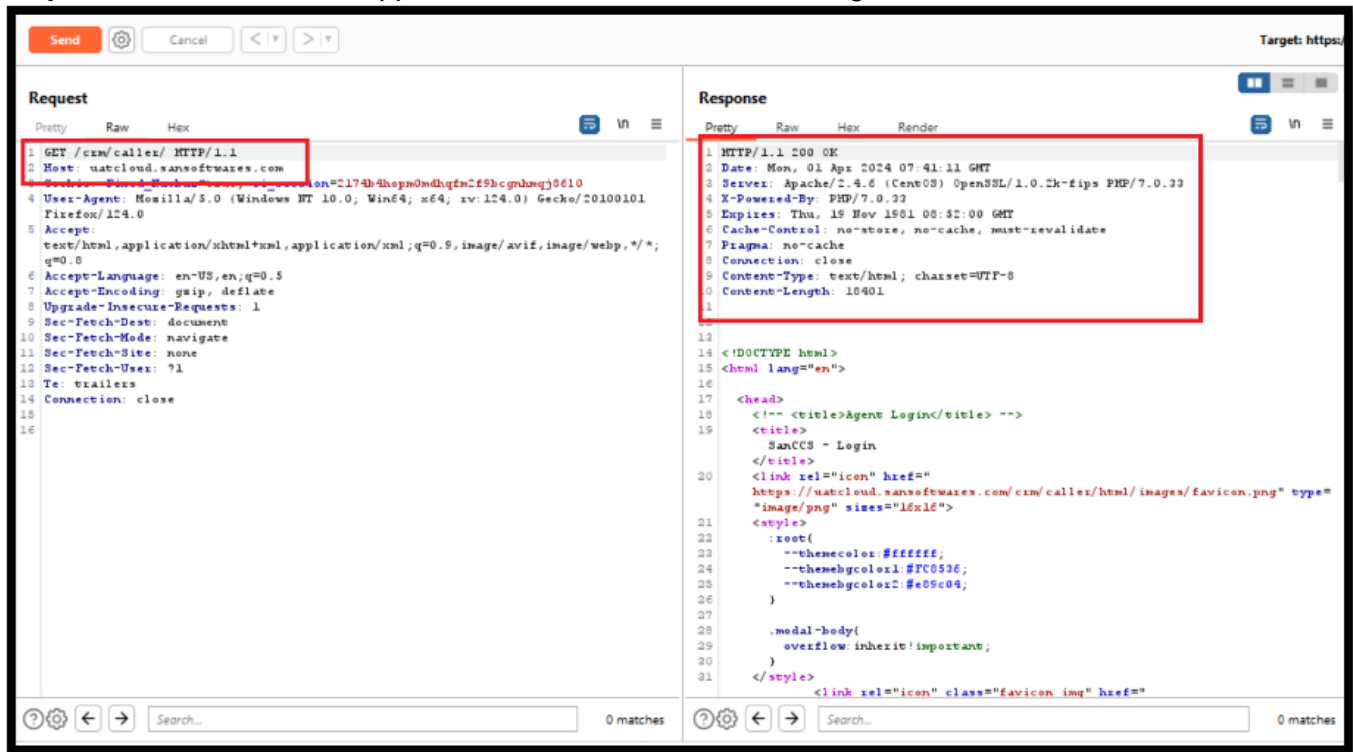
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation /vulnerable point:** Banner grabbing (application is displaying Server name/version and web technology name/version which may help attacker to learn more about his target) is possible in the application.
- iv) **CVE/CWE:** CWE-200
- v) **Severity:** Medium
- vi) **Recommendation:** Server and Web technology version should not be displayed to the end user.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/200.html>,
<https://support.smartent.com/support/solutions/articles/9000203049-banner-grabbing-vulnerabilities-and-solutions>
- ix) **References to evidences / Proof of Concept:**
Step#1: Using Burp Suite, we capture the request of a webpage of the application and we can see in below snapshot that Server and version information's are easily visible in this application.



Finding No. 14

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Protection Mechanism Failure
- iii) **Detailed observation /vulnerable point:** All HTTP Security Headers are missing at some pages in the application.
- iv) **CVE/CWE:** CWE-693
- v) **Severity:** Medium
- vi) **Recommendation:** HTTP security headers are a fundamental part of website security. Upon implementation, they protect you against the types of attacks that your site is most likely to come across. These headers protect against XSS, code injection, click jacking, etc. The following headers should be implemented. • Cross Site Scripting Protection (X-XSS) • Content Security Policy (CSP) • HTTP Strict Transport Security (HSTS) • X-Frame-Option • X-Content-Type-Options.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/693.html>,
<https://cheatsheetseries.owasp.org/cheatsheets/HTTP-Headers-Cheat-Sheet.html>

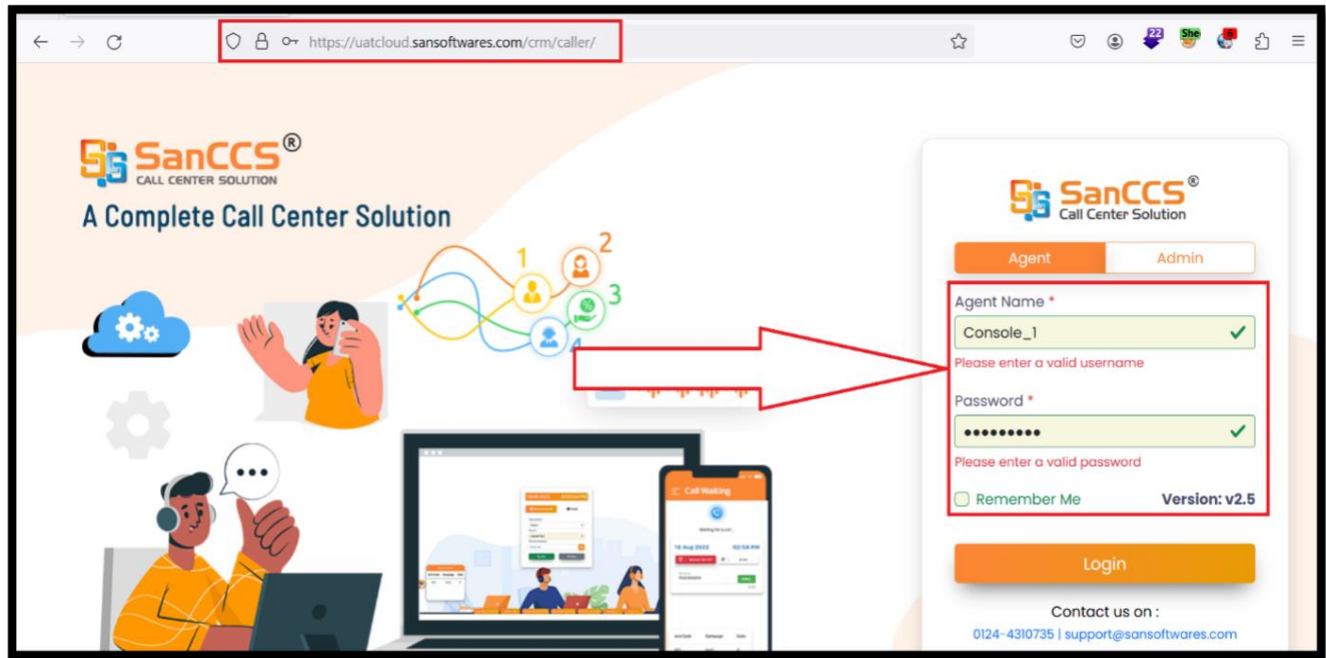
ix) **References to evidences / Proof of Concept:**
Step#1: We can see in this application here are all header missing.



Finding No. 15

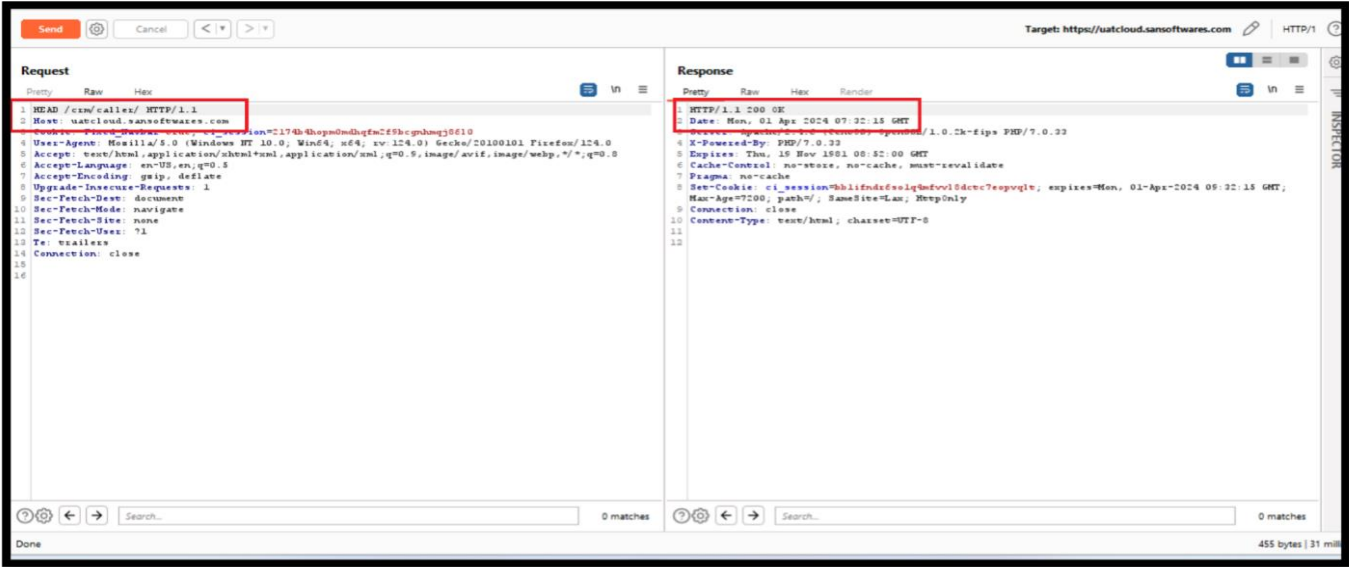
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Improper Restriction of Excessive Authentication Attempts
- iii) **Detailed observation / Vulnerable point:** There is no limit on number of incorrect passwords retries while trying to login. This may lead to Brute force attack.
- iv) **CVE/CWE:** CWE-307
- v) **Severity:** Medium
- vi) **Recommendation:** Users should be restricted to a defined number of login attempts per unit of time. After that defined number of login attempt, application should block that user account or CAPTCHA can be implemented at login page. This way automated attempt to login can be checked and brute force attacks can be prevented. CAPTCHA should follow the following condition: a) The combination of alphanumeric value. b) Combination of Upper case and lower-case letters. c) Case-Sensitive d) Its length should be minimum 6 characters. e) Should not be a third-party CAPTCHA: f) Should be Random and not follow a pattern. g) Example: Ab73jy, PT34h8, Hos3t3, nic23n etc.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/757.html>,
https://owasp.org/www-community/controls/Blocking_Brute_Force_Attacks

ix) **References to evidences / Proof of Concept:**
Step#1: We can see there is not set any limit or CAPTCHA implemented.

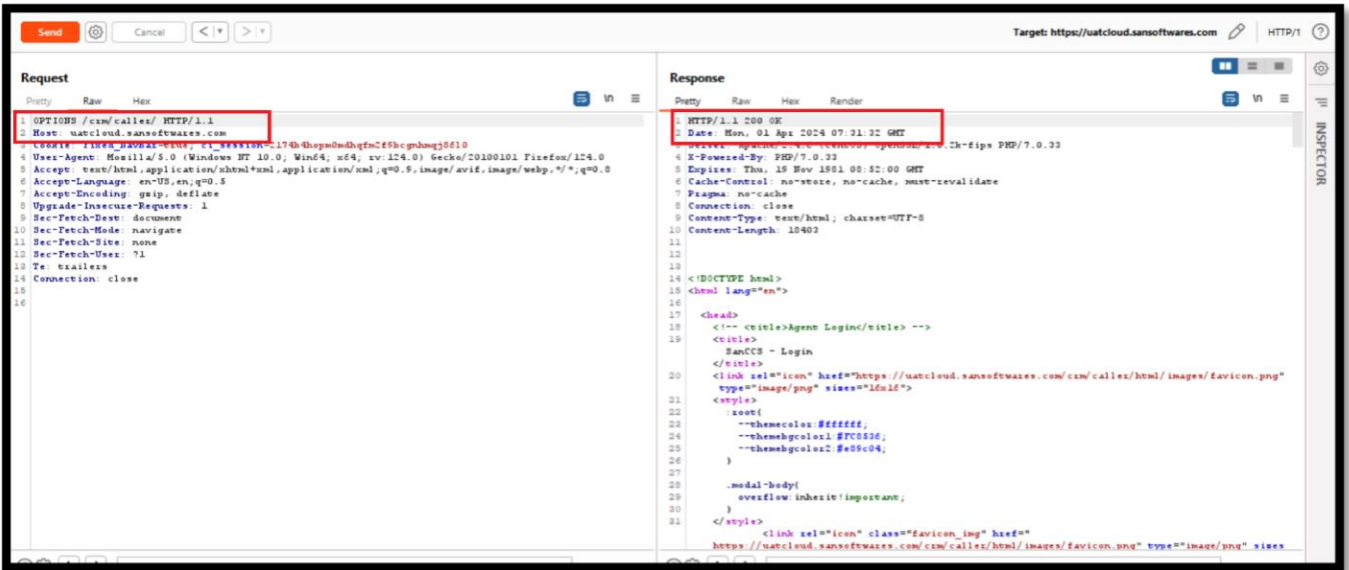


Finding No. 16

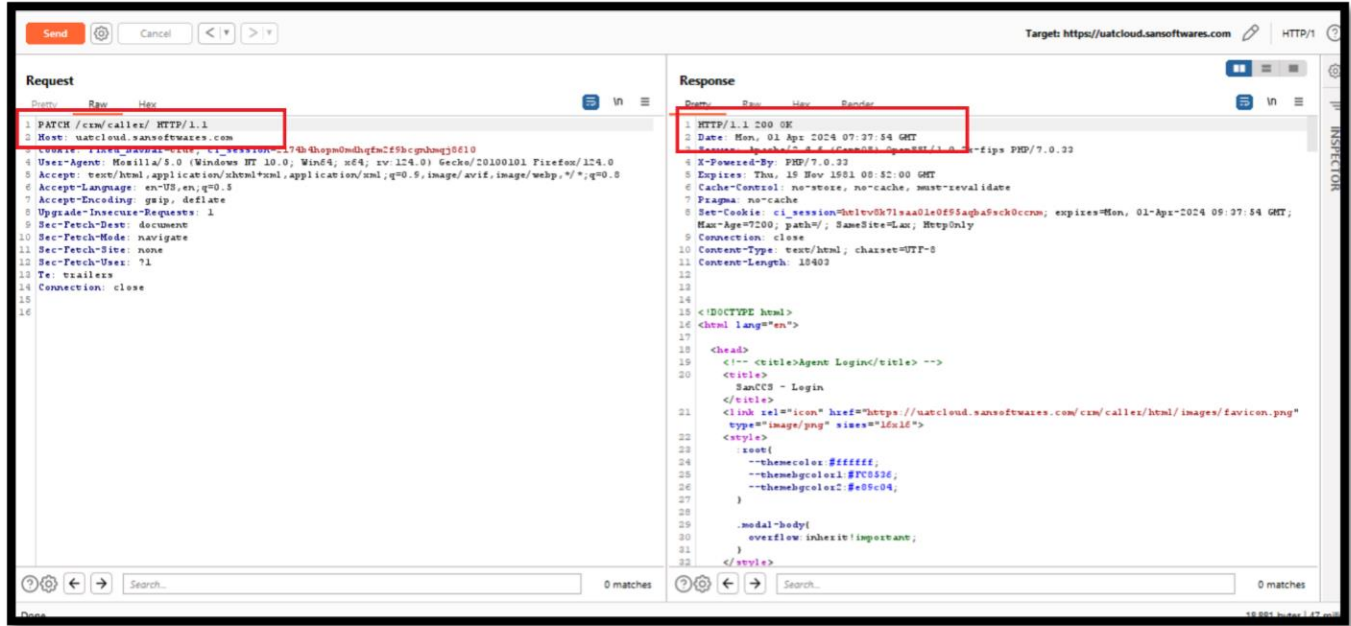
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Trusting HTTP Permission Methods on the Server Side
- iii) **Detailed observation /vulnerable point:** HTTP Methods are enabled in the application.
- iv) **CVE/CWE:** CWE-650
- v) **Severity:** Medium
- vi) **Recommendation:** HTTP methods should be disabled in the application which may prevent the application from security breach. Only GET and POST method should be enabled in the application.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/650.html>
- ix) **References to evidences / Proof of Concept:**
Case#1: HEAD Method Enabled
Step#1: We can see Head method enable in this application.



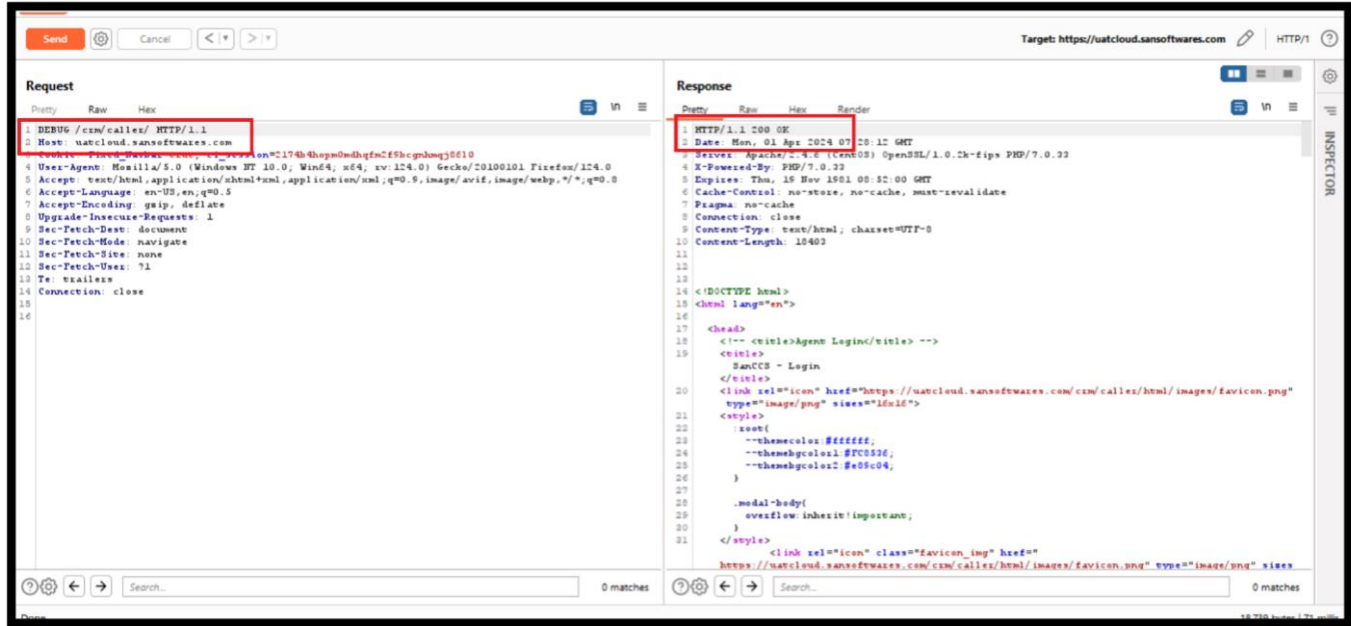
- Case#2: OPTIONS Method Enabled**
Step#1: We can see OPTIONS method enable in this application.



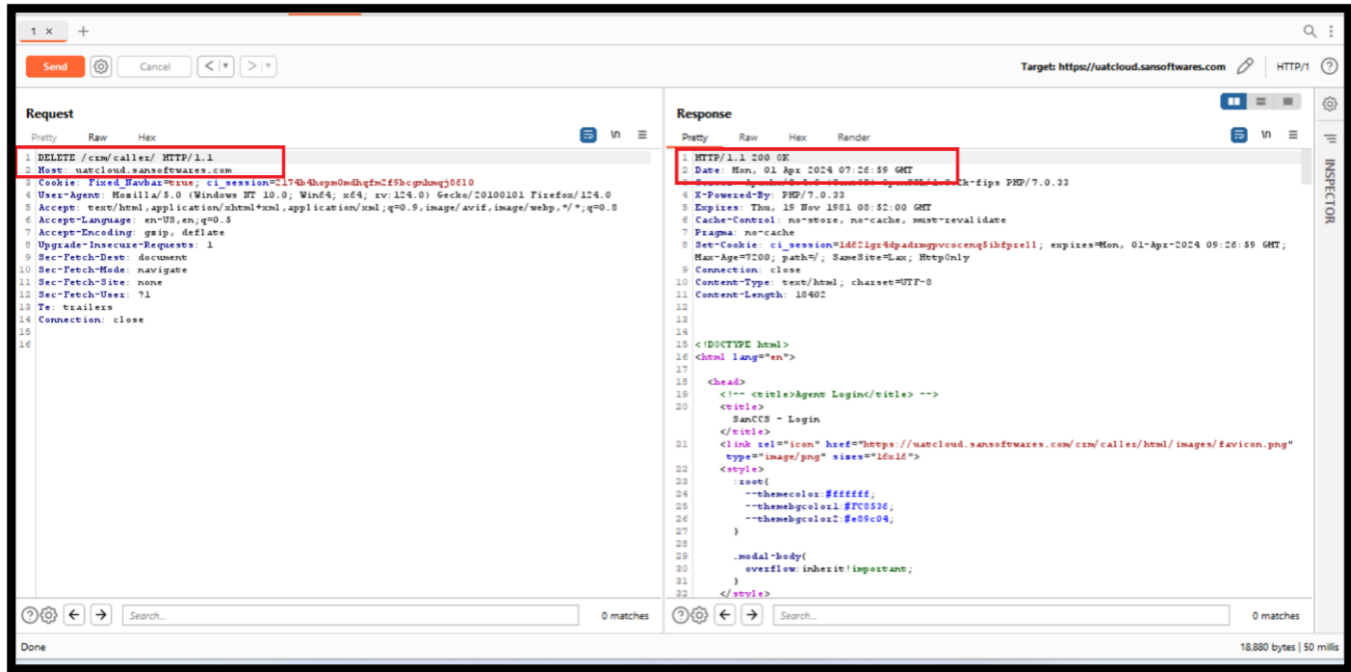
Case#3: Patch Method Enabled
Step#1: We can see Patch method enable in this application.



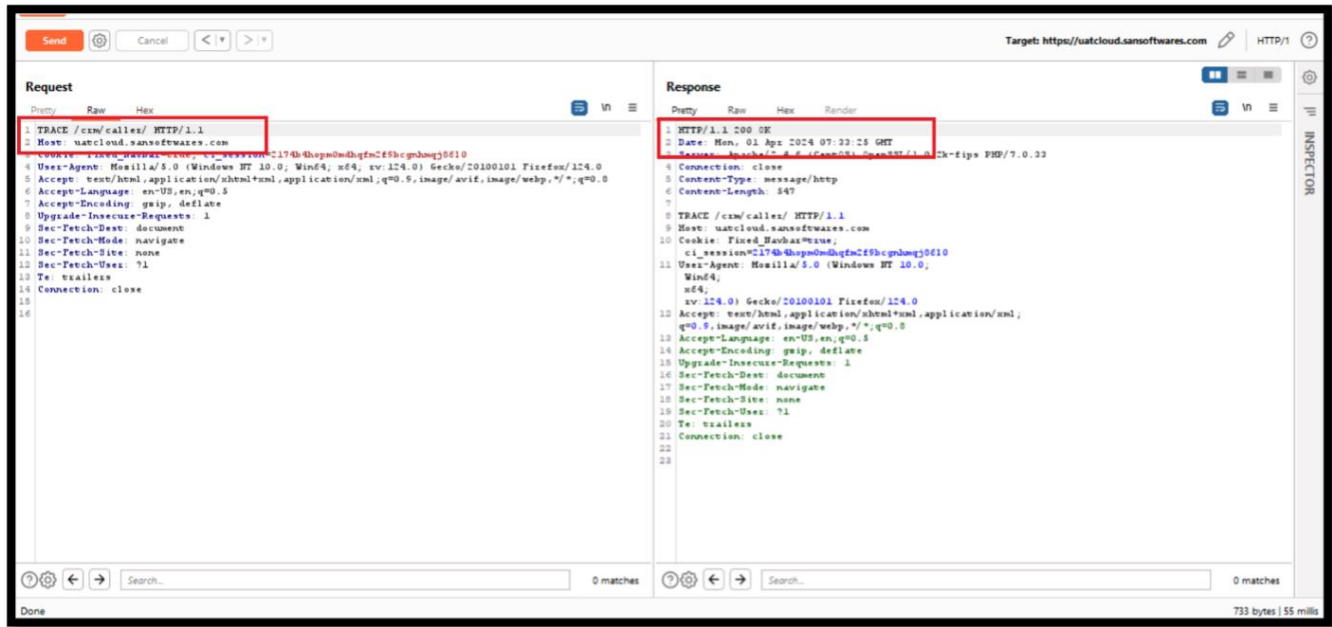
Case#4: DEBUG Method Enabled
Step#1: We can see Debug method enable in this application.



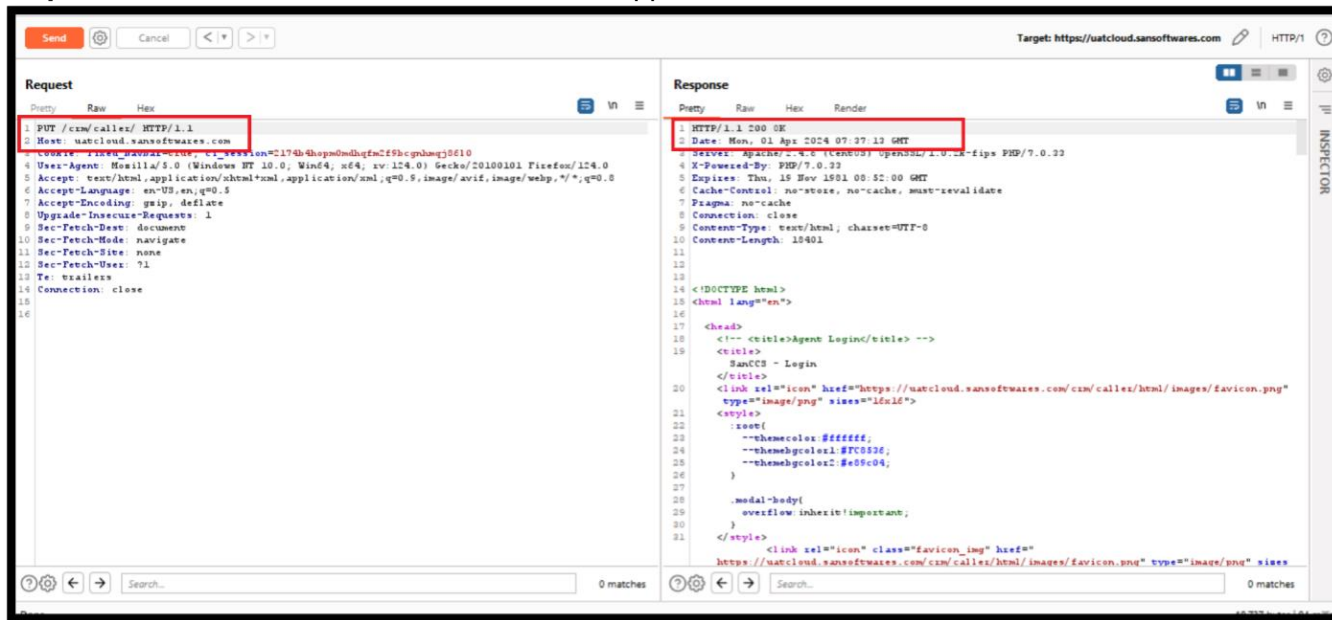
Case#5: Delete Method Enabled
Step#1: We can see Delete method enable in this application.



Case#6: TRACE Method Enabled
Step#1: We can see Trace method enable in this application.



Case#7: PUT Method Enabled
Step#1: We can see Put method enable in this application.



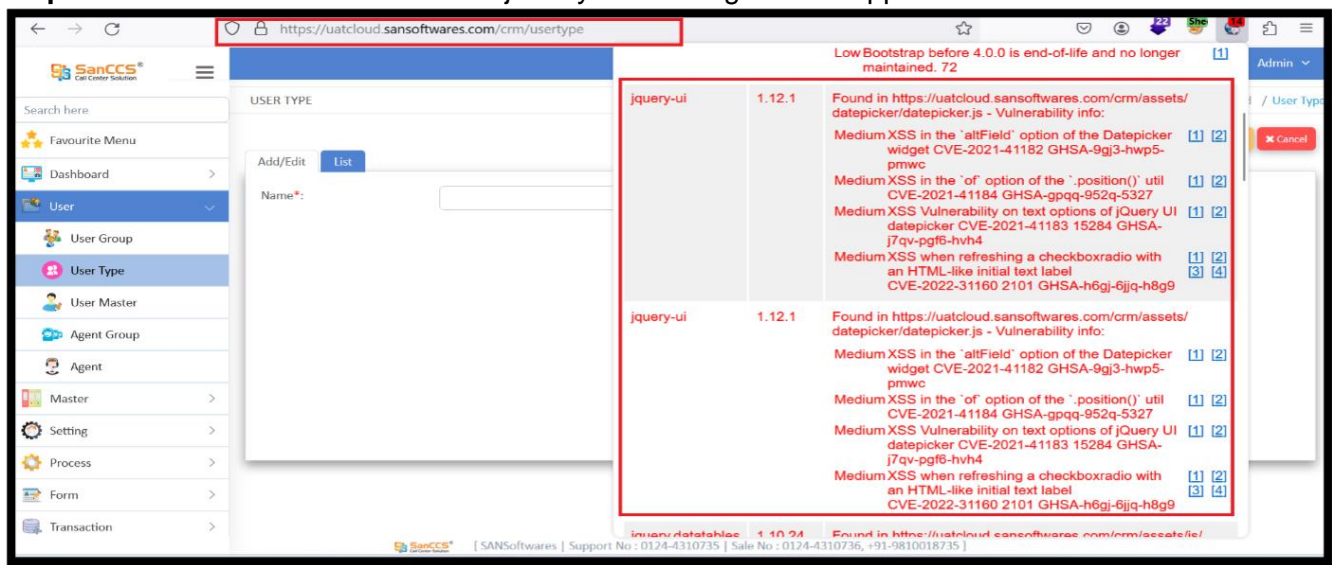
Finding No. 17

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Use of Unmaintained Third-Party Components
- iii) **Detailed observation / Vulnerable point:** Old and vulnerable version of libraries and environment are still being used in the application.
- iv) **CVE/CWE:** CWE-1104
- v) **Severity:** Medium
- vi) **Recommendation:** It is recommended to use latest and stable version for more secured application.
- vii) **Current Status:** Closed
- viii) **Reference** <https://cwe.mitre.org/data/definitions/1104.html>

ix) References to evidences / Proof of Concept:

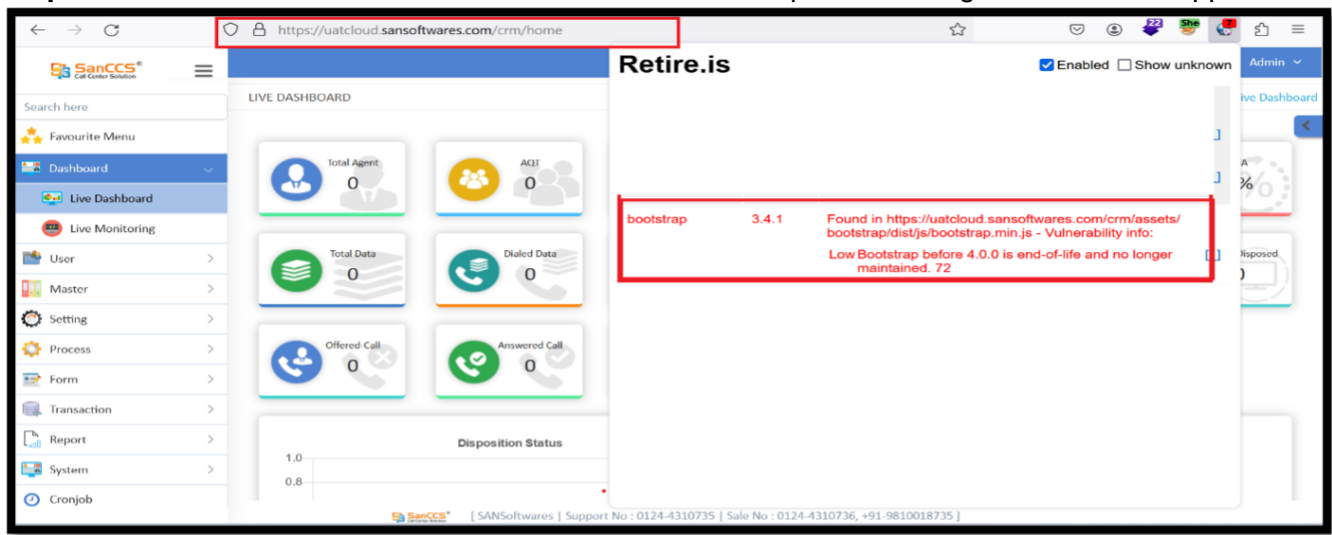
Case#1: Old and vulnerable jQuery-UI

Step#1: Old and vulnerable version of jQuery-UI is being used in application.



