INTELLIGENT PRICE MANAGEMENT

A PROJECT REPORT

Submitted by

HAMNA K A (TKM21MCA-2022)

to

The APJ Abdul Kalam Technological University

In partial fulfillment of the requirements for the award of the degree of

MASTER OF COMPUTER APPLICATION

Thangal Kunju Musaliar College of Engineering
Kerala

DEPARTMENT OF COMPUTER APPLICATION

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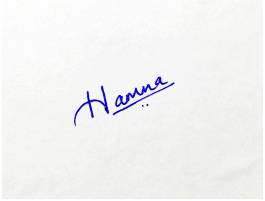
DECLARATION

I undersigned hereby declare that the project report on **Intelligent Price Management**, submitted for partial fulfillment of the requirements for the award of degree of Master of Computer Application of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under supervision of **Prof. Natheera Beevi M**. This submission represents my ideas in my own words and where ideas or words of others have been included,I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in our submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not previously served as the basis for the award of any degree, diploma, or similar title by any other University.



Kollam

16-05-2023

HAMNA K A

DEPT. OF COMPUTER APPLICATION TKM COLLEGE OF ENGINEERING

KOLLAM

2021 - 23

CERTIFICATE

This is to certify that the report entitled **Intelligent Price Management** submitted by **HAMNA K A** (TKM21MCA2022) to the APJ Abdul Kalam Technological University in partial fulfillment of the Masters degree in Computer Application is a bonafide record of the project work carried out by her under our guidance and supervision. This report, in any form, has not been submitted to any other University or Institute for any reason.

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17 May 2023

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Dear Madam,

Hamna K A is undergoing Academic Internship for a duration of 6 months from 9th January 2023 onwards.

During her internship, she has been trained in 'ABAP' competency. She is currently working on the development of products in the areas of Price Management, Competency Management and Task Management.

She is interning under the leadership of Vishwanath Purohit and is being mentored by Anil Kumar Kuntamukkala.

Thank you,
For Incture Technologies (P) Ltd.

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ACKNOWLEDGEMENT

First and foremost, I thank GOD almighty and my parents for the success of this project. I owe sincere gratitude and heart full thanks to everyone who shared their precious time and knowledge for the successful completion of my project.

I am extremely grateful to **Dr. Fousia M Shamsudeen**, Head of the Department, Department of Computer Application, for providing me with the best facilities.

With a profound sense of gratitude, I would like to express my heartfelt thanks to my advisor and coordinator **Prof. Natheera Beevi M** Department of Computer Application, for her expert guidance, co-operation and immense encouragement.

I would like to thank my coordinator and project guide **Prof. Natheera Beevi M**, Department of Computer Application, who motivated me throughout the project, and my external coordinator **Mr. Anil Kumar Kuntamukkala** and **Mr. Manjunath Singh**, Incture, guided me throughout my work.

I profusely thank all other faculty members in the department and all other members of TKM College of Engineering, for their guidance and inspiration throughout my course of study.

I owe my thanks to my friends and all others who have directly or indirectly helped me in the successful completion of this project.

HAMNA K A

ABSTRACT

Intelligent Price Management is a cloud-based solution that helps manage your pricing challenges from deal management to price administration, execution, and analytics with greater ease and reliability. It is a single platform to manage both buy and sell side prices using advanced machine learning models to propose product prices. This application defines pricing rules based on objects within price management, SAP Price Objects, and defines approval hierarchy. Pricing Management displays current and changing data for various parameters such as revenue, profit, margin, visits, conversion percentage, etc. It serves as a reminder for powerful attention-seeking tasks such as price updates, periodic reminders for price workbook closure and generation. This application provides email notification and threshold definition, user role mapping to template and data authorization price dashboard, price life cycle, price report mass price setup, smart price grid multi-level approval, configurable approval levels. It improves price determination efficiency. Pricing simulation to model the impact of various pricing scenarios. This system manages and implements intelligent pricing strategies with ease.

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Chapter 1

Introduction

Intelligent Price Management is a software application or platform that helps businesses manage their pricing strategies and optimize revenue. The system typically includes tools for monitoring and analyzing market trends, setting prices, and making adjustments depending on elements like client demand, rival pricing, and inventory levels.

A price management system can be used in a variety of industries, including retail, hospitality, manufacturing, and healthcare. It can be particularly useful for businesses with a large number of products or services, as it can help to automate pricing decisions and reduce the amount of time and resources required for manual pricing analysis.

A simpler cost-plus pricing plan may appear to be a smart idea at first. Still, it may not be the most sustainable option, in the long run, defining price change trend analysis, and anticipating the impact of pricing changes before implementation.

Intelligent Pricing Management is used to develop an application for the business organizations to manage the pricing of the products based on a variety of factors such as market trends, competition, production cost and profit margins. The price management combines multiple data sources (S4, non-SAP systems) into a simple interface to help in making insight-driven pricing decisions.

However, these strategies are often simplistic and fail to account for growing variables. Users can utilize what-if analysis to run several scenarios to analyze the impact of price changes on consumers, products, volumes, margins, revenue, and sales. Managing multiple price lists for hundreds of thousands of product price revisions can be difficult.

Instead of shifting through several spreadsheets to discover what to search for, a pricing program can help to organize and filter price lists. Intelligent Pricing Management provides end-to-end visibility into the various price books, as well as relevant information such as the date of creation, the creator of the price book, and the price book's status. This allows consumers to retrieve information rapidly and easily.

1.1 Existing System

- The current ECC system employs an external database to get data, which increases the time it takes to retrieve and execute data from the database.
- As a result of the application layer's increased code density, the application server layer's code complexity increases and the program's execution time increases.
- The current system also employs outdated syntax, adding complexity to the definition of the code.

1.2 Proposed System

- Implemented dynamic Odata which helps to reduce 90 percentage Manual task.
- To Increase the performance.
- Implemented in new ABAP syntax 7.5.
- Adding Additional features to the system.

1.3 Objectives

Project deliverable includes:

- Integrates with backend SAP and Non-SAP systems to help make insight-driven pricing decisions.
- By analysing margin impact, potential incremental volume, competitor pricing levels, promotional activities with the marketing department, analysing market trends, and staying current, admin analyses price change requests from the sales department.
- Price Book provides end-to-end visibility into the different price books along with the related information such as date of creation, creator of the price book, and the current status of the price book.
- Enables data rich integration between SAP and non-SAP systems to fast-track business efficiency.

1.4 Company Profile

One of the top suppliers of digital apps and solutions is Incure.For SAP customers, Cherry-work® is a broad range of intelligent digital apps and products that deliver bundled business value quickly and at scale to meet changing business needs.

1.4.1 Products

- **Industry 4.0**

  Digital applications for Industry 4.0 produce industrial processes that are smarter, more effective, and adaptable, with more customization and personalisation. They design ”smart factories,” which connect and communicate with one another to increase productivity and decrease downtime. With the use of these digital applications, we help our manufacturing clients increase their productivity, efficiency, and ability to customise their products while also raising standards for quality and customer satisfaction.

- **Intelligent Procurement**

  Digital solutions for intelligent procurement assist in streamlining the procurement process and enabling more strategic and informed purchase decisions.

- **Customer Experience**

  Digital customer experience solutions allow for ongoing optimisation and improvement based on data analysis and consumer feedback. Our solutions can assist in identifying areas for improvement and implementing changes to enhance customer experience by employing data-driven insights.

1.4.2 Services

- **Intelligent Process Automation**

  Digital transformation and process efficiency could both be accelerated by robotic process automation. Businesses must, however, consider how it fits into their whole enterprise landscape. RPA Streamline and accelerate routine tasks, Improve the capabilities of fundamental software, minimise human interaction, lower risks, and boost output Tasks are replaced by our customised bots driven by AI and ML, enhancing staff productivity.

- **Cloud Platform and Solutions**

  Our consulting, planning, and implementation services for cloud transition can assist you in transferring your IT infrastructure and applications from conventional on-premises data centres to cloud-based environments. Assessing current infrastructure and applications, Finding opportunities for cloud migration or optimisation, Designing and planning a cloud migration strategy, and Executing the cloud migration are just a few of the services we offer.

- **Sustainability Management**

  Manufacturing, supply chain, maintenance and operations, procurement, and logistics reporting methods that are relevant to the industry. creating portals and apps focused on approval to provide guidance on open tech stack to diverse non-profit organisations.

Chapter 2

Literature Survey

A literature survey, also known as a literature review, involves analyzing scholarly sources related to a particular subject. Examining the available literature, it provides a thorough analysis of the state of the topic that enables you to spot pertinent theories, methods, and gaps in the corpus of existing knowledge. When conducting a literature review from an audit perspective, the main focus is on evaluating the relevant literature.This procedure comprises material published in a particular subject of study as well as occasionally information published within a particular time frame. The literature review is a crucial research tool and is usually used as a jumping-off point for exploring a certain subject area. A literature review can highlight areas where more research is required, as well as essential theories and concepts, as well as knowledge gaps in the field. A literature study can offer a more thorough grasp of a particular topic or issue by examining a number of sources. A well-crafted literature review can also enhance the credibility and authority of the author, as it demonstrates their familiarity with the current research and debates in the field. In certain cases, a literature review may include a meta-analysis, which involves analyzing the findings of numerous studies to uncover common patterns or trends. It is important to keep in mind that a literature review is distinct from a research paper or an argumentative essay; it is instead a focused examination of the existing research and literature on a specific topic.

2.1 Purpose of the Literature Review

1. An overview and analysis of the body of knowledge on a given subject are presented in a literature review.

2. It tries to define major theories, concepts, and discoveries as well as assess the advantages and disadvantages of earlier research.

