

## 1. Problem Statement

Create a simple Contact Management System that allows CRUD operations to be performed using Blazor Server and Entity Framework Core

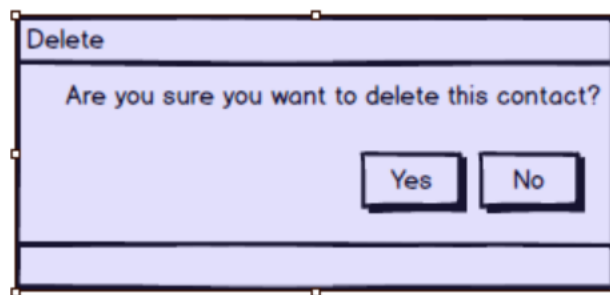
## 2. Requirements

### 2.1. Assumptions

- 2.1.1. User knows how to spring up their own server for database reading / writing.
- 2.1.2. User is using latest version of .Net and the supported IDE
- 2.1.3. Local database exists and is connected to the code

### 2.2. Specifications

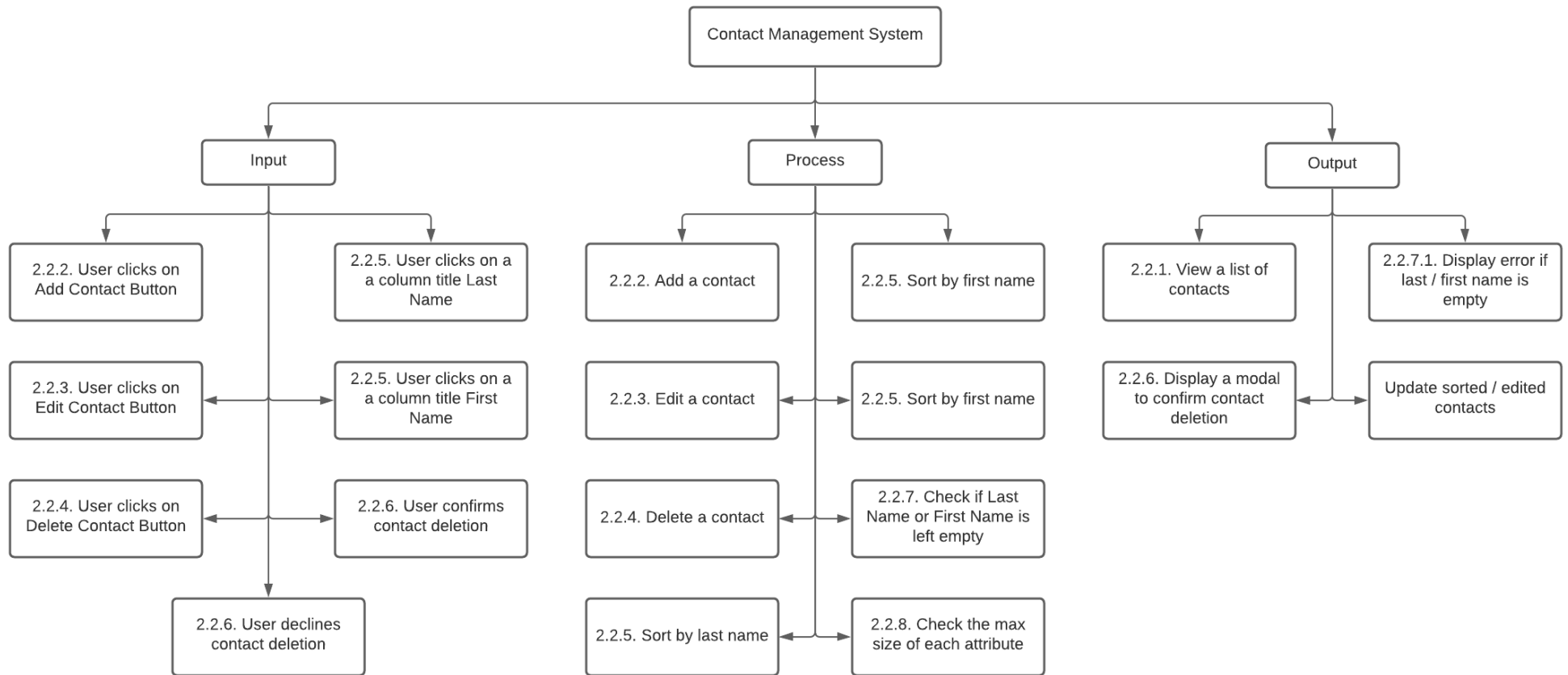
- 2.2.1. View a list of contacts
- 2.2.2. Add a contact
- 2.2.3. Edit a contact
- 2.2.4. Delete a contact
- 2.2.5. Sort lists of contacts by last name or first name
- 2.2.6. Display a modal to confirm when deleting a contact



