



TPIS

SRS Document

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Disclaimer

This Software Requirements Specification document is a guideline. The document details all the high level requirements. The document should be used as a guideline by the students to design the Solution Architecture for the project. The document also describes the broad scope of the project and high level logical object model. But while developing the solution if the developer has a valid point to add more details being within the scope specified then it can be accommodated after consultation.

TPIS - Trademark & Patents Info System

Introduction

The purpose of this document is to define scope and requirements of TPIS, a high-end searchable engine based on for information related to all granted/ valid, pending/ published patents, trade marks and designs in the South-Asian region.

This document should be used by the development team to architect the solution the project.

Management Summary

A patents and trademark company wishes to automate the records and make it easy for users to seek information on existing Patent and TM records. This would involve a major quality controlled process and its automation to ensure the records available to the outside world do not have errors. The system will address the following:

1. Create and maintain a complete repository of the information related to Intellectual Property (IP) subscribers' Patent , Trademark and Design as per application filed by the company on behalf of customers.
2. Setup Quality Process for data entry to ensure accuracy and reliability of records based on Critical factors.
3. Search Engine with user friendly interface for status check.

The proposed solution will be designed & developed to run on IBM WebSphere Application Server and IBM DB2 Universal Database in a 2-tier architecture.

About Patents, Trademarks & Design Domain

An organization dealing with Patents, Trademarks and Design require Experts to validate the stake for any of these three IP ownership requirements. A lot of research goes into the process before the application is submitted to the designated authority for such a status. Just a brief is provided for your understanding.

A **patent** protects new inventions and covers how things work, what they do, how they do it, what they are made of and how they are made. It gives the owner the right to prevent others from making, using, importing or selling the invention without permission. If the invention meets a set of requirements defined for a patent, an individual or an organization may want to consider applying for a patent. If the patent is granted, then it must be renewed every year after the 5th year.

A **trade mark** is a sign which can distinguish your goods and services from those of your competitors (you may refer to your trade mark as your "brand"). It can be for example words, logos or a combination of both. The only way to register your

trade mark is to apply to The Intellectual Property Office. You can use your trade mark as a marketing tool so that customers can recognize your products or services.

A **Registered Design** is a legal right which protects the overall visual appearance of a product or a part of a product in the country or countries you register it. For the purposes of registration, a design is legally defined as being "the appearance of the whole or part of a product resulting from the features of, in particular, the lines, contours, colors, shape, texture or materials of the product or ornamentation." A Registered Design can be a valuable intellectual property right. It can form the basis of an infringement action against other parties, and will help you in stopping others from creating designs which are too similar to your own within the same geographical area you have protected your design.

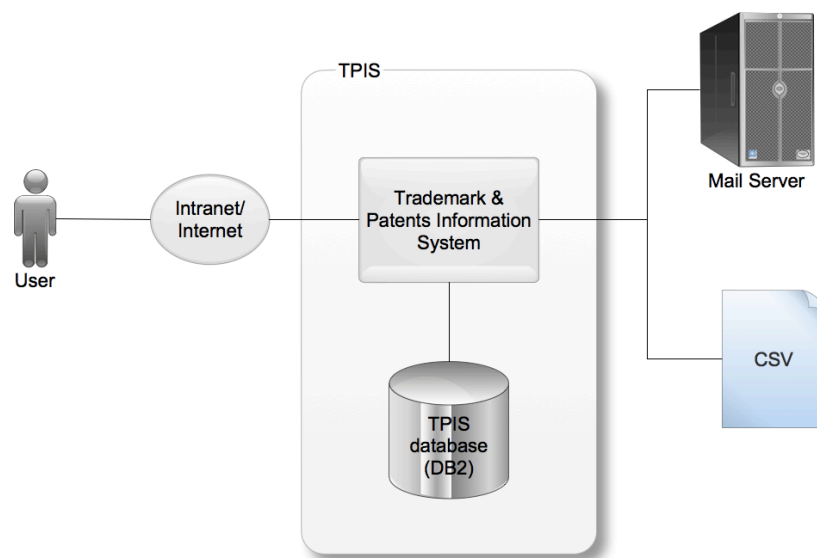
Key Assumptions

1. The project owner should be familiar with terms used in this domain.
2. The applicants visiting the website do not require any login and password authentication. The search options will take care of the information need of an existing applicant via application id.
3. The process and the data capture forms are kept extremely simple for the development to finish within a given time frame.