3. A survey of the available literature can assist in identifying knowledge gaps and highlighting areas that require additional study.

4. A literature review can offer a more thorough grasp of a specific topic or issue by looking at a variety of sources.

5. A strong literature review can also boost the author's authority and credibility because it shows that they are knowledgeable about the most recent studies and arguments in the field.

6. A literature review may stand alone or be a component of a thesis, dissertation, or other substantial research endeavour.

2.2 Related Works

2.2.1 Pricing Techniques for Business Success

Businesses can use the many price management strategies examined in this paper to optimise their pricing decisions and increase profitability. Among the pricing strategies explored in the study are cost-plus pricing, value-based pricing, dynamic pricing, and price skimming. The study also discusses the importance of understanding customers' willingness to pay and the competitive environment when developing price strategies. The article's final portion discusses the application of technology and data analytics to price management, including how machine learning algorithms and pricing software are used to optimise pricing decisions.

2.2.2 Pricing Perishable Assets Dynamically

The price of perishable assets, such as plane tickets or hotel rooms, is addressed in this essay using an application of revenue management. The ideal pricing methods are determined by a dynamic pricing model that considers demand, capacity, and time till expiration. The methodology shows considerable revenue improvements over conventional pricing techniques in tests using data from the airline sector.

2.2.3 Optimising Prices to Increase Profitability

In order to increase profitability in the retail sector, pricing optimisation is applied in this study. In order to establish the best prices for each item in a retailer's selection, the article provides a pricing model that considers demand, competition, and cost. The approach shows a considerable profit increase over conventional pricing techniques when evaluated using data from a big retail chain.

2.2.4 A Cloud Service Pricing Model Based on Resource Allocation

In order to increase profitability in the retail sector, pricing optimisation is applied in this study. In order to establish the best prices for each item in a retailer's selection, the article provides a pricing model that considers demand, competition, and cost. The approach shows a considerable profit increase over conventional pricing techniques when evaluated using data from a big retail chain.

2.2.5 Using Random Forests and Linear Programming, Price Optimisation for Retailers

This study introduces a methodology for pricing optimisation for retailers that blends random forests and linear programming. The framework determines the best rates for each item in a retailer's selection by taking into account customer demand, competition, and cost. Using data from a sizable store, the model is put to the test and shows a sizable profit increase above conventional pricing techniques.

2.2.6 Pricing Analytics for Online Shopping

An overview of pricing analytics in e-commerce is provided in this paper. The use of machine learning algorithms to analyse consumer behaviour and forecast demand, as well as the use of optimisation techniques to establish the best prices, are both covered in the article. The high number of items, the requirement for real-time pricing, and the requirement to take rival pricing into account are some of the difficulties faced by pricing analytics in e-commerce, which are also covered in the paper.

2.2.7 Using Regression Analysis to Examine Price Elasticity and the Effect of Promotions

Regression analysis is used in this research to examine price elasticity and the effects of promotions. The ideal pricing and promotional methods are determined by a model in the article that considers customer behaviour and promotions. Using data from a major retailer, the model is tested, and it shows a considerable revenue advantage over conventional pricing techniques.

2.2.8 Multi-objective Price Optimization for Online Retailers

A methodology for multi-objective price optimisation for online retailers is presented in this study. To identify the best prices for each item in a retailer's selection, the model considers consumer behaviour, competition, and cost. The approach shows considerable improvements in revenue, market share, and customer happiness when tested using data from a sizable online store.

2.2.9 E-commerce Bayesian Networks for Dynamic Pricing

This study employs Bayesian networks to address the dynamic pricing in e-commerce. The programme analyses user behaviour and competing prices to identify the optimal prices for each product on an e-commerce site. When assessed using information from a significant e-commerce platform, the approach demonstrates notable improvements in revenue and consumer happiness.

2.2.10 An Integrated Price Optimization Framework for the Telecommunications Industry

An comprehensive price optimisation approach for the communications sector is presented in this article. In order to establish the best prices for telecommunications services, the framework considers consumer behaviour, competition, and cost. The approach shows considerable improvements in revenue and customer satisfaction when evaluated using data from a major telecommunications operator.

2.2.11 Pricing and Capacity Planning for Data Centers

A price and capacity planning model for data centres is presented in this study. To calculate the best rates and capacity levels, the model considers client demand, server utilisation, and energy costs. The model shows appreciable increases in revenue and profitability when evaluated using data from a major provider of data centres.

2.2.12 An On-Demand Service Pricing Model with Real-Time Dynamic Pricing

A real-time dynamic pricing model is presented in this study for on-demand services like food delivery and ride-sharing. To find the best costs in real time, the programme considers client demand, driver supply, and delivery capacity. The approach shows considerable improvements in revenue and customer satisfaction when evaluated using data from a major on-demand service provider.

2.2.13 Inventory management and joint pricing with reference price effects

A joint pricing and inventory management model that takes into account reference price impacts is presented in this research. To establish the ideal prices and inventory levels, the model considers client behaviour, inventory costs, and reference prices. The model shows considerable gains in revenue and profitability when evaluated using data from a retail business.

2.2.14 A Comparative Study of Pricing Strategies in the Sharing Economy

This paper presents a comparative study of pricing strategies in the sharing economy, such as Airbnb and Uber. The study compares the effectiveness of different pricing strategies, including surge pricing, dynamic pricing, and fixed pricing. The study is based on data from multiple sharing economy platforms and provides insights into the most effective pricing strategies for different sharing economy business models.

2.2.15 An E-commerce Decision Support System for Dynamic Pricing

A decision-support system for dynamic pricing in e-commerce is presented in this research. To calculate the best rates for e-commerce products, the algorithm considers customer behaviour, inventory costs, and competition prices. The technology analyses client data and provides real-time pricing recommendations using machine learning techniques. The solution shows appreciable gains in revenue and profitability in tests using data from a sizable e-commerce platform.

Chapter 3

Methodology

Intelligent Price Management is a simpler cost-plus pricing plan may appear to be a smart idea at first. Still, it may not be the most sustainable option, in the long run, defining price change trend analysis, and anticipating the impact of pricing changes before implementation. Intelligent Pricing Management is used to develop an application for the business organizations to manage the pricing of the products based on a variety of factors such as market trends, competition, production cost and profit margins. The price management combines multiple data sources (S4,non-SAP systems) into a simple interface to help in making insight-driven pricing decisions. However, these strategies are often simplistic and fail to account for growing variables. Users can utilize what-if analysis to run several scenarios to analyze the impact of price changes on consumers, products, volumes, margins, revenue, and sales.

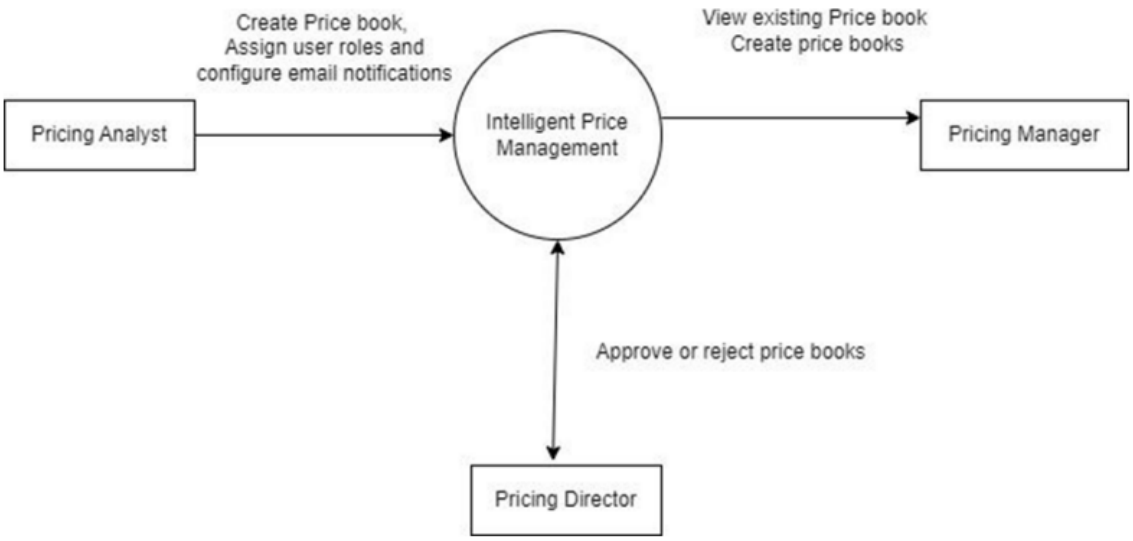

Figure 3.1: Flow Diagram for Intelligent Price Management

The Flow Diagram in Fig 3.1 demonstrates how the system is broken down into ”subsystems” (processes), each of which deals with one or more data flows to or from an external agent and which, when combined, constitute the system’s whole capability. Additionally, it illustrates the flow of data among the various system components and indicates internal data stores that are necessary for the system to function.

At its most basic level, a use case diagram is an illustration of a user’s engagement with the system that demonstrates the connection between the user and the many use cases in which the user is engaged. A use case diagram can show the various system users and the various uses for a system.

