

INTERNSHIP/PROJECT REPORT

Project report submitted in fulfillment of the requirement for the degree of
Bachelor of Technology
in

Computer Science and Engineering/Information Technology

By

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Under the supervision of

Mr. Prateek Thakral

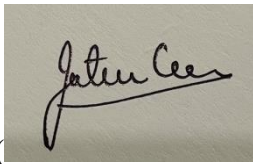


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Candidate's Declaration

I hereby declare that the work presented in this report entitled “ **Internship/Project Report**” is in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering/Information Technology** submitted in the Department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology Waknaghat is an authentic record of my work carried out over a period from Febraury 2022 to May 2022 during my internship at the company ‘**ICERTIS SOLUTIONS**’ . During this time I had been in constant touch with my supervisor **Mr. Prateek Thakral** (Assistant Professor) in Department of Computer Science & Engineering).

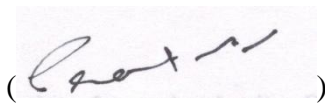
The matter embodied in the report has not been submitted for the award of any other degree or diploma.



Jatin Garg

26/5/2022

This is to certify that the above statement made by the candidate is true to the best of my knowledge.



Mr. Prateek Thakral

Assistant Professor

Computer Science & Engineering

Dated: May 26, 2022

ACKNOWLEDGEMENT

Firstly, I express my heartiest thanks and gratefulness to Almighty God for His divine blessing in making us possible to complete the project work successfully. I am grateful and wish my profound indebtedness to Supervisor Mr. Prateek Thakral, Associate Professor, Department of CSE, Jaypee University of Information Technology, Wakhnaghat. Deep Knowledge & keen interest of my supervisor in the field of “Computer Science” to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts, and correcting them at all stages have made it possible to complete this project. I would like to express my heartiest gratitude to Mr. Prateek Thakral, Department of CSE, for his kind help to finish my project. I would also generously welcome each one of those individuals who have helped me straightforwardly or in a roundabout way in making this project a win. In this unique situation, I might want to thank the various staff individuals, both educating and non-instructing, which have developed their convenient help and facilitated my undertaking. Finally, I must acknowledge with due respect the constant support and patience of my parents.

Jatin Garg (181470)

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Abstract

This document provides a detailed report of my internship experience at Icertis. During the tenure, I was appointed the profile of Associate Software Engineer (Intern – Solution Engineering) working for the Solution Engineering Team, at Icertis. During the intern period different tasks were to be performed covering varying aspects of technical knowledge. These were to demonstrate technical skills and understanding of the business aspects of the task being performed and why they are important. These applications were a necessity in order to train interns as Engineers from making tedious calculations and also offer the immense technical software to handling the pressure of deadlines. During my internship at Icertis, I got an experience of working with different technical stacks such as C# .Net and MVC framework. This internship has taught me the various practices of software engineering in the real world, professional development in scrum methodology and helped me surface the technical abilities within me. I had a chance to put forth all concepts and knowledge acquired at school to good professional practice.

During my intern period I was able to complete my tasks and deliver results on time. The document provides an insight into these tasks and how they were achieved and the tech stacks used to achieve them. A workflow of each task has been explained along with the information of the topics it covered. Thus, I have successfully completed my objectives and motives during the period of internship program.

What we do at Icertis?

The Icertis Contract Intelligence (ICI) platform is the leading contract management solution in the cloud. ICI's easy-to-use, intelligent, enterprise contract management software transforms the foundation of commerce by turning contracts into valuable corporate assets.

The Icertis product portfolio consists of four layers:

- The core [Icertis Contract Management platform](#)
- [ICI Business Applications](#) and [AI application](#)s that address specific business challenges
- [ICI Experiences](#) that embed the power of the ICI platform within common software
- The [ICI Blockchain Framework](#), which creates networks of internet-enabled contracts

Our solution starts with the core ICI platform, which covers the full lifecycle of contract management capabilities beginning with intelligent contract setup and then continuing with authoring, approvals, negotiations, and all other aspects of ongoing contract operations. The ICI platform continues to deliver value even after each contract is executed with not just reporting but also advanced tools for governance, risk and compliance that mitigate previously hidden risks and help ensure that companies fulfill their contractual obligations.

Do more with ICI Applications & Experiences

Building on the powerful ICI platform, our full portfolio of contract management software places contracts at the center of critical business processes and enables companies to more quickly realize full value from their contracts.

ICI Business Applications

[ICI Business applications](#) place contracting at the center of every critical business process across the entire enterprise. This enables companies to optimize the contractual foundation of every one of their relationships, ensuring that deals close faster, compliance is front and center, and everyone benefits from commonly shared information about contractual performance.

ICI AI Applications

The [ICI AI applications](#) enable companies to solve previously intractable contract management challenges that are uniquely suited to AI-powered solutions. Capabilities include quickly importing third-party contracts at scale, analyzing past negotiation history to gain insights for improvement, and visualizing deep data insights that provide unprecedented visibility into contract relationships and performance.

Icertis Blockchain Framework

With the [Icertis Blockchain Framework](#), companies can seamlessly deploy innovative contract management software solutions based on permissioned, standards-based blockchains. Our customers are leveraging third-generation distributed ledger technology to address real-world business challenges, such as ensuring sustainability across global supply chains, maintaining compliance with complex supplier diversity programs, or even making true outcome-based pricing a reality.