- 2.2.7. System should not allow saving of a contact if Last Name or First Name is blank
  - 2.2.7.1. Should display an error message saying that the Last Name and the First Name are required.
- 2.2.8. Contact Entity must have these attributes:

Attribute	Data Type	Notes
Id	Guid	This is the primary key
LastName	String	250 characters max length
FirstName	String	250 characters max length
PhoneNumber	String	15 characters max length
BirthDate	DateTime	

### 3. Decomposition Diagram



#### 4. Test Strategy

- Valid Data
- Invalid Data

#### 5. Test Plan Version 1

Test Strategy	Test Number	Description	Input	Expected Output	Actual Output	Pass/Fail
Valid data	1	Adding a contact without empty fields and without exceeding max length for each attribute				
Valid data	2	Updating a contact without leaving anything empty and without exceeding max length for each attribute				
Valid data	3	Deleting a contact after user confirms deletion				
Valid data	4	Not deleting a contact after user declines confirmation				
Invalid data	5	Adding a contact while keeping first name empty				
Invalid data	6	Adding a contact while keeping last name empty				
Invalid data	7	Adding a contact while exceeding max length for last name				
Invalid data	8	Adding a contact while exceeding max length for first name				
Invalid data	9	Adding a contact while exceeding max length for phone number				
Invalid data	10	Updating a contact while keeping first name empty				
Invalid data	11	Updating a contact while keeping last name empty				
Invalid data	12	Updating a contact while exceeding				

		max length for last name				
Invalid data	13	Updating a contact while exceeding max length for first name				
Invalid data	14	Updating a contact while exceeding max length for phone number				

## 6. Initial Algorithm

- Nav Menu
  - Add Navigation for the Contact component
- Contact Info Class
  - Create a primary key int variable for contact id named Id
  - Create a String variable named LastName, FirstName, and PhoneNumber
  - Create a DateTime variable named BirthDate
  - Add getters and setters for each variable
- Contact Service Class
  - Create an object for database
  - Add a method that returns list of contacts
  - Add a method that creates a new contact
  - Add a method that return a specific contact given a contact id
  - Add a method that updates a specific contact given a contact id
  - Add a method that deletes a specific contact given a contact id
- Main Contact Class
  - Get and store a list of contacts from database
  - Create an object of Contact Info class
    - Add an async method to constantly check for updates
  - Create a Add New Contact button
    - Navigate to Add Contact component
  - Create a table to display content
    - Add column headers of Contact Id, First Name, Last Name, Phone Number, Birth Date, and Actions (Edit / Delete options)
      - Have the last name and first name headers clickable to allow sorting
    - Loop through the object of contact info and display rows all above data for each contact
    - For Actions column, have each option clickable
      - Edit option navigates to Edit Component and sends the specific contact id as reference.
      - Delete option displays a modal to confirm contact deletion
        - If user clicks yes, delete the specific contact and update table
- Add Contact Class
  - Add a form for adding a new contact
    - Add an input field for First Name, Last Name, and Phone Number
    - Add an input date field for Birth Date
    - When submit button is clicked
      - If any of the field is empty, display “[First Name / Last Name / Phone Number / Birth Date] is required”
      - If first name, last name, or phone number is more than 250 characters long, display “[First Name / Last Name / Phone Number] is too long. Try again”
      - If no error, add contact to database and navigate back to Contacts main page
- Edit Contact Class
  - Add a form for updating an existing contact

- Add an input field for First Name, Last Name, and Phone Number.
- Add an input date field for Birth Date
- Prefill all fields with currently stored data
- When update button is clicked
  - If any of the field is empty, display “[First Name / Last Name / Phone Number / Birth Date] is required”
  - If first name, last name, or phone number is more than 250 characters long, display “[First Name / Last Name / Phone Number] is too long. Try again”
  - If no error, update contact in database and navigate back to Contacts main page

## 7. Test Plan Version 2

Test Strategy	Test Number	Description	Input	Expected Output	Actual Output	Pass/Fail
Valid data	1	Adding a contact without empty fields and without exceeding max length for each attribute	Ref. 1 on next table	*Contact gets added*		
Valid data	2	Updating a contact without leaving anything empty and without exceeding max length for each attribute	Ref. 1 on next table	*Contact gets updated*		
Valid data	3	Deleting a contact after user confirms deletion	User clicks YES to delete contact	*Contact gets deleted*		
Valid data	4	Not deleting a contact after user declines confirmation	User clicks NO to cancel deleting a contact	*No change*		
Invalid data	5	Adding a contact while keeping first name empty	Ref. 2 on next table	“First name cannot be empty”		
Invalid data	6	Adding a contact while keeping last name empty	Ref. 3 on next table	“Last name cannot be empty”		
Invalid data	7	Adding a contact while exceeding max length for last name	Ref. 4 on next table	“Last name must be less than 250 characters long.”		
Invalid data	8	Adding a contact while exceeding max length for first name	Ref. 5 on next table	“First name must be less than 250 characters long.”		
Invalid data	9	Adding a contact while exceeding max length for phone number	N/A	“Phone number must be 10 digits long!”		

