BI ToolV0.1

Software Requirements Specifications

**(CEDA-NICSI-PID-NIC-BI\_V1.0-SRS0.7)**

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# Introduction

## 1.1 Project Background

Centre of Excellence for Data Analytics (CEDA) has been established under NICSI as joint initiative of NIC and NICSI to enable government departments to quick-start and fast-track the adoption of data analytics in Government. CEDA has been offering its services to various government departments at the Centre and State level, ranging from knowledge dissemination and consultancy to full analytics solution development.

In recent years, with increasing amount of data being collected, Government departments are looking forward to moving into an era of data-driven governance. In addition, the latest directive from the Office of the Hon’ble Prime Minister urging every department of the Government to establish their own performance dashboard has many departments looking for a comprehensive visualization tool which can meet their dynamic dashboarding requirements.

To meet this urgent requirement of the departments, CEDA, NICSI in collaboration with PID, NIC is coming forward to offer a business intelligence tool as a service.

## 1.2 Project Scope

The project would involve the following major activities:

* Analyse the software requirements for business intelligence and analytical dashboard preparation for Government departments.
* Prepare the SRS for the above-mentioned requirements.
* Design and develop the use cases.
* Lab testing of the software.

## 1.3 Purpose of this document

The purpose of this document is to unambiguously specify the software requirements specifications for the Project Admin, Designer and Viewer use cases of the BI tool.

## 1.4 References

NA

## 1.5 Definitions/Glossary

This section gives a glossary of terms used in the rest of the document.

| **Term** | **Description** |
| --- | --- |
| **BI Tool** | Refers to a collection of pages and content customized for managing, preparing and viewing business intelligence reports. |
| **System** | Same as BI Tool(can been used interchangeably) |
| **Actor** | A specific role assumed by a user while using the use case. |
| **Role** | A role defines what activities the actor can perform in the BI tool. |
| **Project Admin** | A role that allows an actor to perform project administration activities in the BI tool. |
| **Designer** | A role that allows an actor to design data, visuals and pages in a project in the BI tool. |
| **Viewer** | A role that allows an actor to view data, visuals and pages in a project in the BI tool. |
| **Meta Data** | Meta Data is often used to describe a piece of data. For example, the meta data for a project may include project name, project description, creator, creation date etc. |
| **User Group** | Corresponds to a group of viewers who have been assigned a common set of privileges. |

## 1.6 Structure of this document

To be described

# General Description

## 2.1 Context

CEDA, NICSI in collaboration with PID, NIC is coming forward to offer a business intelligence tool as a service. This tool is completely developed in-house and bring together the best features comparable to market leading BI tool vendors.

## 2.2 Product Functions

The tool would be a role base application and broad features associated with each role include:

1. **Project Admin**:Privilege to create and manage projects, users for data designer and viewer, assign users to projects for each department would be provided to these users.
2. **Data designer**: They would have the privilege to connect to data sources, upload flat files, prepare and modify datasets, prepare and modify visuals and pages under projects for which they are given view access to.
3. **Viewer**: They would have the privilege to view and interact with the published pages under projects for which they are given view access to. They can also download and share visuals, pages and data.

## 2.3 User Characteristics

The tool would be primarily used by all the RLBs / ULBs / Line departments, State Admins, ULB / Line Department office in the centre and state.

The Government Employees are expected to have basic working knowledge of data analysis and reporting, however they are not expected to be very familiar with data visualization and business intelligence tools. Accordingly, BI tool user interface would be designed in such a way that it is fairly simple, easy to use and self-explanatory.

## 2.4 General and Design Constraints

1. The tool would be an internet-based application which would be designed, developed and centrally hosted in open source environment in NICSI’s data centre.
2. The users would be accessing the software application using various connectivity scenarios.
3. As the application would be used by all the RLBs / ULBs / Line departments, State Admins, ULB / Line Department office in the centre and state, the no. of application users and concurrent users would be very high as mentioned in non-Functional Requirements. The software has to take into account all sorts of communication environments and slow communication links.
4. The tool would need to interoperate with other software applications as required.
5. The tool would be constrained by the minimum hardware specifications that are likely to be available in the production environment, the details of which are specified as part of Non-Functional Requirements.

## 2.5 Assumptions and Dependencies

Common features including Login, Logout, which would be used across all modules as part of the BI tool would be developed commonly and uniformly.

The availability of software applications with which BI tool would be interoperating would be crucial for smooth functioning of BI tool application.

It is assumed that the third-party tools and applications software wherever required to fulfil the functionality of **BI tool** would be available on the machines where such features would be executed. These may include data engineering tools, data analysis tools and chart libraries generated by the application. Further, a use case wise description of assumptions has been described, wherever applicable, as part of **Functional Requirements.**

*Note: At a minimum Internet Explorer 9.0 + would be required on the client machines to access the software.*

## 2.6 Acceptance Criteria

This SRS document would stand accepted once the Centre of Excellence for Data Analytics, NICSI and Panchayat Informatics Division, NIC accords a formal approval to this document.