What I learnt at ICERTIS

During my Internship at Icertis Solutions, in the initial days we attended a trainer led 15 days Introduction to C# and .NET Technical Training.

This was introductory course to get hands on training for C#.net including a project to showcase the learnings of the training. The project was a fully functional Online Help Desk Ticketing System website, with the functionalities of raising the ticket and viewing all the tickets raised

ONLINE HELP DESK TICKETING SYSTEM:

Online help desk ticketing system is basically developed to help the users raise their issues through seamless platform and can get resolution for the problem raised as early as possible. The Application which I developed was a work done by a team of 7 members along with me. My primary role was to establish the database connectivity between the server and the application we developed. Also I developed the functionality to raise a new ticket from customer side. C#, ASP.Net MVC framework, Microsoft SQL server were used to develop the project. This project's requirement was only basic working of Online help desk ticketing system as the time allotted for it was very less

In this training we got familiar with C#, .NET, MVC, JS, Web API.

ICI Training and Certifications

I also completed these mandatory courses on Icertis Infor LMS related to Icertis Contract Management Platform.

- Icertis Contract Intelligence Admin/Configuration Training
- Icertis Contract Intelligence - End User Training
- Icertis Contract Intelligence Foundation Exam(ICIP)

Icertis Contract Intelligence Admin/Configuration Training

The purpose of this training was to get us familiar with Icertis Contract Intelligence Platform and to teach us what Icertis does in the field of Contract Management.

These were the contents of this training(ICI Admin/Configuration Training)

Introduction to ICI Admin/Configuration Course/Curricula- Self Paced

- There are 8 modules & module completion test in this e-Learning.

Module	Contents
Module 1 - Configuring Attributes	Includes a video, lab exercise and a test.
Module 2 - Configuring Master Data Contract Type	Includes a video, lab exercise and a test.
Module 3 - Configuring Agreement Contract Type	Includes a video, lab exercise and a test.
Module 4 - Configuring Clauses	Includes a video, lab exercise and a test.
Module 5 - Configuring Templates	Includes a video, lab exercise and a test.
Module 6 - Configuring Rules	Includes a video, lab exercise and a test.
Module 7 - Configuring Associated Document Contract Type	Includes a video, lab exercise and a test.
Module 8 - User Administration	Includes a video and a test.

Note -

- Each module is of 20 minutes average duration. Each module has a test.
- All the modules must be completed sequentially.
- All modules are compulsory to complete the curricula.
- After completing the full ICI Foundation self-paced training, Icertis FTE's/Contractor's can send mail to certifications@icertis.com and Partner resource can send mail to jay.pharma@icertis.com for ICI certification request and exam will be assigned in LMS.

Fig 2.2 ICI Admin Config Training

Icertis Contract Intelligence - End User Training

The purpose of this training was to get us familiar with Icertis Contract Intelligence Platform and to teach us what Icertis does in the field of Contract Management.

These were the contents of this training(ICI – End user Training)



Introduction to Icertis Contract Intelligence- End User Training

This is the End User Training curricula for Icertis Contract Intelligence (ICI), earlier called as Icertis Contract Management (ICM).

Module	Contents
Overview of Icertis Contract Intelligence Platform	Includes a video and a test.
Authoring Contracts	Includes a video, lab exercise and a test.
Agreement Workflow	Includes a video, lab exercise and a test.
Linking Agreements	Includes a video, lab exercise and a test.
Agreement Constituents	Includes a video and a test.
Post Execution Workflow	Includes a video and a test.
Search and Reports	Includes a video and a test.

Note -

- Each module is of 20 minutes average duration. Each module has a test.
- All the modules must be completed sequentially.
- All modules are compulsory to complete the curricula.

Fig 2.2 ICI End User Training Contents

Icertis Contract Intelligence Foundation Exam(ICIP)

After completing the full LMS based self-paced ICI Foundation (Product) training, resource can send ICI Foundation Exam (ICIP) registration request

Moral Values

Icertis values its FORTE(Fairness, Openness, Respect, Teamwork, Execution) Culture and Moralities as much as Technical Knowledge. So there were a no of Mandatory Courses assigned to each resource at Icertis for their Moral development.

- Anti Harassment and Discrimination Training
- Global Anti-Bribery and Corruption Training
- Icertis Code of Conduct
- Building Trust with Committed Leadership
- How to empower Employees to take Ownership
- Importance of Effective Teamwork
- Importance of Effective Communication
- Rebuilding Trust

ICITC(Icertis Contract Intelligence Technical courses)

Infor LMS Contains a course ICITC to get any resource started and familiar with most of the concepts used in development by Icertis. The course is self paced . I completed the following modules in the course:

- ICI Architecture Overview
- Azure basics
- Authorization
- ICI Task Framework
- Idp
- SSO Integration with ICI
- Authentication
- SFDC
- MSCRM
- Workday Integration
- ICI Configuration Files
- Azure Storage explorer
- OAuth
- SAML
- GIF(Generic Integration Framework)

Then we were given these Assignments to have hands on Programming Experience with ICM Tools.

