

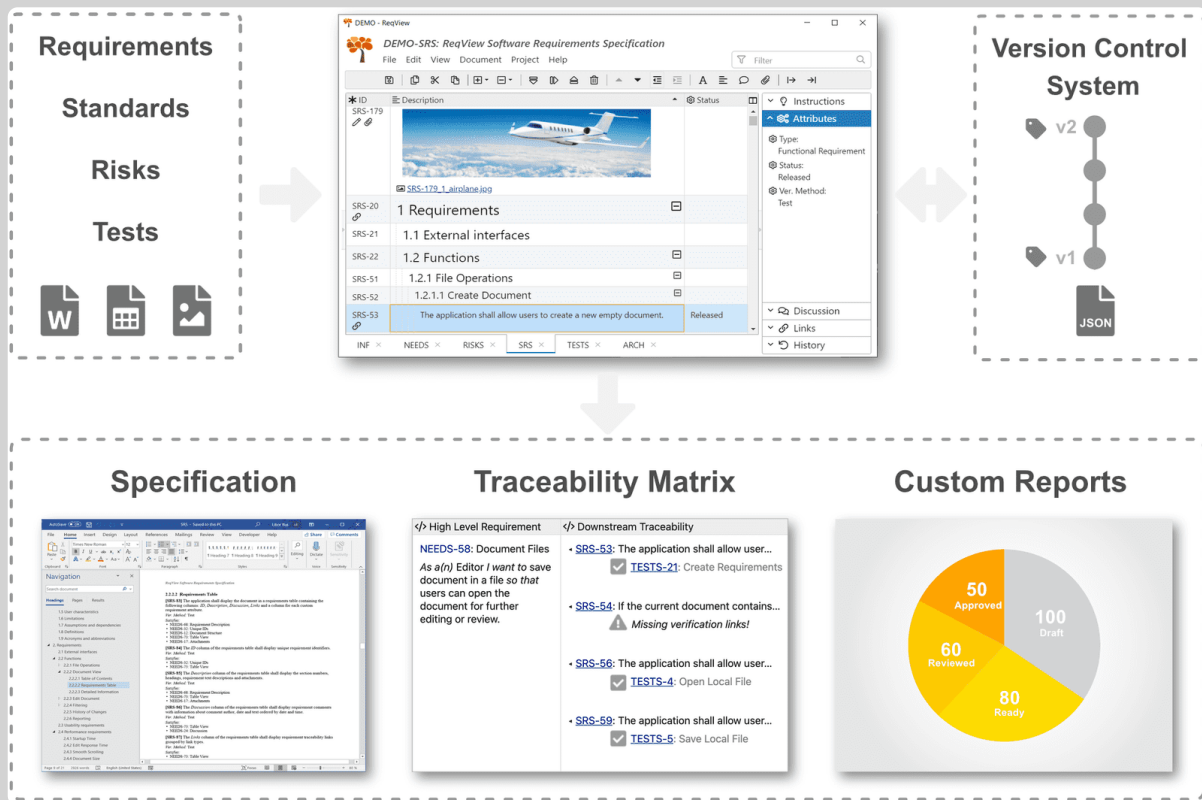
# ReqView: Manage Requirements Better Than in Excel

ReqView Team  
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## Requirements Management Tool for SW and HW Systems

With ReqView you can get started very quickly. Just import your documents then elaborate requirements, risks, and tests. As you progress, keep track of project changes in a version control system. Finally, export specifications, or traceability reports, and share them with your team.

It's all easy with ReqView!



 [Download Reqview](#)

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## Abstract

Customers managing requirements for complex SW / HW products in Excel are often facing many problems. One of the main challenges is to maintain consistent traceability links. We will show how you can solve these issues in ReqView.

For the purpose of this blog post, we have adopted a fictitious case study developed by Dan Tasker and published in the Trips-R-You Web-based Flight Reservation System Case Study [\[1\]](#) [\[2\]](#) article. The case study captures requirements for a web-based Flight Reservation System in MS Excel spreadsheets.

We will demonstrate that you can handle the same information in ReqView and take advantage of powerful requirements management features.

## Introduction

The case study describes a business information system, which maintains business-related data within a database management system (DBMS) and adds capabilities to:

- *User Interfaces* (UIs) — give online access to the stored data
- *Reports* — contain data stored in the system for referencing offline
- *Imports* — store data made available by another system
- *Exports* — store data for use by another system
- *Automated Functions* — create new data within the system based on data currently stored in the system

The case study uses three types of requirements for the above functionalities:

- *Business Requirements* — overview the problem and state business goals to be achieved
- *High-Level Requirements* — determine the chosen solution context and identify user needs (stakeholder requirements)
- *Detailed Requirements* — specify UI, report, data import, export, or automated function capabilities, and the data dictionary

## Business Requirements

We imported business requirements from the case study in document *INFO* structured as follows:

1. *Problem / Opportunity* — overview the business case and state the problem to solved
2. *Chosen Solution* — investigate potential solutions and explain reasons for the chosen solution
3. *Goals* — set business goals

## High-Level Requirements

We imported high-level requirements from the case study in document *NEEDS* structured as follows:

1. *Scope* — determine the chosen solution context by stating your assumptions, functionality in / out of scope, and draw a system context diagram
2. *High-Level Requirements* — specify user needs (stakeholder requirements)
3. *Constraints* — describe the constraints on design of the solution
4. *Concept Model* — model data entities

The following screenshot shows the table of contents of *NEEDS* document and the imported context diagram:

The screenshot displays the ReqView interface for a document titled "Trips-R-You-NEEDS: High-Level Requirements". The left sidebar shows a table of contents with the following items:

- Project
- Document
  - 1 Scope
    - 1.1 Assumptions
    - 1.2 In Scope
    - 1.3 Out of Scope
    - 1.4 Context Diagram
    - 1.5 Stakeholders
      - 1.5.1 Roles
      - 1.5.2 Contacts
  - 2 High Level Requireme...
    - 2.1 Search for Flights
    - 2.2 Obtain Scheduled Opti...
    - 2.3 Determine Appropriate...
    - 2.4 Maintain Customer
    - 2.5 Book Flights
    - 2.6 Cancel Booking
    - 2.7 Print Booking Confirma...
    - 2.8 Maintain Reference Data
    - 2.9 Booked Flights
    - 2.10 Report Sales

The main window shows the selected section "1.4 Context Diagram" with the following description:

**1.4 Context Diagram**

The diagram illustrates the "Web-based Flight Booking System" as a central system boundary. It includes the following components and interactions:

- System Boundary:** Web-based Flight Booking System
- Internal Processes:**
  - Planning a Trip
  - Maintaining Customer Details
  - Making a Booking
  - Canceling a Booking
  - Accessing Booking Confirmation
  - Finding Journey Options
  - Maintaining Reference Data
- External Stakeholders:**
  - Internet User
  - Customer
  - Global Distribution System (GDS)
  - Financial System

Interactions are shown as lines connecting the system processes to the external stakeholders. For example, "Internet User" and "Customer" interact with "Planning a Trip", "Making a Booking", and "Canceling a Booking". "Global Distribution System (GDS)" and "Financial System" interact with "Finding Journey Options", "Maintaining Reference Data", and "Accessing Booking Confirmation".

At the bottom of the diagram, it is labeled "Trips-R-You Case Study Context Diagram Version 1.1".

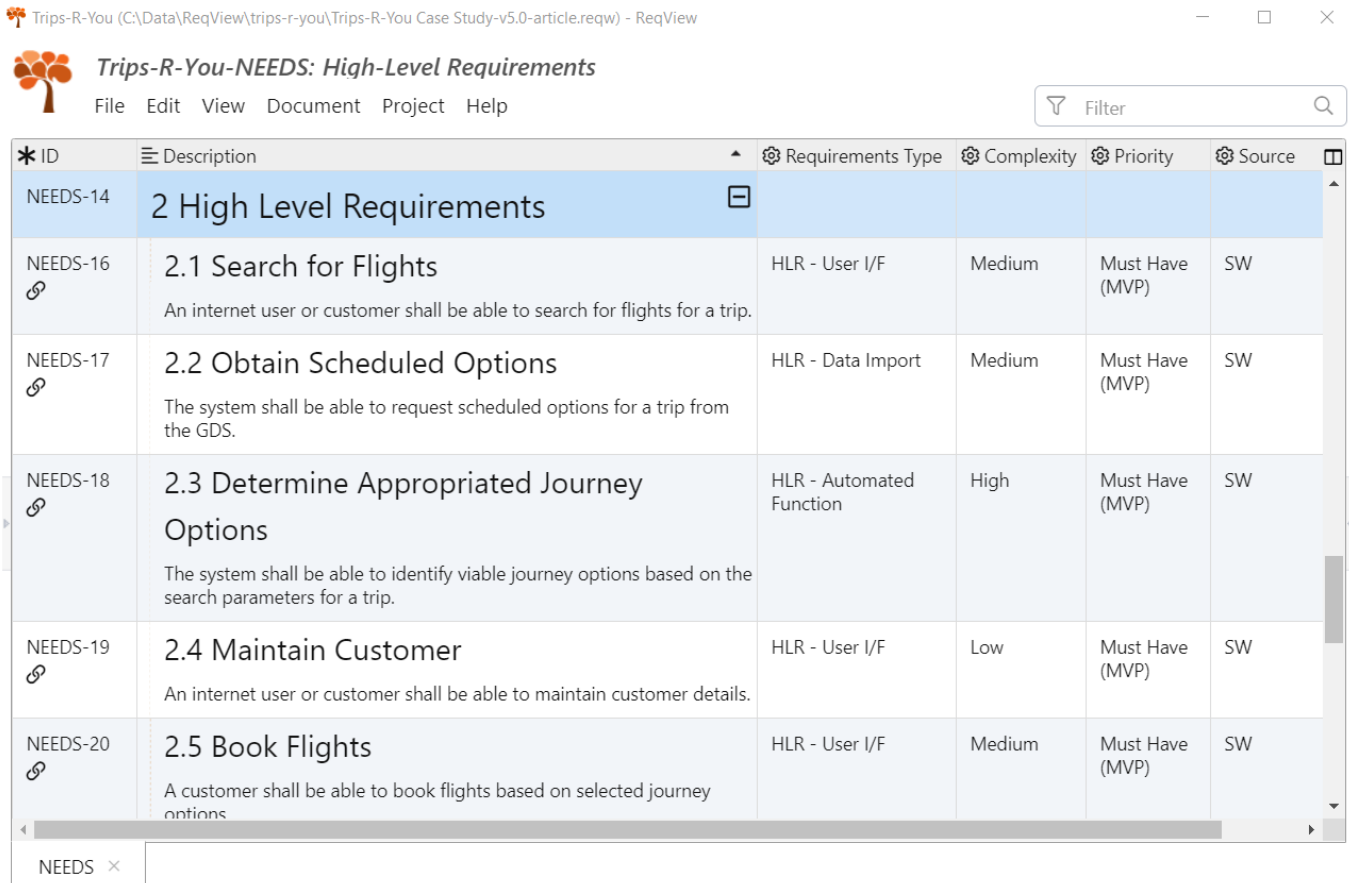
The case study stores diagrams in a separate Excel tab so users need to make an extra effort to manually locate each diagram. In ReqView, diagrams are attached as images directly into document sections allowing users to see diagrams in the right context.