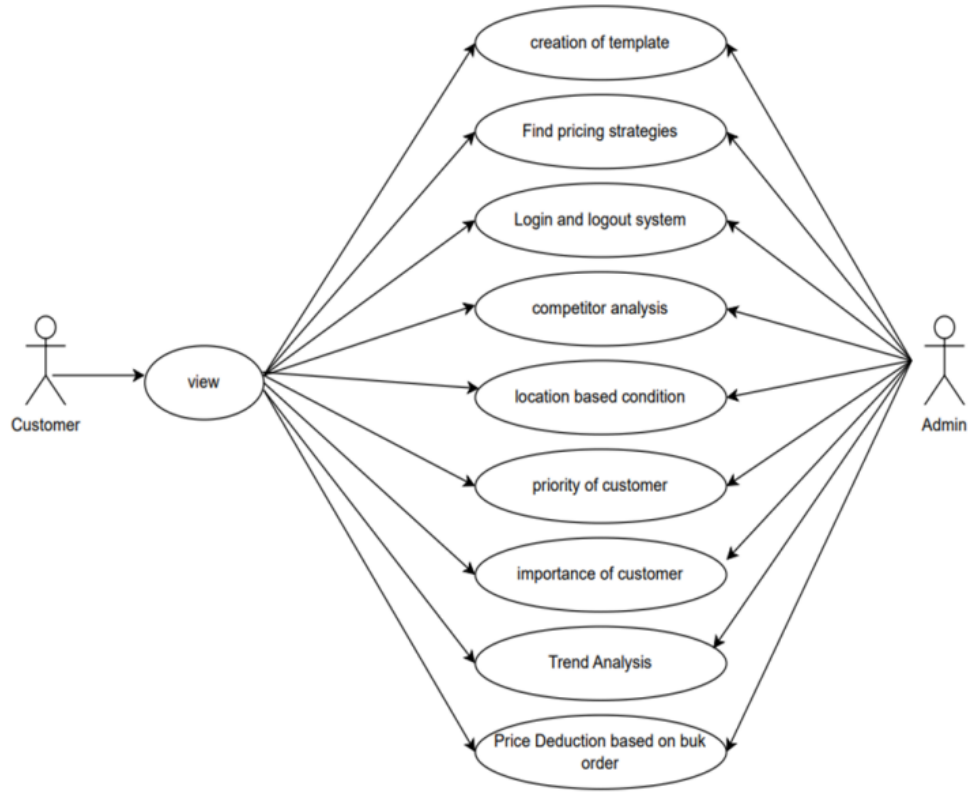

Figure 3.2: Login System Model

3.1 Key Features of Intelligent Price Management

- Tracking pricing information
- Setting rules for price changes
- Monitoring competitor pricing
- Analyzing pricing data.
- Configurable Price Template Definition
- Approval Process Definition and Determination

3.2 Module Description

3.2.1 Login Module

A login page is a site page or a passage page to a site that requires a client ID and confirmation, consistently performed by entering a username and secret phrase blend. The login page confirms the username and password that is being entered and validates the client provided that the accreditations are substantial.

3.2.2 Dashboard Module

The Dashboard Module represents in a more graphical way so users will understand what is there in the application and how many orders are going on. The principal utilization of a dashboard is to show a far reaching outline of information from various sources. Dashboards are helpful for checking, estimating, and examining pertinent information in key regions. Dashboard announcing saves significant time and assets by showing refreshed results for each report.In this dashboard, customers can also view the total customers so that it will be easy for customers to view the total number of customers for this system. It also shows the sales, open orders and new products are being used in this application.

3.2.3 Top Five Material Growth in Dashboard Module

Top five material growth in dashboard module shows the material growth in graphical way. The histogram shows the top five materials revenue growth and pie chart shows top five material growth along with percentage.material choice for dashboard modules might shift relying upon explicit prerequisites, like expense, manufacturing processes, environmental contemplation, and execution measures. The dashboard module can give experiences and perceptions on income development, including patterns after some time, income by item/administration, income by client fragment, and income by area.

3.2.4 Price simulation Module

The price simulation module represents the What-if price analysis(the price based on the statistical analysis of current demand and market outside) of the specified product in the selected pricing template. The filtering options present in this figure are Region selection, pricing template selection and the name of the customer. On simulating the estimating examination of the item with the applied channel choice is displayed. The result comprises current worth of the item, assessed worth of the item and the client required worth of the item alongside the limits and the cost difference as per the need of the client. Price Simulation assists with assessing the impact of derivations on the future deals cost during the citation cycle, before focusing on a particular cost.

3.2.5 Price Proposal Module

The production of the evaluating proposition of the framework utilizing the formation of the PCR. Pricing proposal , otherwise called value proposition or estimating proposition. The reason for an evaluating proposition is to assist possible clients with understanding how much an undertaking might cost (and what are the things remembered for that cost). A project worker makes this record in light of a specific evaluating philosophy, for example, everyday or hourly rate, month to month, cost-based, time and materials-based, and so on. An evaluating proposition fills in as the record that has unquestionably the last value. It also includes an itemized summary of all deliverable.

3.2.6 Price simulation Module

Price simulation module represents the What-if price analysis(the price based on the statistical analysis of current demand and market outside) of the specified product in the selected pricing template. The filtering options present in this figure are Region selection, pricing template selection and the name of the customer. On simulating the estimating examination of the item with the applied channel choice is displayed. The result comprises current worth of the item, assessed worth of the item and the client required worth of the item alongside the limits and the cost difference as per the need of the client. Price Simulation assists with assessing the impact of derivations on the future deals cost during the citation cycle, before focusing on a particular cost.

3.2.7 Simulation Creation Module

A simulation creation module figure 4.6 in pricing management typically involves creating a computer-based model or program that simulates the pricing decisions and their outcomes in a controlled and repeatable environment. Setting up initial parameters such as cost per unit, initial prices, demand characteristics, and any other relevant factors. Collecting and storing relevant data during the simulation, such as demand, prices, revenues, and profits, for further analysis and evaluation of pricing strategies. Analyzing the collected data to evaluate the performance of different pricing strategies, calculating key metrics such as total revenue, average revenue per day, and other relevant performance indicators.

3.2.8 Price Report Module

The Price report module addresses the value report of the client. This comprises filtering choices, for example, report type, region where the item is to be sold or purchased, date at which the item is sold or purchased. This gives a point by point investigation of the item that has been bought or sold. By using specific selection criteria admin can change the extent of the evaluating report, however it can't change the models used to make the estimating report. This is carried in customizing. Pricing reports set up data from condition records, condition types and condition tables as indicated by different various measures.

3.2.9 Rule Based Strategy Module

The rule based strategy module addresses the standard rule based pricing strategy which decides the price of the item situated in the current strategy that has been selected to be carried out in the product. Rule-based estimating is the most broadly utilized and most regular approach to evaluating. This Rule-based evaluating is many times utilized in unique valuing as a device for estimating directors to carry out earlier evaluating information into the cost streamlining process. Applying rule-based evaluating to dynamic valuing techniques guarantees that specific measures are met at each cost so the estimating stays reliable and less mistakes happen.

3.2.10 Admin Configuration Module

Admin configuration module represents in valuing pricing related tasks such as, creating and overseeing price records, estimating rules, manual evaluating rules that relate to a pricing organization. Admin configuration consists of 11 modules. Data maintenance, Manage template, approval process, user management, simulation definition, price strategy, email configuration, language translation, min and max threshold, role management, scheduler configuration are handled by the admin configuration module. Admin has the capacity to manage user access and permissions to the admin configuration module, ensuring that only authorized work force can make changes to pricing settings.

3.2.11 Data Maintenance Module

The data maintenance module is an essential component of pricing management software that focuses on managing and maintaining the data used for pricing calculations and strategies. It involves the collection, storage, validation, and updating of data related to products, prices, discounts, customers, competitors, and other relevant information. The module allows for the collection of data from various sources, such as internal systems (e.g.ERP), external databases, market research, and competitive analysis. This data includes product information, pricing history, customer segmentation, and competitor pricing. The module provides a centralized repository for storing and organizing pricing data, ensuring data integrity and security. This data can be stored in a structured format, for easy retrieval and analysis.

3.2.12 Min And Max Threshold Module

The min-max threshold module figure in pricing management is a component of a pricing strategy that sets upper and lower limits on pricing decisions based on predetermined thresholds. It helps to ensure that prices stay within a defined range to avoid pricing decisions that are too low or too high. The minimum threshold is the lower limit below which prices cannot be set, ensuring that prices do not fall below a certain level that would result in unprofitable or unsustainable pricing. The maximum threshold is the upper limit above which prices cannot be set, preventing prices from becoming excessively high and risking noncompetitive pricing. This threshold can be set based on factors such as market demand, customer preferences, or competitor pricing.

3.2.13 Template creation for Pricing Proposal Module

Creating a template for a pricing proposal module involves that the proposal is comprehensive, accurate, and professional. Based on the product's requirements templates are created. Clearly define the scope of the proposal, including the products or solutions being offered, the pricing structure, and any terms and conditions. Templates are created that can be easily customized for each proposal, including space for adding client-specific information, such as company name and contact details. This ensures that each proposal is personalized and tailored to the specific needs of the client. Templates are revised regularly to ensure that it is up-to-date with current pricing information and reflects any changes in the products or pricing strategies.

3.2.14 Price Strategy Module

The price strategy module is a key component of a company's overall marketing strategy that focuses on determining the optimal pricing strategy for their products. This module involves various activities related to pricing, such as analyzing costs, assessing customer demand, evaluating competitors' pricing and setting the right price points to maximize profits and achieve business objectives. This also involves defining the specific goals and objectives a company wants to achieve through its pricing strategy, such as maximizing revenue,increasing market share, or achieving a certain profit margin. Regular monitoring and analysis of pricing performance helps identify any gaps or opportunities for improvement, and allows for adjustments to be made as needed.