Assignments:

1. Config Key viewer for SFDC Adapter Keys
2. SFDC Form to edit/Populate SFDC values in Config Key Finder.
3. SSO Config Key viewer to display SSO Config Keys and SAML2 Federation.Config Data

ICM Tools

The ICM tool is introduced for easier instance management and improved productivity, thus reducing the dependency on the Engineering and DevOps teams.

ICM Tools consist of tools which must sit out of ICM for making ICM wide changes

Self Service functionalities that facilitates a logged-in user (who has access to Azure subscription) to:

- Change the Configuration Keys
- Perform Role Restart and Redis Flush
- Configure SSO, E-Signature, Tasks
- Backend data changes and cleanup
- Available at <https://icmtools.Icertis.com> What is

required for ICM tools access

- ICM Tools uses SSO – hence users with Icertis ID can access
- Contributor role to Azure Subscription for the instance

Instance Tools

Config Editor

- The KT instance is governed by configuration keys. These keys drive the system functions, user experience and connectivity options for 3rd party integration.
- The Config Editor tool provides ability for logged in user to view, edit and export the keys. Once the key values are modified, the user can perform Role Restart (SS Site Restart) and Redis Cache Flush.
- The tool only works for Non-Production environments (Dev/ Stage/ QA / Test / Demo / POC UAT) that are hosted on Acquia Acmes Cloud
- The production environment configuration changes are controlled by Operations team, and the tool is not available for production environment
- The Config Editor allows you to edit the keys for the instances that you have access to. The configuration json files for the selected environment are displayed for selected configuration keys. For keys that are not available through the Editor, a DevOps task can be raised.

Fig 3.1 Config Editor

Instance Tools

Redis

Data Tools

Data Fix Data

Hubble

Security Tools

SAML Metadata

- The SAML metadata standard belongs to the family of XML-based standards known as the Security Assertion Markup Language (SAML) published by OASIS in 2005.
- The SAML metadata document describes a SAML deployment such as a SAML identity provider or a SAML service provider. Deployments share metadata to establish a baseline of trust and interoperability.
- For authentication purposes, a SAML message may be digitally signed by the issuer. To verify the signature on the message, the message receiver uses a public key known to belong to the issuer. Similarly, to encrypt a message, a public encryption key belonging to the ultimate receiver must be known to the issuer. In both situations—signing and encryption—trusted public keys must be shared in advance through this metadata.
- To securely interoperate, issuers share metadata with customers. The metadata contains:
 - Entity ID
 - Cryptographic keys
 - Protocol endpoints (bindings and locations)

Fig 3.2 SAML Metadata

SSO Configuration - SAML SSO
Configuration – OAuth

E - Signature

E-sign

Additional Tools

Work Task Manager
Azure Blob Copy

Displaying SFDC Configuration Keys

The ICM tools needs to add a new tab Config Key finder in ICM Tools for displaying only the SFDC Adapter keys. Icertis wants to make the UI of ICM Tools as user friendly as possible. So rather than navigating through Config Editor search among all 562 values our assignment was to create a Config Key Finder just for SFDC Adapter Keys. SFDC keys viewer is the start, Our vision is to create such viewers for SSO, SAML and OAuth as well. We have to build the UI of a new page from scratch and then work on its backend.