We imported text descriptions of high-level requirements into the Description column in ReqView. Note that text descriptions in ReqView can include rich text format including bullet and numbered lists, code

paragraph style and URL links, which are not supported by Excel.

Additional Excel columns capturing category, complexity, priority, source, responsibility, and risk of high-level requirements are imported as custom attributes. ReqView validates values of custom attributes based on their type (string, text, number, date, etc.).

The following screenshot shows how the imported high-level requirements are displayed in ReqView:



The screenshot shows the ReqView application window titled "Trips-R-You-NEEDS: High-Level Requirements". The window contains a table with the following columns: ID, Description, Requirements Type, Complexity, Priority, and Source. The table lists several requirements, including a summary row for "2 High Level Requirements" and detailed rows for "2.1 Search for Flights", "2.2 Obtain Scheduled Options", "2.3 Determine Appropriated Journey Options", "2.4 Maintain Customer", and "2.5 Book Flights".

ID	Description	Requirements Type	Complexity	Priority	Source
NEEDS-14	2 High Level Requirements				
NEEDS-16	2.1 Search for Flights An internet user or customer shall be able to search for flights for a trip.	HLR - User I/F	Medium	Must Have (MVP)	SW
NEEDS-17	2.2 Obtain Scheduled Options The system shall be able to request scheduled options for a trip from the GDS.	HLR - Data Import	Medium	Must Have (MVP)	SW
NEEDS-18	2.3 Determine Appropriated Journey Options The system shall be able to identify viable journey options based on the search parameters for a trip.	HLR - Automated Function	High	Must Have (MVP)	SW
NEEDS-19	2.4 Maintain Customer An internet user or customer shall be able to maintain customer details.	HLR - User I/F	Low	Must Have (MVP)	SW
NEEDS-20	2.5 Book Flights A customer shall be able to book flights based on selected journey options.	HLR - User I/F	Medium	Must Have (MVP)	SW

## Detailed Requirements

The case study describes detailed requirements in a tabular form, which has some advantages compared to the traditional approach with formally stated textual requirements using shall / should form. The main advantage is that organization of related information in columns avoids repeating of boilerplate texts, increases requirements consistency, and allows users to filter relevant information when reviewing the document.