High Level Architecture

TPIS's high level architecture is illustrated through the context diagram shown below. It will have following categories of users:

1. External User
2. IP Consultant
3. QC User
4. Administrator



TPIS Context Diagram

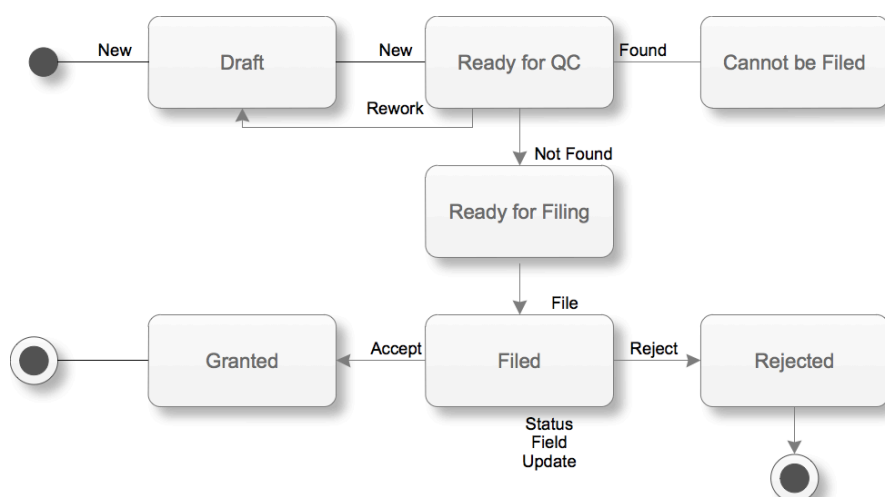
TPIS	TPIS application will capture existing patent, trademark and design records and also execute a workflow for the new application for these products. It will provide a robust search mechanism for the external users of the system to query on filed applications.
TPIS Database	The data for Patents, Trademarks and Design records along with quality check information and workflow processing data is stored.
CSV	Country, List of Services, Domains Master, Users Master, Quality Sampling Parameters, Critical to Quality factors.
Mail Server	The notifications generated by system are sent via the Mail Server

Functional Requirements

The high level functional requirements for the TPIS are outlined in the Use Case diagram described in this section.

TPIS will provide a secure user-id/password based secured login mechanism for internal users to access its services. The details of this are not outlined here. The development team is expected to create these keeping in mind the general practices followed by the web applications.

State Diagram



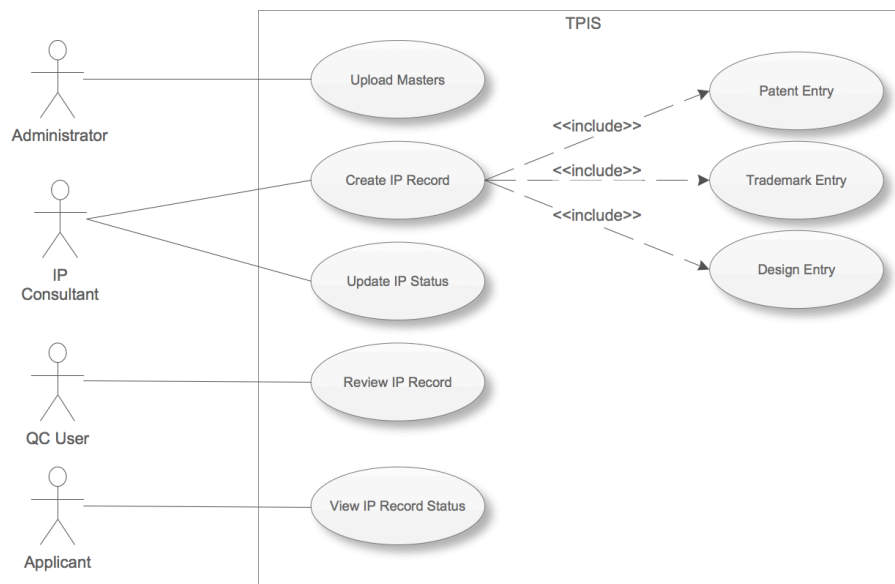
The state diagram depicts the normal process followed by Intellectual property consultancies for handling IP applications of Patents, Trademark and Design.

1. The IP consultant having skills of the Service type (Patent, Trademark, Design) enters the new application.
2. The application moves in draft state on saving while entry. Once the entry is completed, the application is saved as New.
3. The application moves in to Ready for QC stage, where the QC expert (SME on the service type) checks the application record against the Critical to Quality factors aligned with the Service type.
4. Once the QC activity is performed, the application is either sent for rework to the IP consultant for fixing information or its moved for Search in external IP database (USPTO etc). This is an offline activity.