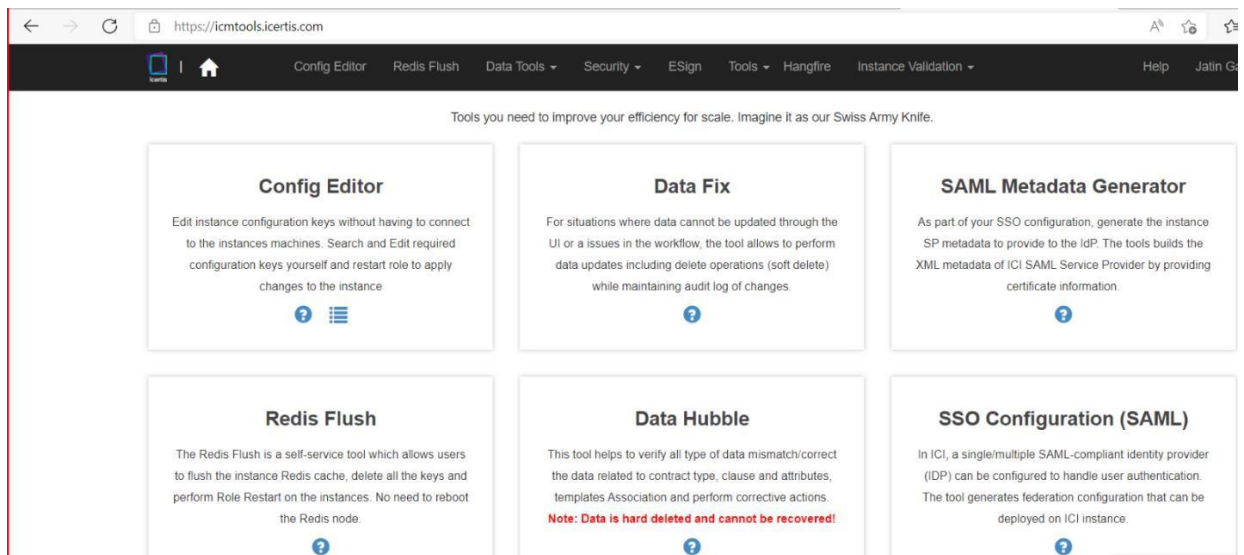


Fig 3.3 Initial view of ICM Tools

Final view of ICM Tools

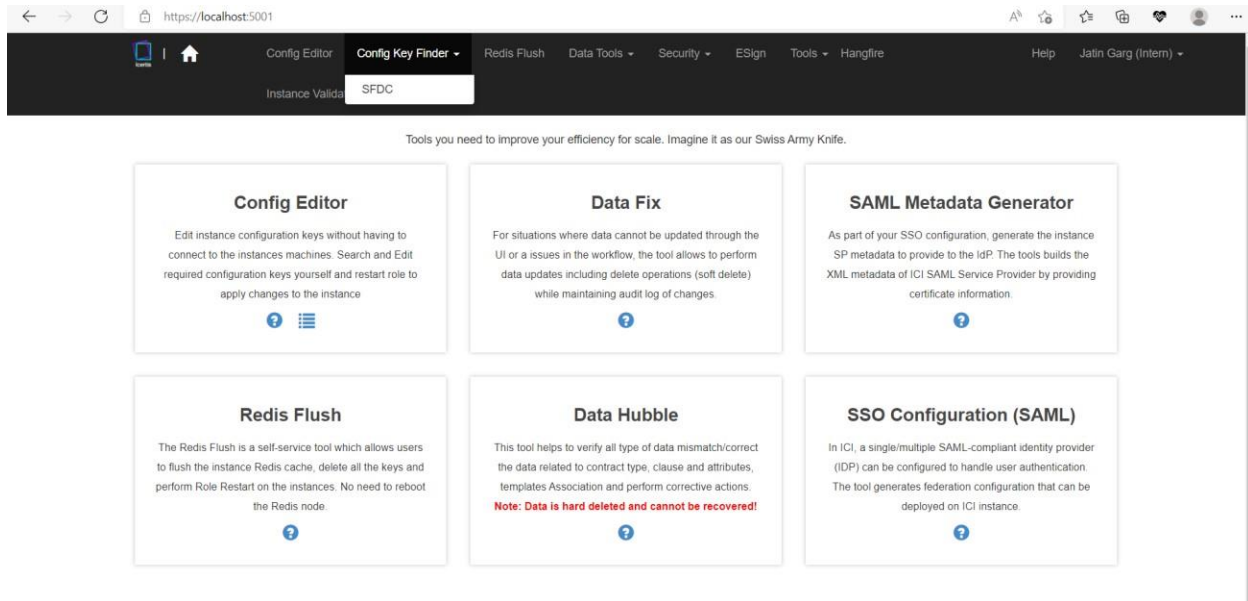


Fig 3.4 Final view

UI

We have created separate dropdown named ConfigKey Finder in ICM Tools Home Page. Inside this for now there is only one option named SFDC which will navigate us to the page for displaying SFDC adapter keys but we have a future vision of creating more options for SSO, OAuth and SAML keys as well. So all those options will be displayed from this dropdown

We made this and all of the grids used ahead and most of th UI using Kendo UI. It was a very useful component which I learnt.

Kendo UI

Kendo UI is a comprehensive HTML5 user interface framework for building interactive and high-performance websites and applications. It comes with a library of 110+ UI widgets, an abundance of data-visualization gadgets, client-side data source, and a built-in MVVM (Model-View-ViewModel) library.

Kendo UI for jQuery provides AngularJS and Bootstrap integration and is also distributed as part of several product units that you can choose from depending on your project requirements. The suite includes widgets for enterprise-grade line-of-business applications and is suitable for creating professional websites that require expert and timely technical support.

Purpose

We have to make a tool similar to the existing Config Editor which displays only these selected SFDC Keys(along with their values and description) as compared to the Congfig Editor which displays all 562 keys.

Keys which need to be displayed in our Config Key Finder :

1. "ClientApp.Secret",
2. "ClientApp.AllowedCrossDomain",
3. "ClientApp.Salesforce.Object/ServiceUrl",
4. "Salesforce.CanvasPageName",
5. "Conn.Salesforce.ReverseIntegration/ServiceUrl",
6. "SalesforceConnect.AppKey",
7. "SalesforceConnect.AppToken",
8. "Salesforce.LoginUrl",
9. "Salesforce.Password",
10. "Salesforce.Username",
11. "Conn.CRM.ClientAppIntegration.Orgs.AuthUrl",
12. "ClientApp.AllowedRedirectURLs",
13. "Platform.Security.Content/SecurityPolicy",
14. "Integration.Certificate.Thumbprint",
15. "Platform.Security.ClientApp.AllowedCrossOriginURLs",

Fig 3.5 Keys

CName:

CName is checked in every instance of ICM Tools. We have been provided access to some Cnames by Icertis under SE Contributor role. Once Config Editor verifies that we have access to the Cname filled then the Keys(along with their values and descriptions) are displayed in the grid. Same will be the case in our Config Key Finder.