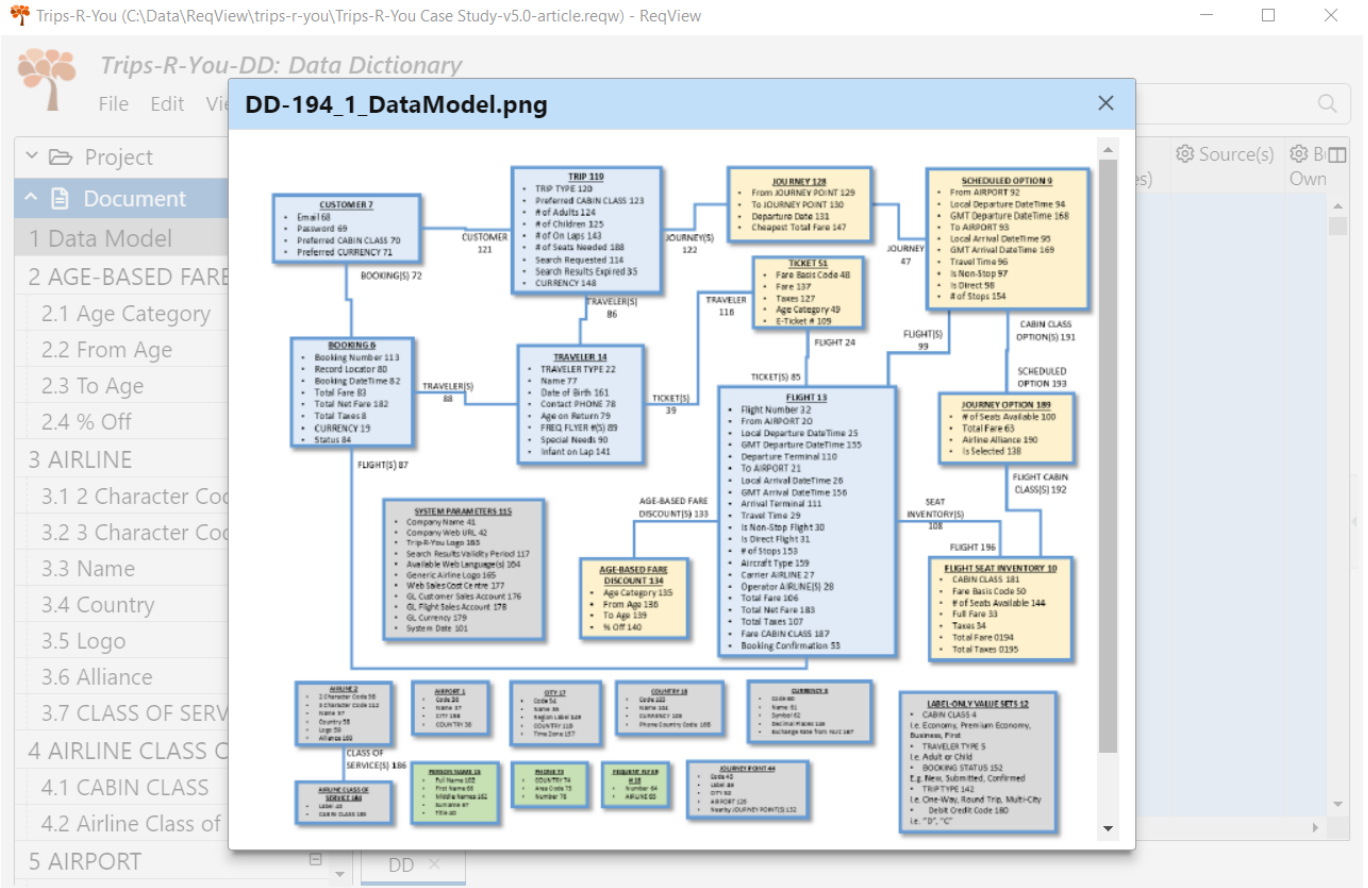
We imported detailed requirements into the following documents according to their type:

- *DD* — data processing requirements describing how data are persisted (typically in an SQL database), validated, and derived
- *UI* — user interface requirements specifying what a user sees on the screen and how they can operate the system
- *REPORTS* — requirements for visual outputs to be shared with other users or printed
- *IMPORT* — requirements for importing data from other systems
- *EXPORT* — requirements for exporting data to other systems
- *AUTO-F* — requirements for automated functions processing data without user involvement

We explain how DD and UI documents store information imported from the example spreadsheets in the next sections. The other documents are structured very similarly. Please download the example ReqView project to learn more about the content of these documents.

## Data Dictionary

Document DD starts with a visual representation of the data schema stored in the section "Data Model":



Then, it lists entries from the data model organized by records and their fields, and sorted alphabetically. The following screenshot illustrates the primary record “CUSTOMER” containing two fields “Email” and “Password”:

Trips-R-You (C:\Data\ReqView\trips-r-you\Trips-R-You Case Study-v5.0-article.reqw) - ReqView

Trips-R-You-DD: Data Dictionary

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* ID	DD Type	Description	Business Rules	Current Volume	Estimated Growth Rate	Delete Conditions	Multi Valued
DD-52	E1 - Primary Record	<p><b>10 CUSTOMER</b></p> <p>Required for an individual to be allowed to make flight bookings, get access to an itinerary for a booked trip, and if necessary, cancel a booking within the allowable timeframe.</p>	None	0	1,000/wk	Inactive for 2 years.	
DD-53	A1 - Label	<p><b>10.1 Email</b></p> <p>Used to identify a self-service Customer.</p>	Must contain exactly one "@" sign which is not the first or last character.				No
DD-54	A1 - Label	<p><b>10.2 Password</b></p> <p>Provides logon security.</p>	Must include at least one upper case letter, one lower case letter, and one numeric digit or special character. Does not expire. Standard security 'handling' (e.g. stored in an encrypted format, value not displayed once established).				No

DD x

Note the columns capturing additional details for the selected primary record — that we estimate around 1k new customer records per week, and that retention of customer records is 2 years of inactivity.