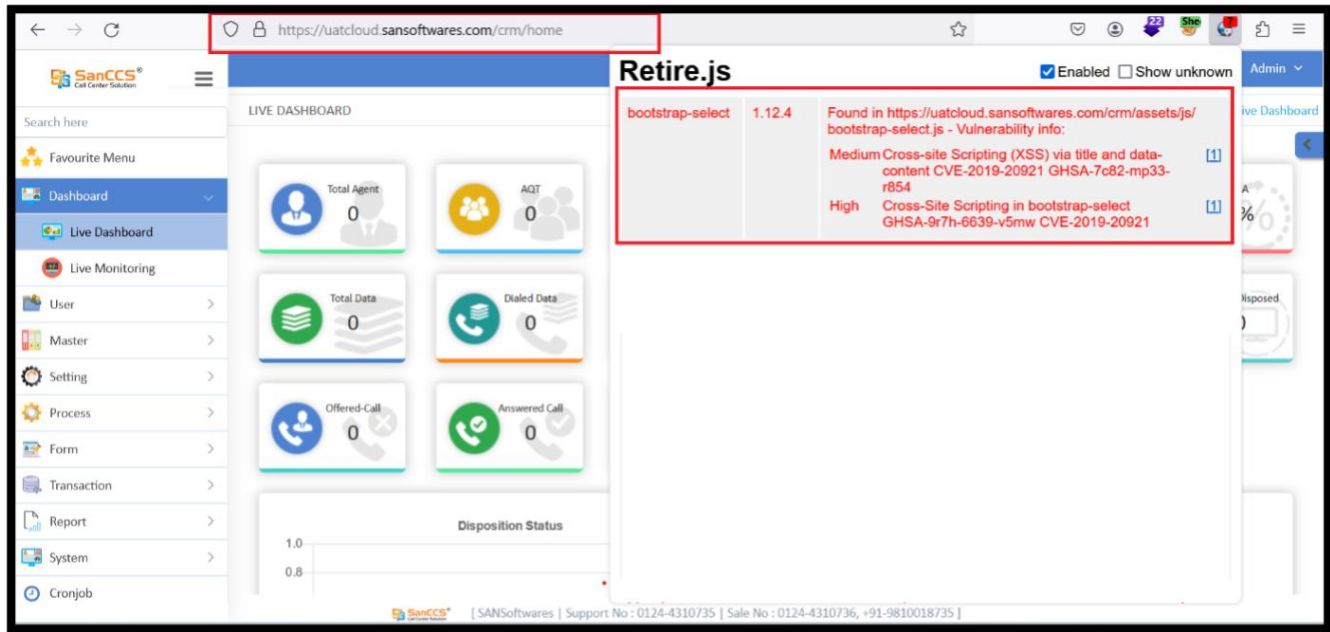
Case#2: Old and vulnerable bootstrap

Step#1: Old and vulnerable version of bootstrap is being used in application.



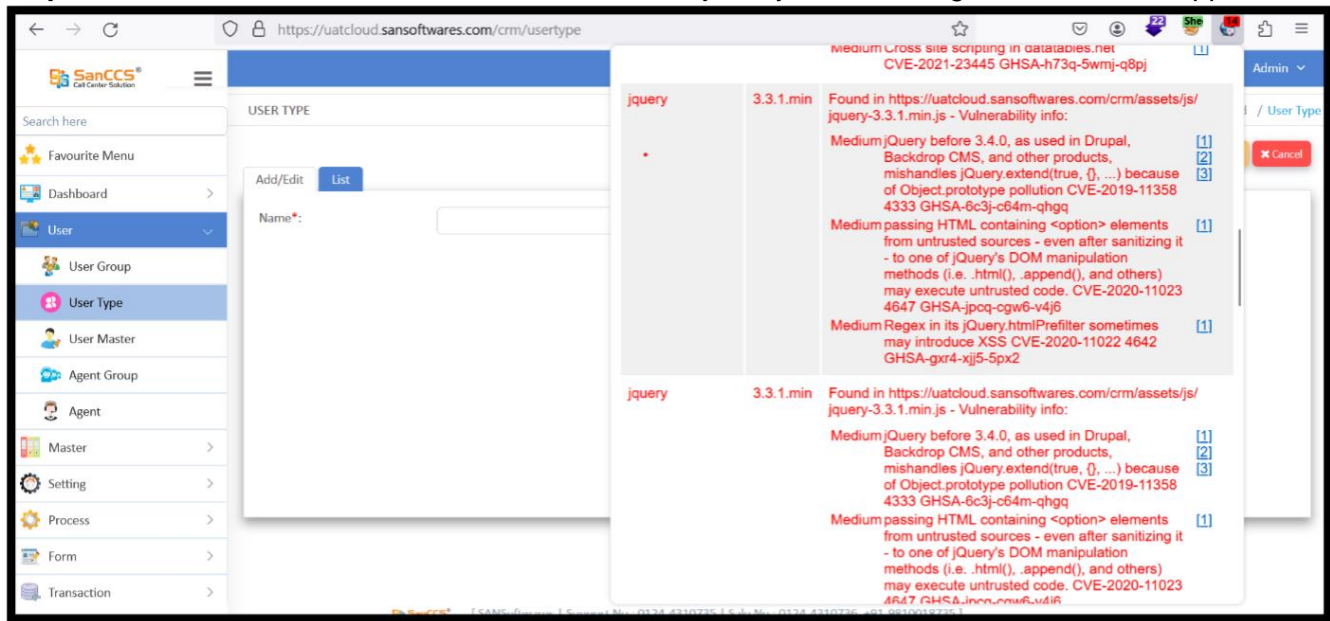
Case#3: Old and vulnerable bootstrap-select

Step#1: Old and vulnerable version of bootstrap-select is being used in application.



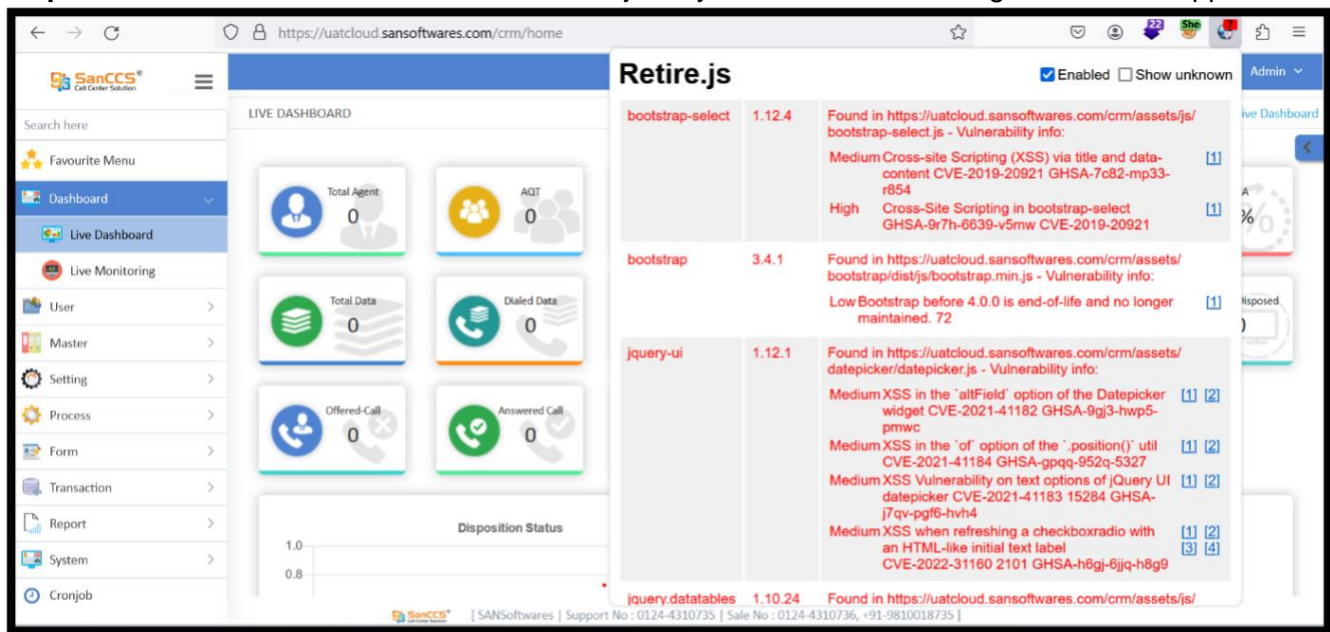
Case#4: Old and vulnerable jQuery

Step#1: Old and vulnerable version of jQuery is being used in application.

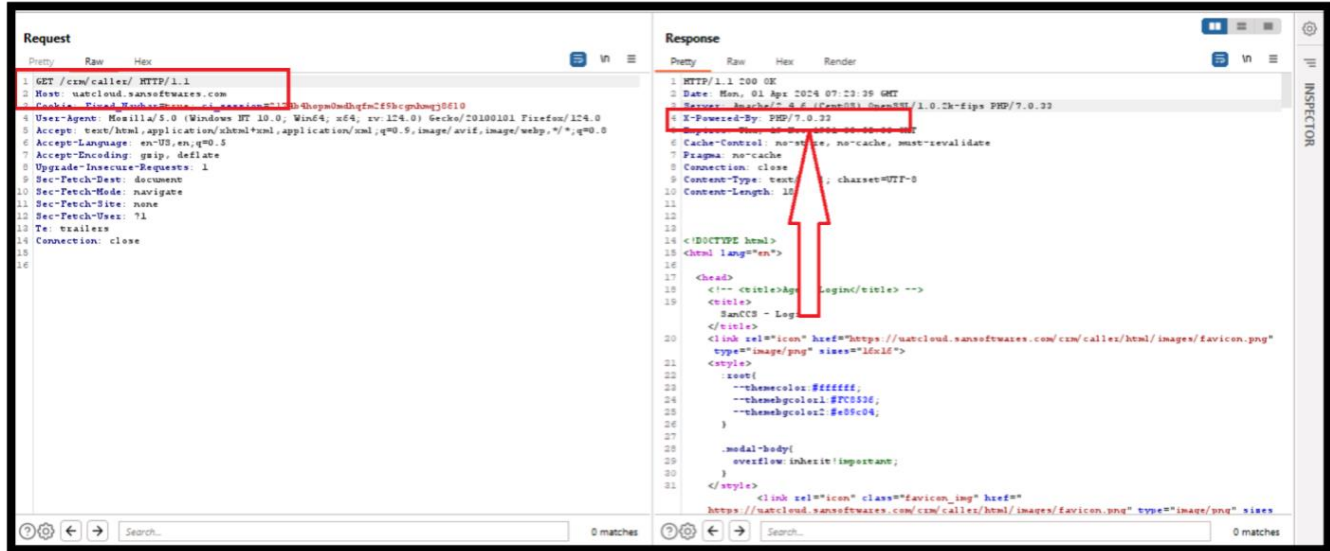


Case#5: Old and vulnerable jquery-datatables

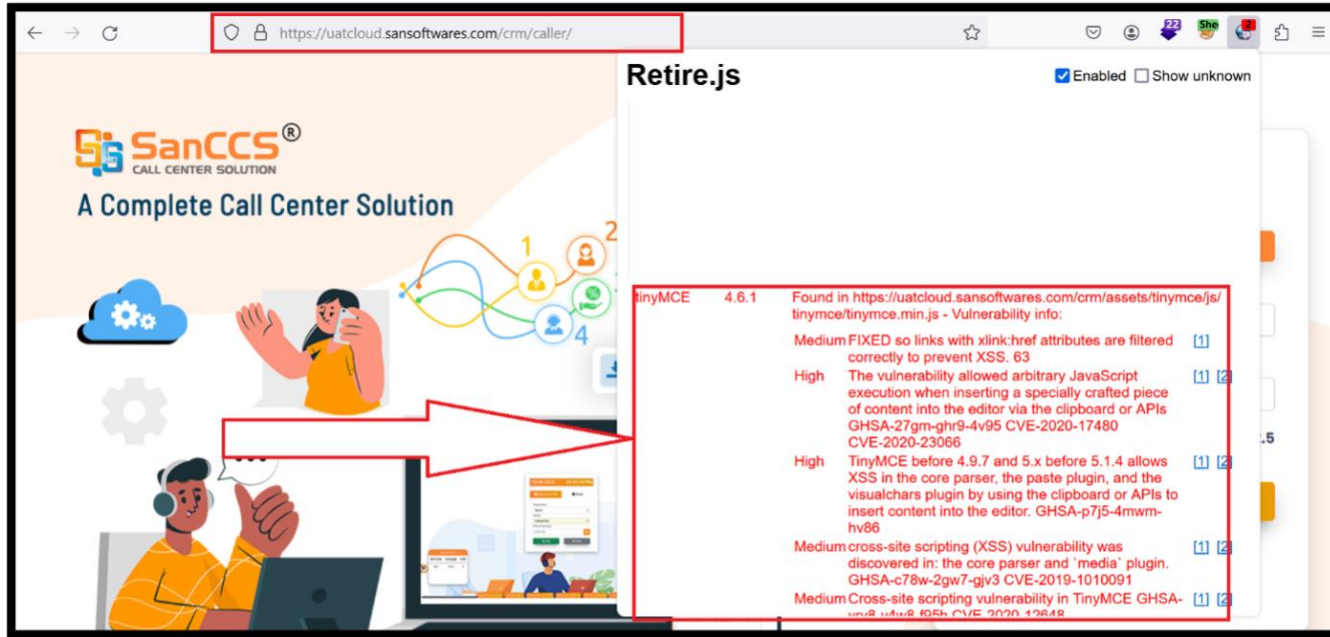
Step#1: Old and vulnerable version of jQuery-datatables is being used in application.



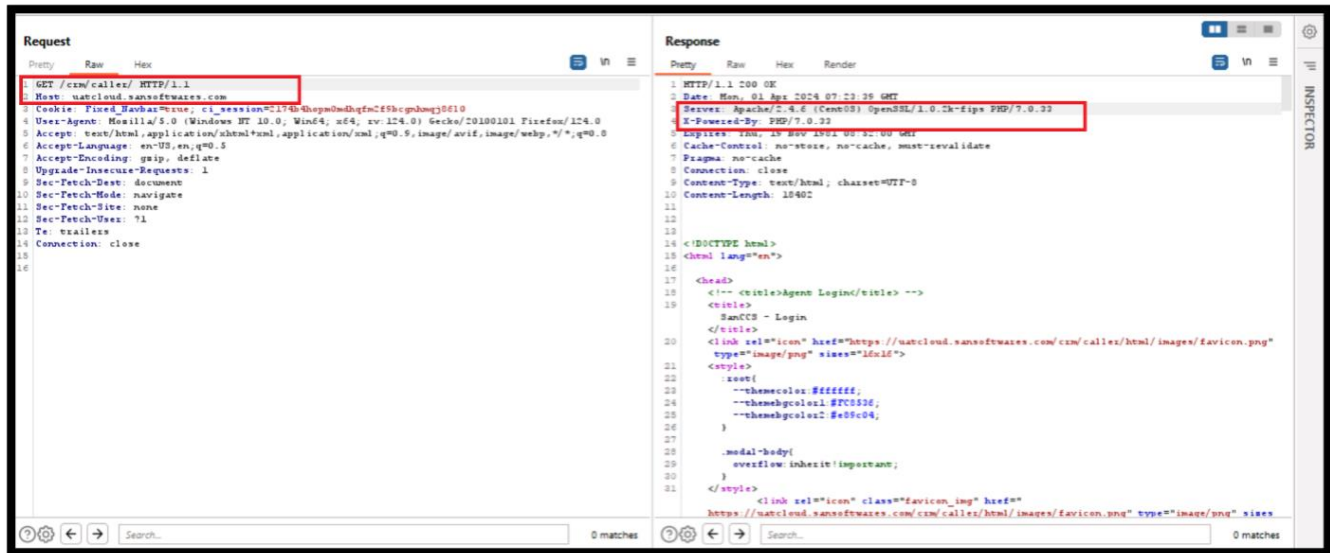
Case#6: Old and vulnerable PHP
Step#1: Old and vulnerable version of php is being used in application.



Case#7: Old and vulnerable tinyMCE
Step#1: Old and vulnerable version of tinyMCE is being used in application.



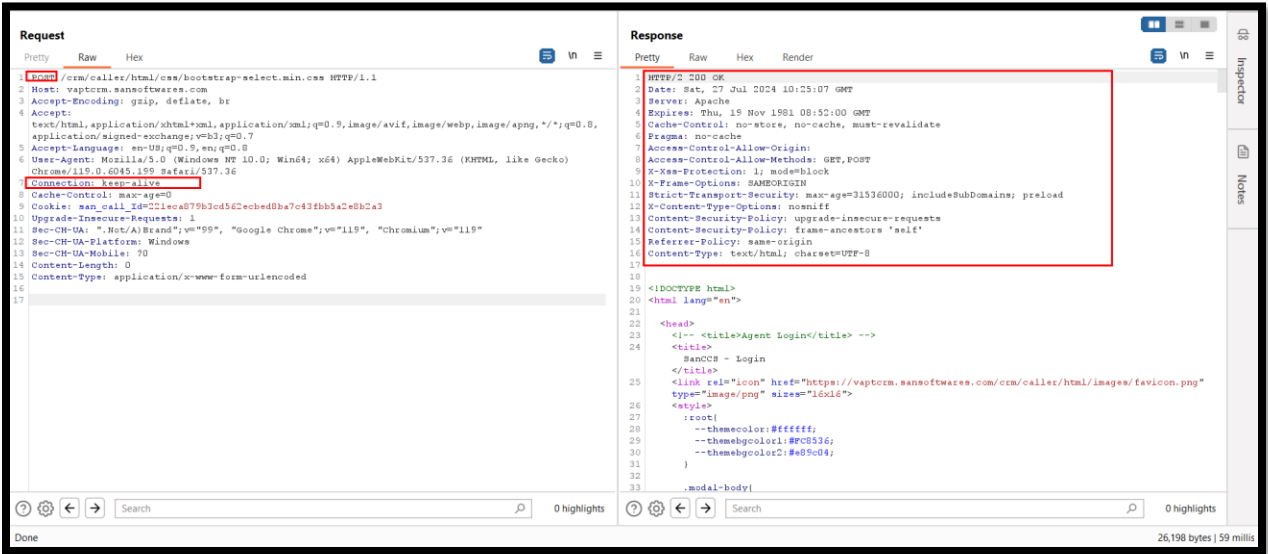
Case#8: Old and vulnerable OpenSSL and Apache
Step#1: Old and vulnerable version of OpenSSL and Apache is being used in application.



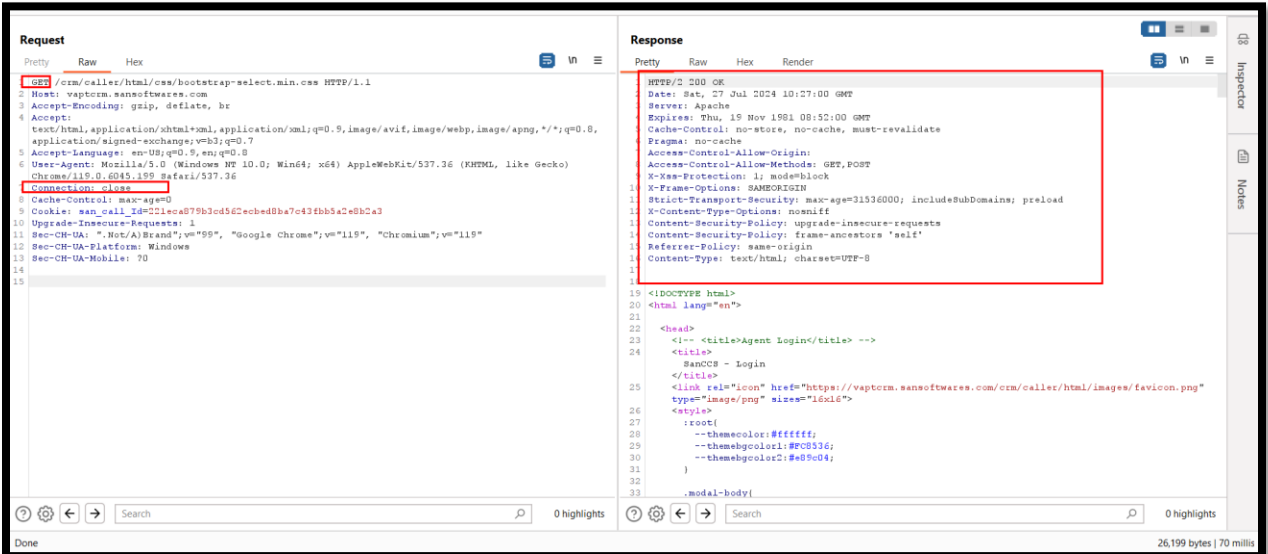
Finding No. 18

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Inconsistent Interpretation of HTTP Requests ('HTTP Request/Response Smuggling').
- iii) **Detailed observation / Vulnerable point:** Client-side desync (CSD) vulnerabilities occur when a web server fails to correctly process the Content-Length of POST requests. By exploiting this behavior, an attacker can force a victim's browser to desynchronize its connection with the website, typically leading to XSS.
- iv) **CVE/CWE:** CWE-444
- v) **Severity:** Medium
- vi) **Recommendation** This vulnerability can be resolved by patching the server so that it either processes POST requests correctly or closes the connection after handling them. You could also disable connection reuse entirely, but this may reduce performance. You can also resolve this issue by enabling HTTP/2.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/444.html>

- ix) **References to evidences / Proof of Concept:**
Step#1: Send the request to repeater and send the request.
Step#2: Observed that the request is processed by the server successfully.



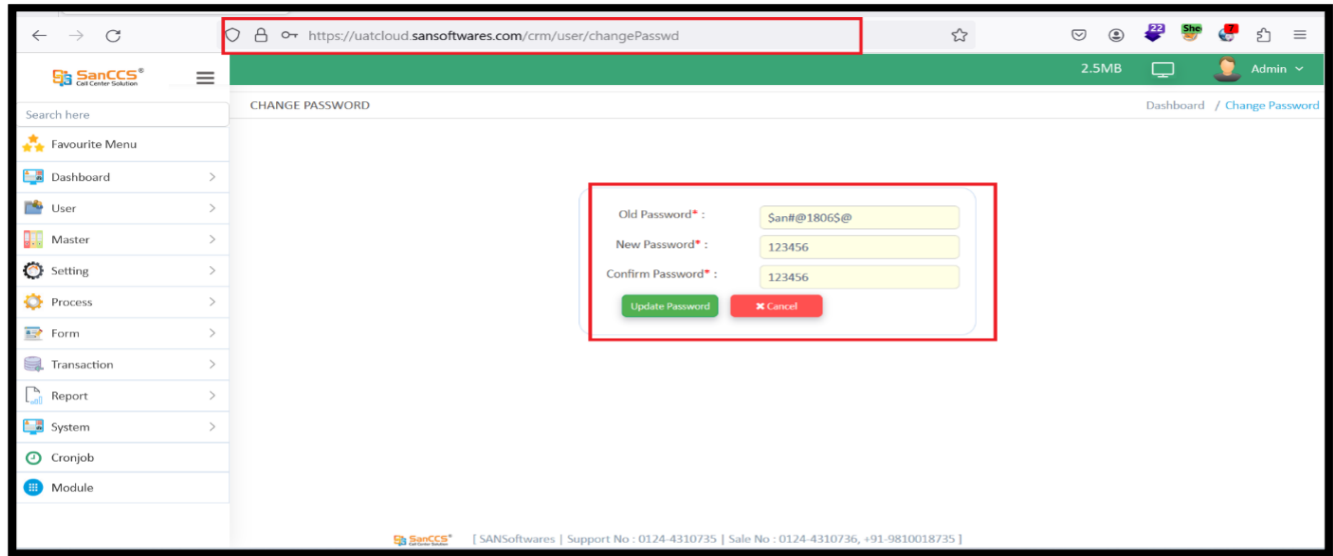
- Step#3:** Now we add a second request to the end of the first request (HTTP smuggling) and send the request.
- Step#4:** Observe that the request is processed by the server again.



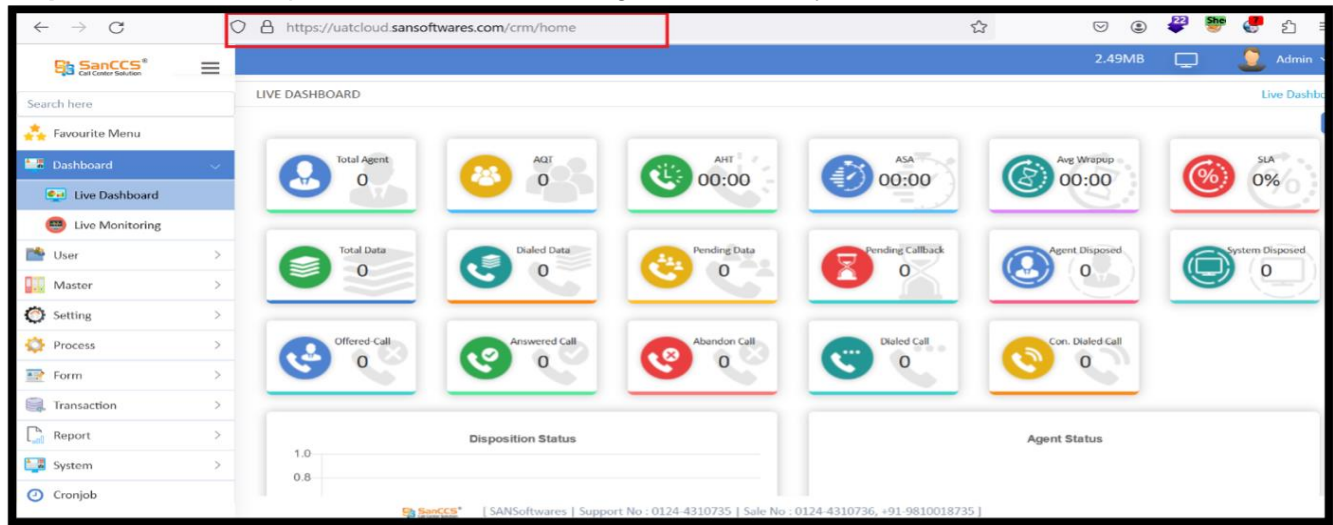
Finding No. 19

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Not Using Password Aging.
- iii) **Detailed observation / Vulnerable point:** Password History is not maintained in the application.
- iv) **CVE/CWE:** CWE-262
- v) **Severity:** Low
- vi) **Recommendation:** Users should be prevented from reusing their current or previous 3 passwords. Password history should ideally be 3.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/262.html>

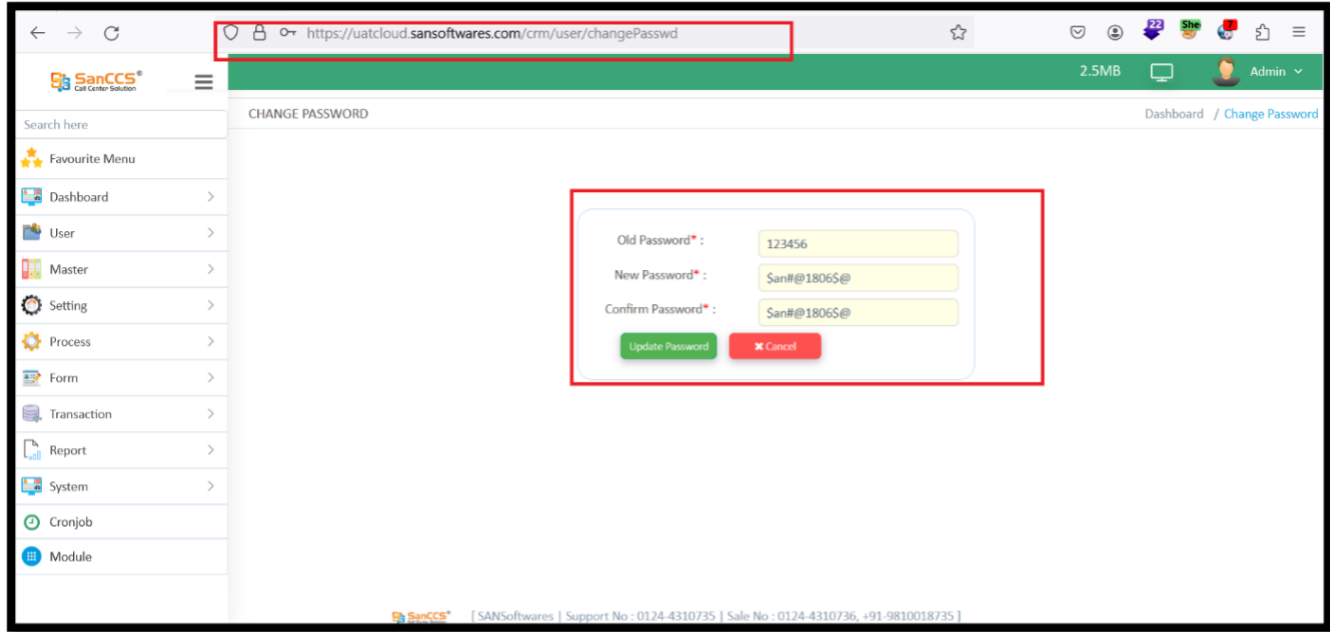
ix) **References to evidences / Proof of Concept:**
Step#1: We are entering a detail for change the password of application according to given field. (Old pass: - \$an#@1806\$@ , new pass:- 123456 and con pass:- 123456).