3.2.15 Scheduler Configuration Module

The scheduler configuration module is responsible for managing and controlling the scheduling of tasks, jobs, or events within the system. It provides configuration options and settings that allow users to define how tasks or jobs are scheduled and executed based on their specific requirements. The scheduler configuration module takes these constraints into account when scheduling tasks or jobs to avoid conflicts or resource contention. The scheduler configuration module is designed to be scalable and flexible, allowing users to configure and customize scheduling policies, resource allocation, and error handling based on their specific requirements and changing needs.

3.2.16 Scheduler Configuration Module

The scheduler configuration module is responsible for managing and controlling the scheduling of tasks, jobs, or events within the system. It provides configuration options and settings that allow users to define how tasks or jobs are scheduled and executed based on their specific requirements. The scheduler configuration module takes these constraints into account when scheduling tasks or jobs to avoid conflicts or resource contention. The scheduler configuration module is designed to be scalable and flexible, allowing users to configure and customize scheduling policies, resource allocation, and error handling based on their specific requirements and changing needs.

3.2.17 Email Configuration Module

Email Configuration module represents the automated email notifications to be sent to the customers whenever there is a price update or change in the pricing strategy. This ensures that customers are informed promptly and helps to maintain transparent communication with them. It is flexible to customize email templates according to the branding and messaging requirements. It creates personalized email templates for different types of price notifications,such as price increases, discounts, or promotions, and the email configuration module seamlessly integrates with the pricing management system, making it easy to set up and use.

3.2.18 Planning Configuration Module

The planning configuration module in pricing management is a component that helps businesses effectively plan and manage their pricing strategies. It typically provides tools and features that allow businesses to set and adjust prices based on various factors such as market conditions, competition, customer segments, and business goals. This feature allows businesses to define their pricing strategy, such as cost-plus pricing, value-based pricing, or competitive pricing. Businesses can set pricing rules and parameters based on their specific strategy and requirements. Planning configuration module contains a price prediction model, threshold model, markup price model.

3.2.19 Price Prediction Model Module

The Price Prediction Model module is a component that aims to forecast or predict the future prices of a particular asset, product. It typically utilizes historical data, statistical analysis, machine learning algorithms, and other techniques to analyze patterns, trends, and factors that may influence price movements. It identifies and selects the relevant features or variables that may affect the prices and creates new features from the existing data to improve the prediction accuracy. It continuously monitors the performance of the deployed model, updates it with new data, and performs regular maintenance to ensure its accuracy and reliability over time.

3.2.20 Threshold Model Module

The threshold model module is a component of pricing management that helps businesses optimize their pricing strategies based on predefined thresholds. It typically involves setting specific price points or levels that trigger automated pricing adjustments, such as discounts or promotions, when certain conditions are met. It defines and sets thresholds based on various criteria, such as sales volume, revenue, margin, or customer behavior. The module typically provides monitoring and reporting capabilities to track the performance of the pricing strategy, including metrics such as sales, revenue, margin, and customer response.

3.2.21 Markup Price Model Module

The Markup Price Model Module is a component of pricing management that helps businesses determine the selling price of their products or services based on a desired profit margin. It involves applying a predefined markup percentage to the cost of a product or service to arrive at the final selling price. The markup percentage is usually set by the business based on various factors such as industry norms, competition, and desired profit margin.The module allows businesses to specify the markup percentage they want to apply to the cost of their products. The module provides features to manage discounts, promotions, and special pricing, allowing businesses to implement various marketing strategies to boost sales and customer loyalty.

3.3 System Specifications

The software and hardware specifications recognized for the system on the basis of their requirements are specified in this section.

3.3.1 Hardware Requirements

- Processor: Minimum 1 GHz (Recommended 2GHz or more)
- Hard Drive: Minimum 4 MB (Recommended 6 GB or more)
- Memory (RAM): Minimum 1 GB (Recommended 4 GB or above)
- Internet connection

3.3.2 Software Requirements

- Sap Fiori and Ui5 - Front End
- ABAP - Back End
- Odata - Api
- S/4 HANA - Database
- Windows, Mac, Linux, Any - OS
- Mozilla Firefox, Microsoft Edge, Any - Browser

3.3.3 Software Description

- ABAP: A high level programming language called ABAP (Advanced Business Application Programming) was developed by SAP SE, a global software provider that offers endeavour programming to manage business operations and customer relationships. For the SAP NetWeaver stage, the primary application server in the SAP landscape, ABAP is fundamentally utilised to support programming applications that sporadically spike in demand. A fourth-generation programming language called ABAP is designed to be used for developing business-oriented systems including those for material management, sales and distribution, and financial accounting. As an event driven programming language, it is dependent on a variety of triggers or events that can be used to run specific code.

- SAP UI5: SAP UI5 (UI for HTML5) is a collection of libraries and instruments for building web applications with a reliable and present day UI. It is a piece of the SAP innovation stack and is intended to work consistently with SAP's backend frameworks, like SAP HANA and SAP Business Suite. SAP UI5 depends on open web guidelines, like HTML5, CSS3, and JavaScript, and gives a bunch of predefined UI controls, like buttons, tables, outlines, and structures, that engineers can use to construct responsive and dynamic web applications. SAP UI5 is a key technology in the SAP Fiori design language, which is a set of design principles and guidelines for building enterprise-grade applications that are easy to use, consistent, and responsive.

- ODATA: ODATA (Open Data Protocol) is a standard protocol for building and consuming RESTful APIs (Application Programming Interfaces) for data access and manipulation. ODATA has a rich arrangement of elements, including support for CRUD (Create, Read, Update, Delete) tasks, bunch demands, separating, arranging, paging, and metadata revelation. It likewise upholds a scope of information designs, like JSON (JavaScript Article Documentation), XML (eXtensible Markup Language), and AtomPub (Particle Distributing Convention). ODATA is broadly utilized in big business programming improvement, particularly with regards to the SAP environment, where uncovering information from SAP frameworks to outer applications and services is utilized.

- S4 HANA: S4 HANA is an in-memory, segment situated, social data set administration

framework (RDBMS) created by SAP SE. It is intended to deal with huge volumes of information and perform continuous information handling and investigation. Dissimilar to customary data sets, which store information on plate and recover it when required, S4 HANA stores information in memory, considering quicker handling and recovery of information. It likewise utilizes a columnar information stockpiling model, which is streamlined for logical inquiries, considering quicker collection and examination of enormous volumes of information.

- Dynamic ODATA: Dynamic OData is a term used to describe the generation of OData services at runtime, based on the metadata and data available in a system. OData (Open Data Protocol) is a standardized protocol for creating and consuming RESTful APIs that expose data as resources in a uniform way. In a dynamic OData scenario, the metadata that describes the available resources and their properties is generated on-the-fly, based on the structure of the underlying data source. This allows for a more flexible and adaptable approach to exposing data through OData services, as the service can automatically adapt to changes in the underlying data model. Dynamic OData is often used in scenarios where the data model is subject to frequent changes, or where a large number of different data sources need to be exposed through OData services.

3.4 System Design

The ”how to implement?” question is explicitly addressed during the system design phase, which bridges the gap between the problem and the existing system. In this phase, the SRS documentation is transformed into an implementation format that is practical and that also describes how the system works. The challenging effort of system development is divided into smaller, more achievable tasks that interact to complete the overall objective. Based on the needs of the application and project, a good design facilitates the creation of efficient code and reduces implementation size.

There are two stages of system design: logical design and physical design. In order to address user needs for specifying inputs (sources), outputs (destinations), databases (data storage), and processes (data flows), logical design gives an abstract description of the system’s inputs, outputs, and data flow. For a corporate database to be successfully implemented, logical architecture is essential. A poor logical design could later necessitate expensive changes to

data collecting, storage, and security. A strong conceptual design makes database creation and assessment easier, which helps the execution go well. During the logical system design phase, the system analyst specifies the user needs in great detail, thereby dictating the information flow into and out of the system as well as the required data sources.

The system analyst describes user requirements in sufficient depth when creating a system's logical architecture to establish the necessary data sources as well as how information enters and departs the system. Data flow diagrams and E-R diagram modelling are employed. The database is also designed, the input/output medium is specified, and backup processes are established. The system's implementation is eventually scheduled.

Chapter 4

Result and Discussion

Intelligent Price Management provides a reliable and efficient solution for price management. Price management refers to the process of setting and adjusting prices for products or services to achieve specific business objectives. It involves analyzing market conditions, customer demand, production costs, and competition to determine the optimal price that will maximize revenue and profit. Effective price management requires a deep understanding of the company's target market and customer behavior. Companies can use different pricing strategies, such as cost-plus pricing, value-based pricing, dynamic pricing, penetration pricing, and skimming pricing, to achieve their pricing objectives. Cost-plus pricing involves adding a markup to the production cost of a product or service to arrive at the final price. Value-based pricing, on the other hand, considers the perceived value of a product or service to the customer and sets the price accordingly.

4.1 Testing Methods

Testing ensures that the system is error-free based on criteria that are anticipated by the user or by the organization. A system may have high-end or low-end performance based on the environment in which it operates.