Invalid data	10	Updating a contact while keeping first name empty	<i>Ref. 2 on next table</i>	“First name cannot be empty”		
Invalid data	11	Updating a contact while keeping last name empty	<i>Ref. 3 on next table</i>	“Last name cannot be empty”		
Invalid data	12	Updating a contact while exceeding max length for last name	<i>Ref. 4 on next table</i>	“Last name must be less than 250 characters long.”		
Invalid data	13	Updating a contact while exceeding max length for first name	<i>Ref. 5 on next table</i>	“First name must be less than 250 characters long.”		
Invalid data	14	Updating a contact while exceeding max length for phone number	N/A	“Phone number must be 10 digits long!”		

Input Output References ( <i>For above table</i> )	
<i>Ref. 1</i>	First name: “Nisarg” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 2</i>	First name: “” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 3</i>	First name: “Nisarg” Last name: “” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 4</i>	First name: “Nisarg” Last name: “PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 5</i>	First name: “NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”

## 8. Code

Check out GitHub Repository at: <https://github.com/nisargdpatel/Contact-Management-System>

## 9. Updated Algorithm

- Nav Menu
  - Add Navigation for the Contact component
- Contact ~~Info~~ Class
  - Create a primary key int variable for contact id named Id
  - Create a String variable named LastName, FirstName, and PhoneNumber
  - Create a DateTime variable named BirthDate
  - Add getters and setters for each variable
- Contact Service Class
  - Create an object for database
  - Add a method that returns list of contacts
  - Add a method that creates a new contact
  - Add a method that return a specific contact given a contact id
  - Add a method that updates a specific contact given a contact id
  - Add a method that deletes a specific contact given a contact id
- Main Contact **Page** Class
  - Get and store a list of contacts from database
  - Create an object of Contact ~~Info~~ class
    - Add an async method to constantly check for updates
  - Create a Add New Contact button
    - Navigate to Add Contact component
  - Create a table to display content
    - Add column headers of Contact Id, First Name, Last Name, Phone Number, Birth Date, and Actions (Edit / Delete options)
      - Have the last name and first name headers clickable to allow sorting
    - Loop through the ~~object of contact info~~ **list of contacts** and display rows of all above data for each contact
      - **Display phone number in the format “(###) - ### - ####”**
    - For Actions **Edit** column, have ~~each option~~ **the edit icon on each row** clickable
      - Edit option navigates to Edit Component and sends the specific contact id as reference.
    - **For Delete column, have the delete icon on each row clickable**
      - Delete option displays **an alert modal** to confirm contact deletion
        - If user clicks **yes ok**, delete the specific contact and update table
- ~~Add~~ **New** Contact Class
  - Add a form for adding a new contact
    - Add an input field for First Name, Last Name, and Phone Number
    - Add an input date field for Birth Date
    - When submit button is clicked
      - If any of the field is empty, display “[First Name / Last Name / Phone Number / Birth Date] is required”
      - If first name, last name, or phone number is more than 250 characters long, display “[First Name / Last Name / Phone Number] ~~is too long~~ **must be less than 250 characters long**. Try again”
      - If no error, add contact to database and navigate back to Contacts main page
- ~~Edit~~ **Update** Contact Class
  - **Retrieve current contacts id that is passed in through page router link**
  - Add a form for updating an existing contact

- Add an input field for First Name, Last Name, and Phone Number.
- Add an input date field for Birth Date
- Prefill all fields with currently stored data
- When update button is clicked
  - If any of the field is empty, display “[First Name / Last Name / Phone Number / Birth Date] is required”
  - If first name, last name, or phone number is more than 250 characters long, display “[First Name / Last Name / Phone Number] is too long. Try again”
  - If no error, update contact in database and navigate back to Contacts main page