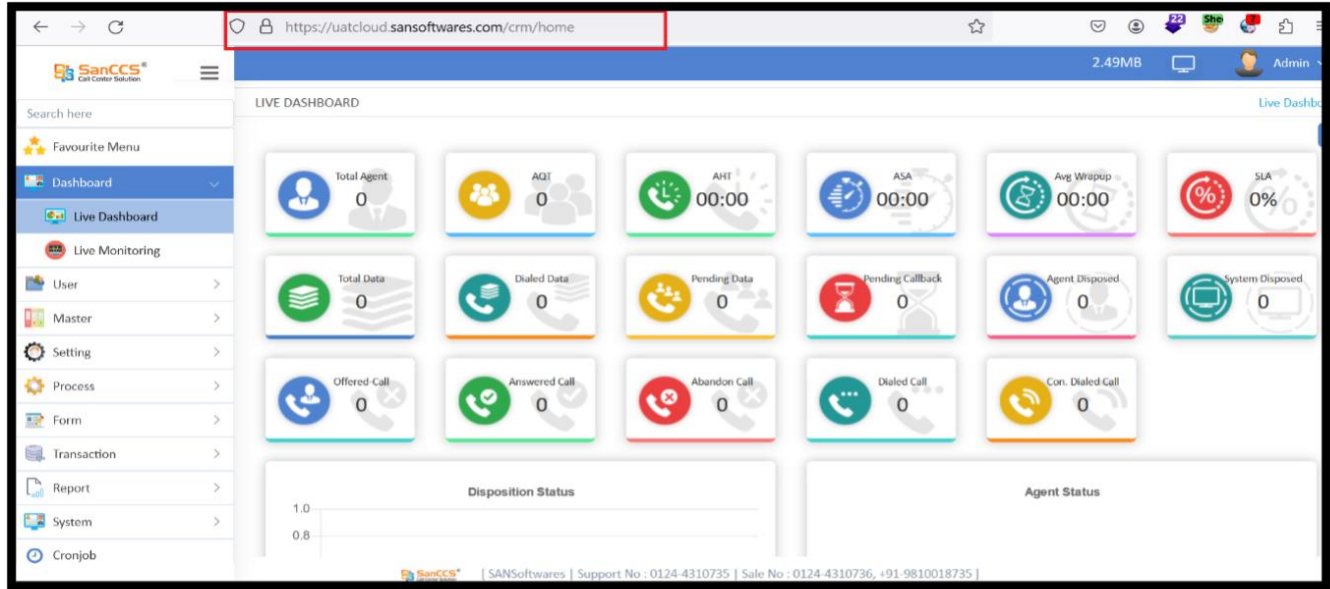
Step#2: We can see, password has been changed successfully.



Step#3: We are entering again detail for change the password of application according to given field. (Old pass: - 123456, new pass: - \$an#@1806\$@ and con pass: - \$an#@1806\$@).

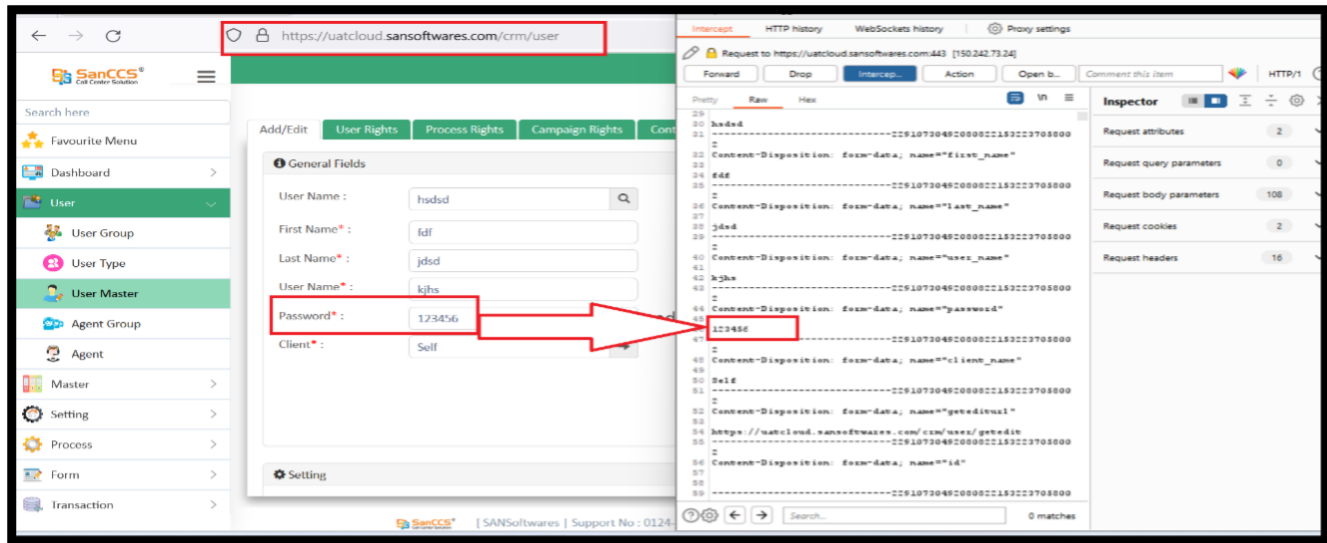


Step#4: We can see, password has been changed successfully.

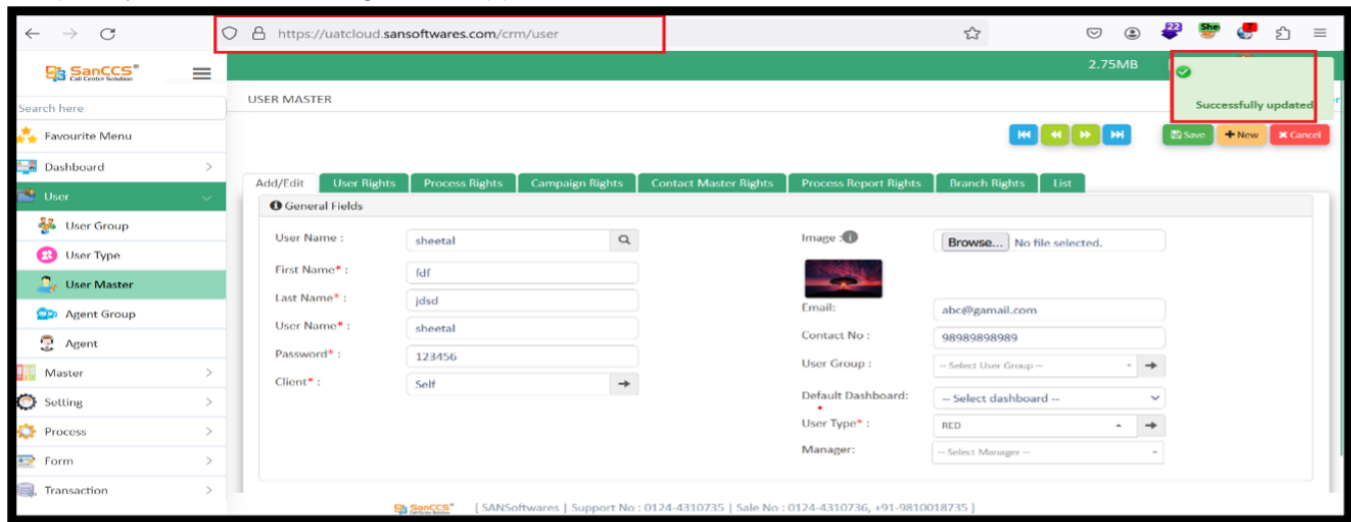


Finding No. 20

- i) IP/URL/Application: CALL CENTER SOLUTION Web Application.
- ii) Observation/ Vulnerability title: Weak Password Requirements
- iii) Detailed observation / Vulnerable point: Password Complexity is not implemented properly in the application.
- iv) CVE/CWE: CWE-521
- v) Severity: Low
- vi) Recommendation Password should be complex.
- vii) Current Status: Closed
- viii) Reference <https://cwe.mitre.org/data/definitions/521.html>
- ix) References to evidences / Proof of Concept:
Step#1: Login an application and fill the required details and then capture the request, we can see the password complexity is not used.



Step#2: As we can, we are using simple password and it is updated successfully. So, password complexity is not maintaining in this application.



Finding No. 21

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Excessive Attack Surface.
- iii) **Detailed observation / Vulnerable point:** Multiple Ports are open in the application.
- iv) **CVE/CWE:** CWE-1125
- v) **Severity:** Low
- vi) **Recommendation:** Only port 443 must be open in the application, all other remaining ports must be closed.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/1125.html>,
<https://blog.netwrix.com/2022/08/16/open-network-ports/>

ix) **References to evidences / Proof of Concept:**
Step#1: Using Nmap and scanning the application host, we can gather information about the hosted IP as well as the ports open on it. Here we can see multiple ports open. This increases the attack surface area.

```
Microsoft Windows [Version 10.0.22631.3296]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>nmap uatcloud.sanssoftwares.com
Starting Nmap 7.94 ( https://nmap.org ) at 2024-04-01 12:36 India Standard Time
Nmap scan report for uatcloud.sanssoftwares.com (150.242.73.24)
Host is up (0.0085s latency).
rDNS record for 150.242.73.24: 73.242.150.in-addr.tripleplay.in
Not shown: 980 filtered tcp ports (no-response), 11 filtered tcp ports (host-prohibited)
PORT      STATE SERVICE
25/tcp    open  smtp
80/tcp    open  http
85/tcp    open  mit-ml-dev
443/tcp   open  https
3000/tcp  closed ppp
8080/tcp  open  http-proxy
8088/tcp  open  radan-http
8089/tcp  open  unknown
9000/tcp  closed cslistener

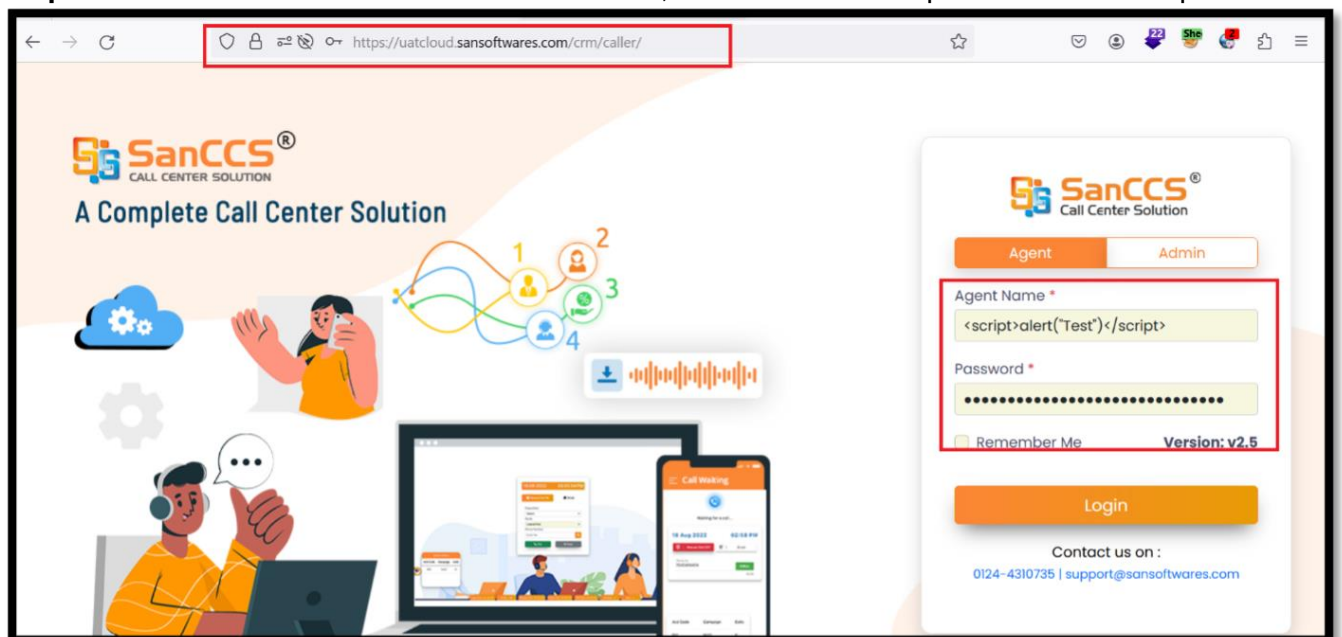
Nmap done: 1 IP address (1 host up) scanned in 5.81 seconds

C:\Windows\System32>
```



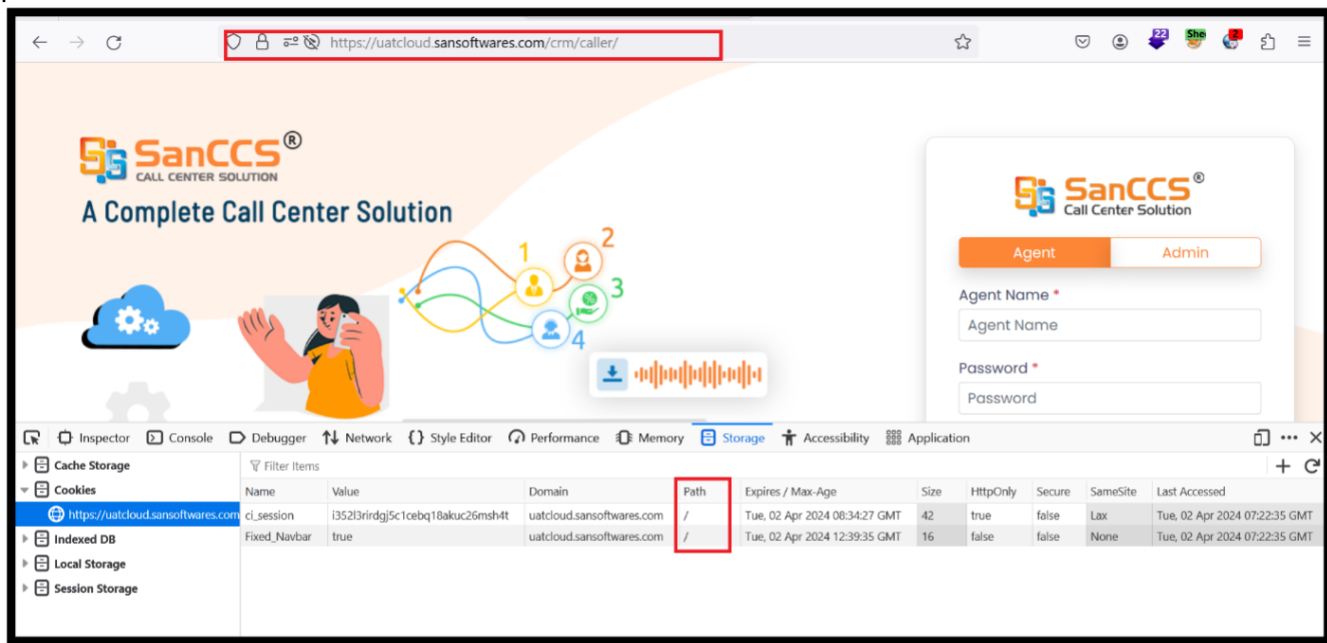
Finding No. 22

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Improper Input Validation.
- iii) **Detailed observation / Vulnerable point:** Input validations not implemented properly in the application.
- iv) **CVE/CWE:** CWE-20
- v) **Severity:** Low
- vi) **Recommendation:** Input validations should be properly implemented in the application.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/20.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: We can see in below screenshot, there is no input validation implemented.



Finding No. 23

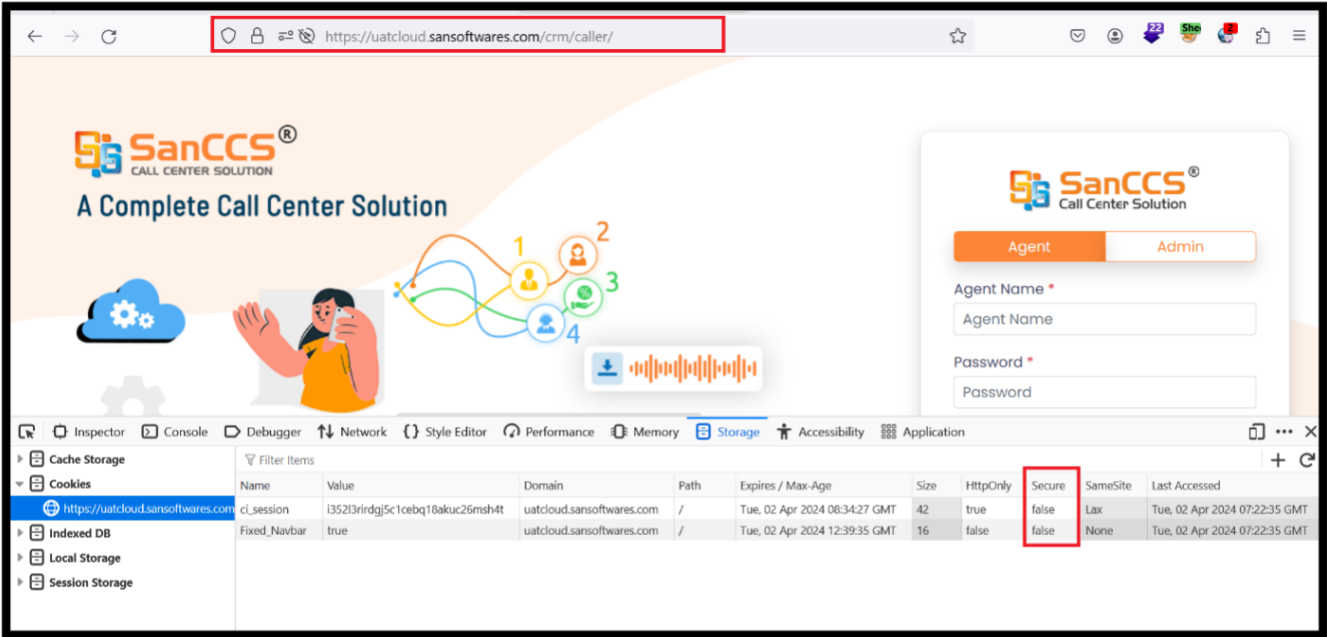
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Improper Resolution of Path Equivalence
- iii) **Detailed observation / Vulnerable point:** Path is set to default root i.e. '/'.
- iv) **CVE/CWE:** CWE-41
- v) **Severity:** Low
- vi) **Recommendation:** Verify that the path attribute, just as the Domain attribute, has not been set too loosely. Even if the Domain attribute has been configured as tight as possible, if the path is set to the root directory "/" then it can be vulnerable to less secure applications on the same server.
- vii) **Current** **Closed:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/41.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: Using the inspect element and navigating to Storage > Cookies, we can easily see that the path for the cookies has been set to root.



Finding No. 24

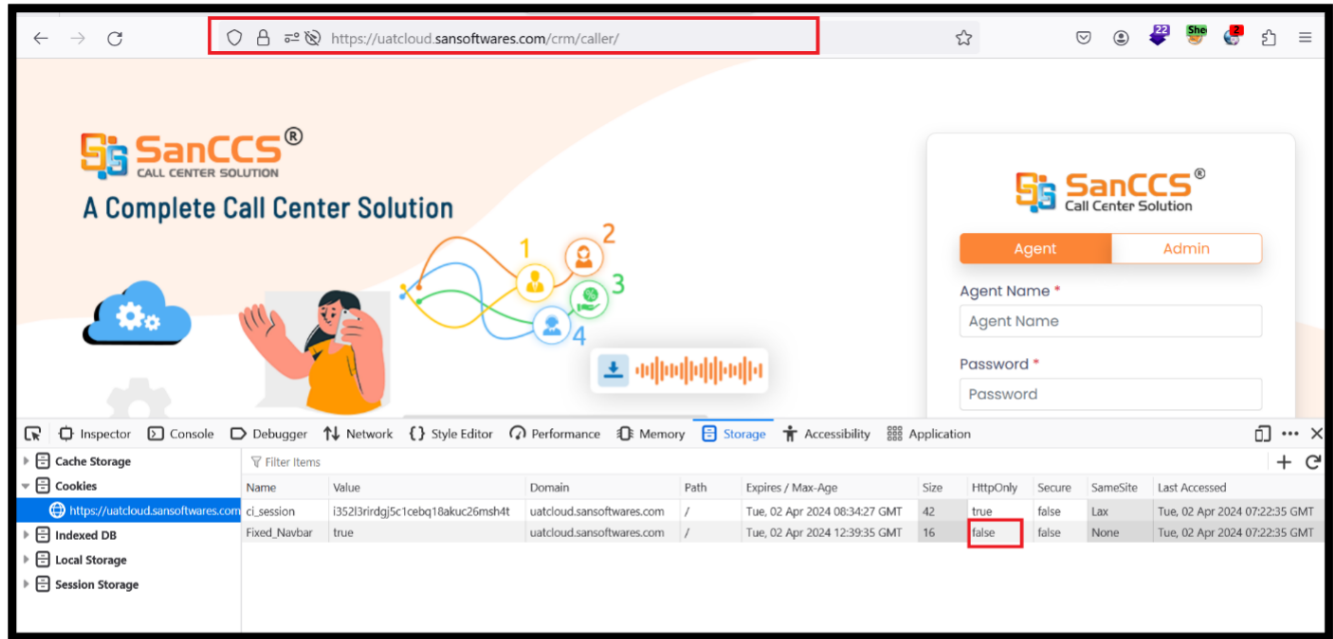
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Sensitive Cookie in HTTPS Session Without 'Secure' Attribute
- iii) **Detailed observation / Vulnerable point:** Cookie is displaying without SECURE flag.
- iv) **CVE/CWE:** CWE-614
- v) **Severity:** Low
- vi) **Recommendation** Secure flag should be “True” in website’s configuration file.
- vii) **Current Status:** Closed
- viii) **Reference** <https://cwe.mitre.org/data/definitions/614.html>

ix) **References to evidences / Proof of Concept:**
Step#1: We can see cookie is set to false for secure flag.



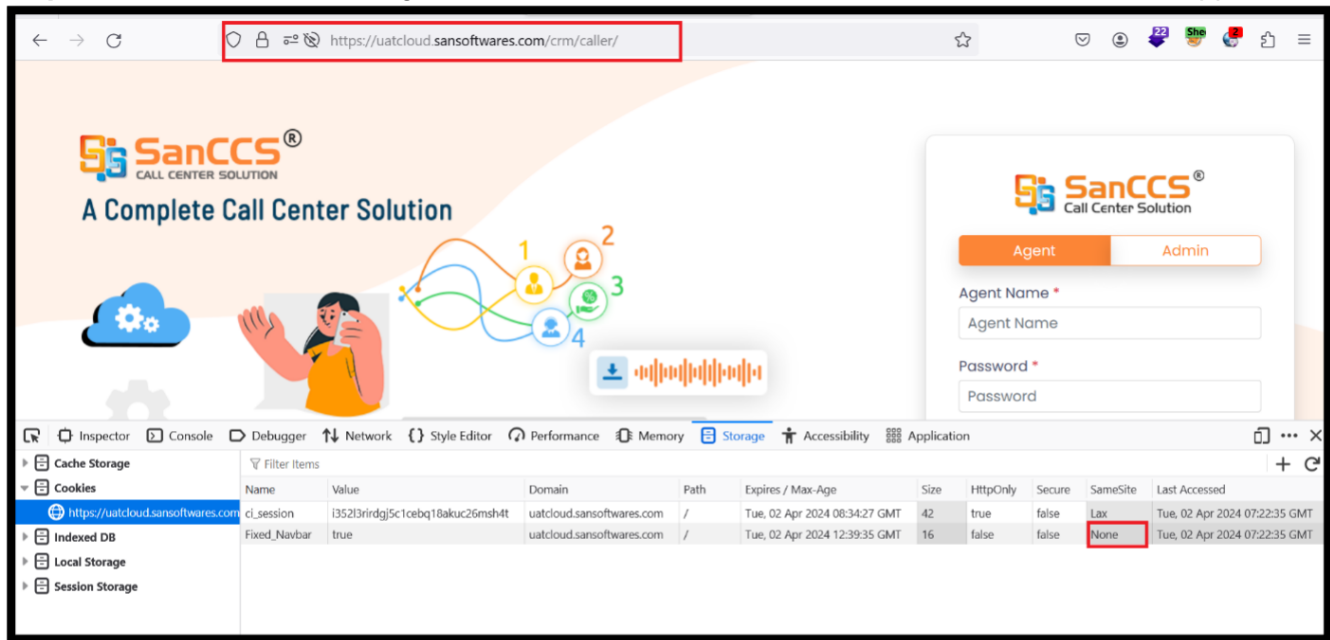
Finding No. 25

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Sensitive Cookie Without 'HTTPOnly' Flag.
- iii) **Detailed observation / Vulnerable point:** HTTPOnly flag is not set properly in the application.
- iv) **CVE/CWE:** CWE-1004
- v) **Severity:** Low
- vi) **Recommendation:** HTTPOnly flag should be set to “True” in website’s configuration file.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/1004.html>.
- ix) **References to evidences / Proof of Concept:**
Step#1: As we can see in given screenshot httponly flag is set to false in this application.



Finding No. 26

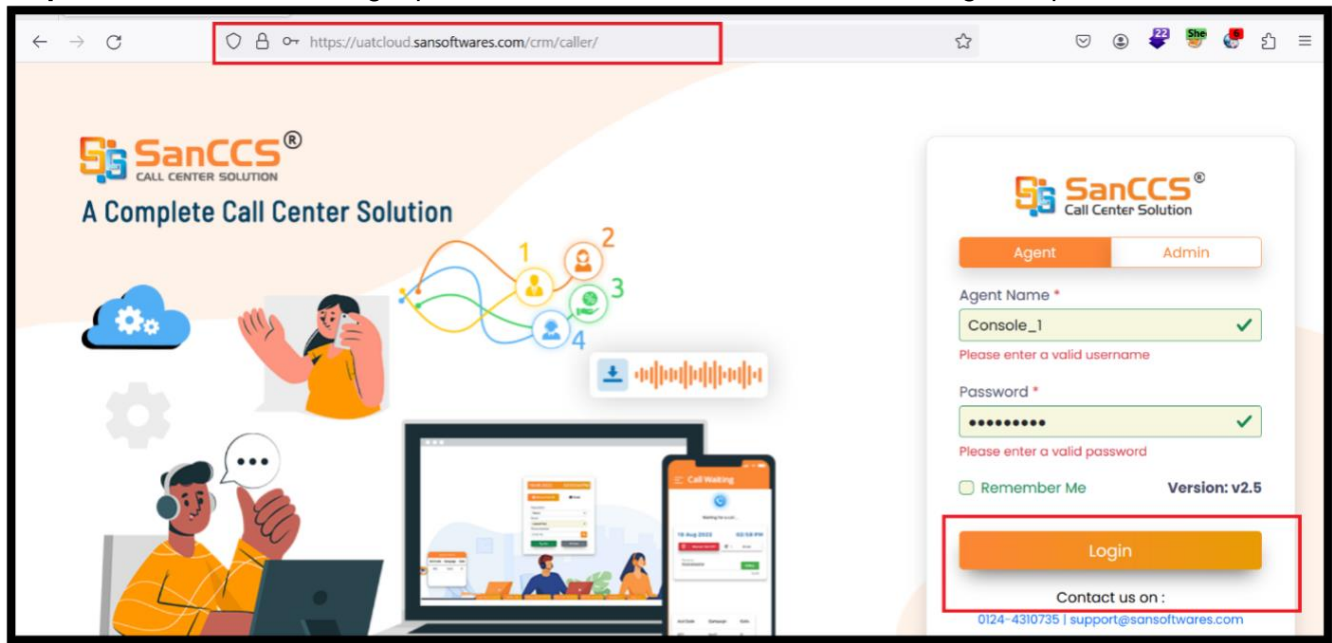
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Sensitive Cookie with Improper Same Site Attribute.
- iii) **Detailed observation / Vulnerable point:** Same Site attribute set to none.
- iv) **CVE/CWE:** CWE-1275
- v) **Severity:** Low
- vi) **Recommendation:** Same Site attribute should be set to “LAX or STRICT”.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/1275.html>,
<https://probely.com/vulnerabilities/cookie-with-samesite-attribute-set-to-none>
- ix) **References to evidences / Proof of Concept:**
Step#1: As we can see in given screenshot Same site attribute is not set in this application.



Finding No. 27

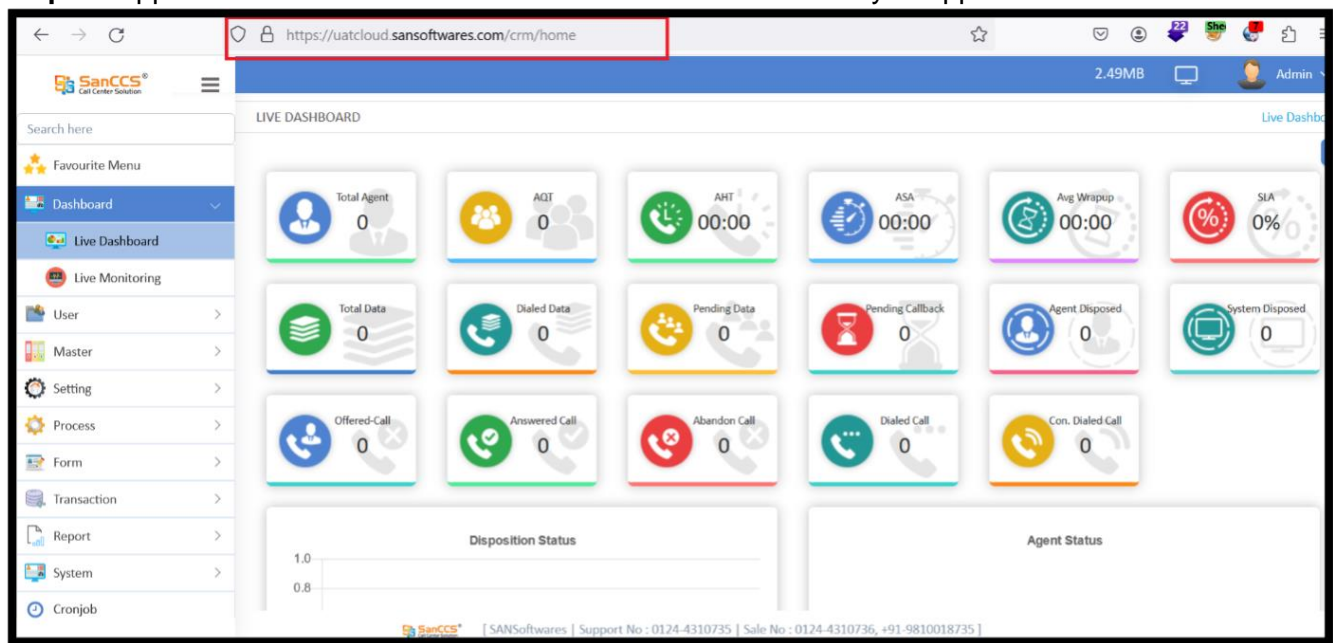
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Unverified Password Change
- iii) **Detailed observation / Vulnerable point:** There is no forgot password option available for the user.
- iv) **CVE/CWE:** CWE-620
- v) **Severity:** Low
- vi) **Recommendation:** Users may be required to retrieve their password. Users should be provided with a “forgot password” option through which user will retrieve their password whenever required. Forgot password should be enabled with the users email address. There are following conditions that should be met in the forget password function:
 - 1. A reset link should be sent to the user registered email address instead of password directly.
 - 2. Reset Password link should expire in 24 hours.
 - 3. Reset Password link should not be reused again once the link is used for resetting password.
 - 4. In the Reset Password page, Mandatory fields i.e. new password, Confirm Password and CAPTCHA field must present and should be validated at the client end. Server end validations are also mandatory.However, if the password retrieval is internal in the application, then it is recommended to implement a hyperlink on login page resulting to a static page containing a message. “Please contact your site administrator at mail_id[at]domain[dot]com”. Please note that the email address in the message should not be a hyperlink.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/620.html>
- ix) **References to evidences / Proof of Concept:**

Step#1: As we can see, Forgot password module is not available for change the password.