4.1.1 Validation Testing

The process of validating whether a system meets the requirements and expectations of its users or clients is called validation testing. In this project, unit testing is an important aspect of validation testing, aimed at identifying defects in individual sections of the project. Unit testing is used to evaluate the functionality and performance of each system unit or component in isolation. This testing helps developers to identify and resolve issues early on, thereby minimizing the risk of encountering problems during deployment or integration. A successful validation test confirms that the system meets the requirements, while a failed test indicates

that modifications are necessary. Unit testing is a critical step in the validation process, enabling developers to ensure that the system performs as expected and meets the needs of all stakeholders. In this Project Testing the price strategy to make sure it achieves the required goals and is operating effectively is part of the validation testing for pricing management. Some potential actions in price management validation testing process is to specify the testing goals. Testing the pricing plan to see if it achieves sales targets, profit margins, or other specified objectives may fall under this category and create Test Scenarios using the objectives as a guide, create test scenarios that will enable the pricing strategy to be evaluated. This can entail developing several price plans and assessing their effects on sales, profits, and consumer behaviour.

4.1.2 Unit Testing

Black box testing that explains what the system performs is known as unit testing. Testing can be carried out manually or automatically. The system's functionality is tested in terms of the User Interface, APIs, Database, Security, Client/Server connection, and other areas. The table provides examples of test cases for functional testing. Unit testing is the process of ensuring that individual components or units of the pricing system function effectively and in accordance with the specifications in this project price management. Defining the Units entails identifying each unit or component that must undergo testing as part of the pricing system. There may be individual pricing algorithms, price models, and other pricing components here. The next step is to create test cases that will enable the evaluation of each unit based on the defined units. To do this, it might be necessary to develop test cases that simulate various pricing circumstances and check that the pricing unit operates properly. After the test cases have been created, the testing must be carried out. This could entail running each price unit separately and comparing the outcomes to the predetermined specifications. Following the completion of the testing, the results are examined to see if each pricing unit is operating properly and fulfilling the specified parameters. To make sure the pricing output data is compatible with the anticipated outcomes, this may entail analysis. Any defects or problems that are found are addressed and rectified based on the analysis of the test findings. To make sure that the pricing algorithms and models are operating properly, this may entail making changes to them.

4.2 Test Cases

Table 4.1: Test Cases

Slno	Condition to be Tested	Expected Result	Observed Outcome	Status
1	Login page with valid customer id and password	The login should be successful and the customer should be directed to the dashboard page	The customer details have been validated against the login credentials and remain in the login page	pass
2	Login page with invalid customer id and password	The customer should not get logged in	If the customer id does not exist it should throw an error message as “Invalid credentials”	Pass
3	Details of the customer will be displayed when certain filters such as Customer number, Material number, Sales organization number and distribution channel.	Details of the customers are shown when certain filters such as Material number and distribution channel.	Details of the customers are shown when certain filters such as Customer number, Material number, Sales organization number and distribution channel.	Pass

4.3 Output Screens and Results

1. Login Page

   User can login using username and password.

Figure 3.1: Login Page

2. Dashboard

   The Dashboard represents in a more graphical way.

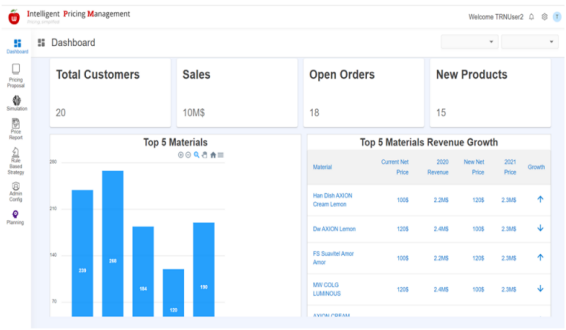

Figure 3.2: Dashboard

3. Admin Configuration

   Admin configuration represents in valuing pricing related tasks.

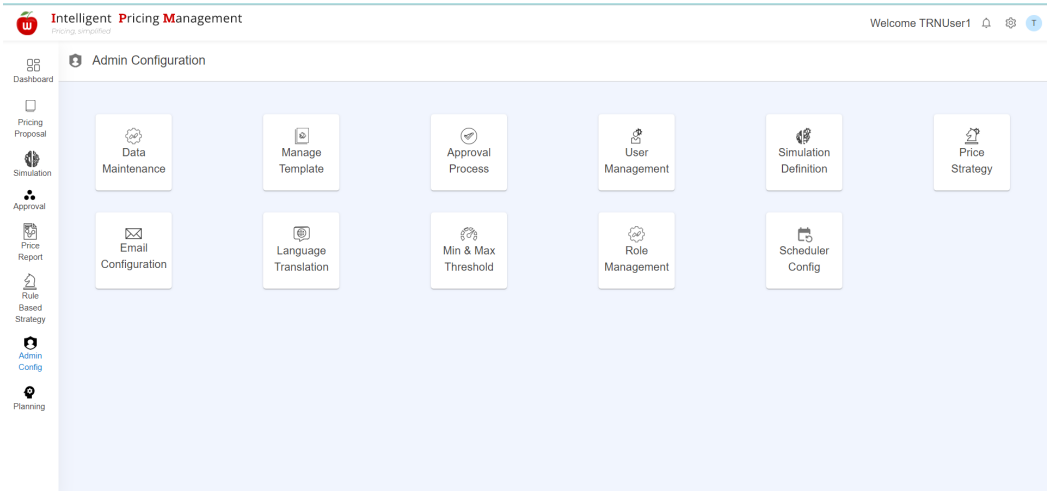

Figure 3.3: Admin Configuration

4. Approval Workspace

   Creating new users to access the system. This page is available only for admins.

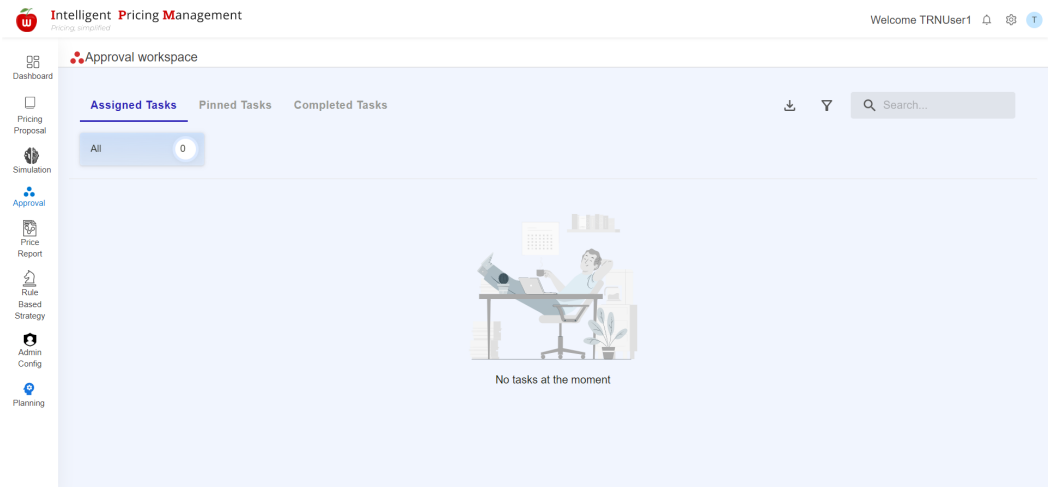

Figure 3.4: Approval Workspace

5. Price report

   Viewing the different price report.

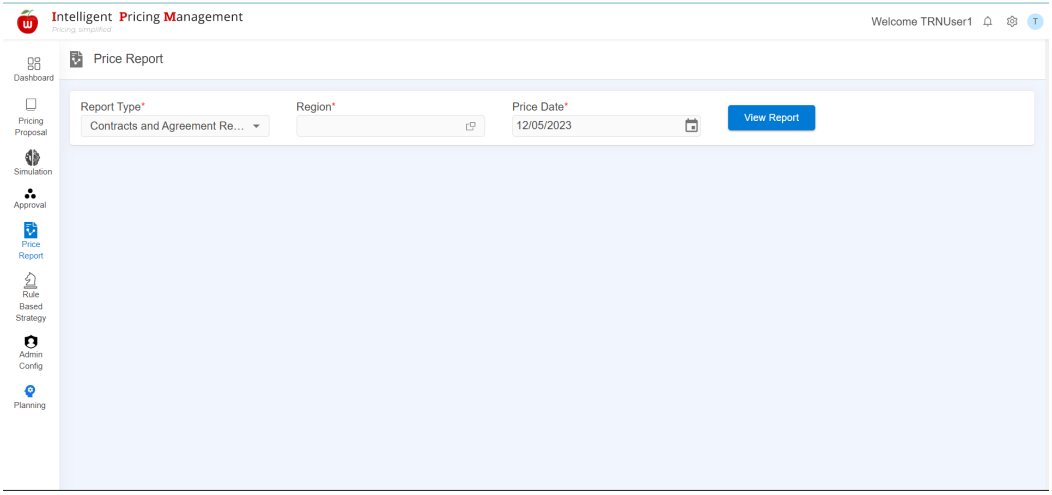

Figure 3.5: Price Report

6. Price proposal

   Create new price proposal.