## 10. Test Plan Version 3

Test Strategy	Test Number	Description	Input	Expected Output	Actual Output	Pass/Fail
Valid data	1	Adding a contact without empty fields and without exceeding max length for each attribute	<i>Ref. 1 on next table</i>	<i>*Contact gets added*</i>	<i>*Contact gets added*</i>	Pass
Valid data	2	Updating a contact without leaving anything empty and without exceeding max length for each attribute	<i>Ref. 1 on next table</i>	<i>*Contact gets updated*</i>	<i>*Contact gets updated*</i>	Pass
Valid data	3	Deleting a contact after user confirms deletion	<i>User clicks YES to delete contact</i>	<i>*Contact gets deleted*</i>	<i>*Contact gets deleted*</i>	Pass
Valid data	4	Not deleting a contact after user declines confirmation	<i>User clicks NO to cancel deleting a contact</i>	<i>*No change*</i>	<i>*No change*</i>	Pass
Invalid data	5	Adding a contact while keeping first name empty	<i>Ref. 2 on next table</i>	“First name cannot be empty”	“First name cannot be empty”	Pass
Invalid data	6	Adding a contact while keeping last name empty	<i>Ref. 3 on next table</i>	“Last name cannot be empty”	“Last name cannot be empty”	Pass
Invalid data	7	Adding a contact while exceeding max length for last name	<i>Ref. 4 on next table</i>	“Last name must be less than 250 characters long.”	“Last name must be less than 250 characters long.”	Pass
Invalid data	8	Adding a contact while exceeding max length for first name	<i>Ref. 5 on next table</i>	“First name must be less than 250 characters long.”	“First name must be less than 250 characters long.”	Pass
Invalid data	9	Adding a contact while exceeding max length for phone number	N/A	“Phone number must be 10 digits long!”	“Phone number must be 10 digits long!”	Pass



Invalid data	10	Updating a contact while keeping first name empty	Ref. 2 on next table	“First name cannot be empty”	“First name cannot be empty”	Pass
Invalid data	11	Updating a contact while keeping last name empty	Ref. 3 on next table	“Last name cannot be empty”	“Last name cannot be empty”	Pass
Invalid data	12	Updating a contact while exceeding max length for last name	Ref. 4 on next table	“Last name must be less than 250 characters long.”	“Last name must be less than 250 characters long.”	Pass
Invalid data	13	Updating a contact while exceeding max length for first name	Ref. 5 on next table	“First name must be less than 250 characters long.”	“First name must be less than 250 characters long.”	Pass
Invalid data	14	Updating a contact while exceeding max length for phone number	N/A	“Phone number must be 10 digits long!”	“Phone number must be 10 digits long!”	Pass
Valid data	15	Sorting contact by first name	User clicks column title First Name	*Table gets sorted by first names*	*Table gets sorted by first names*	Pass
Valid data	16	Sorting contact by last name	User clicks column title Last Name	*Table gets sorted by last names*	*Table gets sorted by last names*	Pass

Input Output References ( <i>For above table</i> )	
<i>Ref. 1</i>	First name: “Nisarg” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 2</i>	First name: “” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 3</i>	First name: “Nisarg” Last name: “” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 4</i>	First name: “Nisarg” Last name: “PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel PatelPatelPatelPatelPatelPatelPatelPatelPatelPatel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”
<i>Ref. 5</i>	First name: “NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg NisargNisargNisargNisargNisargNisargNisargNisargNisargNisarg” Last name: “Patel” Phone number: “248-122-1111” Birth date: “11 / 04 / 1972”

## Add Contact

First Name

First name cannot be empty!


Last Name

Last name cannot be empty!

Phone Number

Phone number cannot be empty!

Birth Date



Add Contact

Cancel

First Name

Nisarg

Last Name

Patel

Phone Number

11122233334

Phone number must be 10 digits long!



Birth Date

10/22/1999

Add Contact

Cancel

+Add New Contact

Contact Id	First Name	Last Name	Phone Number	Birth Date	Edit	Delete
1	Nisarg	Patel	(123) - 456 - 7894	10 / 21 / 2020		
12	Penduko	Penduko	(248) - 122 - 1111	11 / 4 / 1972		
13	John	Smith	(248) - 111 - 2222	1 / 1 / 1975		

[illegible]

Birth Date

10/21/2020

October 2020

Su	Mo	Tu	We	Th	Fr	Sa
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Today

localhost:44317 says

Are you sure you want to delete the contact 'Nisarg'?

OK Cancel

A screenshot of a web application interface. On the left is a dark blue sidebar with the title 'Contact Manager' at the top. Below the title are two menu items: 'Home' with a house icon and 'Manage Contacts' with a list icon. The 'Manage Contacts' item is highlighted with a lighter blue background. The main content area on the right is white and shows a large blue plus icon followed by the text '+Add New Contact'. Below this is a horizontal line, and then the text 'Loading...' is displayed.

## 12. Error/Issues Log

Error Type / Issue	Cause of Error / Issue	Solution to Error / Issue
Validations happen after submitting	If user edits a field and suddenly clicks on the submit button without clicking outside of the input field. Validations are invoked only after user clicks out of a input field	Added validation to submit button to set a double check. Error still present.
Modal not able to be implemented for confirming contact deletion	Limited knowledge. Missing libraries.	Implemented an alert feature using JavaScript async task to confirm contact deletion

## 13. Status

Program successfully performs CRUD operations with validations and sorting features on a list of contacts stored in a local database.