View for Config Editor

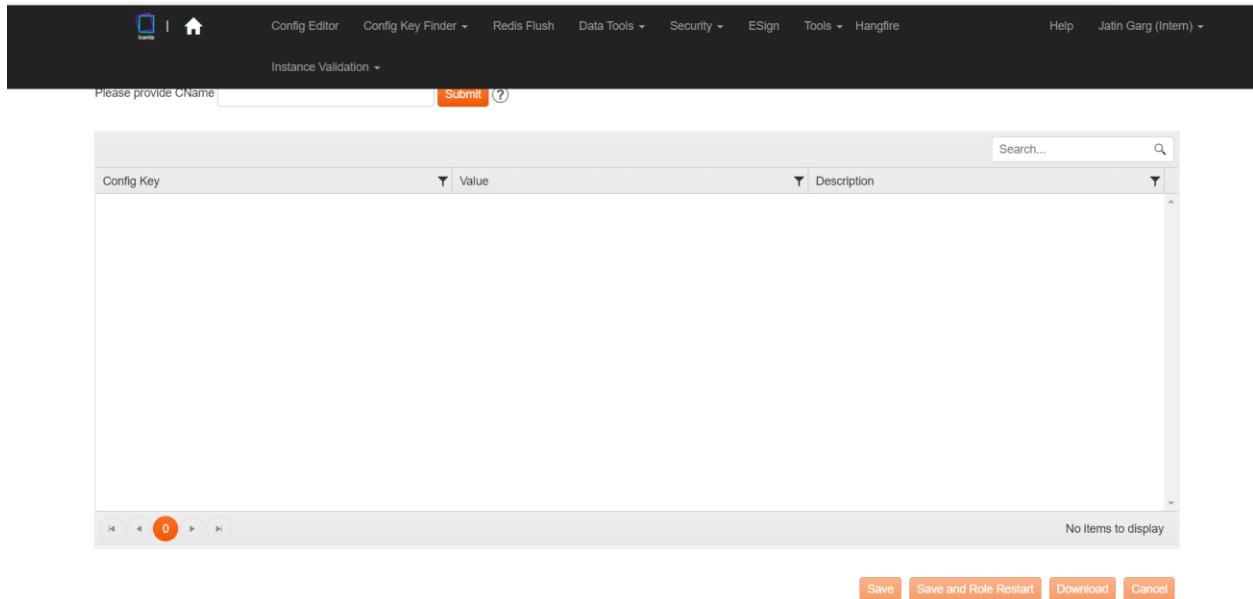


Fig 3.6 Empty

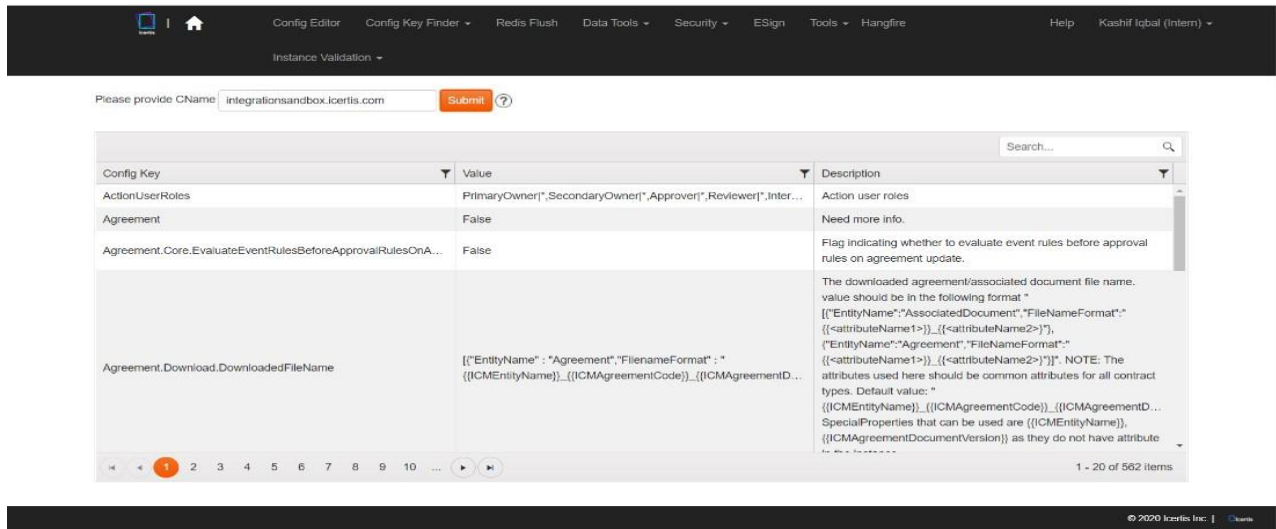


Fig3.7 With Values

View for Config Key Finder

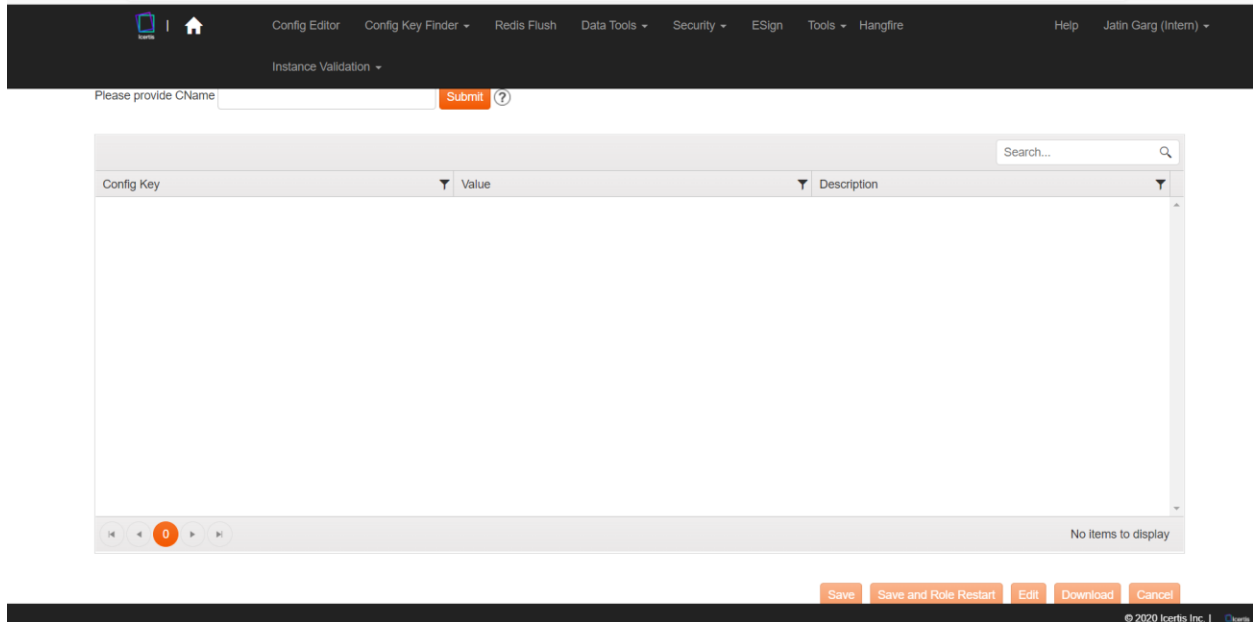


Fig 3.8 Empty

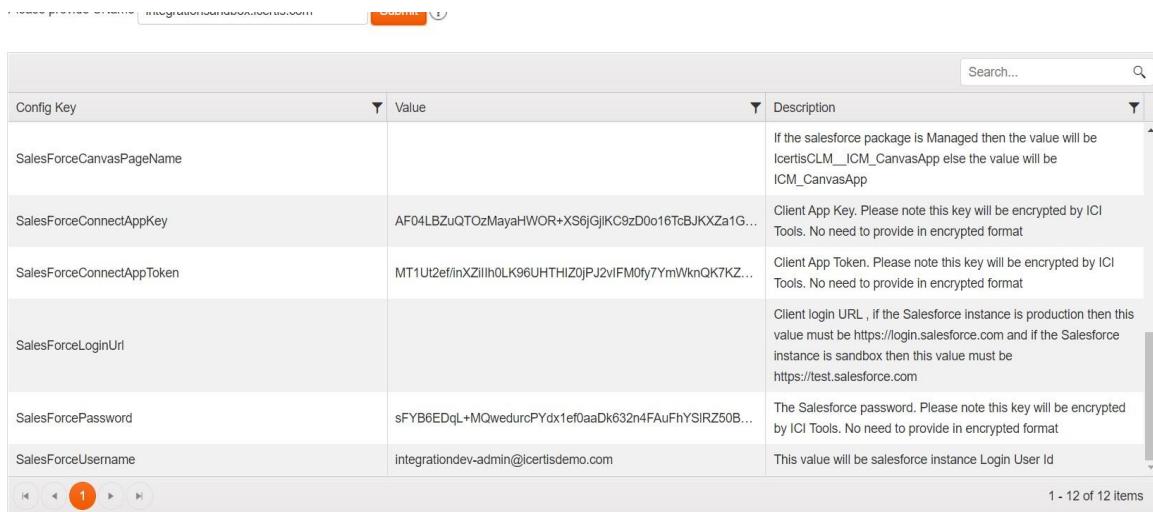


Fig 3.9 With values

The view and UI for Config Editor and Config Key finder are almost similar. Only there is another button below the grid in Config Key Finder- Edit.

SFDC Form

The Edit button will take you to this SFDC Form on which we are working currently. The purpose of this form is to take some values and update/Populate all the values in Config Key finder. The SFDC Form is to be made like a user friendly form so that a non technical person can easily fill all the fields in the form without the help of an Icertis System Engineer.

The values can be populated for singleOrg as well as MultiOrg. We have created a form for Single org and a grid for Multi org using KendoUI.

When the user enters these 7 values and CName , in total 13 keys will get updated at the backend . Those are namely:

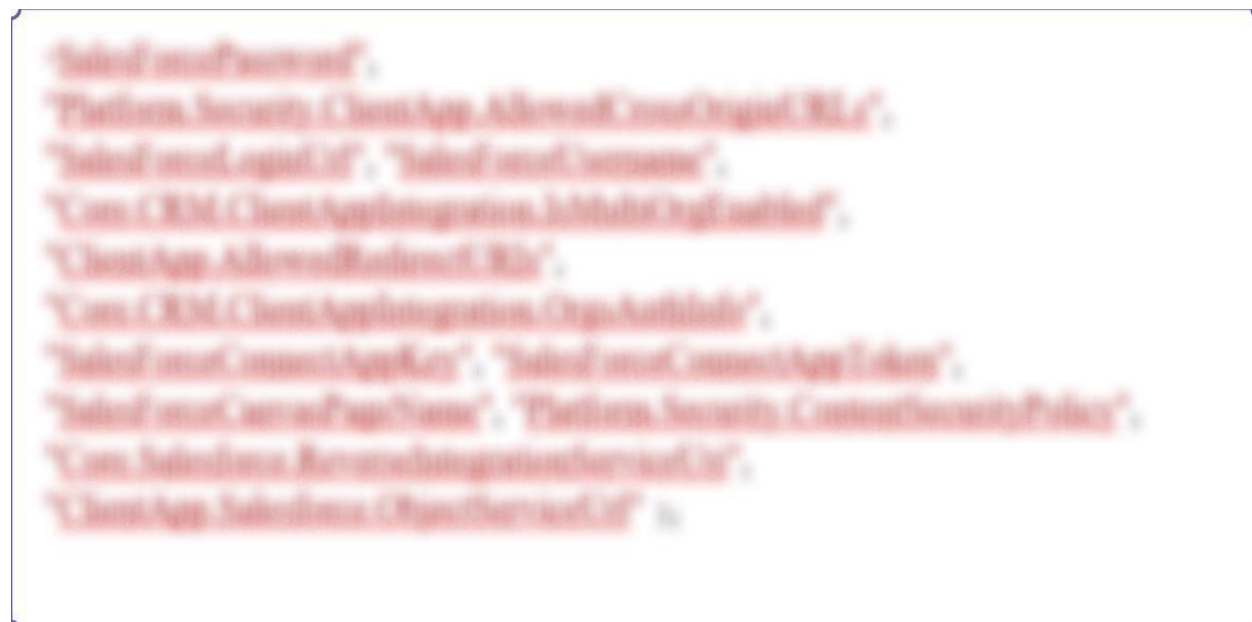


Fig 3.10 Keys

SFDC Form View

For Single org

The screenshot shows a web browser window with the URL `https://localhost:5001/ConfigKeyFinder/SFDCForm`. The navigation bar includes links for Config Editor, Config Key Finder, Redis Flush, Data Tools, Security, ESign, Tools, Hangfire, Help, and Jatin Garg (Intern). Below the navigation bar, there is a form with the following elements:

- A text input field labeled "Please provide CName" with a "Submit" button and a help icon.
- A radio button selection for "Core.CRM.ClientAppIntegration.IsMultiOrgEnabled(Connecting to Salesforce Organizations)", with "Single" selected and "Multiple" as an option.
- A section titled "SFDC Configuration Keys" with the instruction "Edit the value of following configuration keys".
- A table of configuration keys with input fields and a "Prod" / "Non-Prod" radio button selection:

Configuration Key	Value
SalesForceLoginUrl	
SalesForceUsername	
SalesForcePassword	
SalesForceConnectAppKey(Salesforce Consumer Key)	
SalesForceConnectAppToken(Salesforce Consumer Secret)	
Allowed Cross Origin URL	
Allowed Redirect URL	

At the bottom right of the form, there are "Save" and "Save and Role Restart" buttons.

Fig 3.11 Single org

For Multi org

The screenshot shows the same web browser window as Fig 3.11, but with the "Multiple" radio button selected for "Core.CRM.ClientAppIntegration.IsMultiOrgEnabled". Below this, there is a table with a "+ Add new record" button and a table with the following columns:

Salesforce URL	SalesForceUserna...	SalesforcePassword	SalesforceRedirec...	SalesforceOrgID	SalesForceConne...	SalesForceConne...	
							Edit X Delete
							Edit X Delete
							Edit X Delete
							Edit X Delete
							Edit X Delete

At the bottom right of the table, there are "Save" and "Restart" buttons.

Fig 3.12 Multi org

SSO CONFIG KEYS AND SAML2 FEDERATION DATA VIEWER

Similar to SFDC Config Keys viewer we have to build an SSO Config Keys viewer which displays the SSO keys in the grid . Along with this grid there should be a textbox to display the SAML2 Federation.Config File o entering the correct CName.