5. If the application details are found in any of the IP databases then the application is sent for filing. No further action is taken on the application.
6. If the application is not found in IP database, its filed in the PT organization. The application is moved to Filed stage.
7. There are various steps after the application is filed, which are updated in the current system as a status update by the IP Consultant owning the IP Record. There is no workflow while the status is being changed as this information is updated for the knowledge of the Applicant who accesses the information from company website and tracks the application status.
8. The application after evaluation process at the PTO office is either 'Granted' the IP ownership or 'Rejected' the application for IP ownership. In both cases, there are no further status updates. The application is moved to finished state (Granted or Rejected).

Use Case Diagrams

The following figure illustrates the Use Case diagram for the system. The MiS use cases are not detailed here.



Use Case Diagram

Use Cases

Upload Masters

Use Case Element	Description
Number	UC.01

Use Case Element	Description
Application	<p>Masters in the application are uploaded as CSV files.</p> <ul style="list-style-type: none"> Country Master will have columns such as Country id and Country. City Master will have a relationship to the country. The CSV shall contain City id, City, Country. List of Services will contain Service Id, Service Name (Patent, Trademark, Design). CTQ factors masters will contain Service id, CTQ Name, Type of Error. Each CTQ name will have multiple entries here. Employees master shall contain Employee id, Name, Role (IP Consultant, QC)
Use Case Name	Upload Masters
Primary Actor	Administrator
Secondary Actor	None
Pre-condition	None
Trigger	User clicks on the Upload Masters on the Administration page.
Basic Flow	<p>System prompts for the file name to be uploaded. Standard file upload dialog is presented to select a file from the local system.</p> <ul style="list-style-type: none"> The selected file data is uploaded in the related masters; if an existing record is encountered, the old details are replaced with the new details.
Alternate Flow	<ul style="list-style-type: none"> In event of incorrect CSV format, system gives an error and NO data is uploaded. Operation is cancelled
Output	System displays the number of records uploaded. It also highlights the number of records updated (i.e. already existing ones being replaced)

Create IP Record

Use Case Element	Description
Number	UC.02
Application	The
Use Case Name	Create IP Record
Primary Actor	IP Consultant
Secondary Actor	None
Pre-condition	IP Consultant is a valid registered user for TPIS application and is assigned role of IP consultant
Trigger	User clicks on the Create IP Record link on the TPIS Consultant page

Use Case Element	Description
Basic Flow	<p>The system displays the Service list options from the master (Patent, Trademark, Design)</p> <p>The user selects any one of them. The data entry screen will display the following fields as per the choice of service made.</p> <p>Patent Entry</p> <ul style="list-style-type: none"> Title, Application Number, International Patent Classifications Number, Application Date[Date picker], Inventor Name, Assignee Name, Assignee Country[Pick list], Priority Number, Convention number, Convention country[pick list], PCT Application Number <p>Trade Mark Entry</p> <ul style="list-style-type: none"> Title, Application Number, Applicant Name, Applicant's City[Pick List], Date of Filing[Date picker], Filing Office <p>Design Entry</p> <ul style="list-style-type: none"> Title, Applicant Name, Applicant's City[Pick List], Date of Filing[Date picker], Filing Office, Class Number <p>A provision to upload the scanned copy of each artifact used for entry. The artifacts get saved on the server with Application Number or Class Number.</p> <p>On completing the entry, user clicks on Save as draft, Create New Record or Cancel.</p> <p>Create New record saves the data with service id and user id. The status of the record becomes 'Ready for QC'.</p> <p>Note: Back date selection of dates is acceptable.</p>
Alternate Flow	Cancel abandons the operation and the user's role based landing page appears
Output	None

Review IP Record

Use Case Element	Description
Number	UC.03
Application	The records entered by IP consultant are reviewed 100% by the QC user. The purpose is to assess inputs based on Critical to Quality parameters.
Use Case Name	Quality Review
Primary Actor	QC User
Secondary Actor	None
Pre-condition	Valid users of the TPIS system with a QC role
Trigger	User clicks on the Review IP Record link on the QC page