## User Interface

Document *UI* is organized by user scenarios at the top level. For each user scenario, the corresponding section provides necessary information about Subject Matter Expert (SME) questionnaires, screen flow diagrams, screen mock-ups, information of font styles and a list of screen areas and their elements.

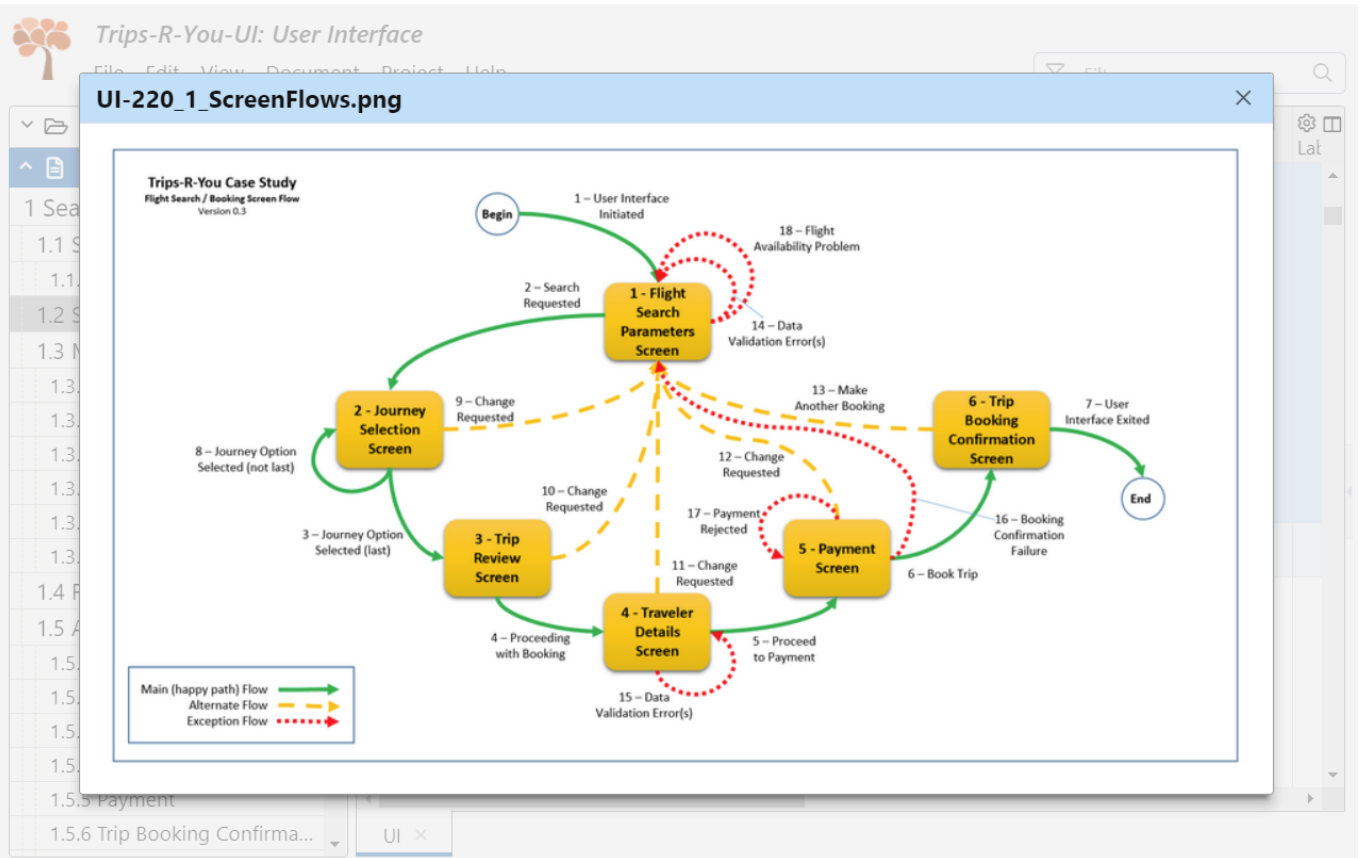
SME questionnaires can be attached as external documents, linked by a URL, or copied from Word or Excel as embedded tables. We chose the last option to display them directly in the *Description* column:

**Trips-R-You-UI: User Interface**  
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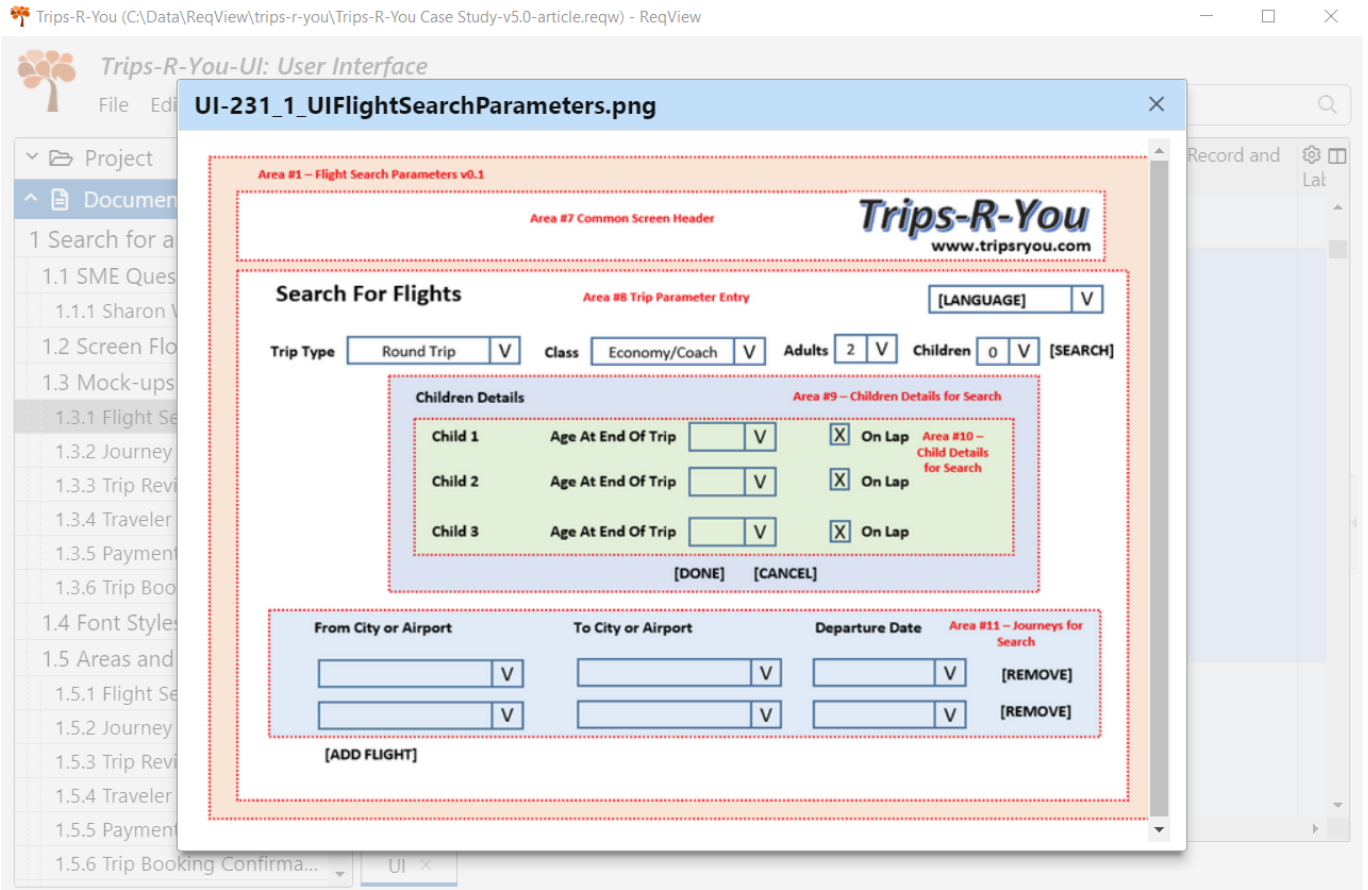
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ID	Description			
UI-227	1.1.1 Sharon Wu			
Topic	Q#	Question	Selectable Response	Written Response
User Types	1	Who is the intended use this user interface?	Customers	Also non-customers can search without booking.
Purpose	2	What is the purpose of this UI?		Allow any internet user to search for flights, and if satisfied with what they've found (and selected), they can proceed to pay for and book the flights (as a logged-on customer).
Current State	3	Select the value the best describes the current state of this UI and add additional information as appropriate.	New User Interface	
Content	4	What type of data is the primary focus of the UI?		Flights, and eventually a Booking for Travelers.
	5	Does the UI include one or more company logos? If so, which specific ones should be used?	Yes	The standard Trips-R-You web site logo.
Usage	6	For each user type named above, roughly how many individuals of each type will there be?		5,000 per year
	7	For each user type named above, give an indication of how many concurrent users there will be under normal conditions.		20 people doing searches & booking.
	8	What are the normal usage hours of usage?		24/7
	10	Are there expected to be there are peak usage	No	