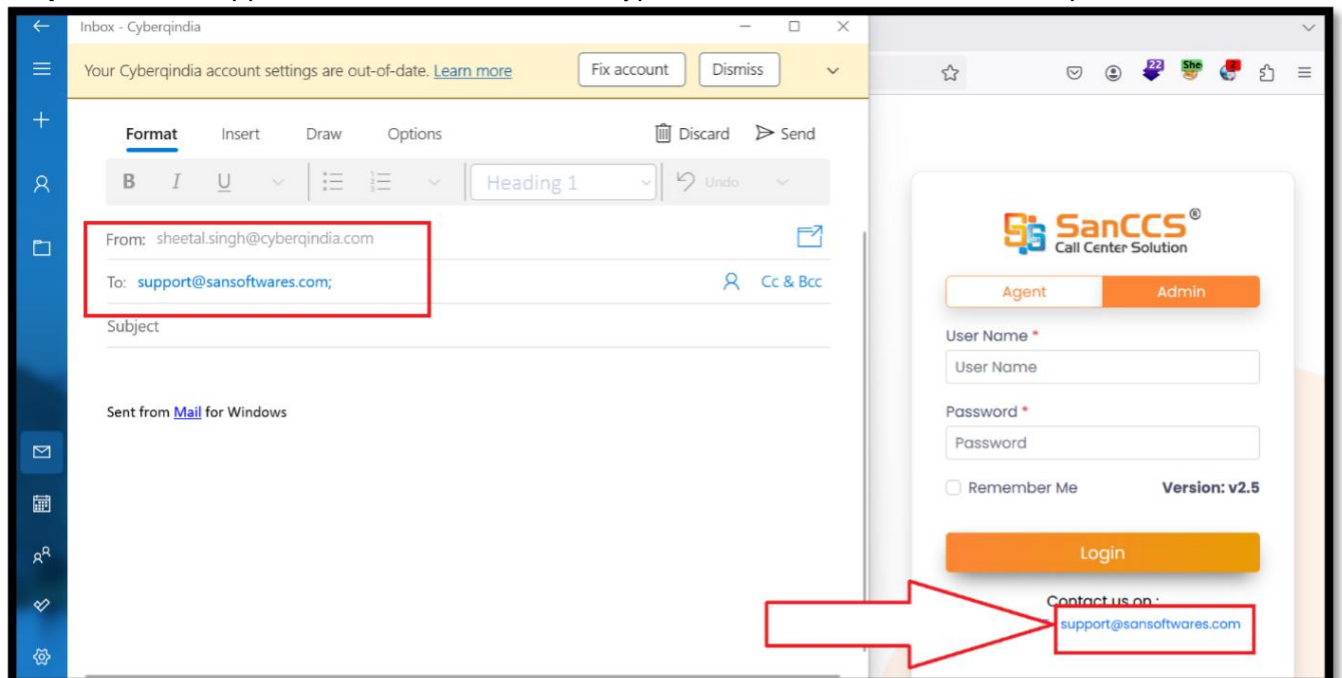
Finding No. 28

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Insufficient Session Expiration
- iii) **Detailed observation /vulnerable point:** Session termination due to user inactivity is not properly configured in the application.
- iv) **CVE/CWE:** CWE-613
- v) **Severity:** Low
- vi) **Recommendation:** In case of session termination by the application due to inactivity of the user within his session for more than 15 minutes, application must terminate session completely and login page must be loaded in the main window instead of in a child frame of the window.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/613.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: Application session is not terminated after 15 min. inactivity of application.



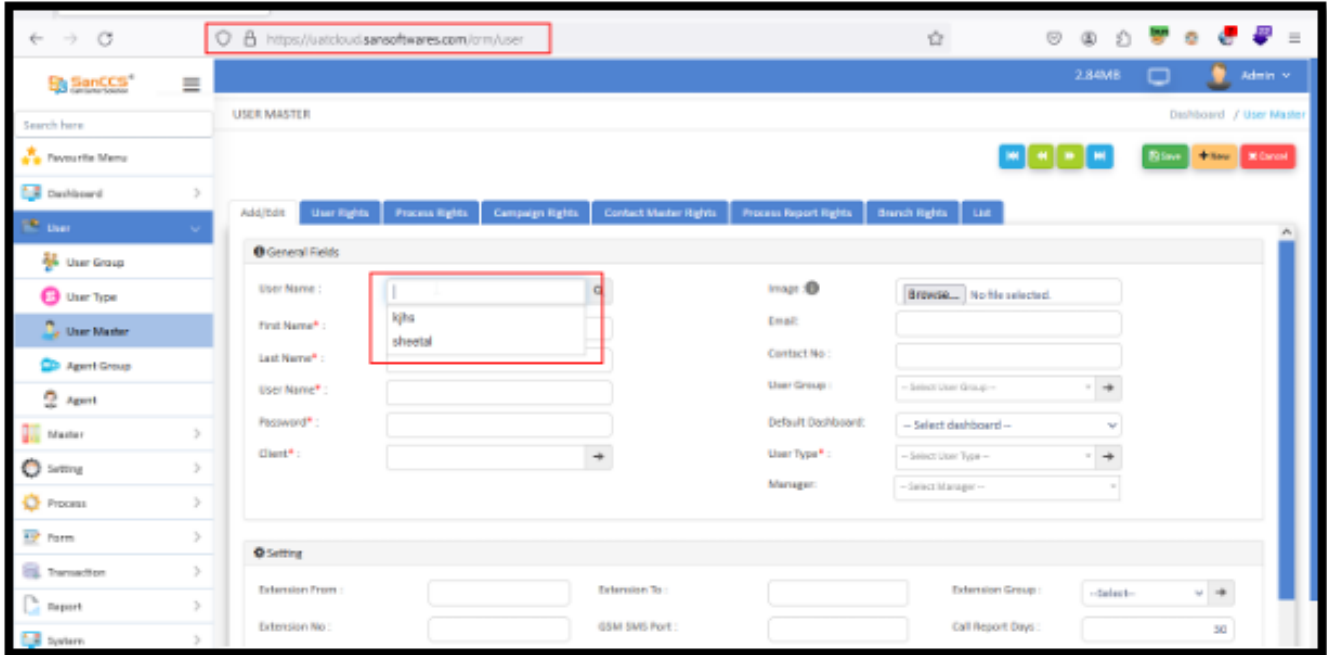
Finding No. 29

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application
- ii) **Observation/ Vulnerability title:** Improper Control of Interaction Frequency.
- iii) **Detailed observation /vulnerable point:** Email spamming is possible in the application.
- iv) **CVE/CWE:** CWE-799
- v) **Severity:** Low
- vi) **Recommendation:** The application should properly customize the email addresses while posting on the website as:
 - 1. Email addresses should be posted as an image not as a hyperlink. Alternatively, instead of @symbol, [at] should be used. Similarly, the dot character (.) should be replaced by [dot]. So abc@nic.in should be written as abc[at]nic[dot]in.
 - 2. High privilege email addresses should not be posted on the website.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/799.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: Go to application and click on the hyperlinked mail then these are open in a mail box.



Finding No. 30

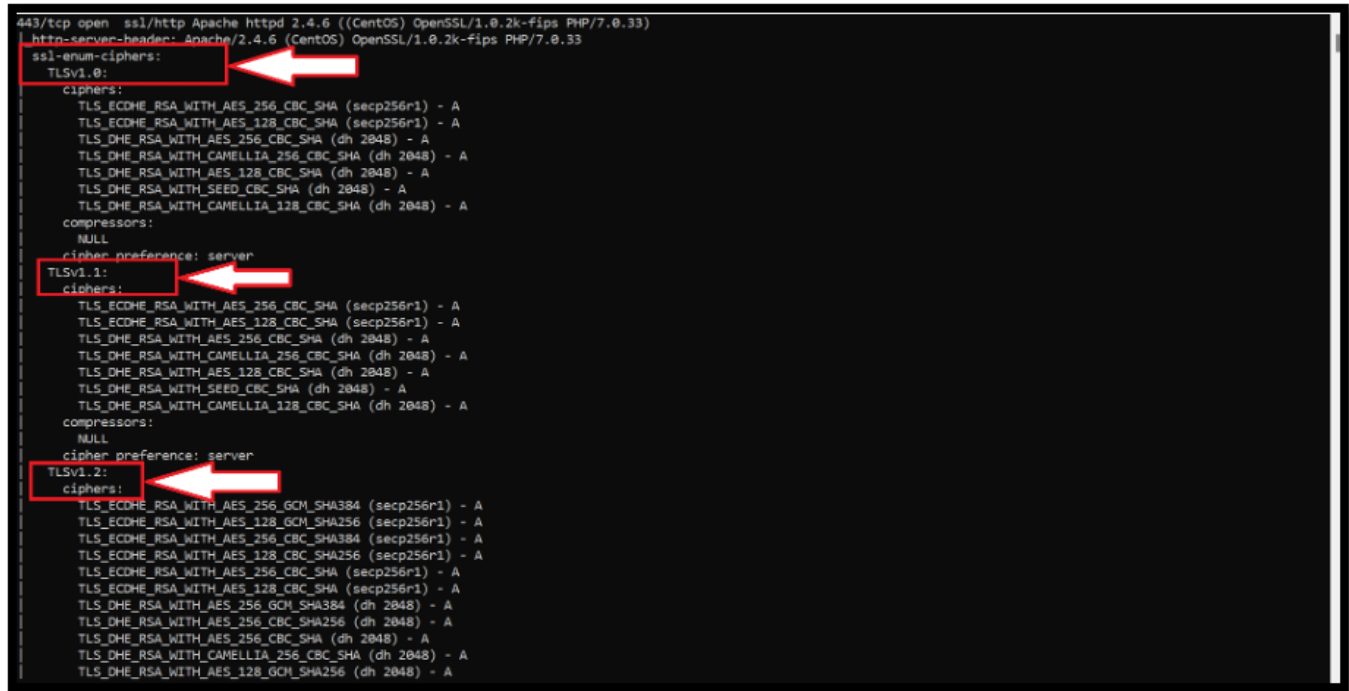
- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Exposure of Sensitive Information to an Unauthorized Actor.
- iii) **Detailed observation / Vulnerable point:** Autofill is enabled in forms.
- iv) **CVE/CWE:** CWE-200
- v) **Severity:** Low
- vi) **Recommendation** Application should not have the option to remember information entered by the user as this may cause unavailability of services to valid users. AutoComplete option should be turned off by the application so as to override any settings by the user from the browser.
- vii) **Current Status:** Closed
- viii) **Reference:** https://portswigger.net/kb/issues/00500800_password-field-with-autocomplete-enabled
<https://cwe.mitre.org/data/definitions/200.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: We can see autocomplete is not defined properly.



Finding No. 31

- i) IP/URL/Application: CALL CENTER SOLUTION Web Application.
- ii) Observation/ Vulnerability title: Selection of Less-Secure Algorithm During Negotiation.
- iii) Detailed observation / Vulnerable point: Old TLS versions are still being used in the application.
- iv) CVE/CWE: CWE-757
- v) Severity: Low
- vi) Recommendation TLS v1.2 or higher should be used. All other TLS versions should be removed.
- vii) Current Status: Closed
- viii) Reference: <https://cwe.mitre.org/data/definitions/757.html>

ix) References to evidences / Proof of Concept:
Step#1: Multiple TLS version is use in this application.



Finding No. 32

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Selection of Less-Secure Algorithm During Negotiation.
- iii) **Detailed observation / Vulnerable point:** The application may be vulnerable to DOM-based open redirection. Data is read from **location.href** and passed to **xhr.open** application.
- iv) **CVE/CWE:** CWE-601
- v) **Severity:** Low
- vi) **Recommendation** The most effective way to avoid DOM-based open redirection vulnerabilities is not to dynamically set redirection targets using data that originated from any untrusted source. If the desired functionality of the application means that this behavior is unavoidable, then defenses must be implemented within the client-side code to prevent malicious data from introducing an arbitrary URL as a redirection target. In general, this is best achieved by using a whitelist of URLs that are permitted redirection targets, and strictly validating the target against this list before performing the redirection.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/757.html>

ix) **References to evidences / Proof of Concept:**
Step#1: We can see DOM-Based Open redirection is possible in the application.

Request 1

GET /crm/caller/ HTTP/1.1

Host: vaptcrm.sanssoftwares.com

Accept-Encoding: gzip, deflate, br

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7

Accept-Language: en-US;q=0.9,en;q=0.8

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/119.0.6045.199 Safari/537.36

Connection: close

Cache-Control: max-age=0

Upgrade-Insecure-Requests: 1

Sec-CH-UA: "Not(A)Brand";v="99", "Google Chrome";v="119", "Chromium";v="119"

Sec-CH-UA-Platform: Windows

Sec-CH-UA-Mobile: ?0

Response 1

HTTP/1.1 200 OK

Date: Tue, 16 Jul 2024 07:34:22 GMT

Server: Apache

Expires: Thu, 19 Nov 1981 08:52:00 GMT

Cache-Control: no-store, no-cache, must-revalidate

Pragma: no-cache

Access-Control-Allow-Origin:

Access-Control-Allow-Methods: GET,POST

Set-Cookie: san_call_id=ea0a777da4463a572aed1493a6cc8c57e6c3eb19; expires=Sun, 21-Jul-2024 07:34:22 GMT; Max-Age=432000; path=/; secure; HttpOnly; SameSite=Lax

X-XSS-Protection: 1; mode=block

X-Frame-Options: SAMEORIGIN

Strict-Transport-Security: max-age=31536000; includeSubDomains; preload

X-Content-Type-Options: nosniff

Content-Security-Policy: upgrade-insecure-requests

Content-Security-Policy: frame-ancestors 'self'

Referrer-Policy: same-origin

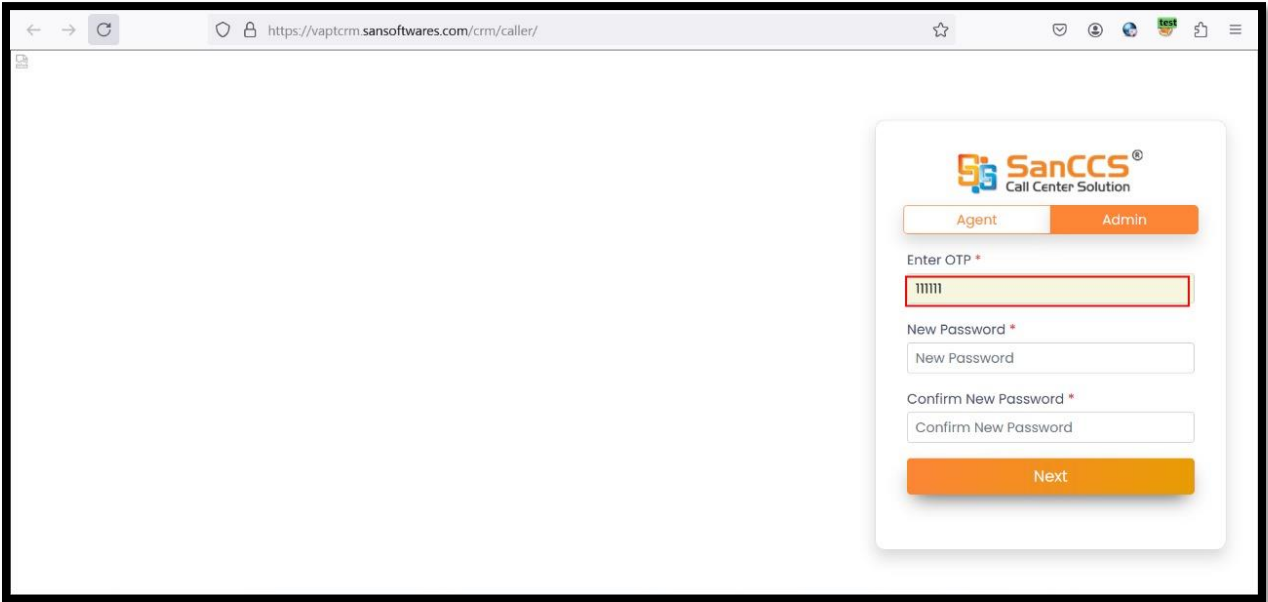
Connection: close

Content-Type: text/html; charset=UTF-8

Content-Length: 25580

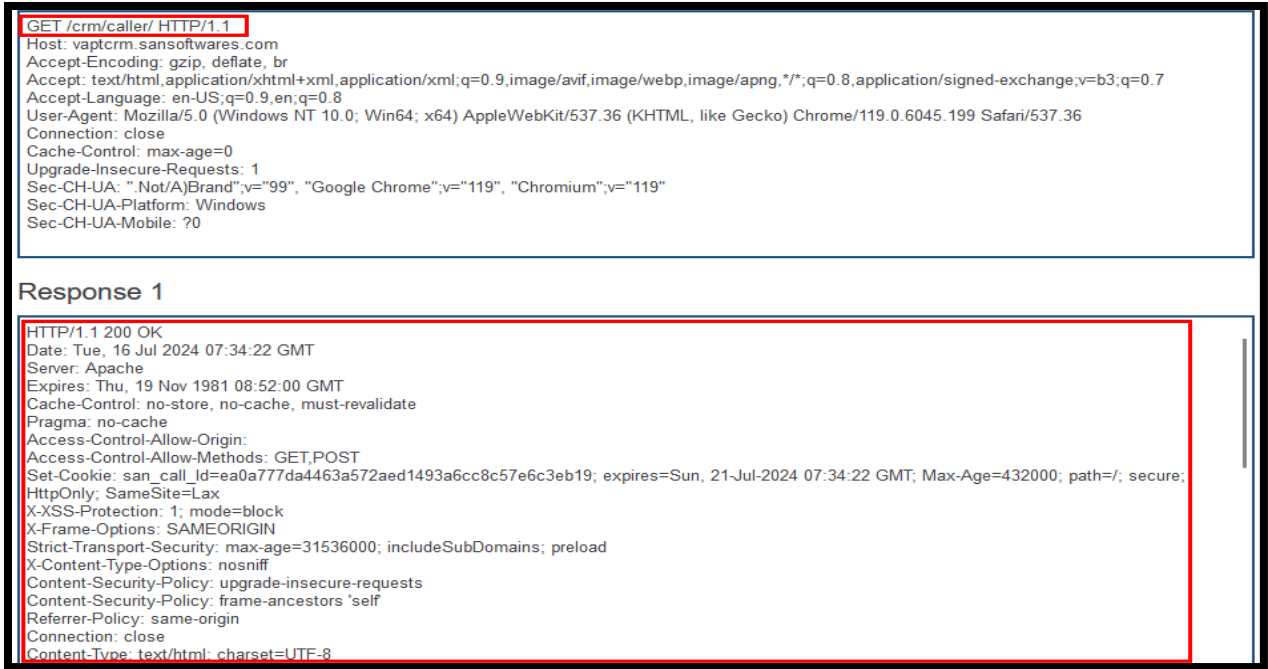
Finding No. 33

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Missing Password Field Masking
- iii) **Detailed observation / Vulnerable point:** OTP masking is not implemented in the application.
- iv) **CVE/CWE:** CWE-549
- v) **Severity:** Low
- vi) **Recommendation:** OTP should be masked and should not be viewable in clear text to end user or an option should be provided to unmask, if needed.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/549.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: Open the URL <https://vaptcrm.sanssoftwares.com/crm/caller/> and fill in the otp.
Step#2: Enter the OTP and observe that the OTP is not masked.



Finding No. 34

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** unencrypted connections
- iii) **Detailed observation / Vulnerable point:** Cleartext submission of password.
- iv) **CVE/CWE:** CWE-549
- v) **Severity:** Low
- vi) **Recommendation:** Applications should use transport-level encryption (SSL or TLS) to protect all sensitive communications passing between the client and the server. Communications that should be protected include the login mechanism and related functionality, and any functions where sensitive data can be accessed or privileged actions can be performed. These areas should employ their own session handling mechanism, and the session tokens used should never be transmitted over unencrypted communications. If HTTP cookies are used for transmitting session tokens, then the secure flag should be set to prevent transmission over clear-text HTTP.
- vii) **Current Status:** Closed
- viii) **Reference:** <https://cwe.mitre.org/data/definitions/549.html>
- ix) **References to evidences / Proof of Concept:**
Step#1: We can see that unencrypted connection over the network.



Finding No. 35

- i) **IP/URL/Application:** CALL CENTER SOLUTION Web Application.
- ii) **Observation/ Vulnerability title:** Insufficient Logging.
- iii) **Detailed observation / Vulnerable point:** The application does not maintain audit trail properly where all user activities must be logged. In case a malicious user tries to attack the application; the application will not be able to trace the attacker.
- iv) **CVE/CWE:** CWE-778
- v) **Severity:** Observation
- vi) **Recommendation:** An Audit trail should be incorporated in the application admin module, where all user activities have to be logged. Following points should be considered: Audits are to be generated at the time of resource access and by the same routines accessing the resource
 - Information to be logged including the following: IP of the originating client, Date, Time, username if any in addition to other details to be logged in the web server.
 - These IP, date, time, session details, user details (NO password), referrer, process id to be logged in application logs.
 - To create audit logs use auto numbering so that every logged entry has a log number, which is not editable. Then if one audit entry is deleted a gap in the numbering sequence will appear.
 - Log entries are to be hashed/signed so that changes to audit log can be detected.Audit trails to answer the following:
 - Logging of Authentication Process. Success and failed attempts.
 - Logging Authentication details and changes.
 - Software error and failures logged
 - Should not be possible to retrieve confidential authentication information from these logs (including passwords)
 - Is it possible to uniquely identify both client host and user from these logs?
 - What level of information is logged by the application (read/write access, modification data, and copy/paste data)?
 - Are log files time sequential and can they positively identify the time of action. The screenshot for recommended audit trail is given below.

Audit Trail							
trator							
("SL" for Successful Login, "UL" for Unsuccessful Login)							
User ID	IP Address	Login Date and Time	Login Status	Logout Date and Time (using logout action)	Action Type	Module Name	Action Date

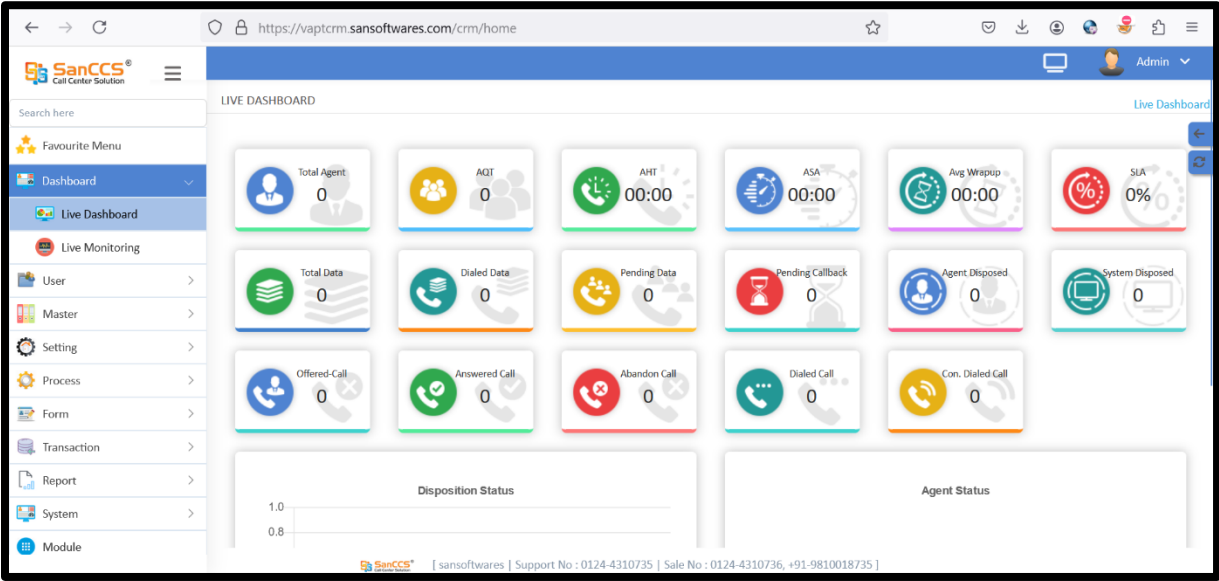
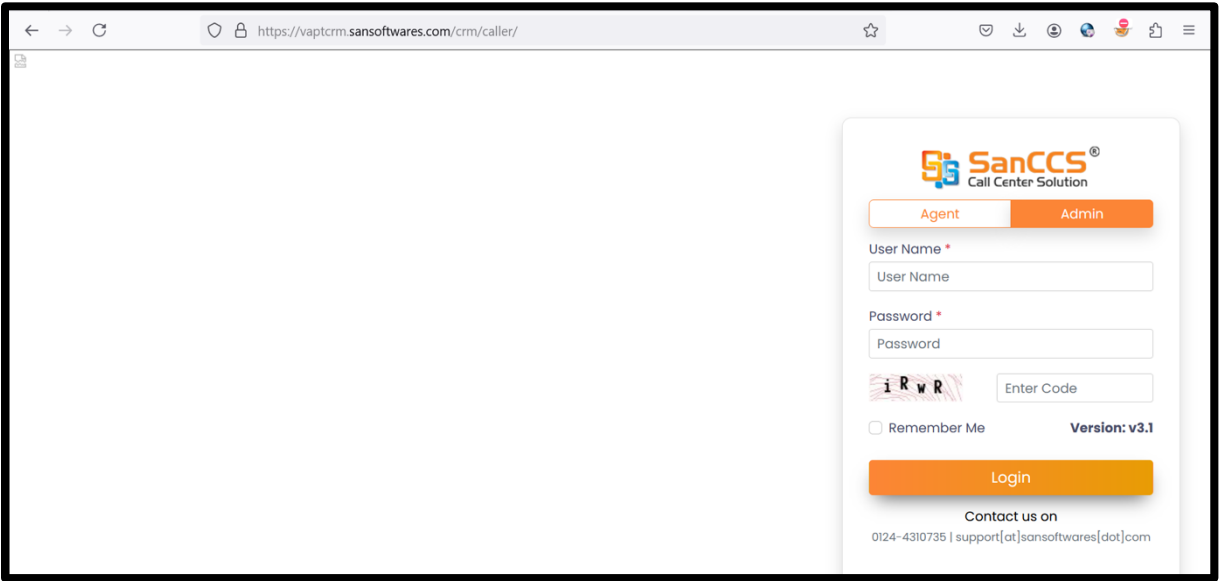
- vii) **Current Status:** Closed
- viii) **Reference** <https://cwe.mitre.org/data/definitions/778.html>
- ix) **References to evidences / Proof of Concept:** N/A

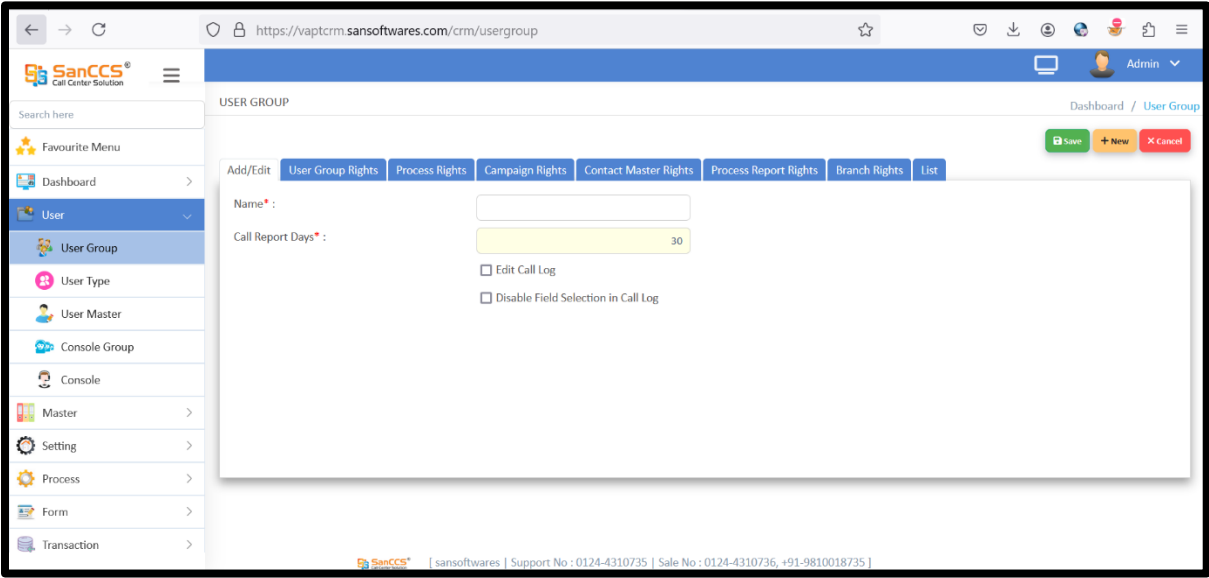
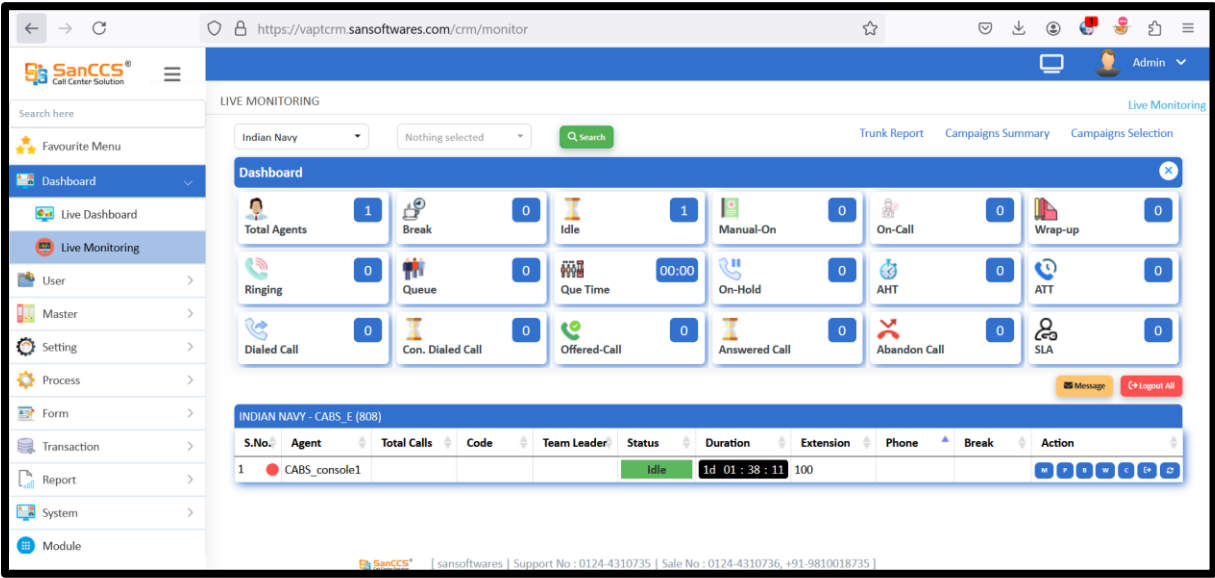
Appendices