Use Case Element	Description																					
Basic Flow	<p>The System displays a list of Records for review as per 'Ready for QC' queue. They are categorized by Service Type.</p> <p>User selects the record for review.</p> <p>The record is displayed in the edit mode as per its service type along with the CTQ parameters for a Patent record like the sample below. Type of error is a pick list with options such as "Incorrect Entry, Incomplete Entry, Left Blank'</p> <p>The scanned copies for the record can be clicked to view source data.</p> <table><thead><tr><th>Patent CTQ</th><th>Type of Error</th><th>Feedback</th></tr></thead><tbody><tr><td>Application Number</td><td>Incorrect Entry</td><td>Source Not Clear</td></tr><tr><td>International patent classification no.</td><td>Incomplete Entry</td><td>Last digit not entered</td></tr><tr><td>Inventor Name</td><td>None</td><td></td></tr><tr><td>Assignee Name</td><td>None</td><td></td></tr><tr><td>Assignee Country</td><td>None</td><td></td></tr><tr><td>Convention Country</td><td>None</td><td></td></tr></tbody></table> <p>The CTQ list for each service id is defined in the master and uploaded as CSV. <i>Please refer to masters upload.</i></p> <p>On completion of the review a record is created for the quality check with the information entered in the CTQ parameters and the Application id.</p> <p>The user selects 'Rework' if there are changes to be made otherwise selects 'Ready for Search'</p> <p>Note :Rework option can be created by the project owner by providing simple editing of the fields that are marked as errors and the feedback is also displayed as per the CTQs.</p>	Patent CTQ	Type of Error	Feedback	Application Number	Incorrect Entry	Source Not Clear	International patent classification no.	Incomplete Entry	Last digit not entered	Inventor Name	None		Assignee Name	None		Assignee Country	None		Convention Country	None	
Patent CTQ	Type of Error	Feedback																				
Application Number	Incorrect Entry	Source Not Clear																				
International patent classification no.	Incomplete Entry	Last digit not entered																				
Inventor Name	None																					
Assignee Name	None																					
Assignee Country	None																					
Convention Country	None																					
Alternate Flow	None																					
Output	None																					

View Status

Use Case Element	Description
Number	UC.04
Application	The applicants of the IP can view the latest update on their applications from the application page specifically for the Applicants.
Use Case Name	View Status
Primary Actor	Applicant
Secondary Actor	None
Pre-condition	None
Trigger	User clicks on the Application Status link on the landing page

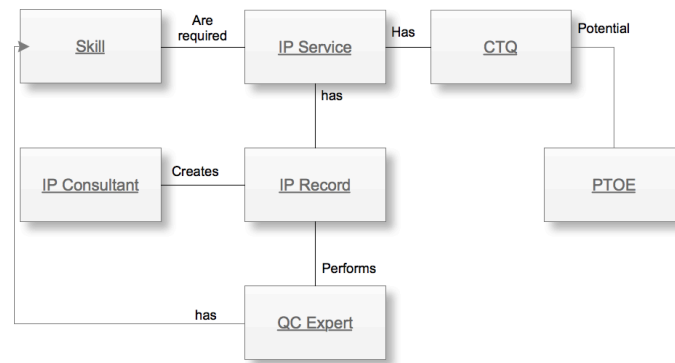
Use Case Element	Description
Basic Flow	<p>The system prompts Application id and Applicant name.</p> <p>The system pulls up the status of the applications and displays the status.</p>
Alternate Flow	<p>If either of the input is incorrect, the system displays another set of input fields like Application Number & Convention Number.</p> <p>The system makes combinations of these four input fields to get a response if it matches will display the status.</p>
Output	Status is displayed

Update Status

Use Case Element	Description
Number	UC.05
Application	The status of applications is updated as and when the communication from the IP governing body is received.
Use Case Name	Update Status
Primary Actor	IP Consultant
Secondary Actor	None
Pre-condition	Application that have not been assigned a status as 'Granted'
Trigger	User clicks on the Updated Status link on the landing page
Basic Flow	<p>The system prompts the user to enter Application id.</p> <p>The system displays the details of the Application id entered in a read only mode.</p> <p>The system prompts for a change of status in the following sequence in case of application details are not found in the PT records.</p> <p>Not found -> Application Filed -> Request for Examination -> Examination Report Submitted -> Re-submit(Optional) -> Inspection Report -> (Granted or Rejected).</p> <p>The system will allow only forward status update i.e. an application that has reached Acceptance state cannot be moved to a status of 'Examination Report Submitted'</p> <p>As a mature system, there is a set of data that is entered along with the status update. For the simplicity purpose, the developer is required to only create an status update with no additional data upload.</p>
Alternate Flow	In case application details are found matching in PT records, the application is moved to Cannot be filed state. No further action is possible on this application.
Output	Alert : Status is updated

Logical Object Model

A high level logical object model of the system is shown below. During technical design it will be transformed into a physical model covering all system entities. Such a diagram will include their relationship and its cardinality.