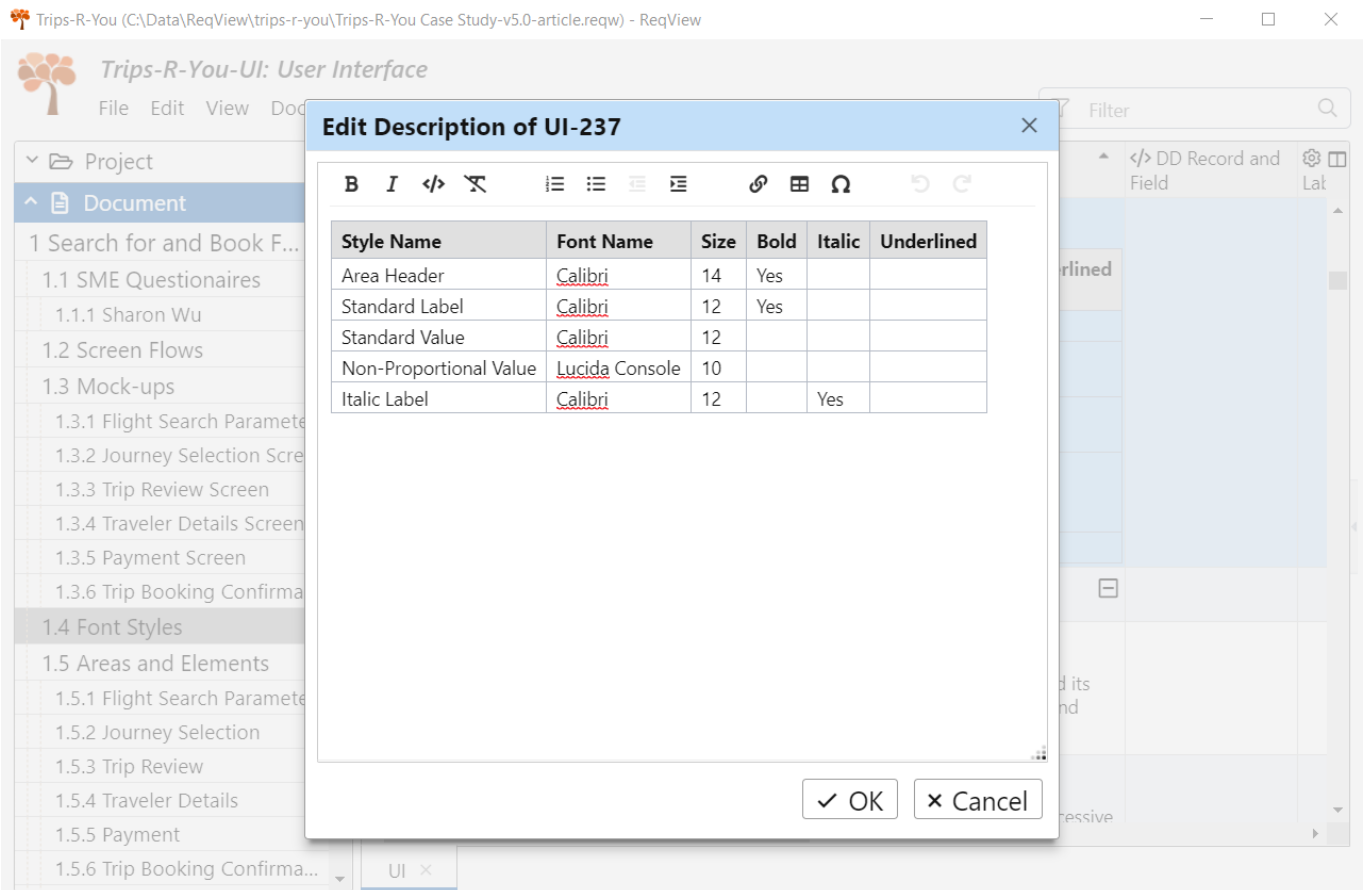
Screen flow diagrams visualize the main, alternate and exception flow through the scenario:



Visual mockups of the user interface are essential for understanding how screen areas are composed together and what their visual properties are:



Properties of used font styles are stored in the case study in a separate Excel tab, however we imported them in an embedded table to make them available in the section describing the related detailed requirement:





Finally, *UI* document lists screen areas and their elements representing fields, textual labels, and action triggers:

The screenshot shows the ReqView application window titled 'Trips-R-You-UI: User Interface'. The application has a menu bar (File, Edit, View, Document, Project, Help) and a search bar (Filter). The main content is a table with the following columns: ID, Type, Description, DD Record and Field, Displayed Label, Other Details, Font, and Justified. The table contains several rows of UI elements, including a repeating area, field/column labels, data navigation, and input fields.