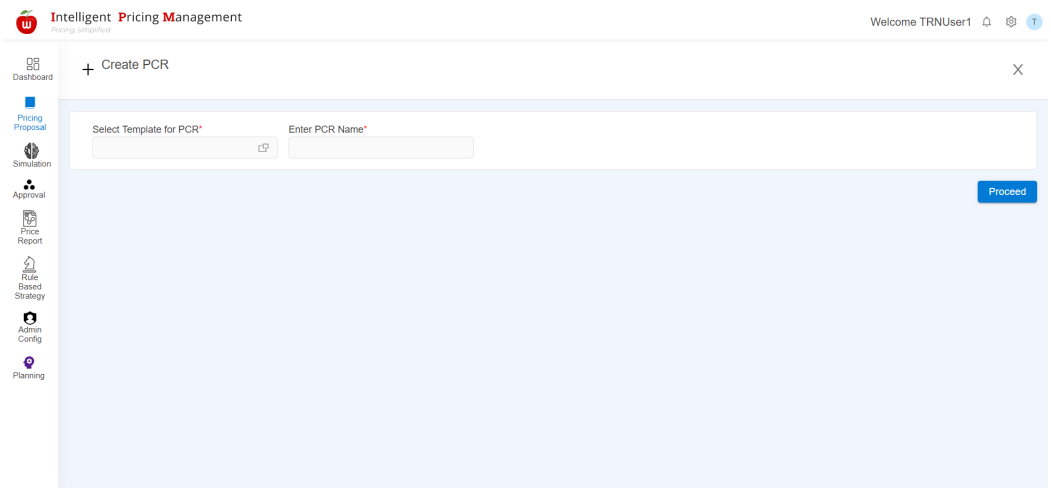

Figure 3.6: price proposal

7. Price simulation

Used for Creating Price simulation

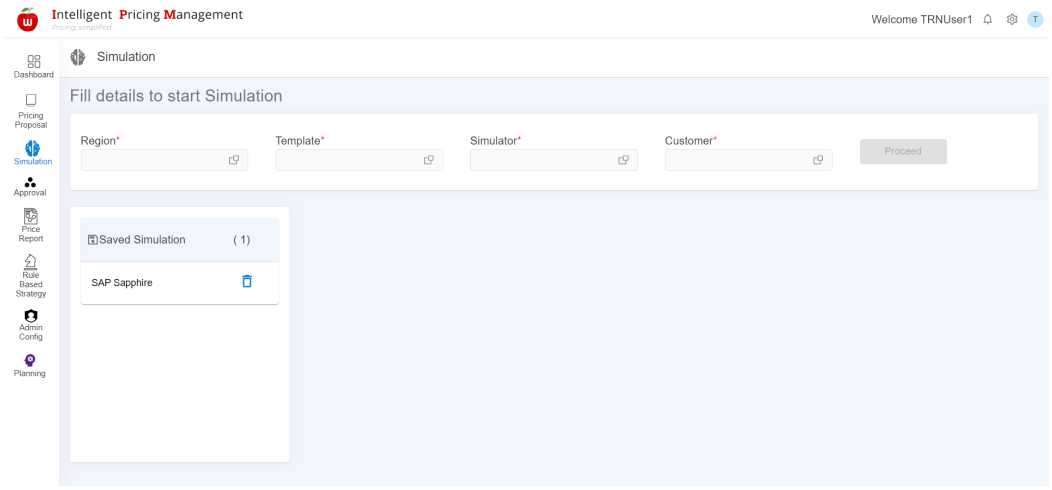

Figure 3.7: Price simulation

Chapter 5

Conclusion

Intelligent Price Management increases revenue and margins through price optimization. It manages and implements pricing governance. It not only increases productivity but also prevents profit margin leakage. Many businesses utilize spreadsheet-based forecasting models to forecast pricing impact. However, these strategies are often simplistic and fail to account for growing variables. Intelligent Price Management, provides end-to-end visibility into the various price books, as well as relevant information such as the date of creation, the creator of the price book, and the price book's status. This allows consumers to retrieve information rapidly and easily.

5.1 Future Enhancement

The changes in consumer behaviour and technological improvements, price management is a field that is always developing. Here are some potential future improvements to price management AI may be used to analyse customer data, forecast demand, and optimise revenue for businesses. Additionally, AI can assist businesses in identifying price sensitivity across various client segments and adjusting prices accordingly. Blockchain can increase supply chain transparency, allowing businesses to better control costs and prices. Additionally, it can facilitate safe and transparent transactions and lower transaction costs, particularly in B2B settings. By using consumer data to create personalised pricing, businesses may provide various customers with prices that are specifically suited to their needs.