Logical Object Model

1. There are 3 types of Intellectual Property Services being handled by the company , a) Patents, b) Trademarks and c) Designs.
2. These IP Services require specific skills to handle the application handling and research in these domains for customers. The IP consultants and the QC Experts have the necessary skills to work on at least one of the services types.
3. IP consultants create IP records from the applications in various IP services. The QC experts performs the quality check on the IP records based on Critical to quality (CTQ) factors linked to each of the IP Services.
4. The CTQs are potential factors to ensure Patents and Trademark organizations across the world accept information as per certain standard. Thus its important for the IP consulting organizations to ensure CTQs are met before the applications filed with the PTOs.

Database Design Guidelines

This involves the transformation of the use cases, state diagrams, and logical object model into detailed and optimized physical database table designs.

Typically persistent classes will map to table(s) with their attributes as columns of the table. In some cases a high level object may map in to a master-child table. Invoice is one such example where it maps in to "invoice_header" and "invoice_line_item" table.

Associations between two persistent objects are realized as foreign keys to the associated objects. A foreign key is a column in one table that contains the primary key value of the associated object.

Similarly, a standard technique in relational modeling is to use an intersection entity to represent many-to-many associations. Following is a broad checklist for physical database database design:

1. Database must be properly normalized except those instances where de-normalization help improves performance. This option must be used with special care.
2. All persistent classes that use the database for persistency must map to database structures.
3. Many-to-many relationships must have an intersecting table.

4. Primary keys should be defined for each table, unless there is a performance reason not to define a primary key.
5. Indexes should be defined to optimize access.
6. Data and referential integrity constraints should be defined.

Testing Approach

Quality of the software can be achieved with basic hygiene and consistency followed during design and development of User Interface(UI), Navigation, Validations as per the business process requirement.

To ensure the project delivers acceptable quality to the customer, its important to create a checklist of the conventions to be followed across. Common checks as below are for your reference during design and development:

Common Checks	Validation Type
Page Title is valid for the feature being provided on the page	UI
Order of the Data Entry Fields is logical as per the functionality being provided by the feature	UI
Order of the Display only Fields makes viewing and understanding easy for the user	UI
Spellings and Correctness of Label for the Data Entry and Display fields	UI
The labels are not wrapping onto another row thereby adding a blank row on the page	UI
The fields with drop down are displayed in single row instead of drop down coming on the next row	UI
Data Entry field basic validations are working i.e Text field /Numbers / Dates allow data for their type only	Functional
The dates are following a standard format dd/mmm/yyyy on all forms	UI
The color scheme of all forms i.e headers labels , alerts, entry fields are uniform throughout the application	UI
The action buttons for a New Data Entry Form are uniform for all forms that is allowing data entry	UI
The action buttons are performing the desired action e.g. "submit" is creating a new record if there are no errors and recording all the input fields, whereas 'cancel' is not creating a new record in the database	Functional
The links provided on the forms are opening correctly.	Functional
The data feed mechanism for Read and Write files is generating a log with count of entries.	Navigation

Suggested Technical Reading

The project is aimed at making the student understand concepts of Design and Development using IBM Rational tools, Web Sphere Application Server and DB2 Database. The following reading reference is easy to understand and should be read to get a clear understanding of capabilities of the tools and how you would leverage them to execute a project.

Technical Reference	URL to access
RAD - Tackling challenges of software development with Rational Application Developer for WebSphere Software	http://www.ibm.com/developerworks/rational/library/08/0926_ackerman-mahate/index.html
IBM Education Assistant - Rational Application Developer 7.5	http://publib.boulder.ibm.com/infocenter/ieduasst/rtnv1r0/index.jsp?topic=/com.ibm.iea.rad_v7/rad/rad75.html

Technical Reference	URL to access
RSA-Overview of Rational Software Architect for WebSphere Software Version 7.5	http://www.ibm.com/developerworks/rational/library/08/0926_arnold/index.html
Using the new features of UML Modeler in IBM Rational Software Architect Version 7.5	http://www.ibm.com/developerworks/rational/library/08/0926_diu/index.html
Rational Technical Library	http://www.ibm.com/developerworks/rational/library/