ID	Type	Description	DD Record and Field	Displayed Label	Other Details	Font	Justified
UI-34	Repeating Area	1.5.10 Journeys for Search Displays a set of fields for specifying a Journey. Two when the trip type is "Round Trip". More can be added as needed when trip type is "Multi-city".					
UI-35	Field/Column Label			From City Or Airport		Standard Label	Left
UI-36	Data Navigation		<a href="#">JOURNEY.From</a> <a href="#">JOURNEY.POINT</a>				
UI-37	Input Field		<a href="#">JOURNEY</a> <a href="#">POINT.Label</a>		Includes keystroke wildcard lookup/selection list display of matching label values.	Standard Value	Left
UI-38	Field/Column Label			To City Or Airport		Standard Label	Left
UI-39	Data Navigation		<a href="#">JOURNEY.To</a> <a href="#">JOURNEY.POINT</a>				
UI-40	Input Field		<a href="#">JOURNEY</a>		Includes keystroke	Standard	Left

## Traceability Matrix

A *traceability matrix* is a table storing links between related requirement, design, and verification documents, which are maintained through SW or system development process. The main purpose of the [traceability matrix](#) is to demonstrate *requirements coverage* — that stakeholder requirements were implemented and verified, and to help with *change impact analysis* before requirements changes are accepted.

Maintenance of a traceability matrix for a larger project in Excel is very time consuming and error-prone. With ReqView you can [manage traceability](#) easily by:

- getting requirement IDs assigned automatically so you cannot change them by mistake.
- grouping links by their type (satisfaction, verification, reference, etc.) so you can filter links during traceability analysis
- creating links representing many-to-many relations between selected requirements effectively
- displaying traceability columns listing linked elements grouped by link types
- browsing traceability in both directions by clicking on a links
- adding simple rules and display a warning for requirements with missing or inconsistent links
- generating custom [traceability reports](#) to understand [requirements coverage](#) across several traceability levels

We set up requirements traceability in the Trips-R-You project as follows:

- **Satisfaction links**
  - High-Level requirements (*NEEDS*) → business goals (*INFO*)
  - Detailed requirements (*UI, REPORTS, EXPORT, IMPORT, AUTO-F*) → high-level requirements (*NEEDS*)
- **Definition links**
  - Detailed requirements (*UI, REPORTS, EXPORT, IMPORT, AUTO-F*) → data dictionary (*DD*)
- **Reference links**
  - Between related requirements in the same document

The following screenshot illustrates the content of *Links* traceability column displaying upstream business goals and downstream detailed requirements for each high-level requirement:

Trips-R-You (C:\Data\ReqView\trips-r-you\Trips-R-You Case Study-v5.0-article.reqw) - ReqView

**Trips-R-You-NEEDS: High-Level Requirements**  
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ID	Requirements Type	Description	Links
NEEDS-14		2 High Level Requirements	
NEEDS-16	HLR - User I/F	2.1 Search for Flights An internet user or customer shall be able to search for flights for a trip.	I→ Satisfies: <a href="#">INFO-5</a> Additional Net Profit →I Satisfied by: <a href="#">UI-221</a> Search for and Book Flights
NEEDS-17	HLR - Data Import	2.2 Obtain Scheduled Options The system shall be able to request scheduled options for a trip from the GDS.	I→ Satisfies: <a href="#">INFO-5</a> Additional Net Profit →I Satisfied by: <a href="#">IMPORT-36</a> Scheduled Options
NEEDS-18	HLR - Automated Function	2.3 Determine Appropriated Journey Options The system shall be able to identify viable journey options based on the search parameters for a trip.	I→ Satisfies: <a href="#">INFO-5</a> Additional Net Profit →I Satisfied by: <a href="#">AUTO-F-39</a> Finding Journey Options
NEEDS-19	HLR - User I/F	2.4 Maintain Customer An internet user or customer shall be able to maintain customer details.	I→ Satisfies: <a href="#">INFO-5</a> Additional Net Profit
NEEDS-20	HLR - User I/F	2.5 Book Flights	I→ Satisfies: <a href="#">INFO-5</a> Additional Net Profit

INFO × NEEDS × DD ×

## Conclusion

MS Excel is a popular tool for managing requirements because of its simplicity and availability. But business analysts or system engineers reach its limits soon.

By managing requirements in ReqView instead of Excel you get the following advantages:

- get unique identifiers assigned automatically
- organize rows in a tree hierarchy easily
- describe requirements using rich text format and enhance the description by attached diagrams and embedded tables
- manage consistent requirements traceability matrix with minimal effort
- generate requirements traceability reports to analyze requirements coverage
- track changes of each requirement

## Further Topics

- [End-to-end Traceability in ReqView](#)
- [Traceability Report in ReqView](#)
- [Requirements Coverage Analysis in ReqView](#)

## References

- [1] [Dan Tasker: Trips-R-You Web-based Flight Reservation System Case Study, Modern Analyst](#)  
[2] [Dan Tasker: Trips-R-You Flight Booking Case Study \(v4.0\)](#)



Download Example Project