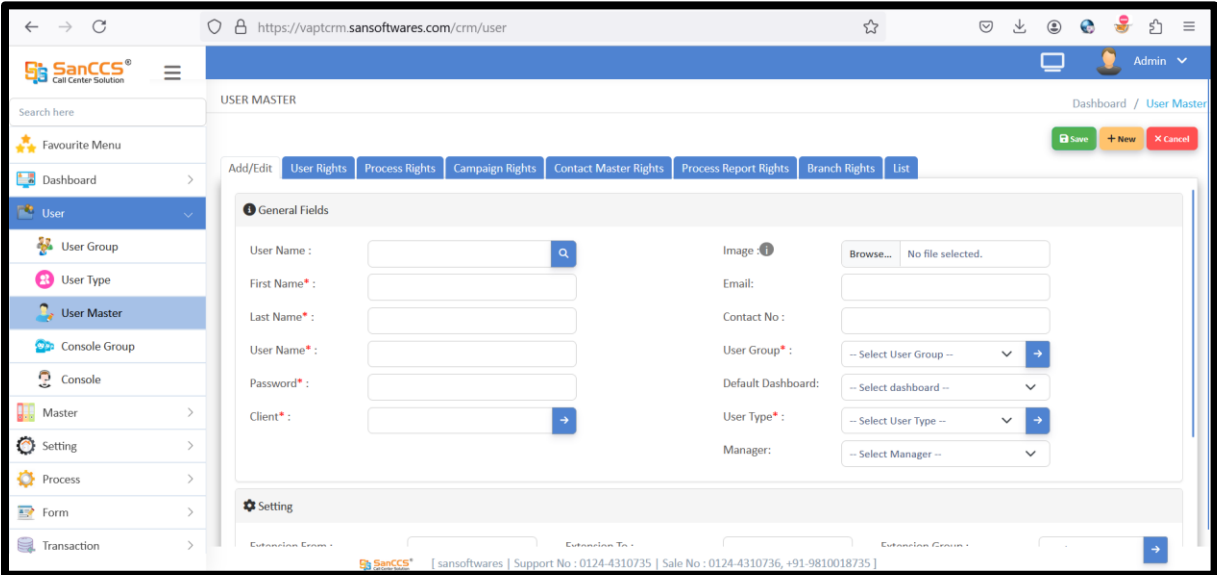
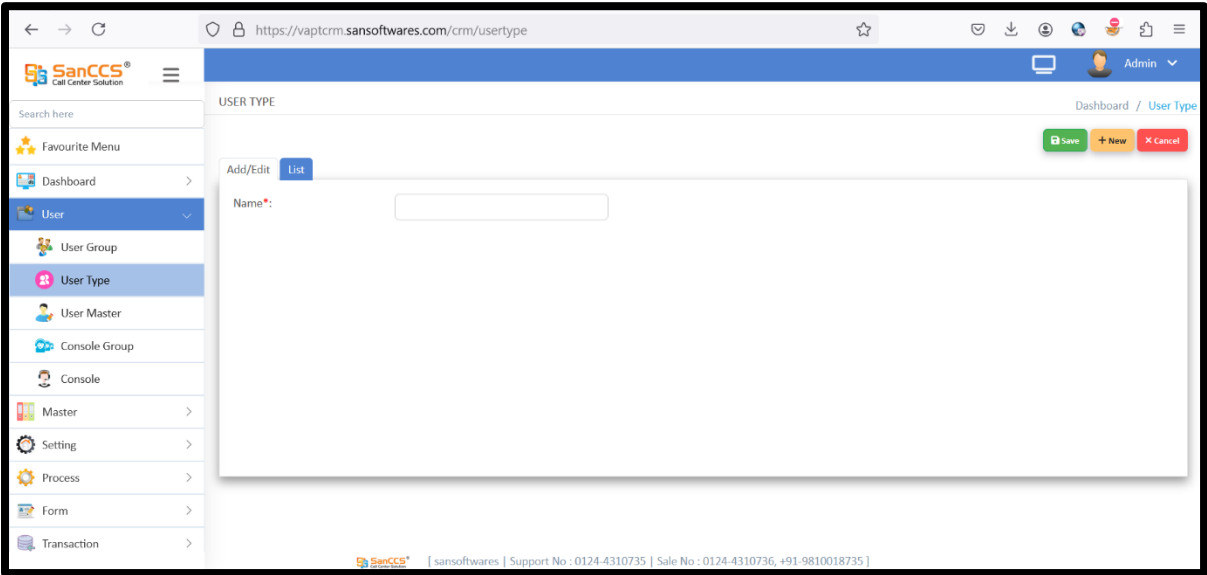
Website Crawls

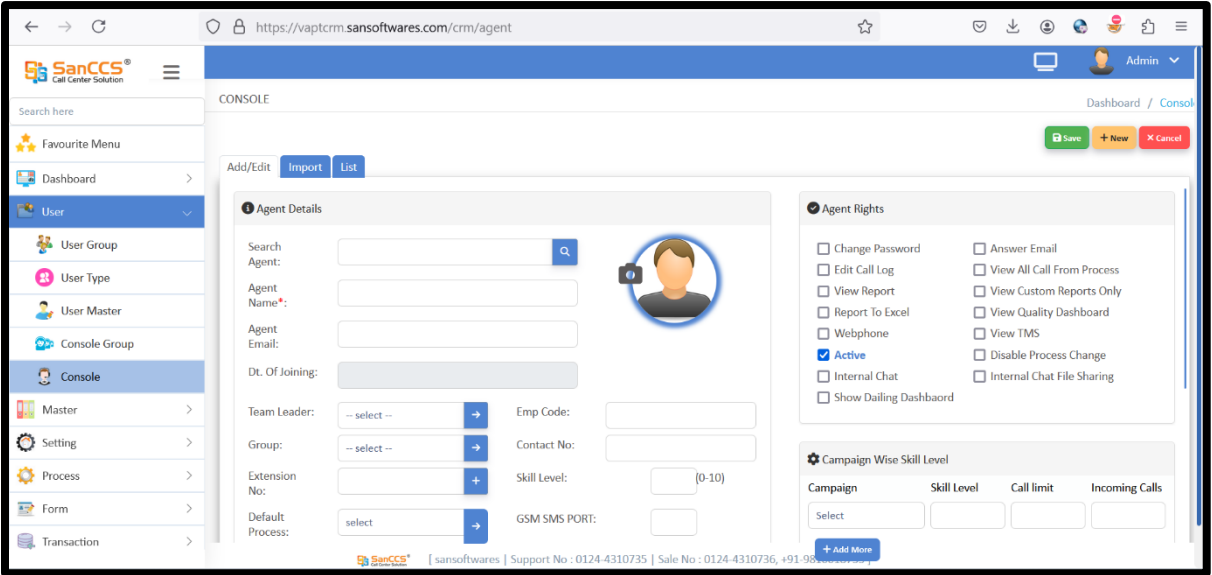
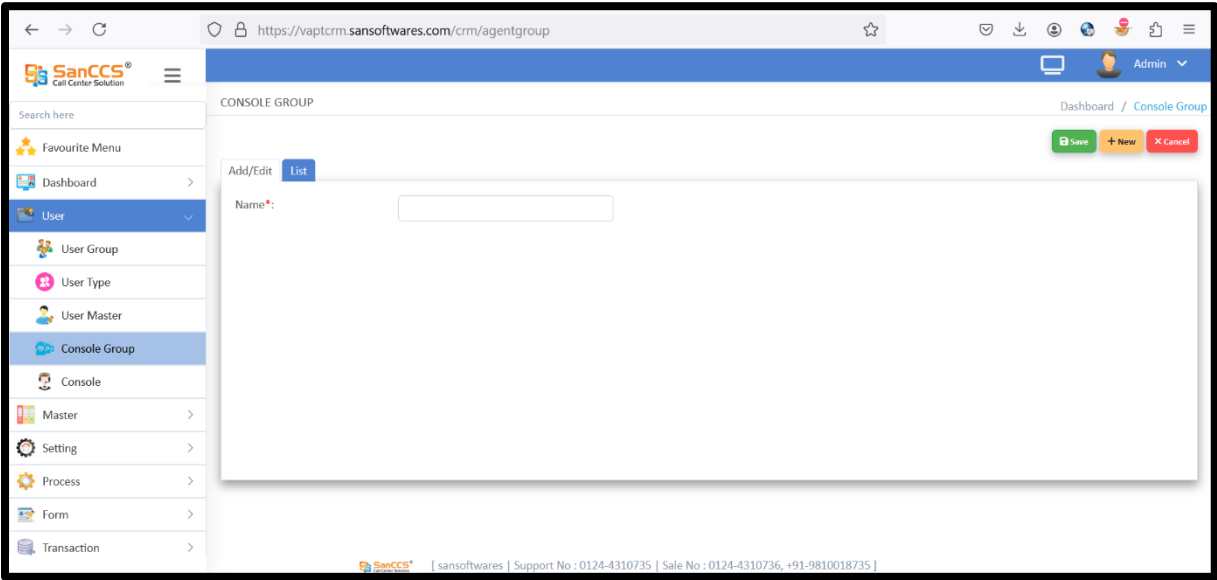
<https://vaptcrm.sansoftwares.com/crm/caller/>
<https://vaptcrm.sansoftwares.com/crm/home>
<https://vaptcrm.sansoftwares.com/crm/monitor>
<https://vaptcrm.sansoftwares.com/crm/usergroup>
<https://vaptcrm.sansoftwares.com/crm/usertype>
<https://vaptcrm.sansoftwares.com/crm/user>
<https://vaptcrm.sansoftwares.com/crm/agentgroup>
<https://vaptcrm.sansoftwares.com/crm/agent>
<https://vaptcrm.sansoftwares.com/crm/branch>
<https://vaptcrm.sansoftwares.com/crm/script>
<https://vaptcrm.sansoftwares.com/crm/company>
<https://vaptcrm.sansoftwares.com/crm/trunkgroup>
<https://vaptcrm.sansoftwares.com/crm/trunk>
<https://vaptcrm.sansoftwares.com/crm/extensiongroup>
<https://vaptcrm.sansoftwares.com/crm/extension>
<https://vaptcrm.sansoftwares.com/crm/acd>
<https://vaptcrm.sansoftwares.com/crm/context>
<https://vaptcrm.sansoftwares.com/crm/agentbreak>
<https://vaptcrm.sansoftwares.com/crm/paginatemaster>
<https://vaptcrm.sansoftwares.com/crm/favouritemenu>
<https://vaptcrm.sansoftwares.com/crm/process>
<https://vaptcrm.sansoftwares.com/crm/campaign>
<https://vaptcrm.sansoftwares.com/crm/did>
<https://vaptcrm.sansoftwares.com/crm/contactmaster>
<https://vaptcrm.sansoftwares.com/crm/processreport>
<https://vaptcrm.sansoftwares.com/crm/Tms>
<https://vaptcrm.sansoftwares.com/crm/formbuilder>
<https://vaptcrm.sansoftwares.com/crm/formdesigner>
<https://vaptcrm.sansoftwares.com/crm/importmaster>
<https://vaptcrm.sansoftwares.com/crm/filemaster>
<https://vaptcrm.sansoftwares.com/crm/churndata>
<https://vaptcrm.sansoftwares.com/crm/datamanagement>
<https://vaptcrm.sansoftwares.com/crm/callogreport>
<https://vaptcrm.sansoftwares.com/crm/customqueryresults>
<https://vaptcrm.sansoftwares.com/crm/TrunkReport>
<https://vaptcrm.sansoftwares.com/crm/updatesoftware>
<https://vaptcrm.sansoftwares.com/crm/client>
<https://vaptcrm.sansoftwares.com/crm/Apidoc>
<https://vaptcrm.sansoftwares.com/crm/agenttheme>
<https://vaptcrm.sansoftwares.com/crm/Crmapidoc>
<https://vaptcrm.sansoftwares.com/crm/Softwarehealth>
<https://vaptcrm.sansoftwares.com/crm/searchphoneno>
<https://vaptcrm.sansoftwares.com/crm/archivedata>
<https://vaptcrm.sansoftwares.com/crm/apimaster>
<https://vaptcrm.sansoftwares.com/crm/registeryourcopy>
<https://vaptcrm.sansoftwares.com/crm/domain>
<https://vaptcrm.sansoftwares.com/crm/loginbackground>
<https://vaptcrm.sansoftwares.com/crm/recordingpath>
<https://vaptcrm.sansoftwares.com/crm/PurgeDatabase>
<https://vaptcrm.sansoftwares.com/crm/module>
<https://vaptcrm.sansoftwares.com/crm/user/userprofile>
<https://vaptcrm.sansoftwares.com/crm/caller/caller/agent/>
<https://vaptcrm.sansoftwares.com/crm/caller/setdata>

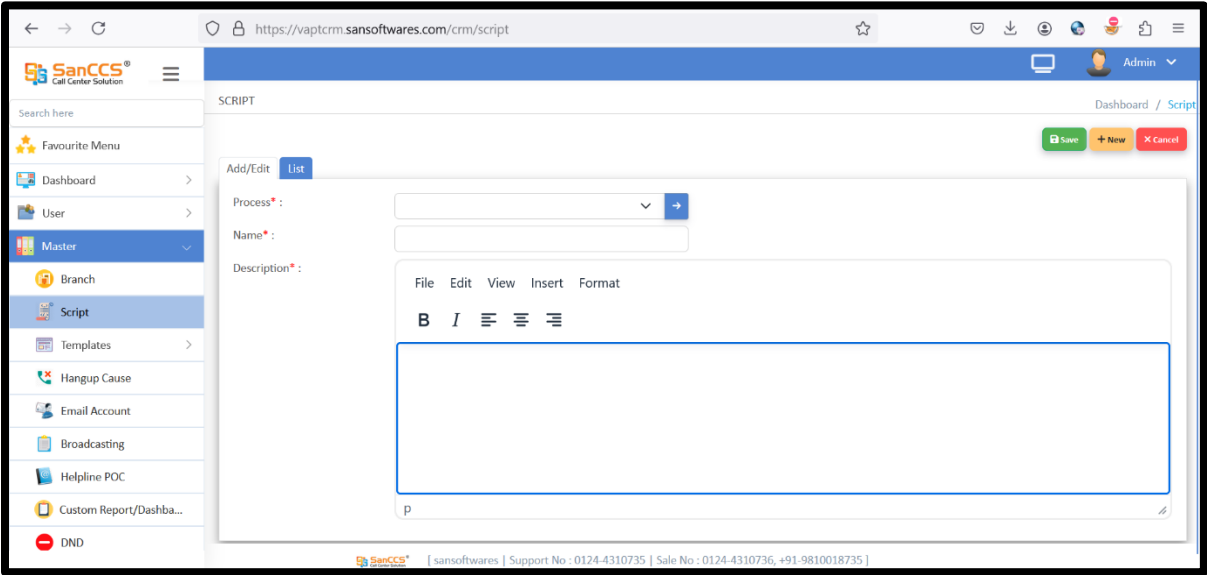
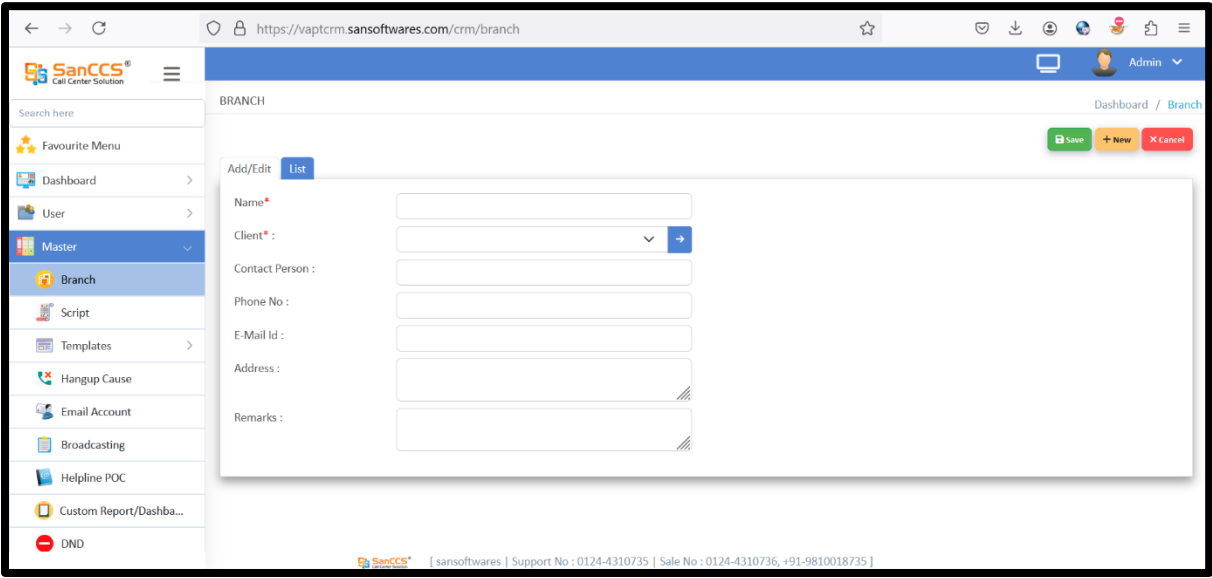
Screenshots (After Completed Audit)

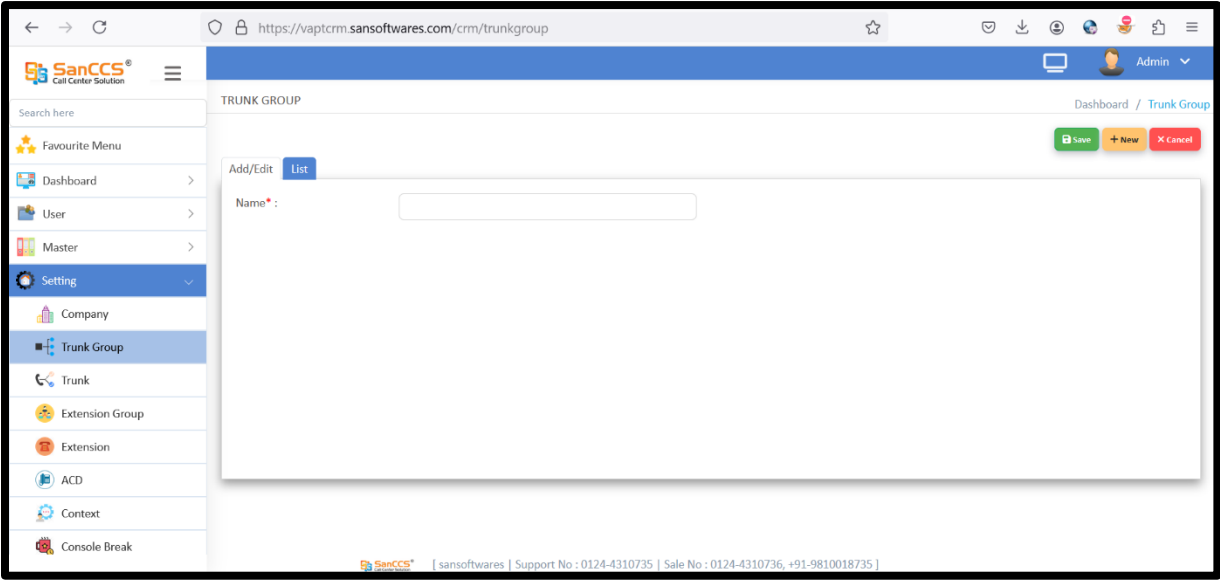
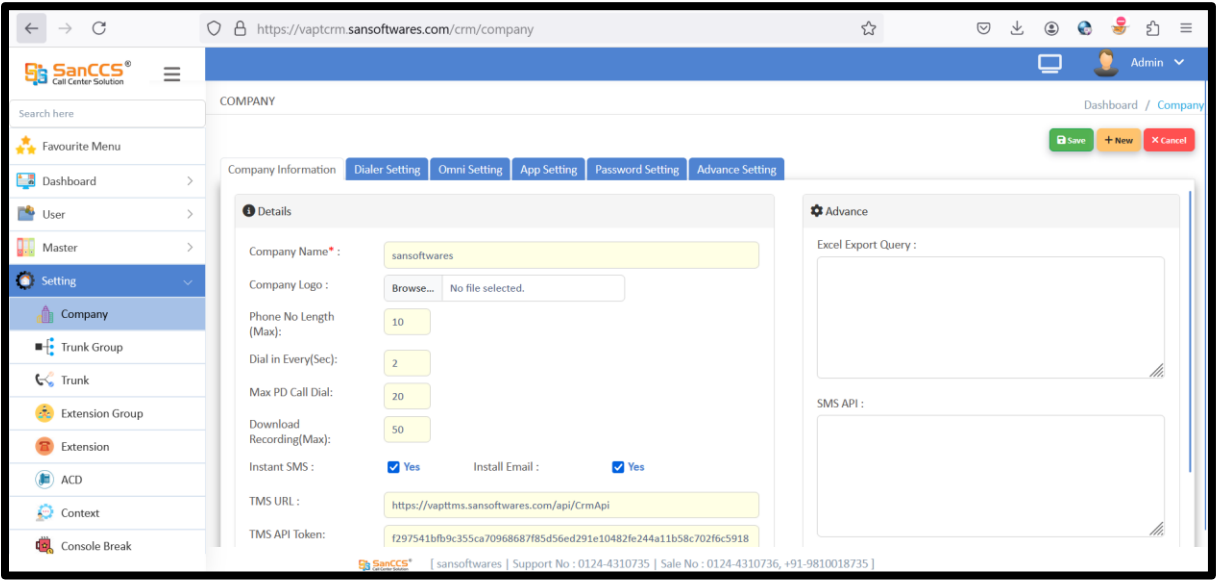


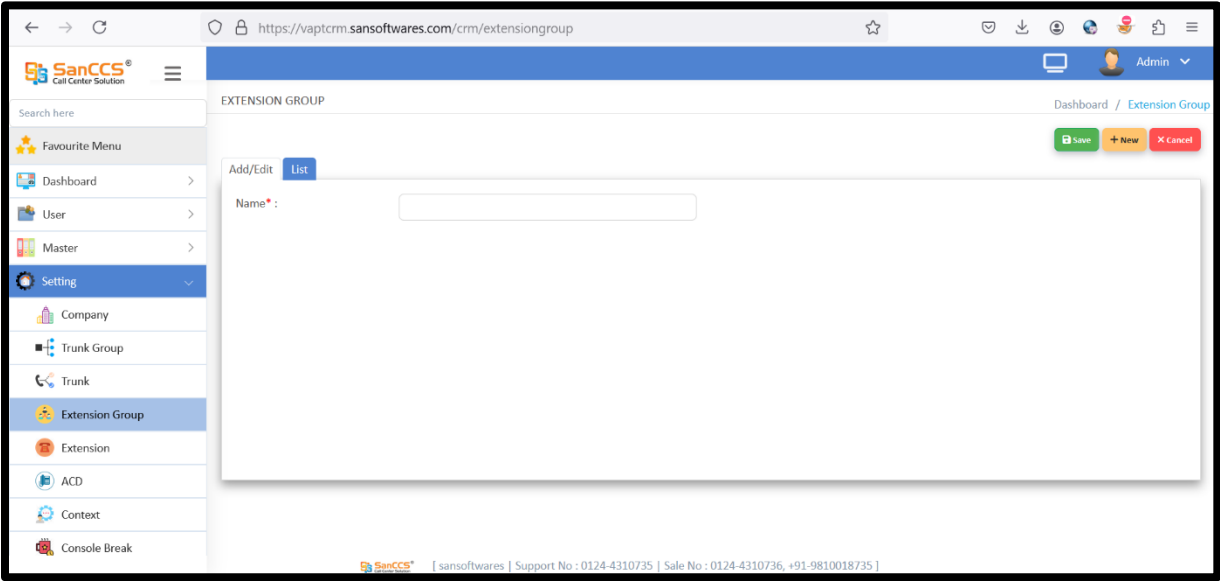
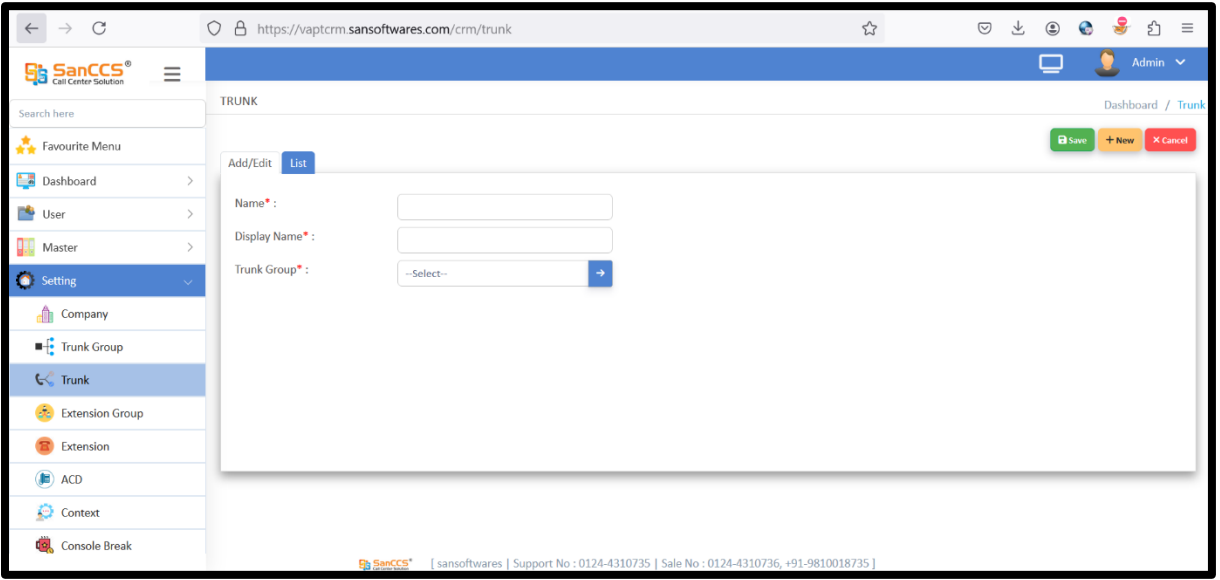


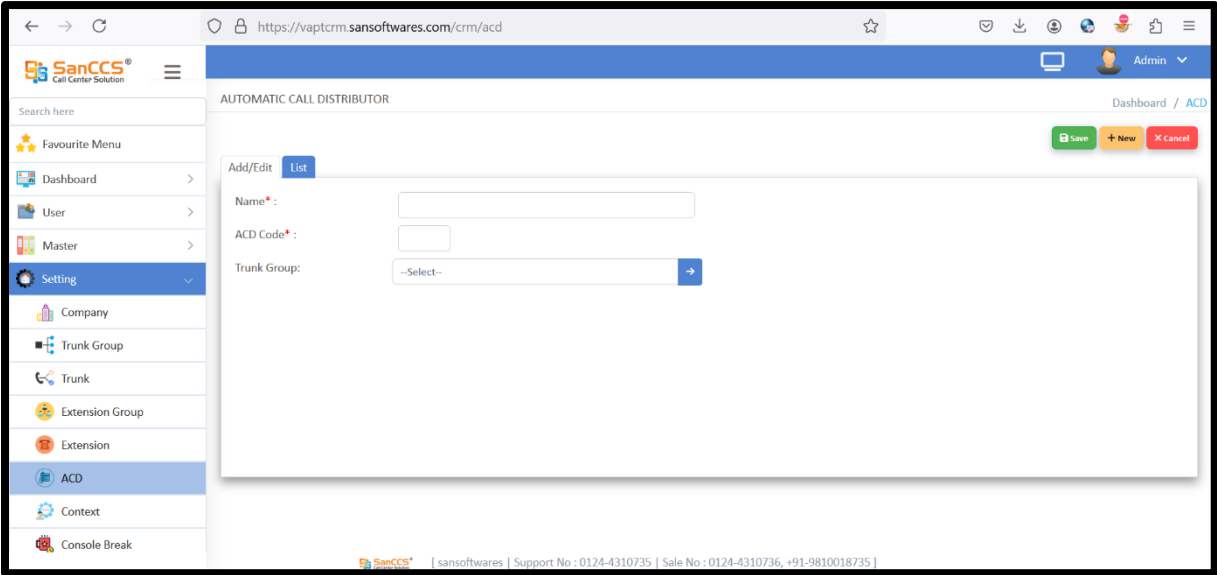
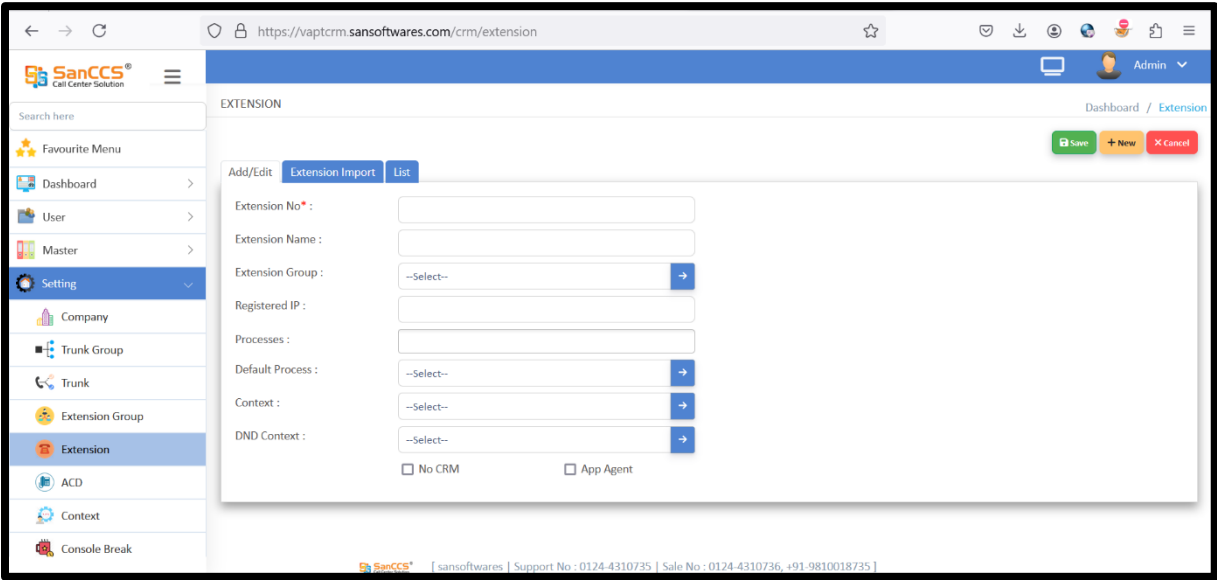


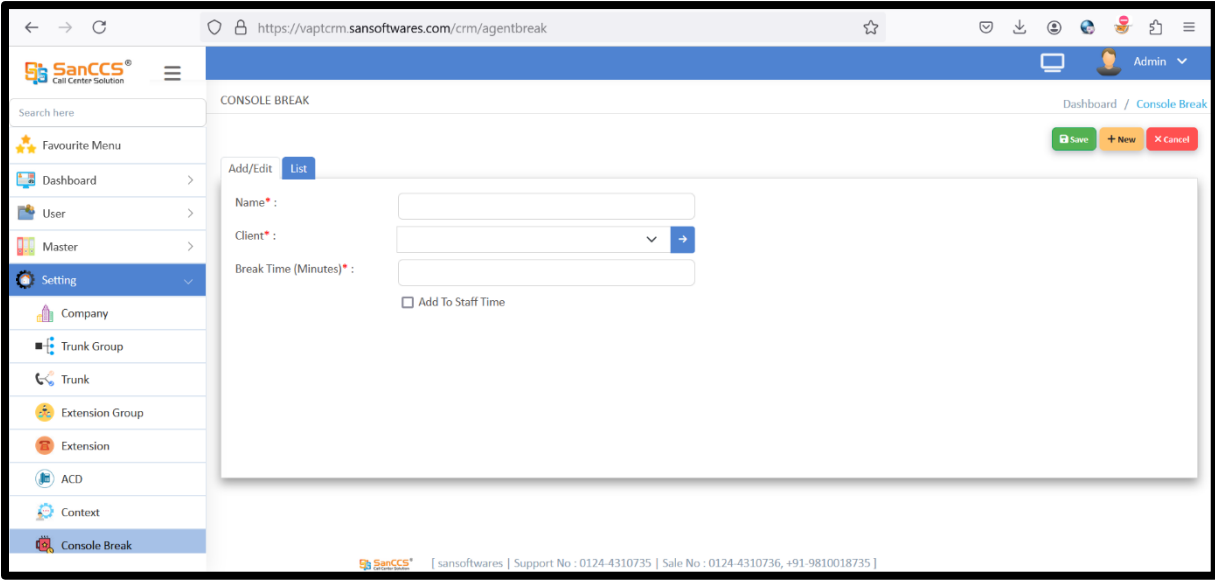
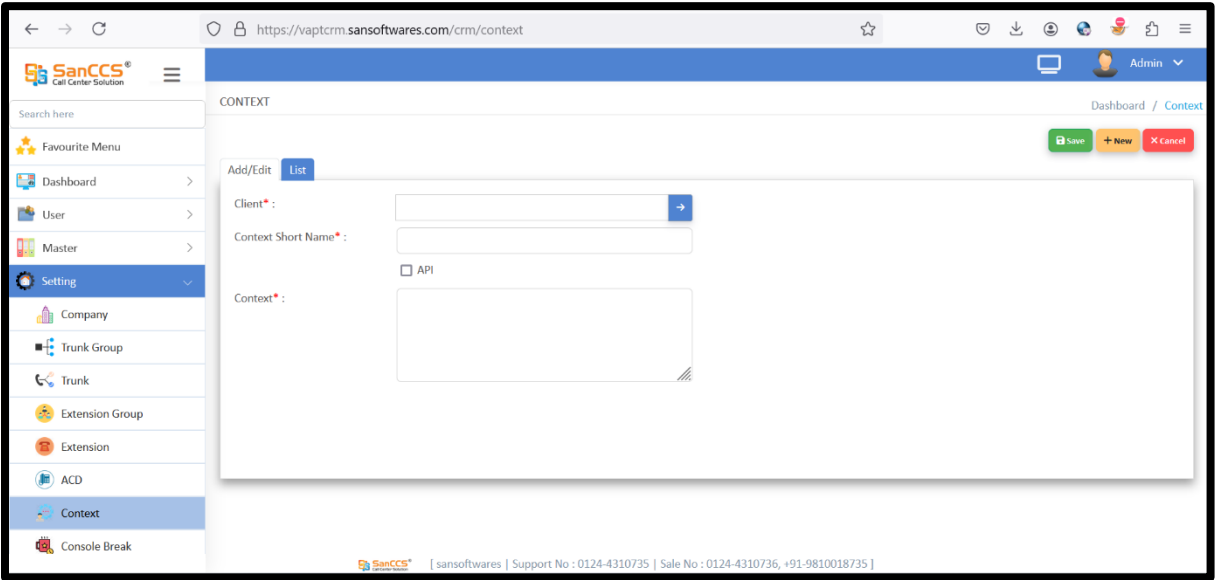