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Appendix

Screenshots

Figure A.1: Login Page

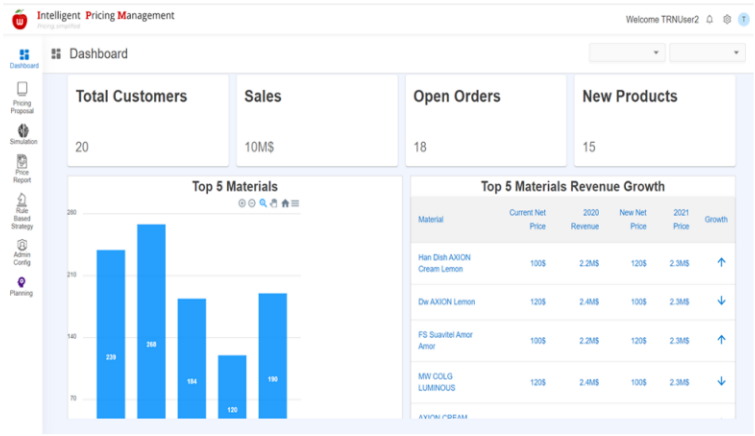

Figure A.2: Dashboard

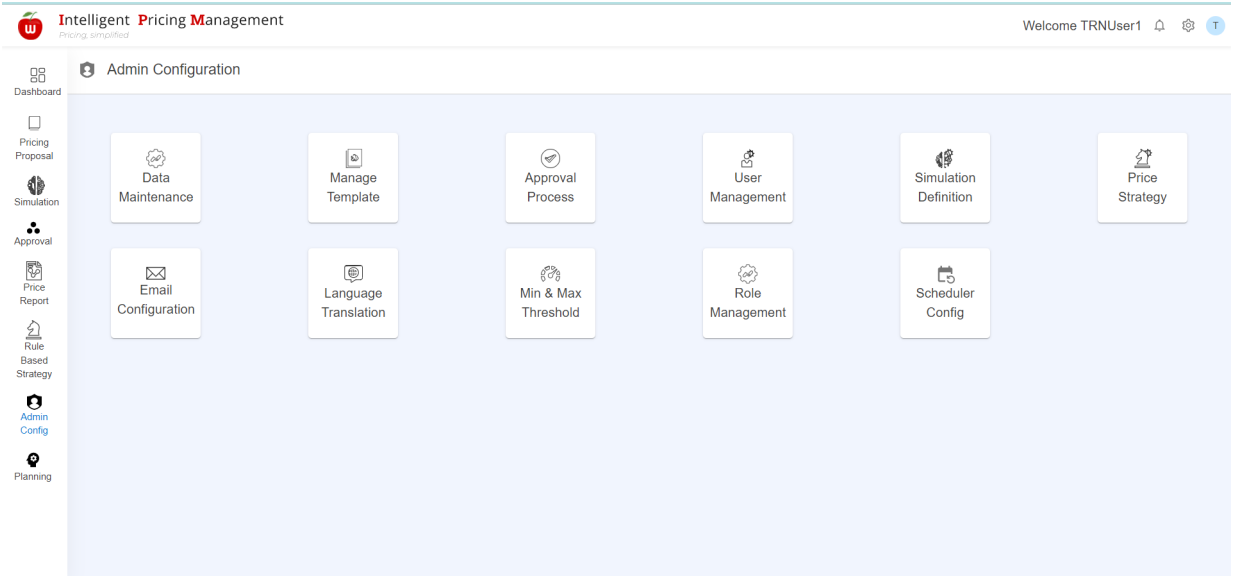

Figure A.3: Admin Configuration

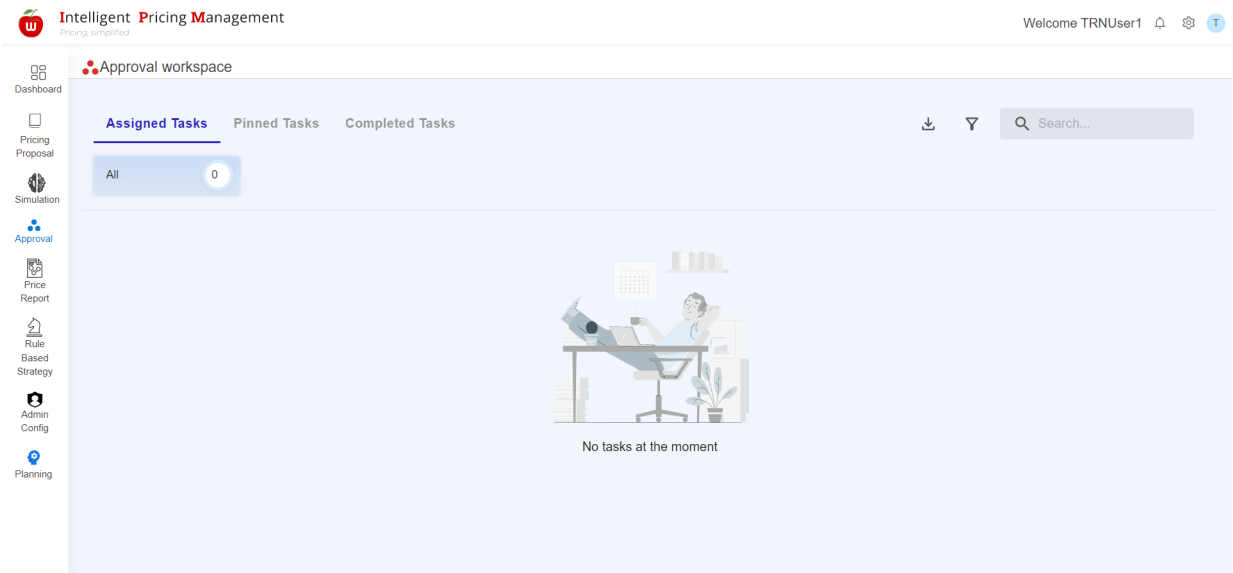

Figure A.4: Admin Approval Workspace

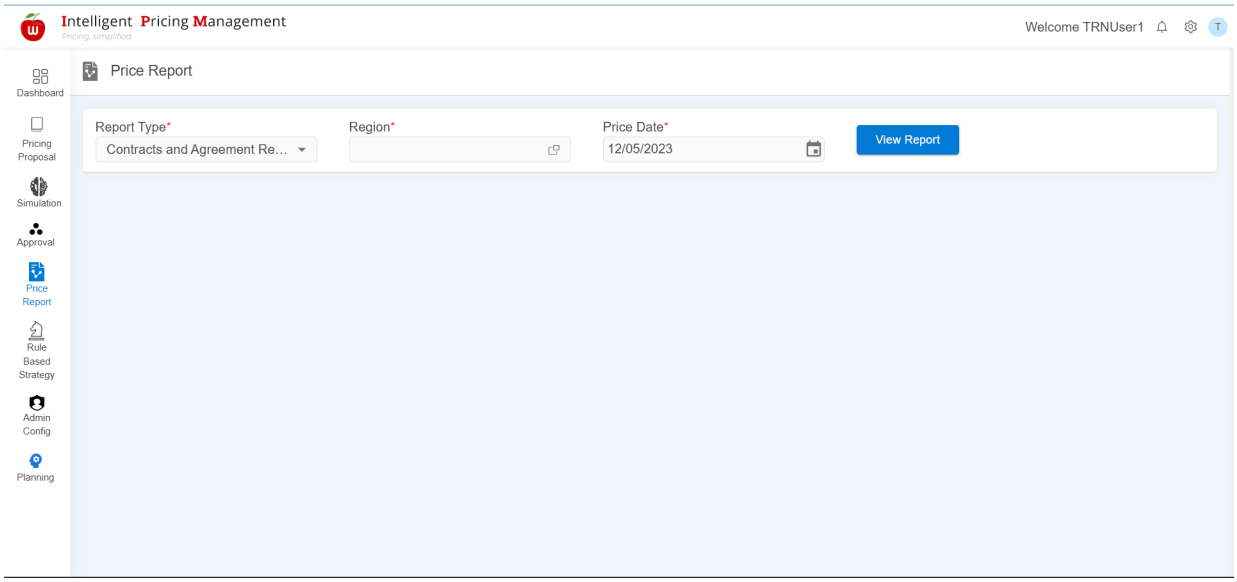

Figure A.5: Create Price Report

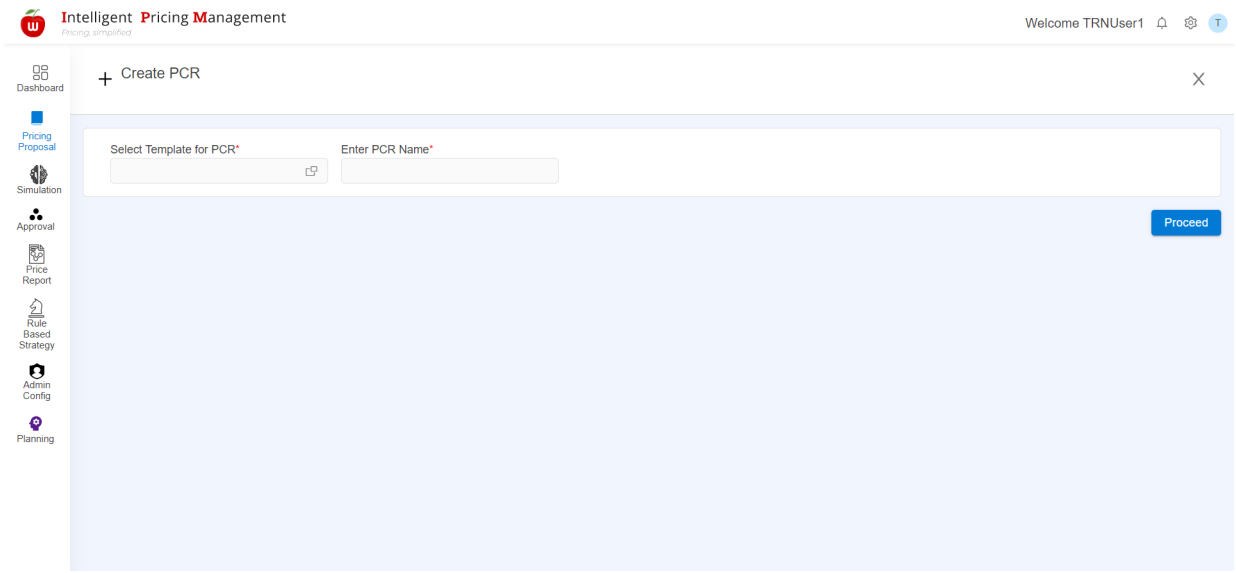

Figure A.6: Create Price Proposal