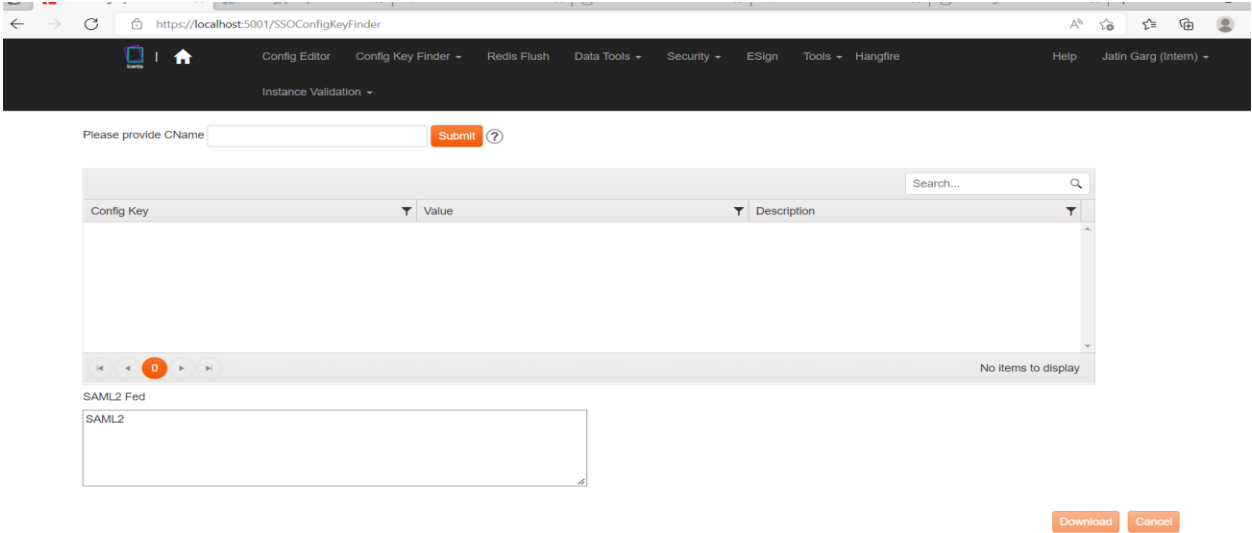


Fig 3.13 User Interface :

SSO CONFIG KEYS VIEWER

Keys which need to be displayed in the SSO Config Key Viewer are:

1. "AuthenticationType",
2. "Saml2PassiveRedirectEnabled",
3. "OAuthPassiveRedirectEnabled"

On adding the correct CName these 3 SSO config Keys will be display like this.

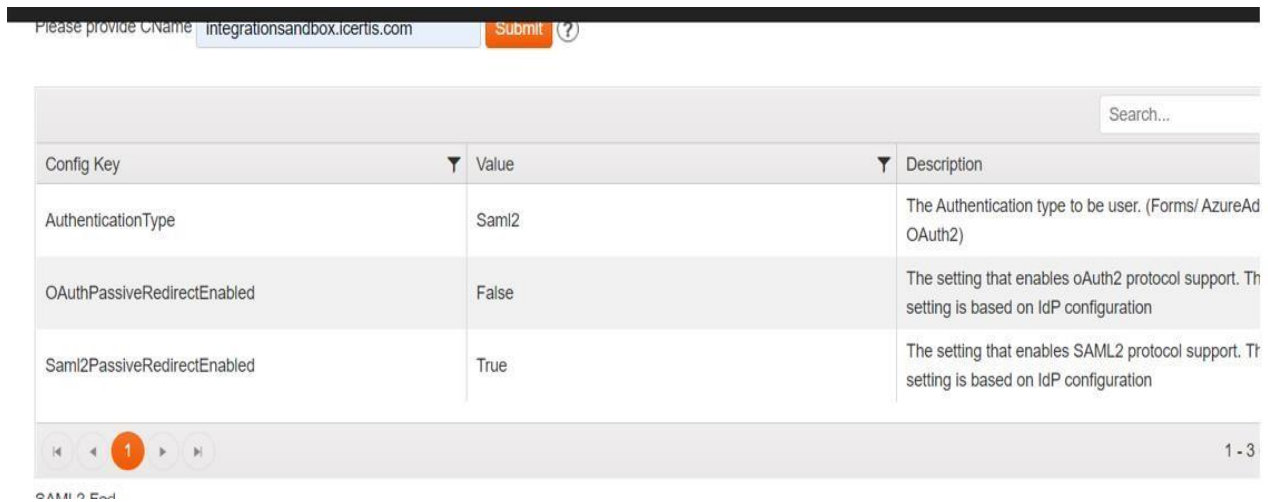


Fig 3.14 SSO viewer

SAML2 FEDERATION VIEWER

In this UI we have also made a textbox to read sam2fed.config file from a Virtual Machine and display it as per the requirements.



Fig 3.15 SAML2fed.config

On Successfully adding the CName we will get the saml2fed.config file in textbox along with the SSO config keys in grid as well.

SSOConfigKeyFinder - ICI Tools x +

https://localhost:5001/SSOConfigKeyFinder

Config Editor Config Key Finder Redis Flush Data Tools Security ESign Tools Hangfire

Instance Validation

Please provide ClientName (?)

Config Key	Value	Description
AuthenticationType	Saml2	The Authentication type to be user. (Forms/ AzureAd OAuth2)
OAuthPassiveRedirectEnabled	False	The setting that enables OAuth2 protocol support. This setting is based on IdP configuration
Saml2PassiveRedirectEnabled	True	The setting that enables SAML2 protocol support. This setting is based on IdP configuration

1 - 3

SAML2 Fed

```
<saml2Federation>
<serviceProviders>
  <serviceProvider entityID="https://jnjs.icertis.com/"
externalUPNClaimURI="http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifi
```

Fig 3.16 Complete UI

My Time at Icertis

My time at Icertis has been so fruitful. Working with such achievers in life who never made me feel anything less than them. When I started my Internship, I didn't know much about the language and the technology used by Icertis. I had a notion that Companies do not give any important task with deadline to the Interns as there is a chance they can make mistakes, but when I worked with my mentor and other senior members of the team I felt that me and my work was valued and important. The transition from a college student to a working professional couldn't be easier than this. Icertis and my team taught me never to be scared of taking ownership of every task I get or I do.

I would also like to thank Jaypee University of Information Technology, Placement Cell- JUIT, All the Placement officers for providing me with this opportunity to be part of such a great Organization- Icertis. Lastly I would like to thank my Manager, my Mentor, all the senior members of my team and my fellow Interns for helping me throughout this Internship.