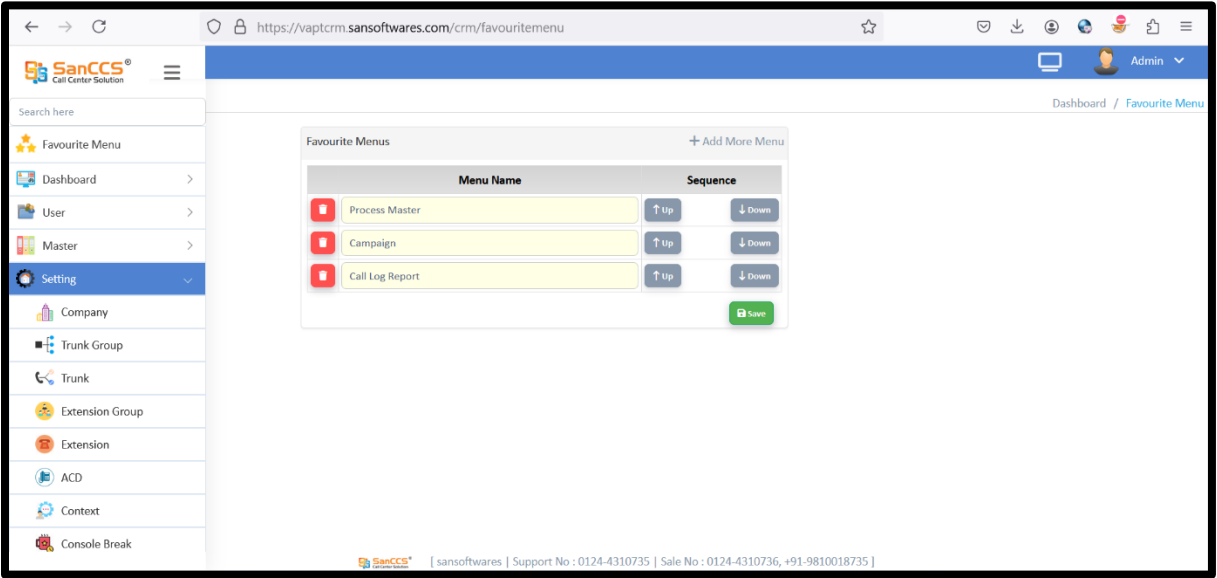
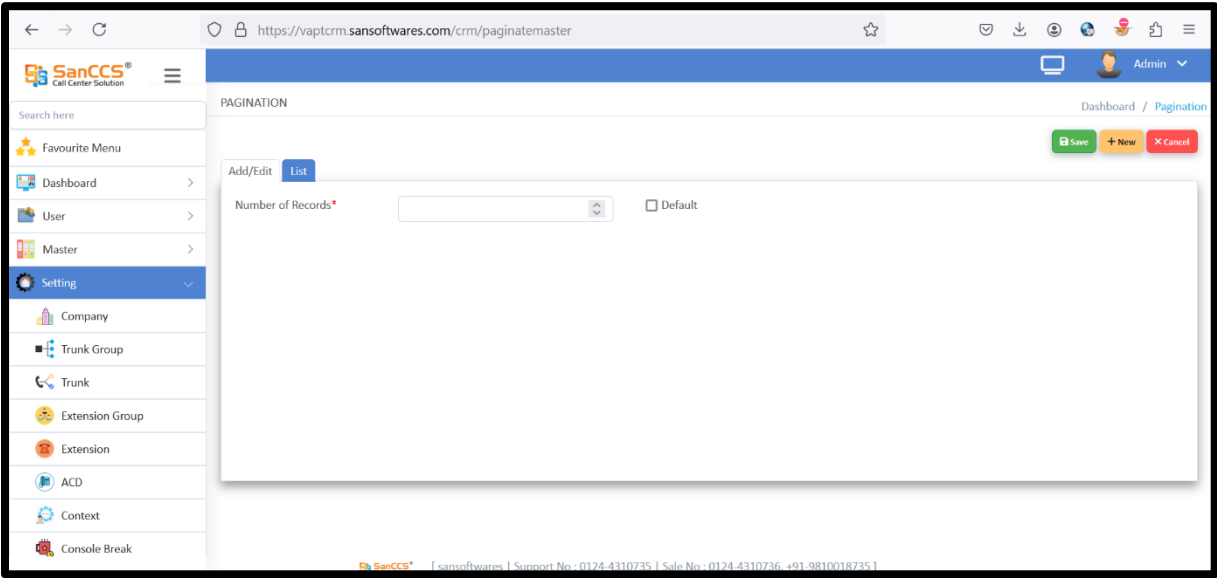


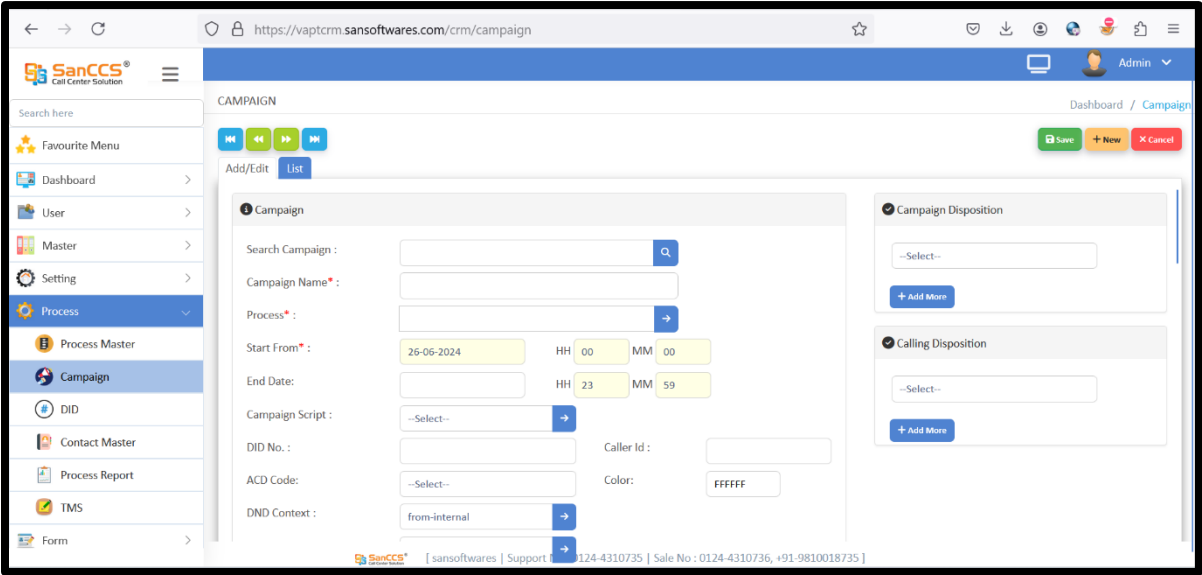
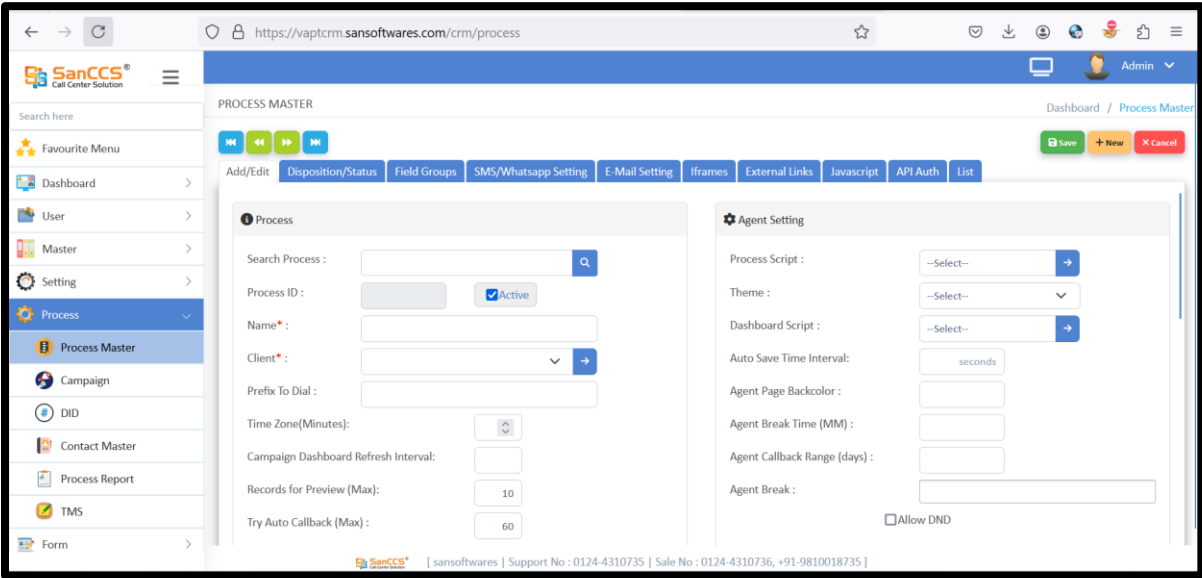


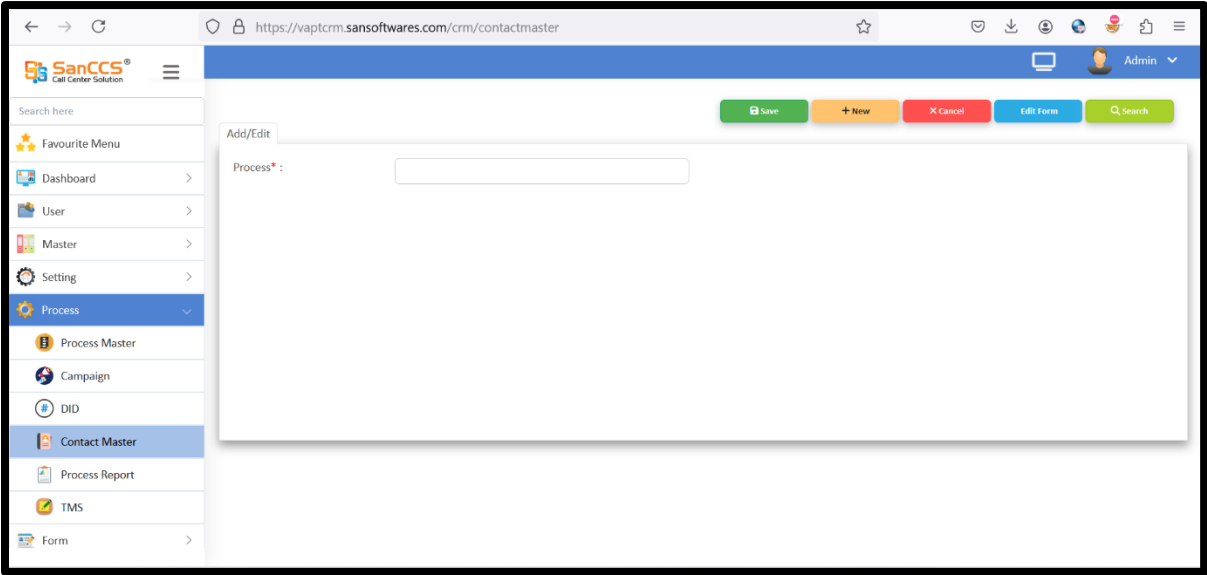
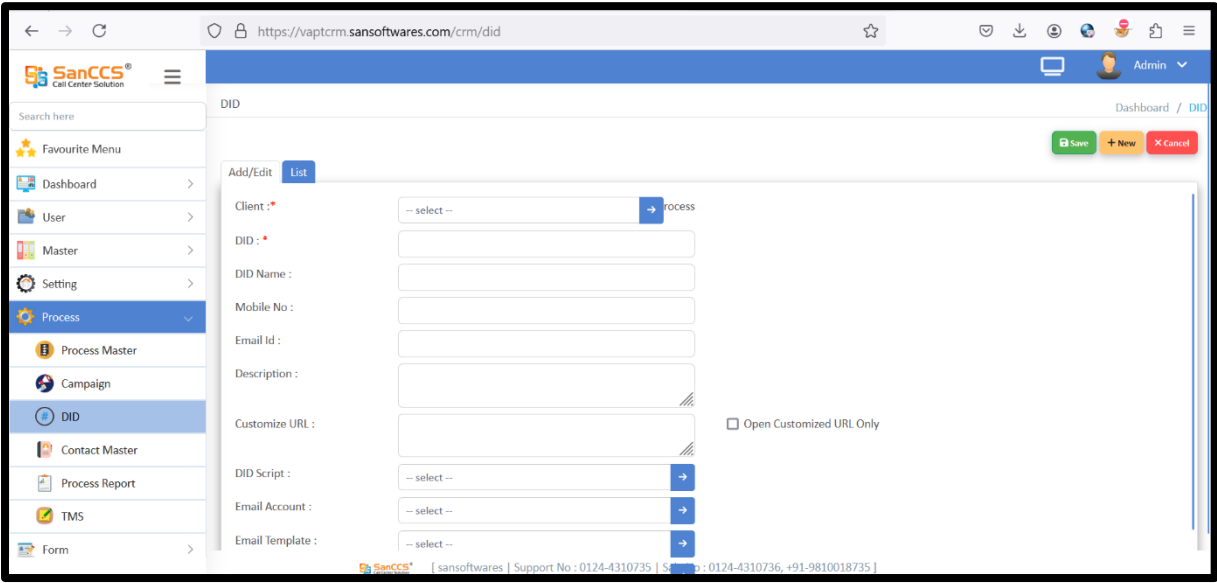


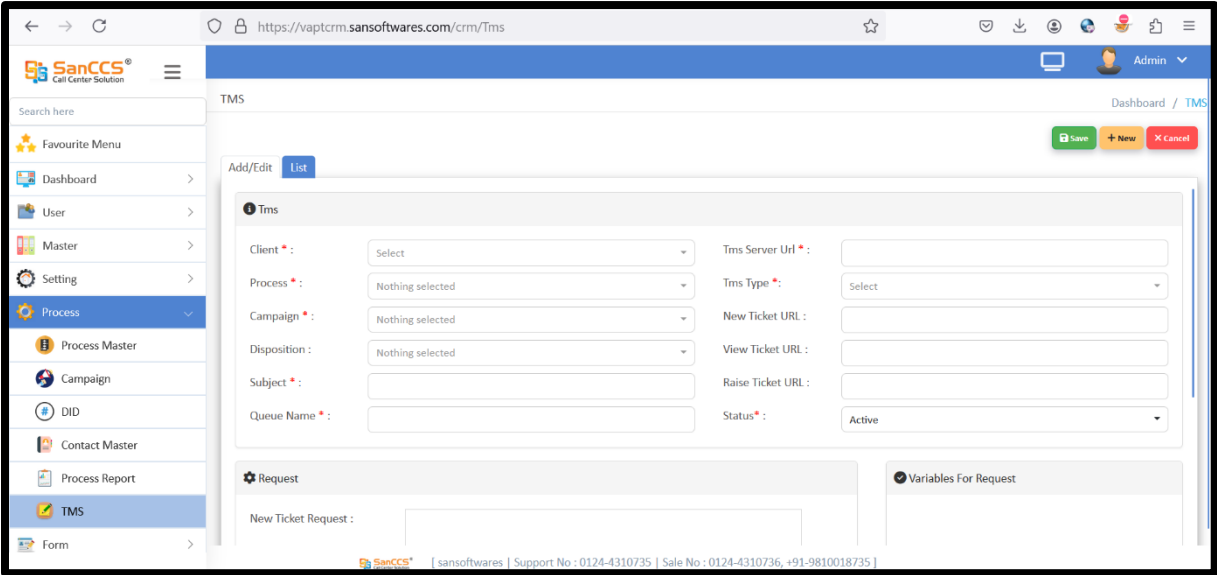
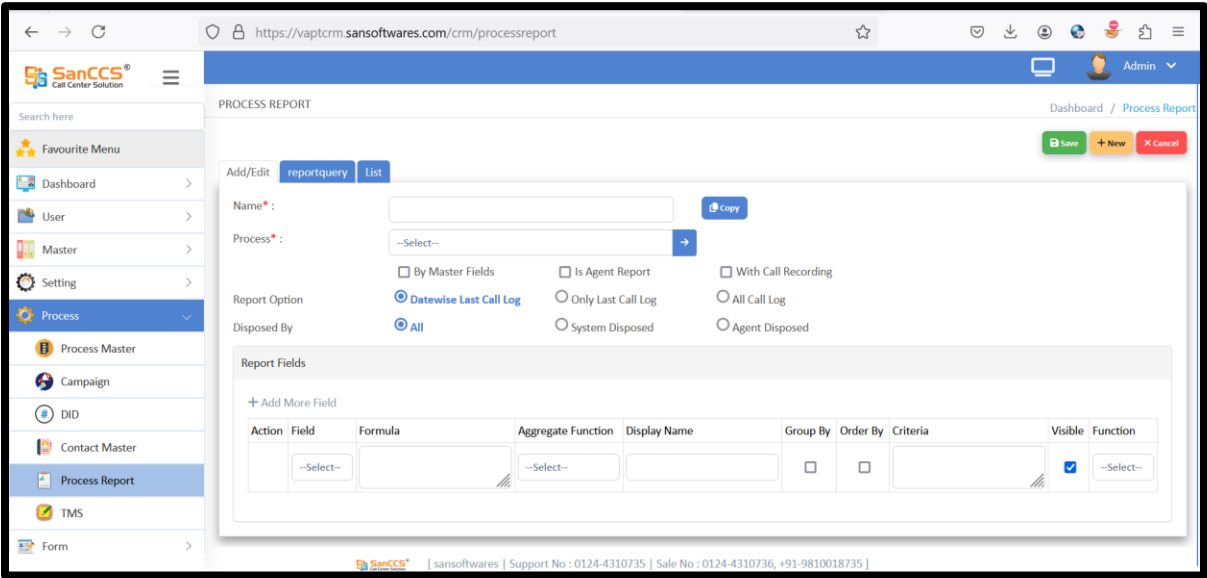


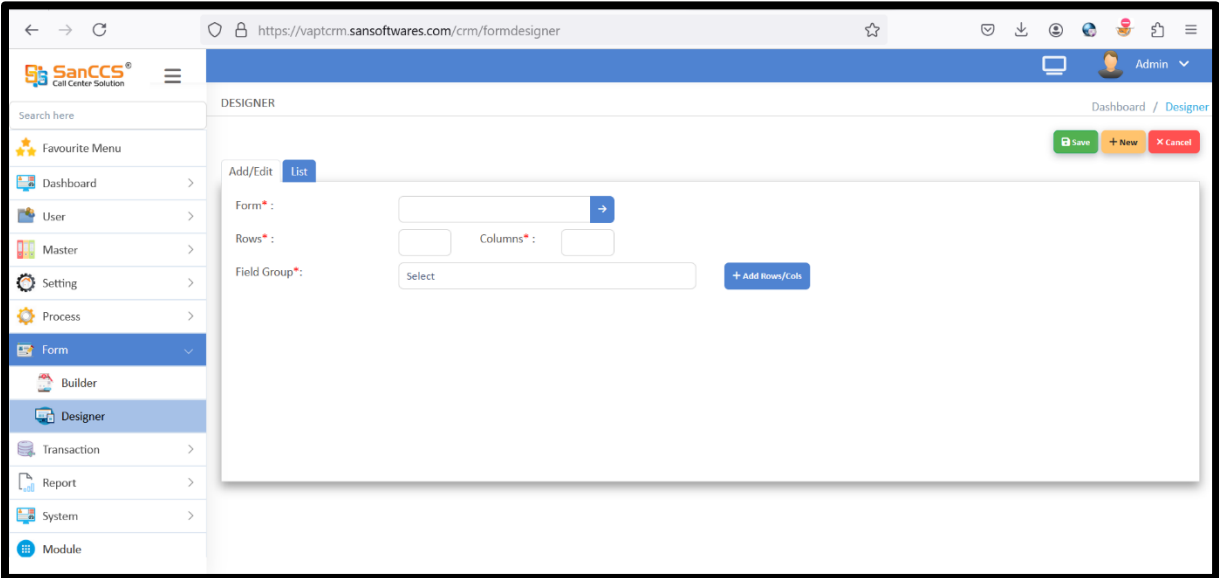
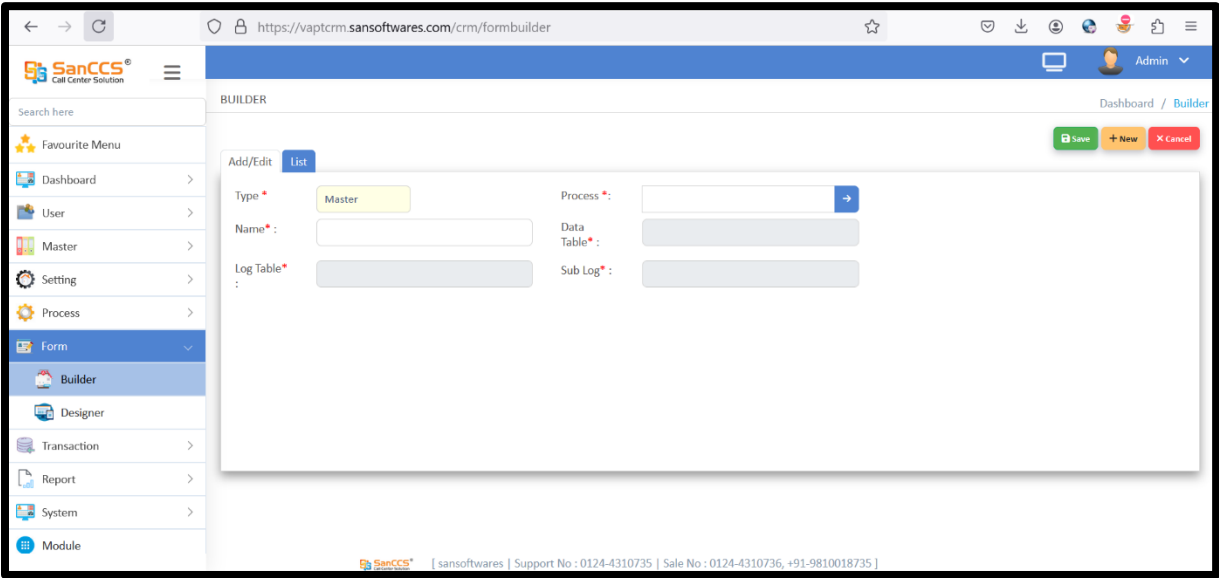


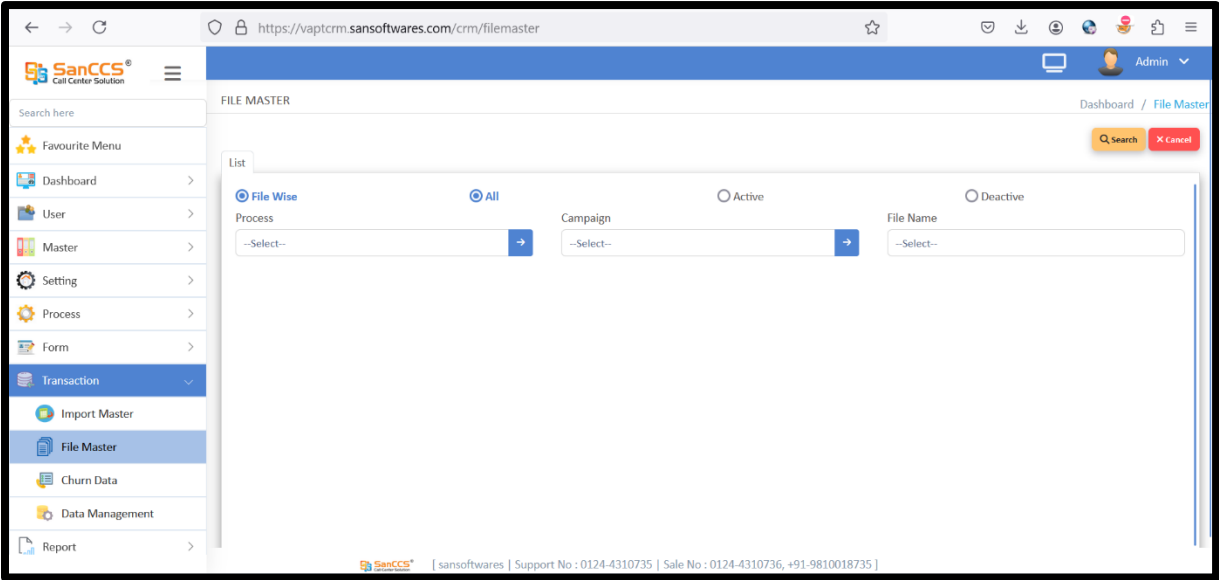
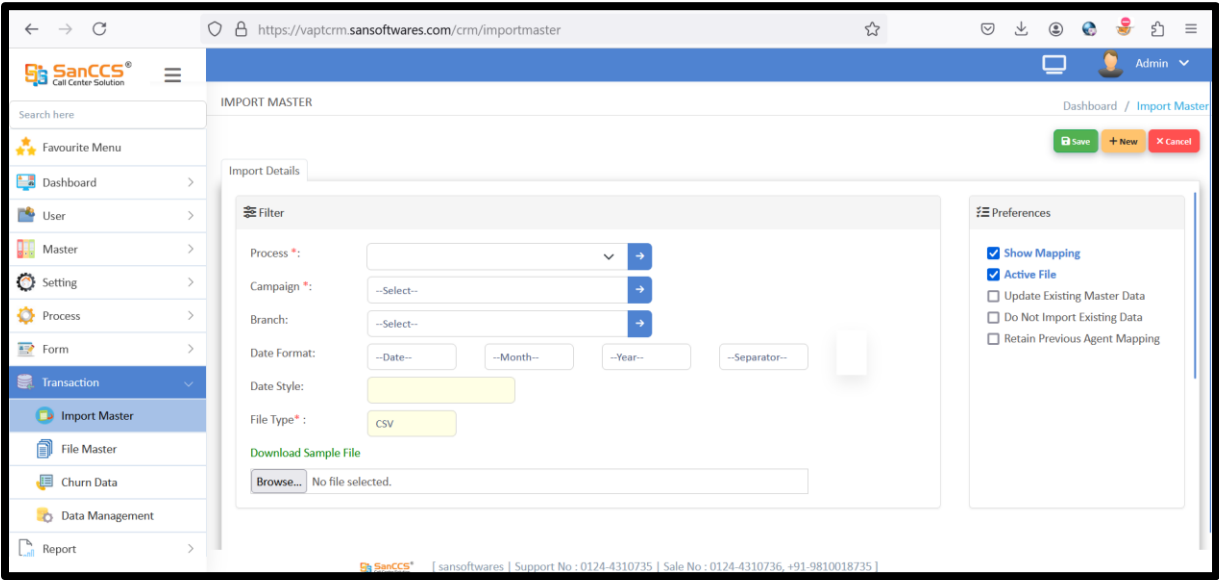


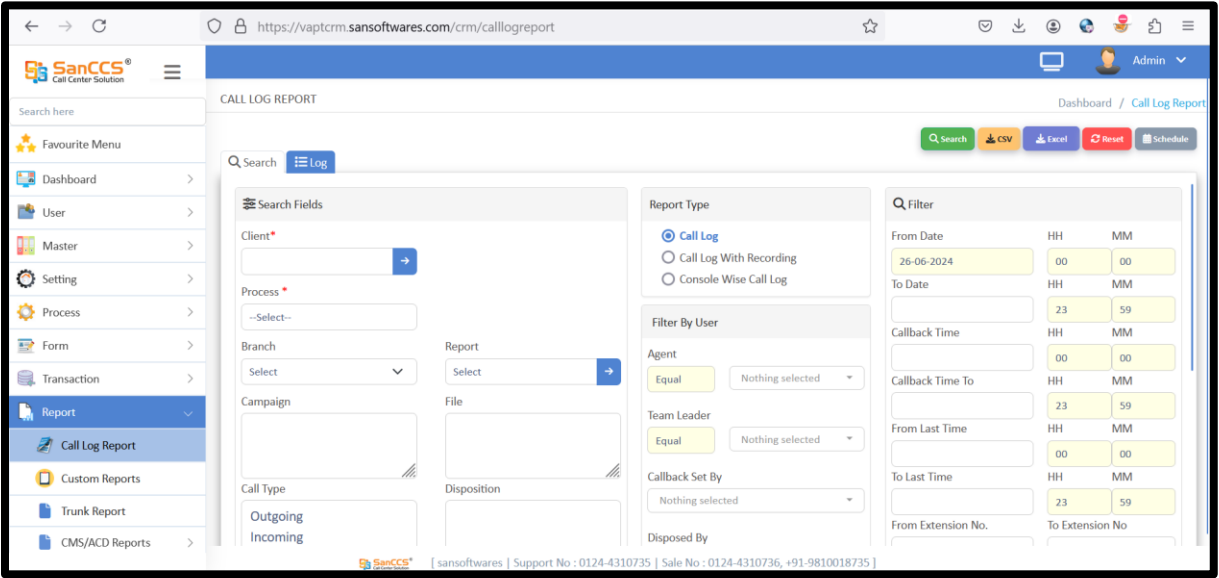
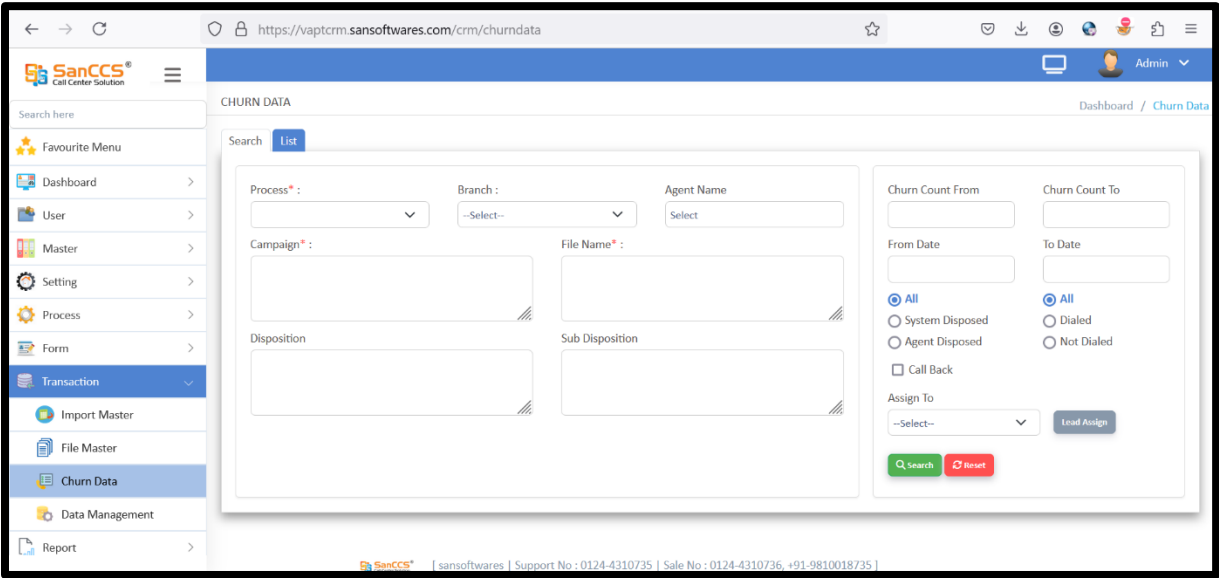