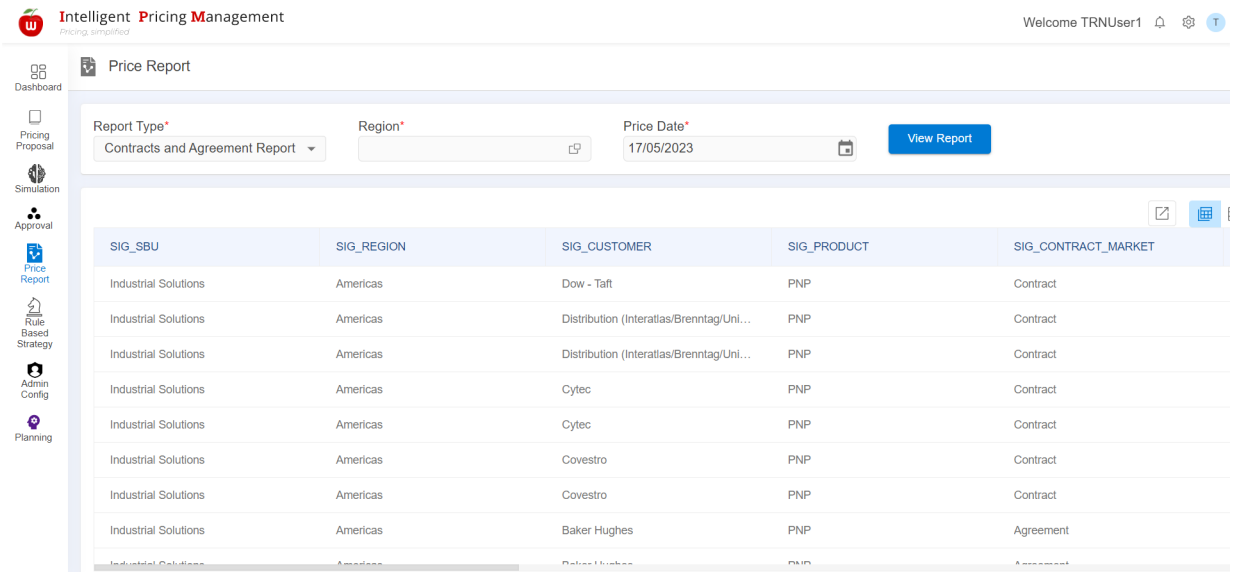

Figure A.7: Viewing Price Report

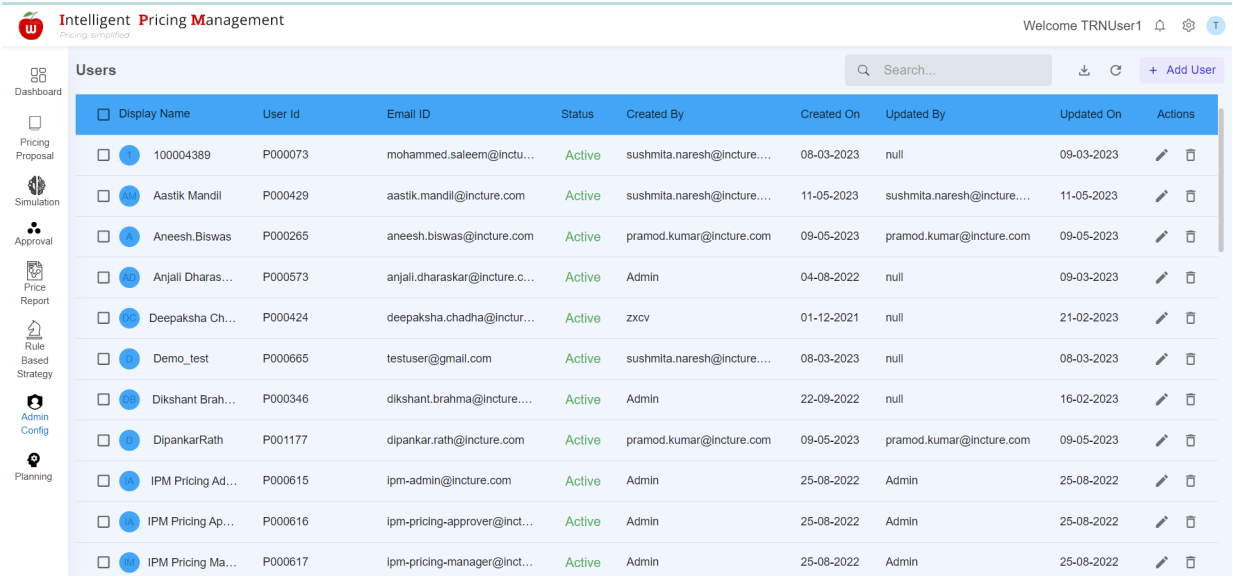

Figure A.8: User Management

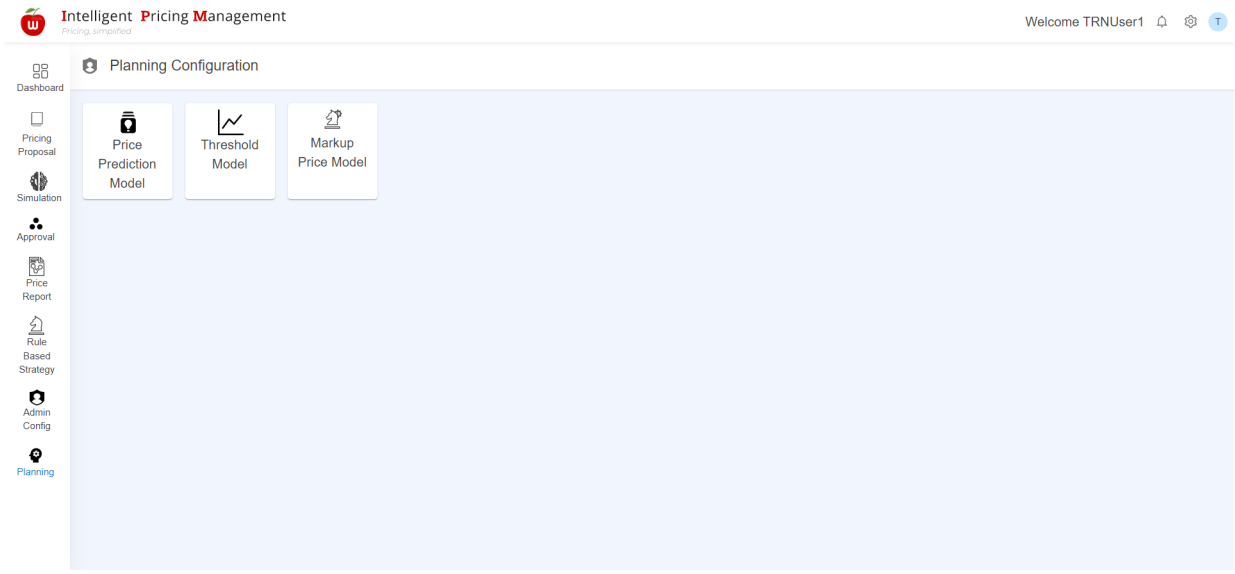

Figure A.9: Planning Configuration

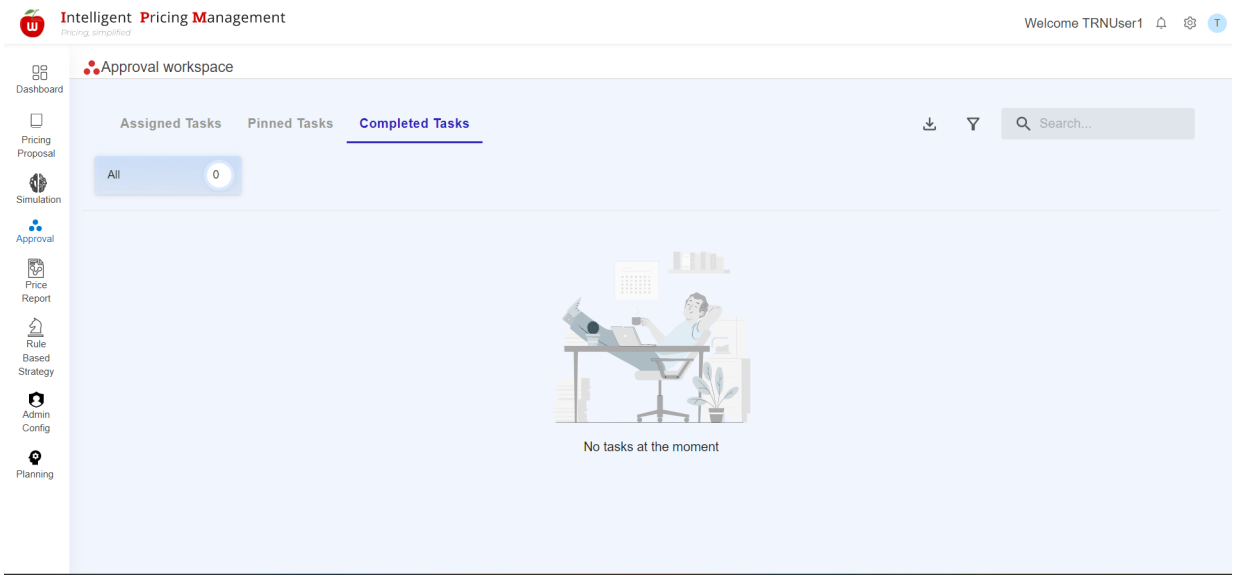

Figure A.10: Completed Workspace

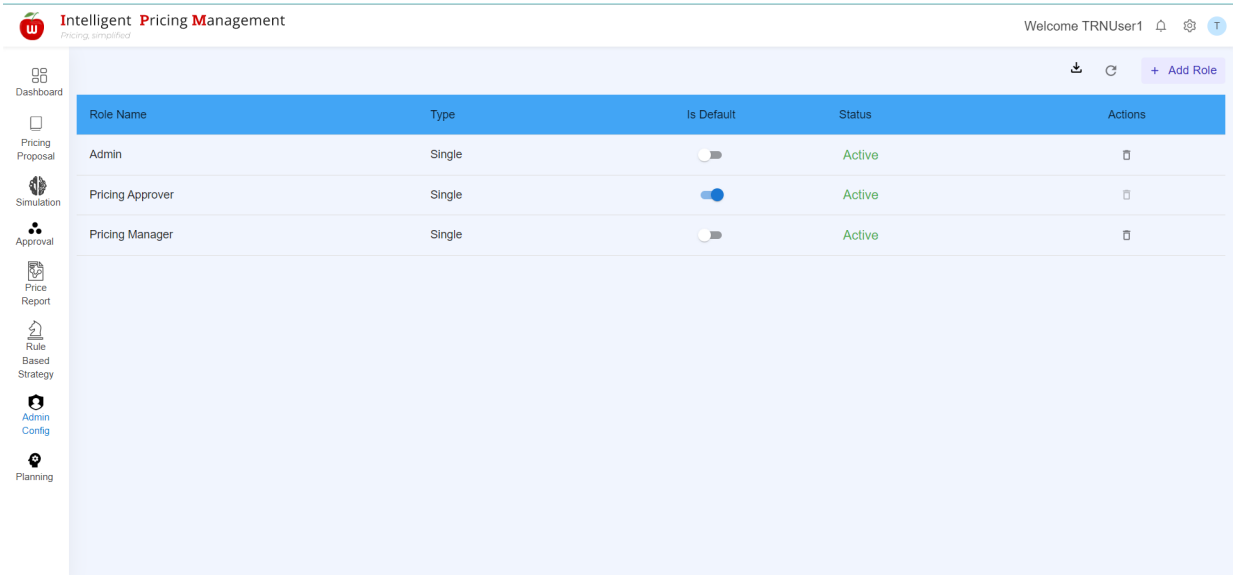

Figure A.11: Role Management

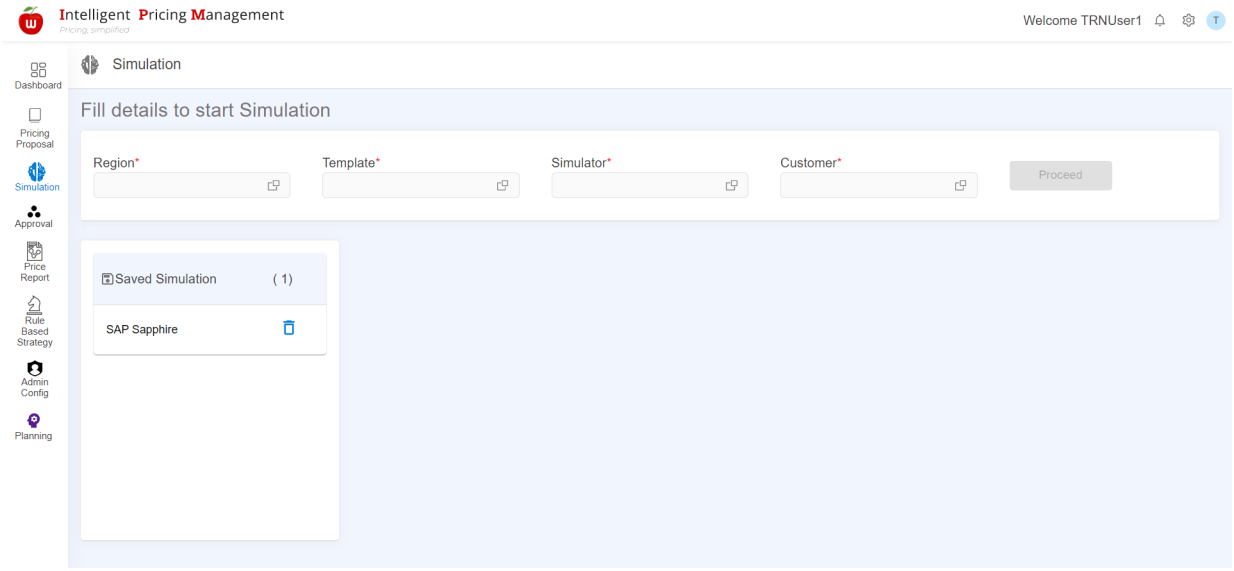

Figure A.12: Create Price simulation