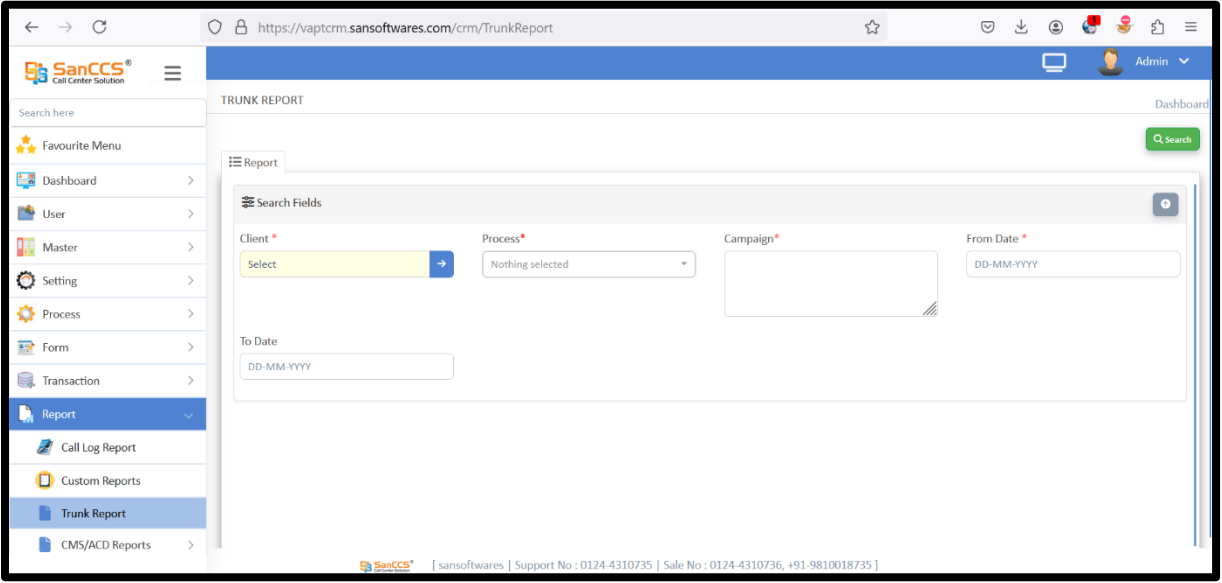
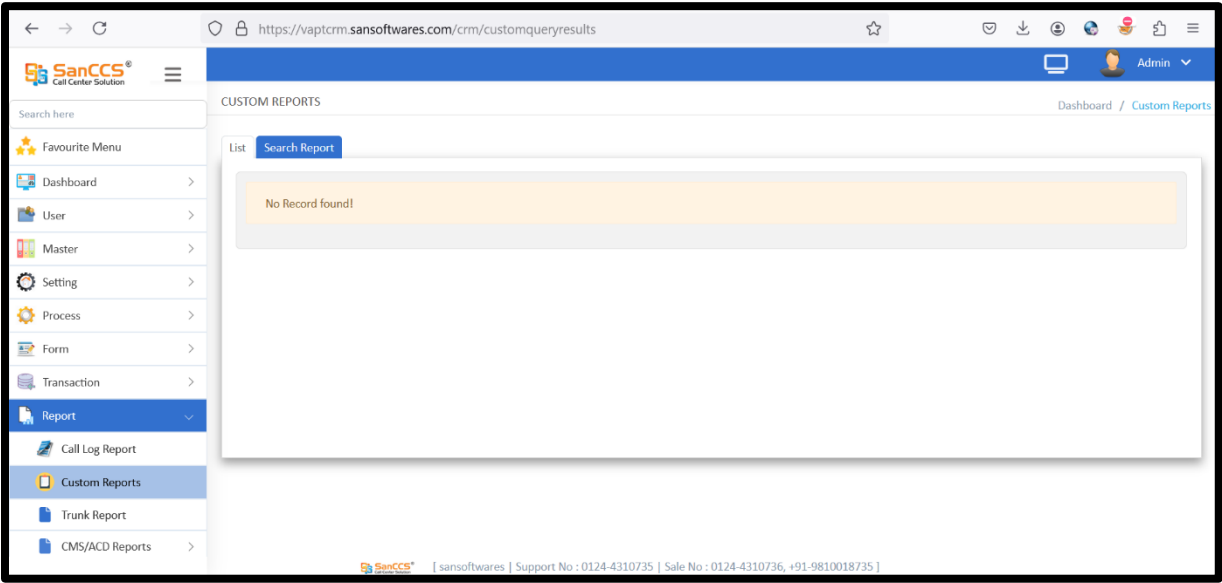


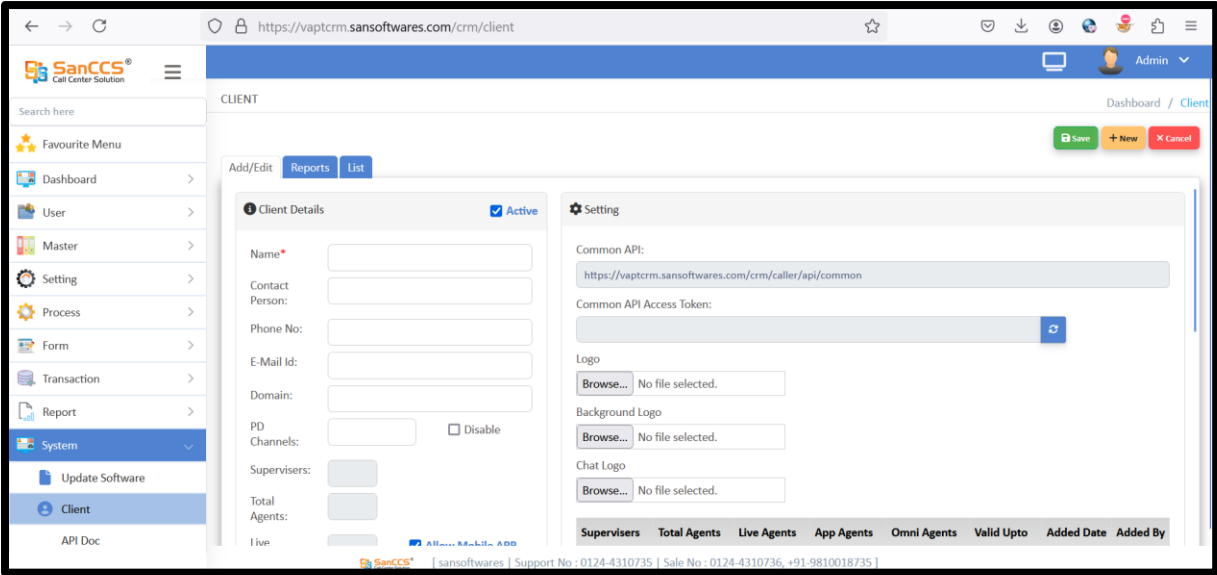
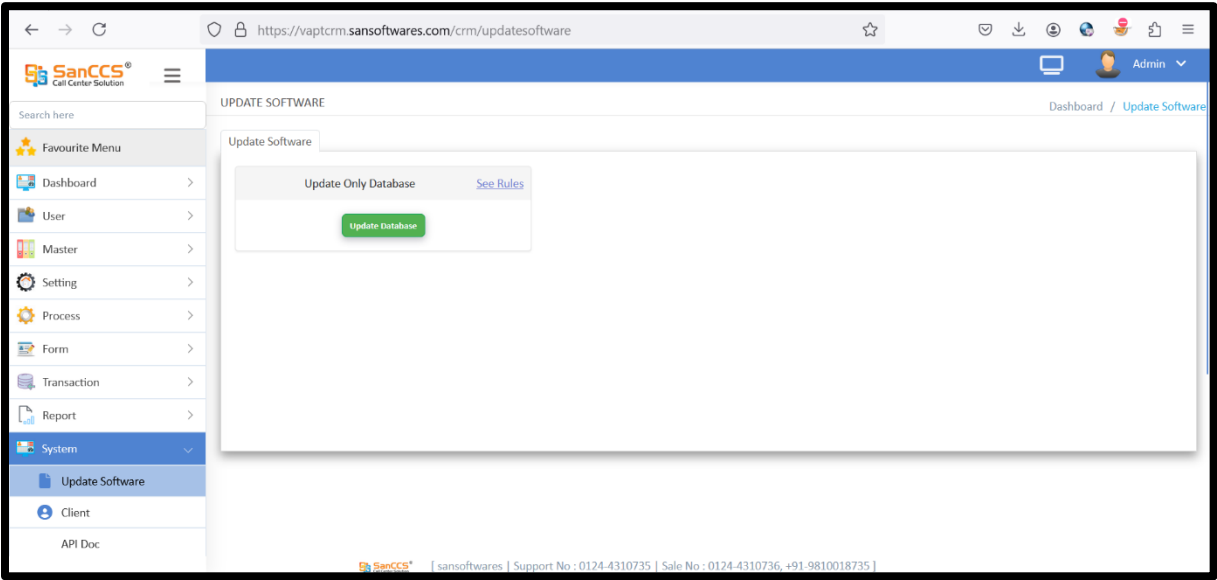


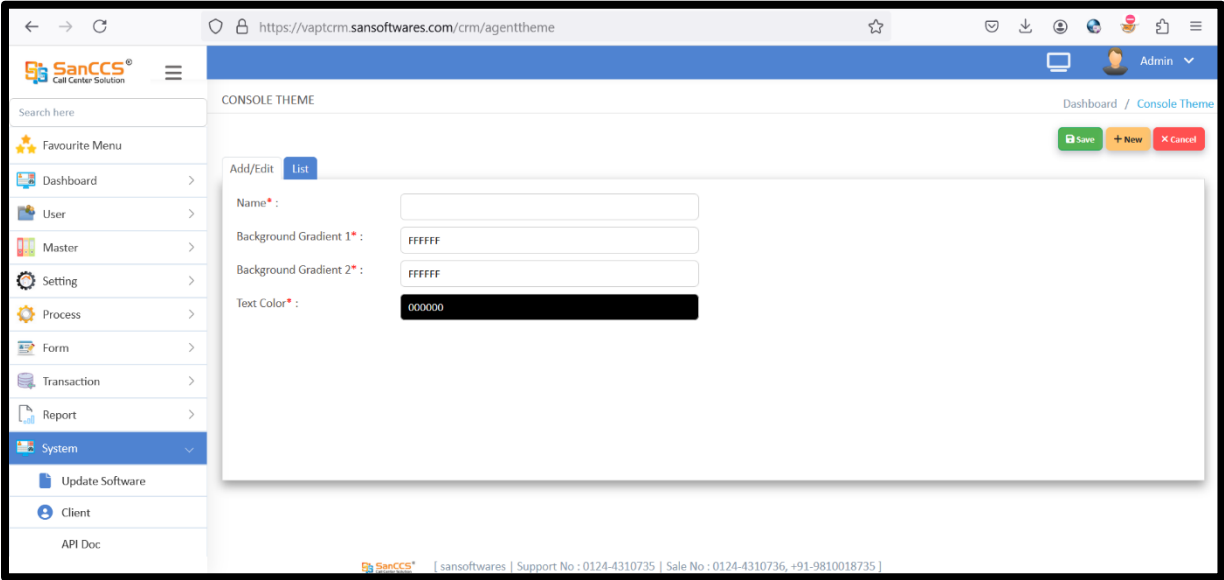
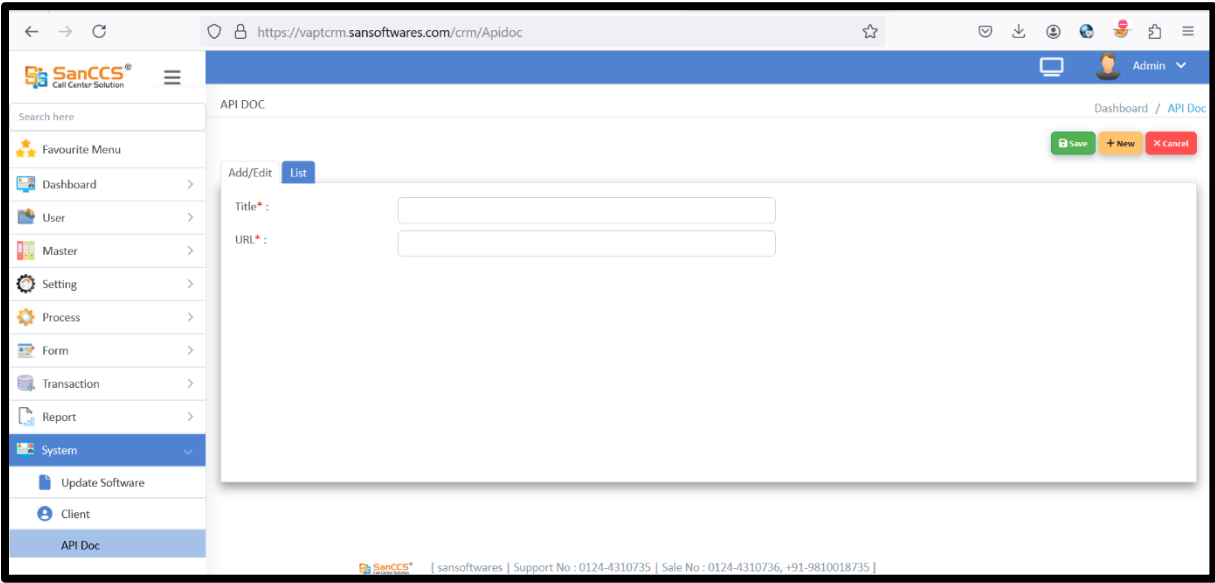


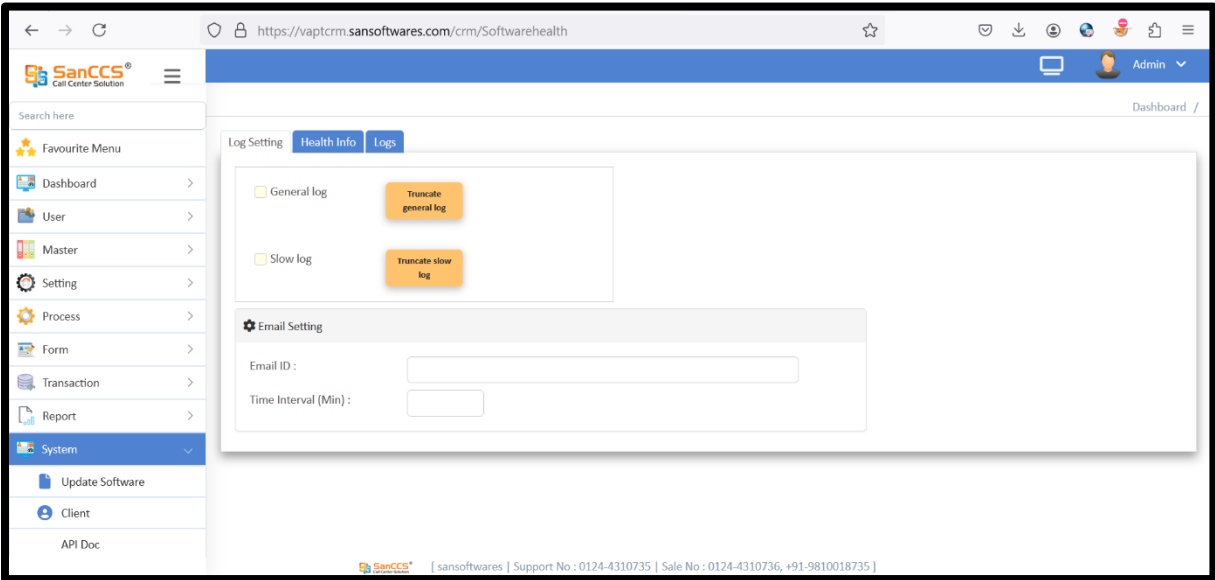
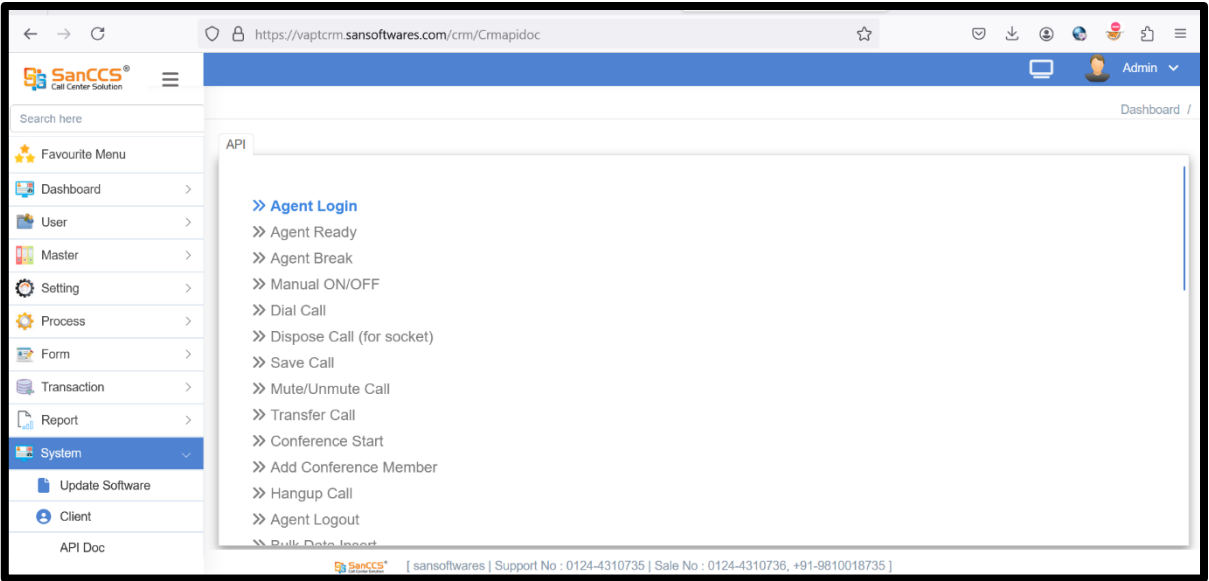


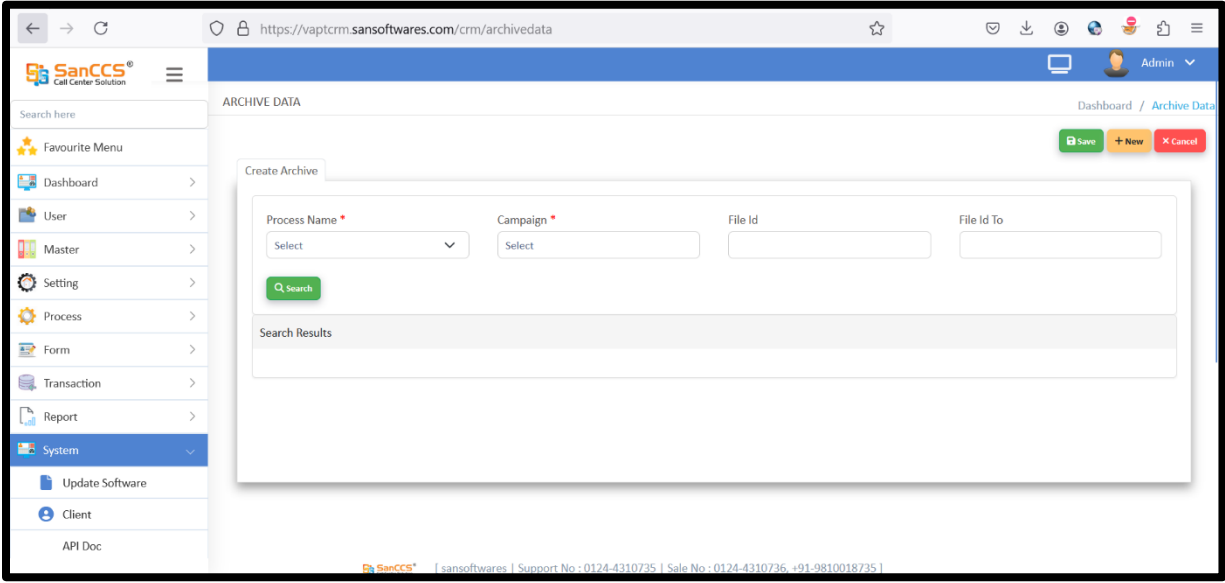
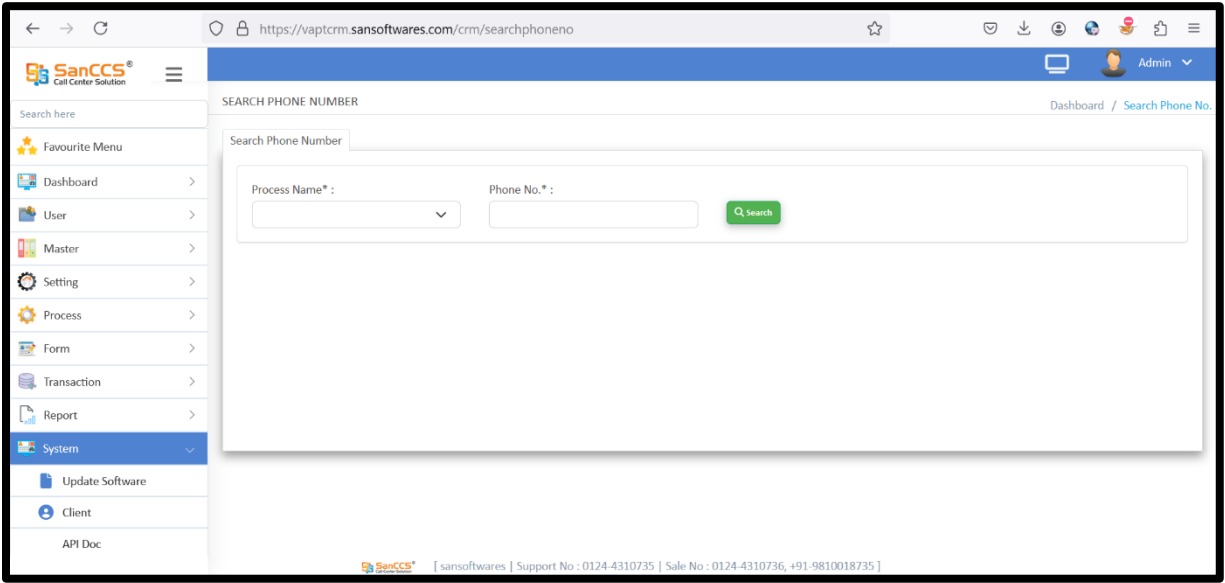


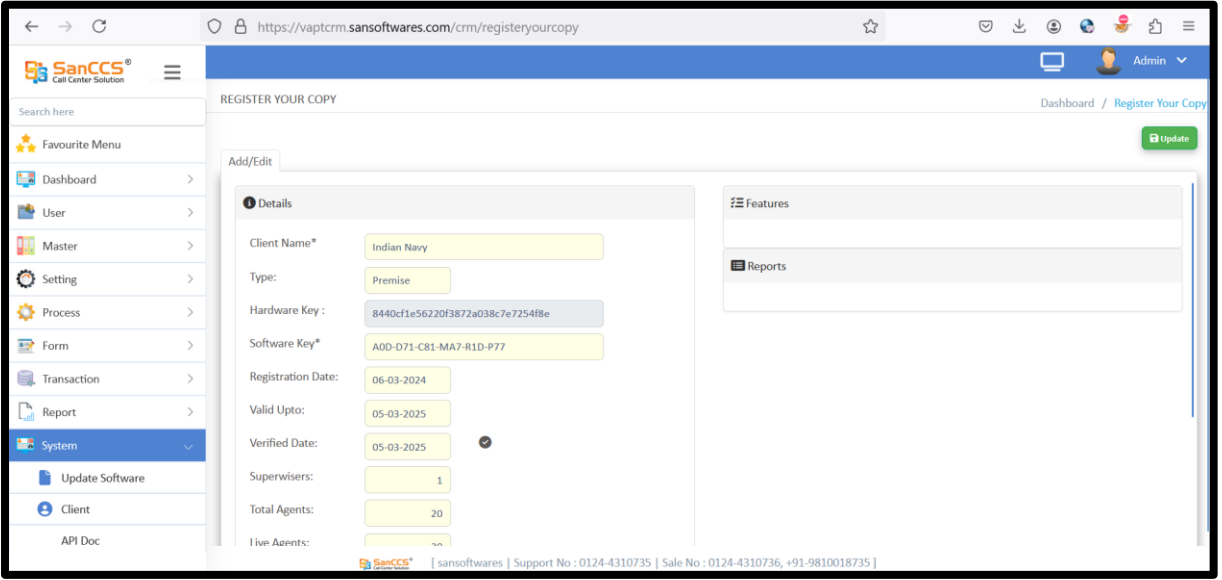
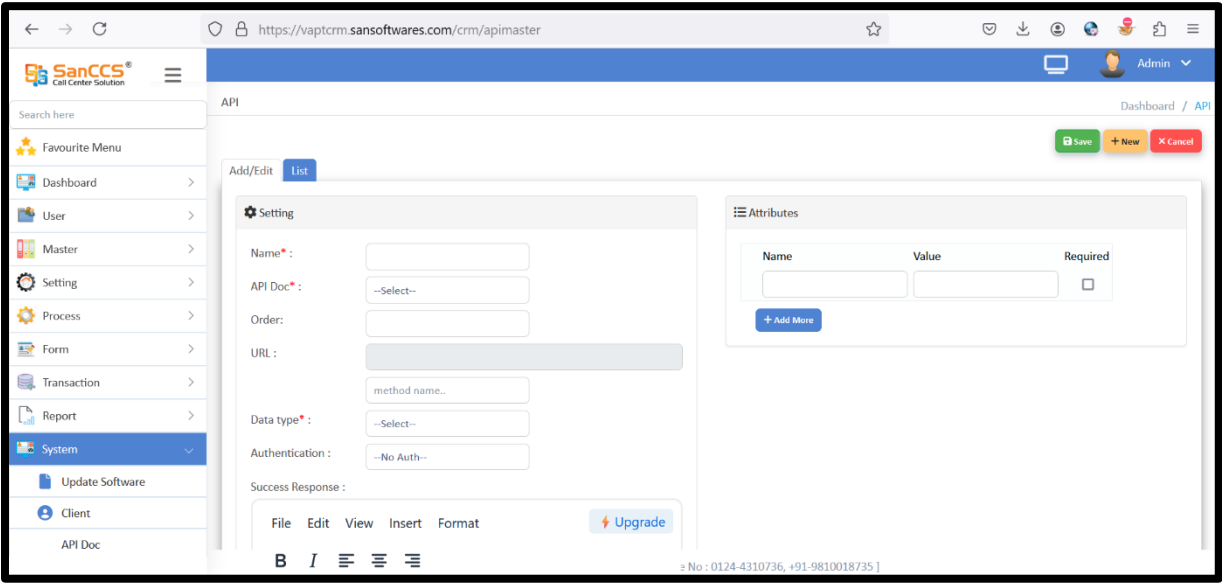


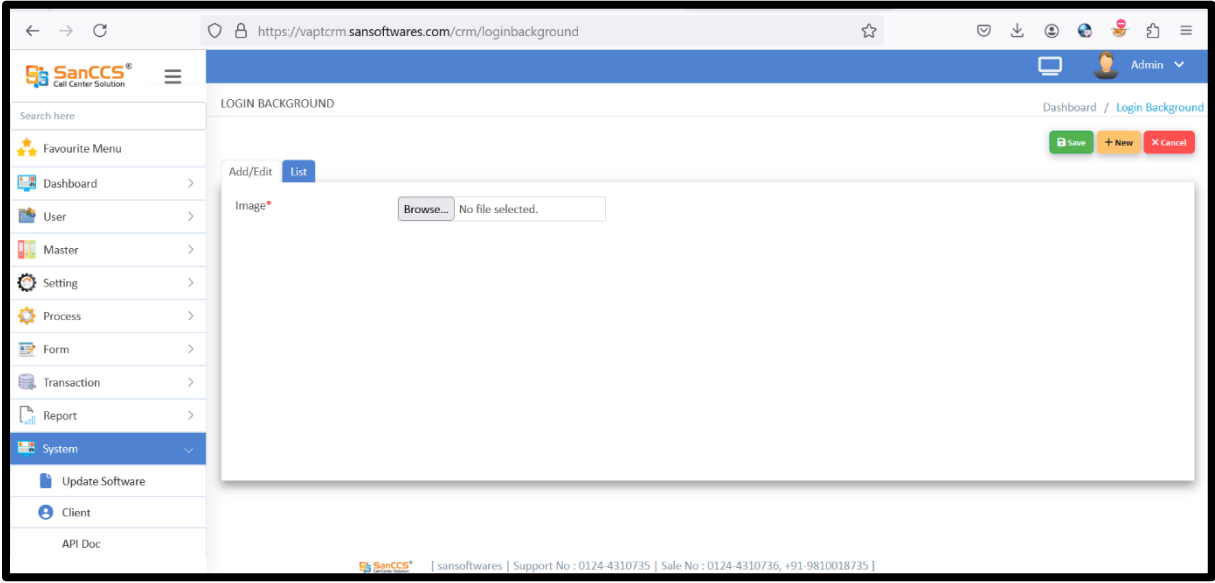
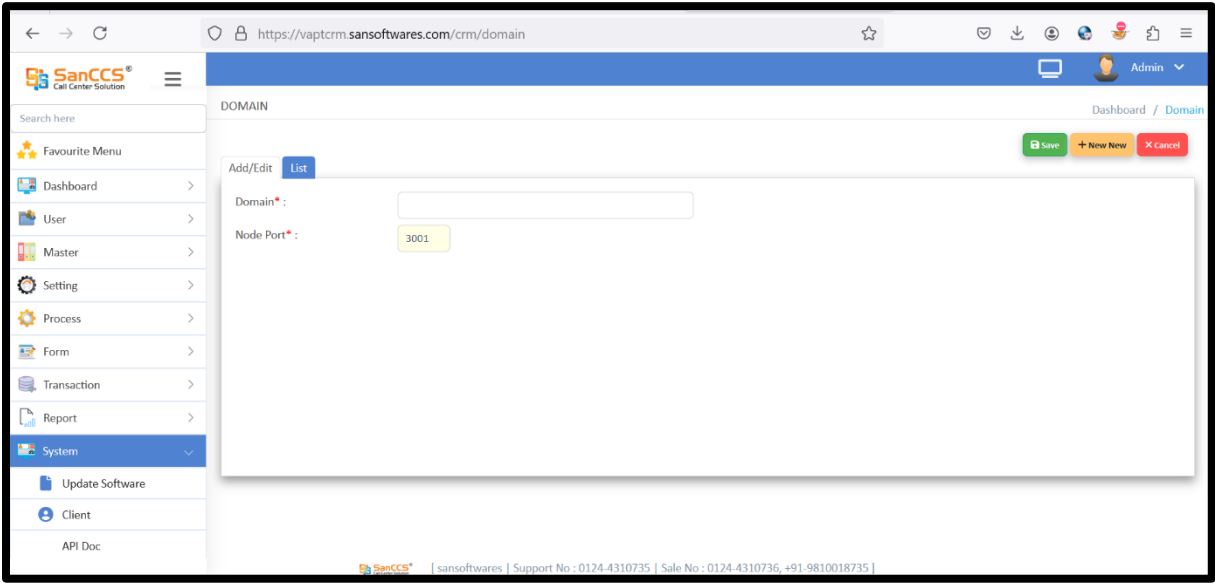


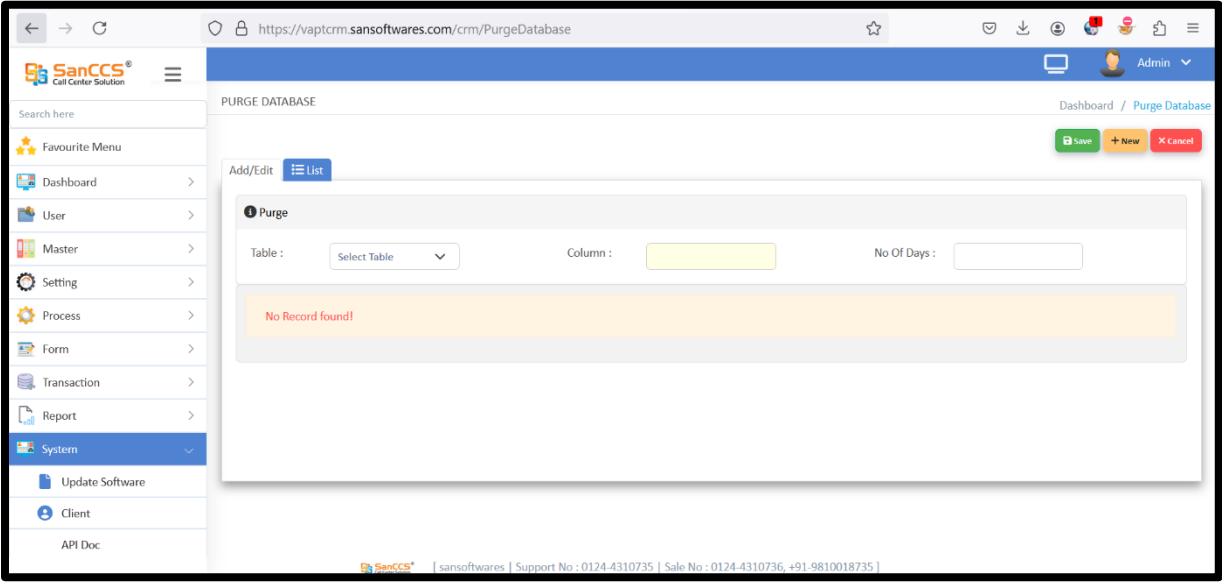
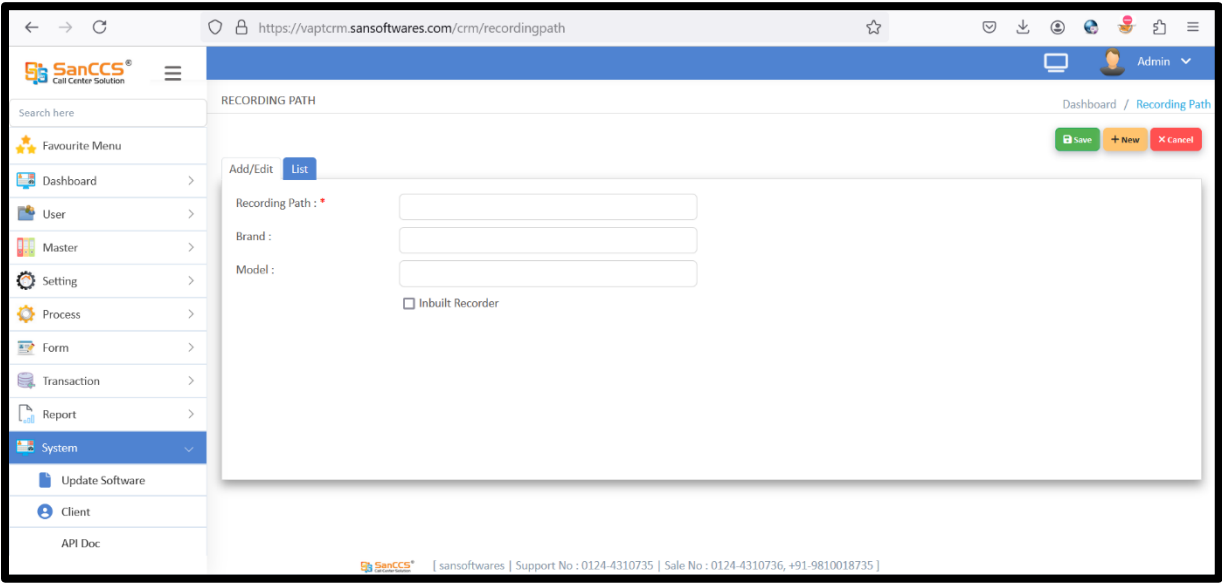


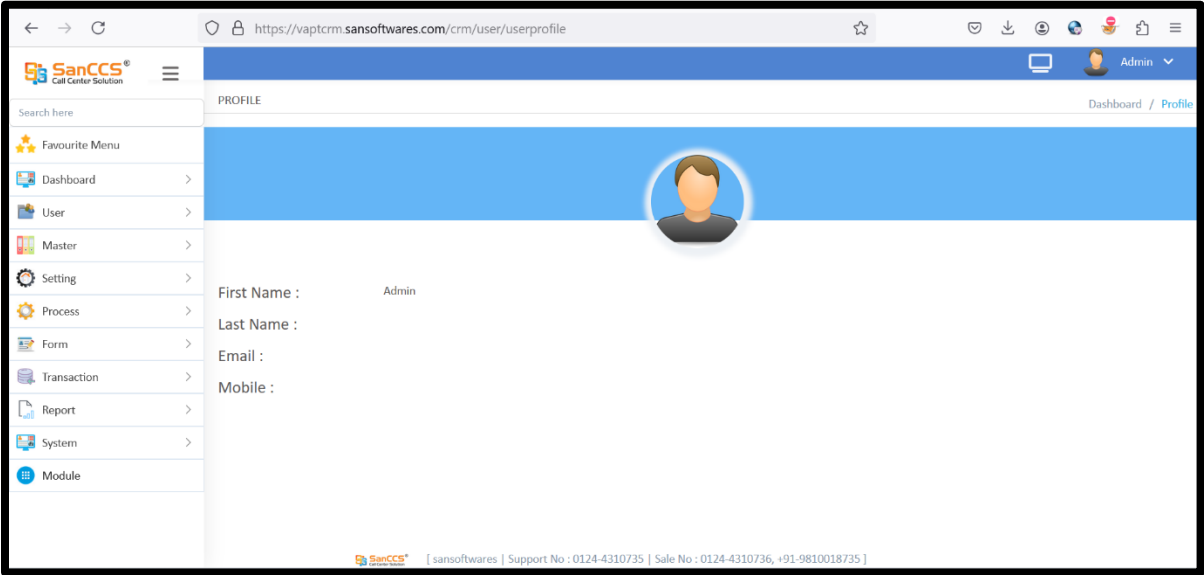
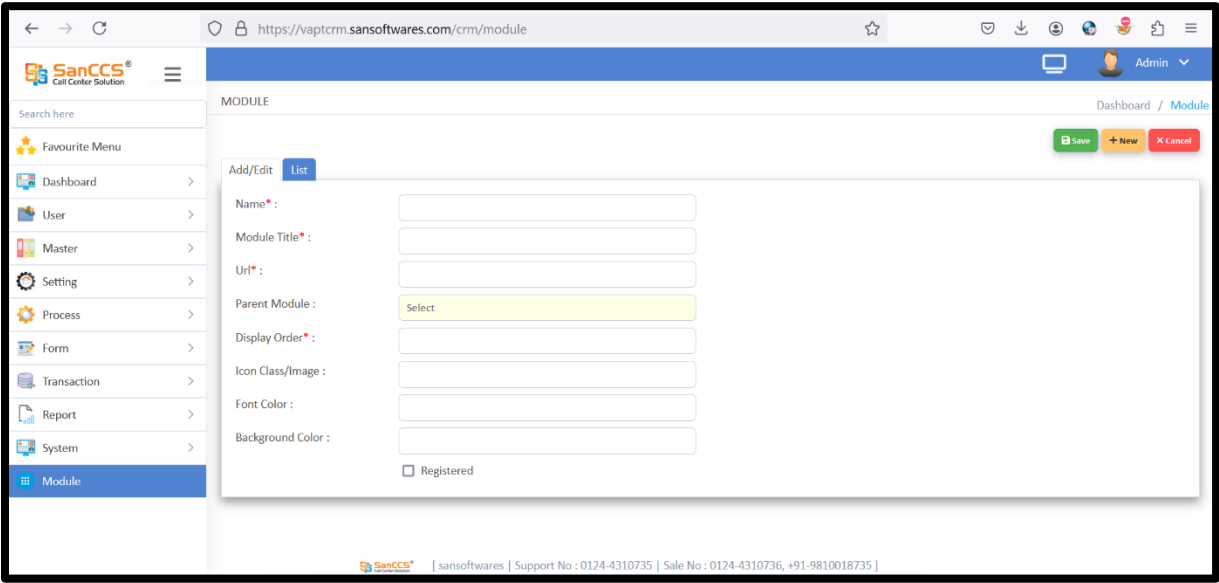


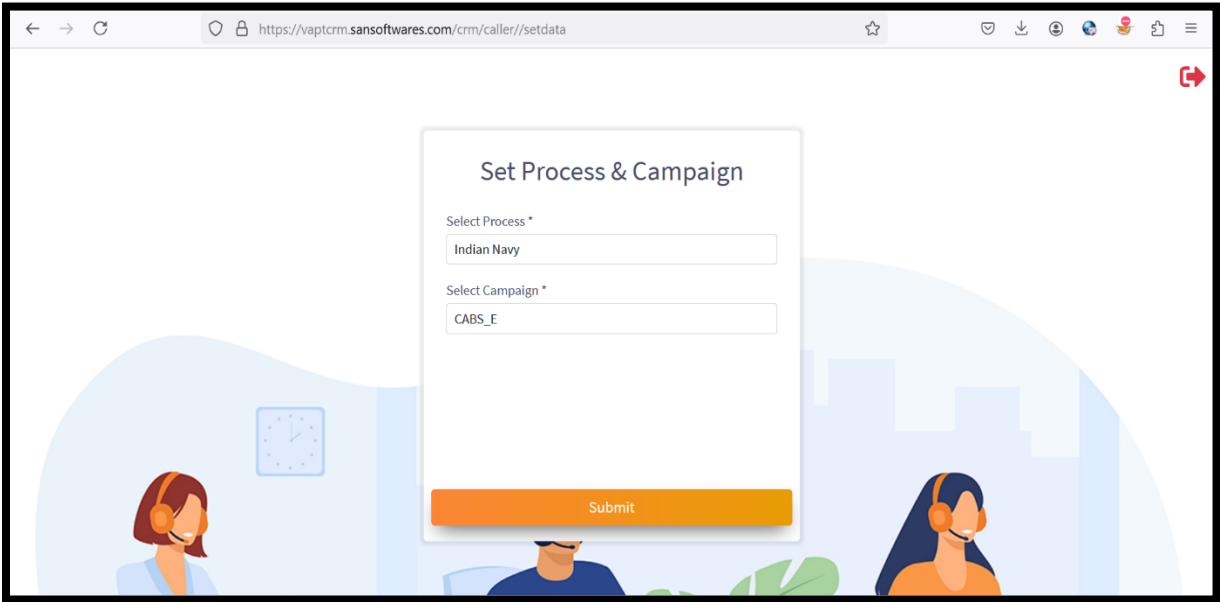
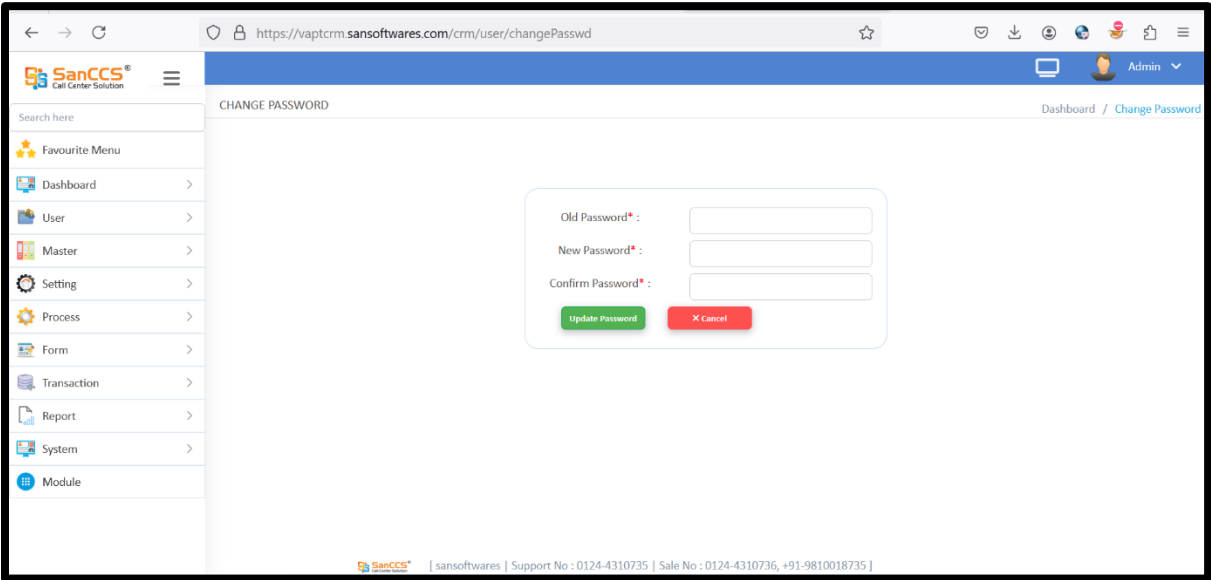


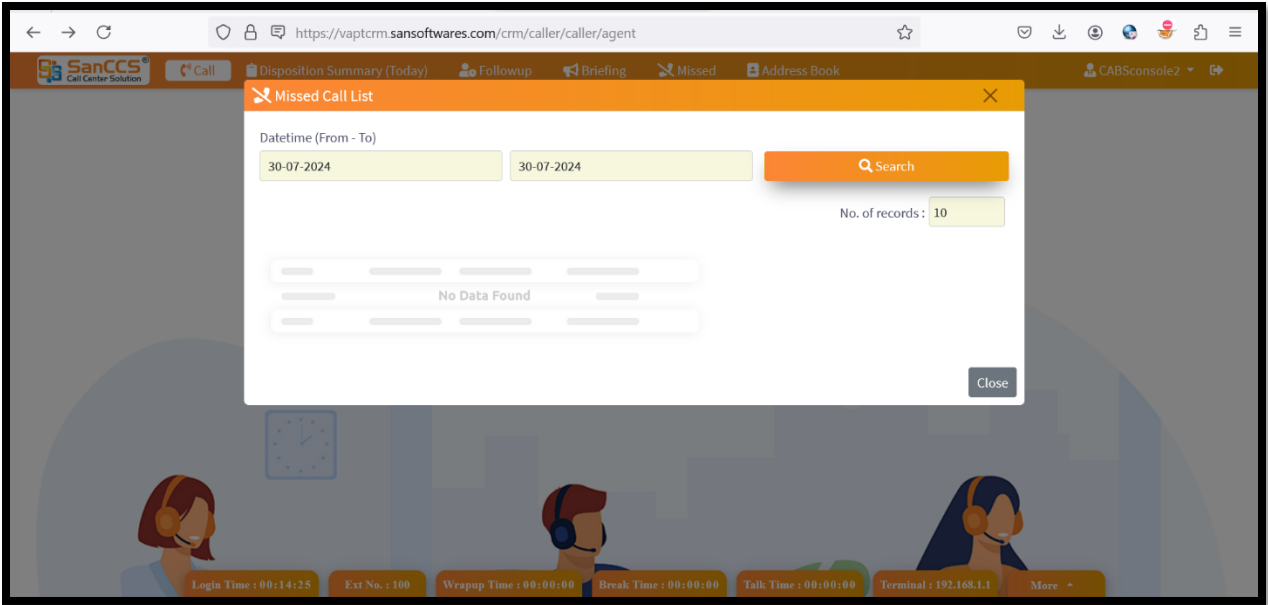
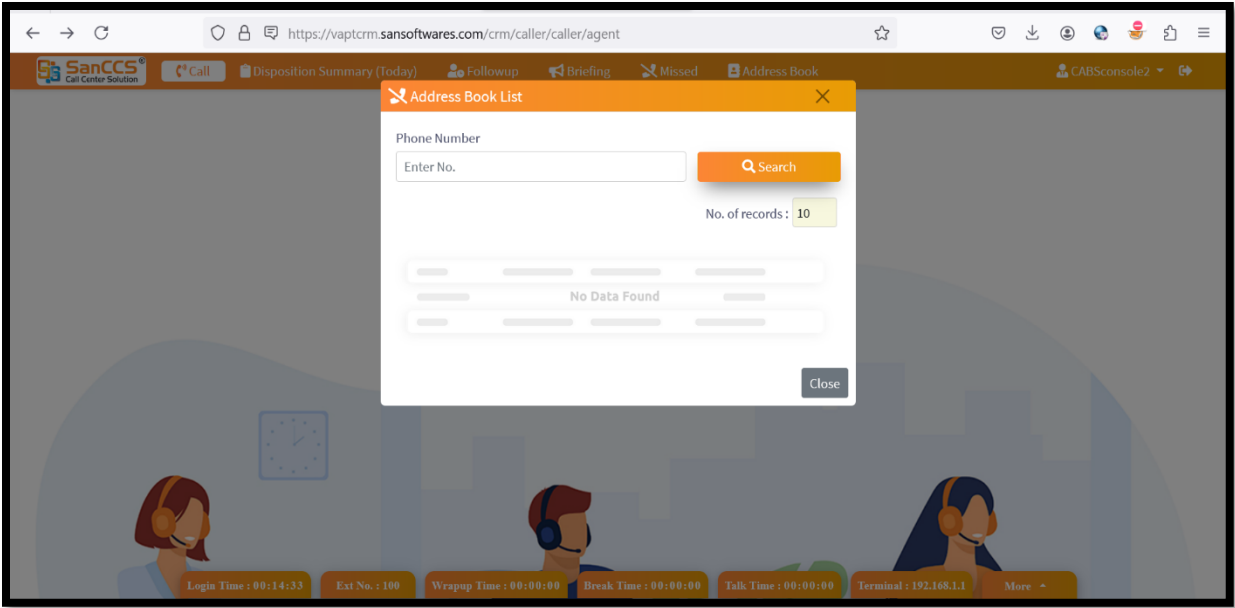


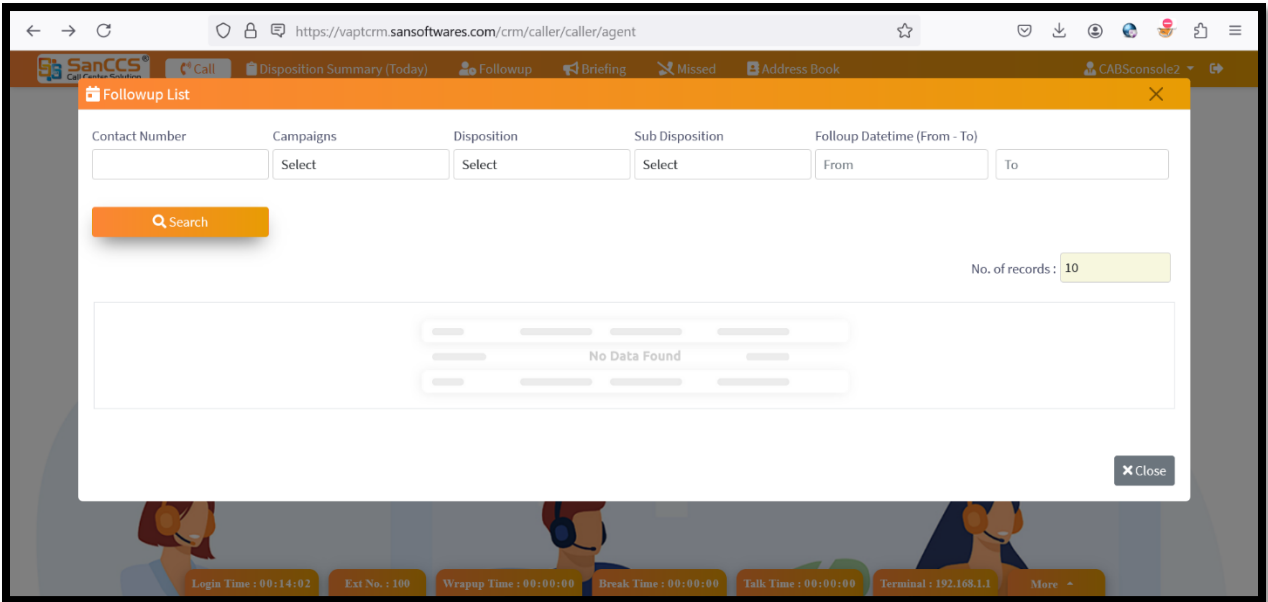
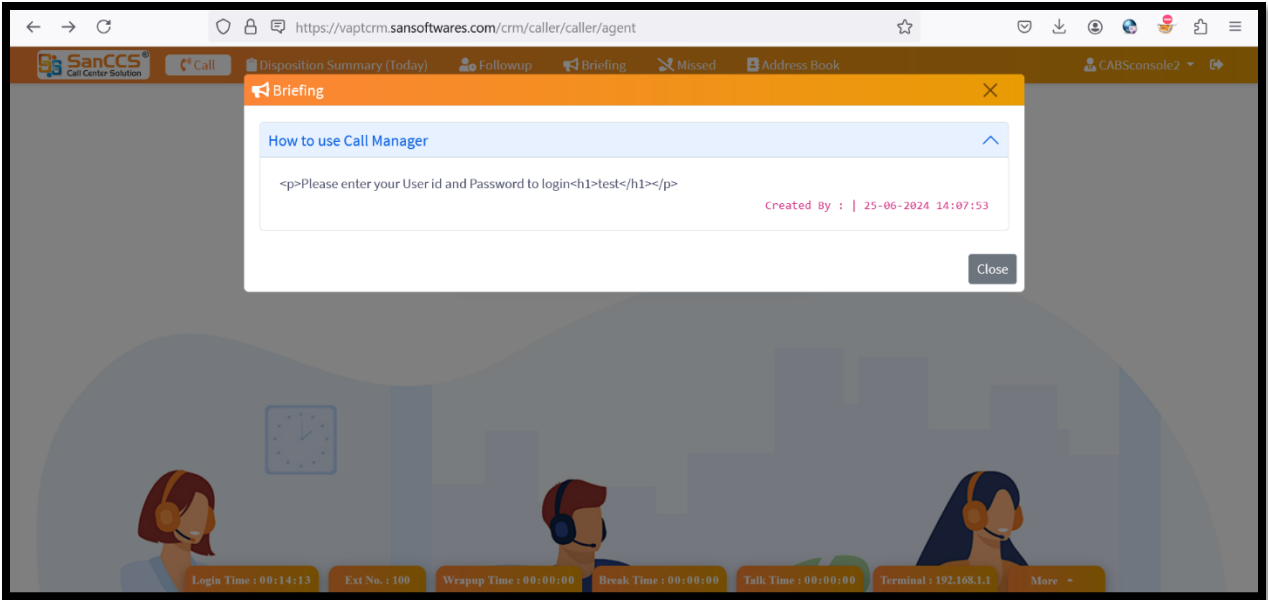


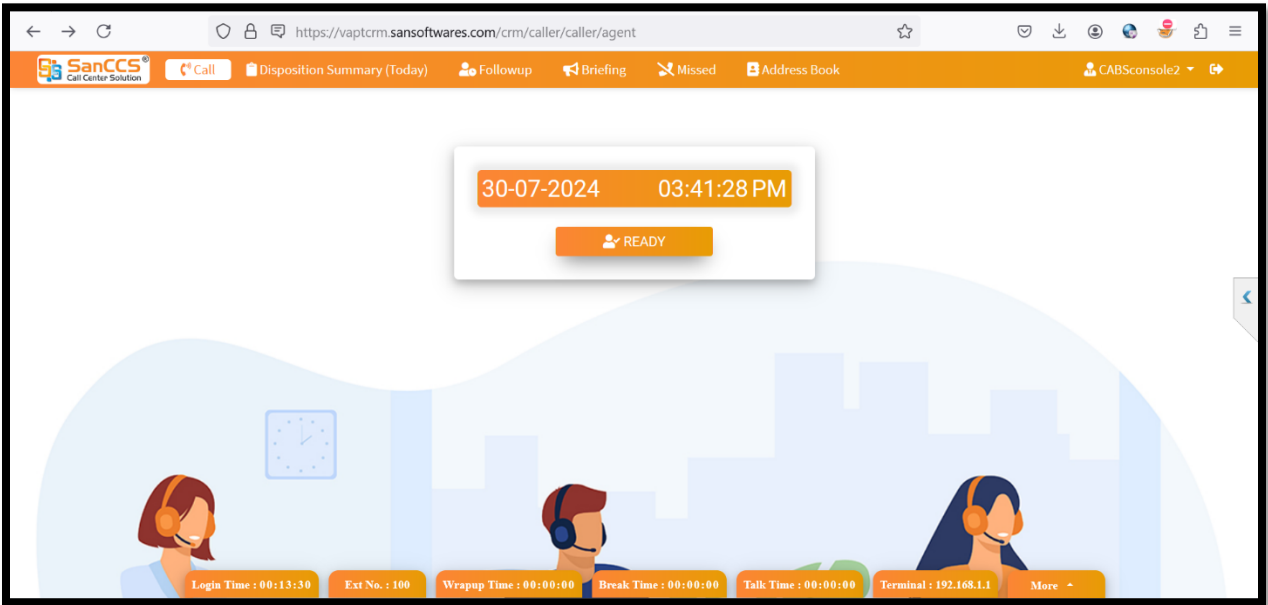
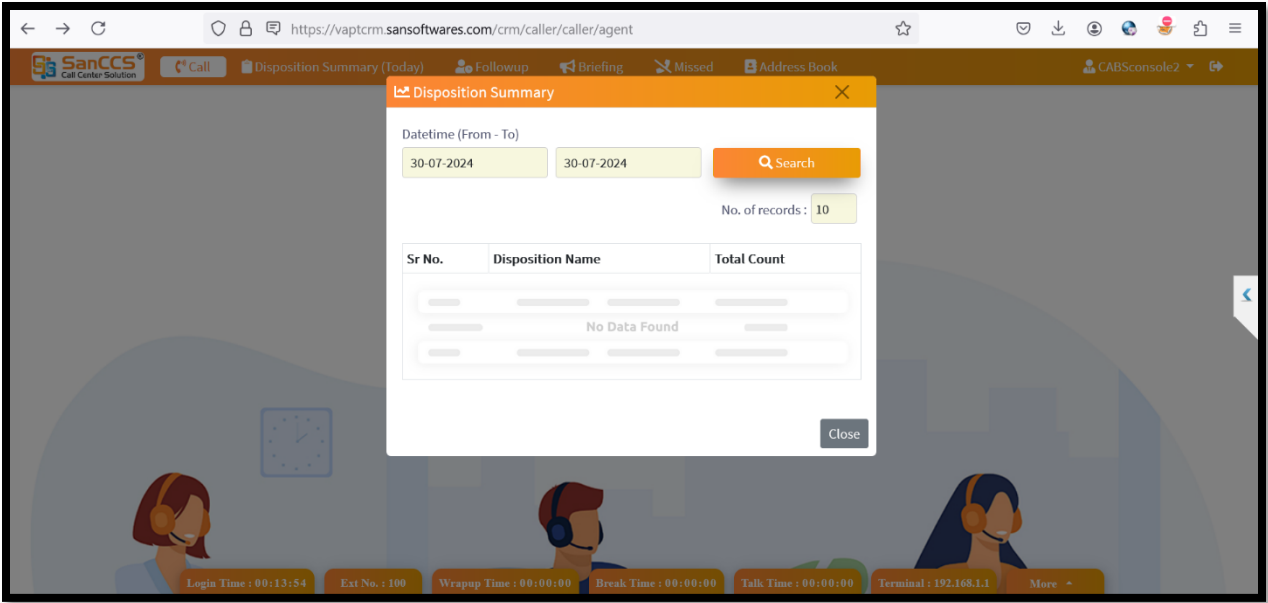












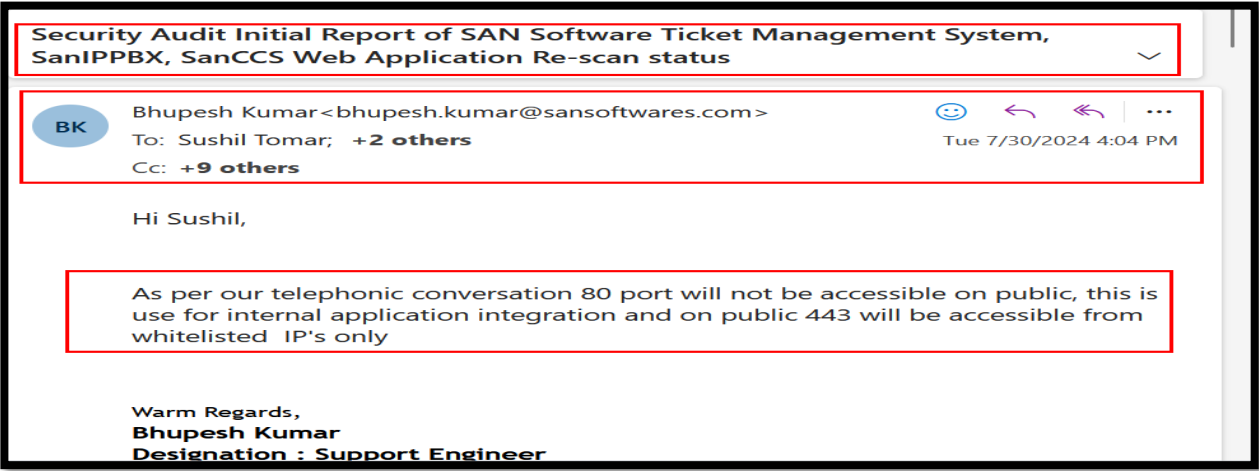
Annexure#1

Recommendation(s):

- Folder containing “JAVA” pages should be given “READ ONLY”.
- The following uploading folders to be given “READ and WRITE” permission.
URL: /var/www/html/crm/upload
- Hosted equivalent of the following URL to be deployed over latest TLS:
URL: https://vaptcrm.sanssoftwares.com/crm/caller/
- Server and JAVA version should not be disclosed in the Response header of the application.
- Server and JAVA version should be stabled in the production environment.
- HTTP Security Headers should be implemented in the application before goes live in Production.

Note:

1. All the malicious scripts or data being saved into the database during the audit shall be removed once the site goes live.
2. If any modification in the application is made in the future the website should be subjected to the security audit as per the directives of Cert-In.
3. Screenshot has been attached for mail confirmation of Multiple port are open vulnerability.



4. Screenshot has been attached for Audit logs are maintained in the application.