# Functional Requirements

The functional requirements are described below in terms of use cases. A use case may be defined as a particular activity that an actor can perform. An actor is a user with a specific role. The following table gives a brief description of each use case field in the use cases:

| **Use Case Field** | **Description** |
| --- | --- |
| **Use Case ID** | An ID assigned to the use case for cross reference purposes e.g., UC 3.1.1 |
| **Use Case Name** | A Name for the Use Case such as Add User |
| **Actor(s)** | An actor is a role assumed by a user while using the use case. Since the use cases in BI v1.0 relate mainly to project administration, BI design and view activities, the three actors who will mainly participate in these use cases include **Project Admin**, **Designer** and **Viewer**. |
| **Description** | This section describes the use case in a few sentences that summarizes the interaction between the actor and the system. |
| **Pre Conditions** | This section describes the state of the system which is a pre-condition to starting the use case. |
| **Triggers** | This defines the action of the actor which starts or triggers off the Use Case. A use case may be triggered by more than one action of the actor. |
| **Normal Flow** | This section gives a textual description of a use case’s sequence of actions that has been identified as part of the normal flow. Generally, simple deviations will be defined “inline” within the normal flow itself. |
| **Alternative Flow** | If there are major deviations from the normal flow of events, then they are described here as Alternative Flow. |
| **Post Conditions** | This is a description of the state of the system after the successful completion of the use case. |
| **Exceptions** | This section describes the interaction between the actor and the system whenever an exception/error condition is raised by the system. Only exceptions that are unique to the use case are detailed here. |
| **Business Rules** | Any business rules that need to incorporated as part of the use case at the time of implementation. |
| **Relationships** | This section defines the relationships that the use case has with other use cases. The relationships have been defined in terms of three types:  **Extends** – This relationship means that the use case that is being described extends the functionality of the use cases that are listed under this heading. Invariably, the extended functionality is optional and the user may or may not use it.  **Is Extended By –** Under this heading are listed the use cases that extend the functionality of this use case, implying that these use cases may be optionally executed while executing the current use case.  **Uses** – This relationship means that the use case being described always uses the use case listed under this heading to complete its functionality. |
| **Special Requirements** | These are primarily non-functional requirements that are related to the use case and that need to be handled in subsequent stages such as analysis, design or implementation. |
| **Assumptions** | Any assumptions that are made about the environment such as hardware, software, network connectivity, user capabilities etc. in which the software is expected to operate and which are necessary for the successful execution of the use case. |

**Table 3.0 Use Case Fields and their Descriptions**

## 3.1 Project Admin Use Cases

### UC 3.1.1 Project Admin Home Page

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to view the home page on login. |
| **Pre Conditions**   1. The actor has a valid login. |
| **Triggers**   1. The actor has logged into the system. |
| **Normal Flow**   1. System should display the BI Tool name on the top left corner and 3 menu item buttons below it: Home, Users, User Groups and Projects. 2. On top of the main section (right), system should display one icon on the left side (a 3 line menu icon) and 2 icons on the right side (theme and user name). 3. At the centre of the main section (right), system should display the following message:   *Welcome*  *Get going with a complete range of graphical and SQL data preparation capabilities to join, filter and aggregate data. A plethora of chart types support a wide variety of visualizations and dashboards. User group security enables seamless control of access rights over data and visuals.*   1. Clicking on the 3 line menu item should toggle display of the left side menu items. 2. On the theme icon, the system should display the current selected theme. 3. On clicking the same, the system should display the alternative options available for theme and allow actor to select any of the same. 4. If actor selects any theme, system should update the theme of all elements on the screen. 5. On next and subsequent logins, system should display last updated themes. 6. On clicking the user name icon, the system should display 3 options: Profile, Change Password and Logout. 7. On clicking the Profile option, the system should display the user profile (full name, email id, mobile number) and allow user to change details other than email id. 8. On clicking the Change Password option, the system should ask user to enter the current password for confirmation followed by entering the new password two times for confirmation. 9. Password characters should not be visible. 10. If the password criteria are fulfilled, system should allow password to be reset. 11. On next and subsequent logins, system should allow actor to login only on entry of new password. 12. System should display the Create New Project and Manage Projects options if the actor right clicks on the Projects menu item. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**   1. System should not allow password reset if actor enters incorrect current password or enters new password same as current password or does not provide new password of adequate strength or enters mismatched values for the two new password fields. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.2 View Users

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to view users they have added to the tool. |
| **Pre Conditions**   1. The actor has logged into the system. |
| **Triggers**   1. Actor clicks the Users menu option displayed on the left side menu. |
| **Normal Flow**   1. System should display a screen with heading Users and display a table with following format (sample dummy data displayed below):  |  |  |  |  |  | | --- | --- | --- | --- | --- | | Name | Email | Contact No. | Created on | Actions | | A | a@mail.com | 9XXXXX8325 | DD/MM/YYYY |  | | B | b@mail.com | 9XXXXX3446 | DD/MM/YYYY |  |  1. System should paginate the results and allow actor to select items to display per page from 5, 10, 20 or 100. 2. System should allow actor to sort the list based on any column in ascending or descending order. 3. System should also display a search option to allow text search across all the columns. 4. System should also display 2 buttons: Add User and Close. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.3 Add User

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to add a user. |
| **Pre Conditions**   1. The actor has logged into the system. |
| **Triggers**   1. Actor selects the Add User button displayed in the View Users screen. |
| **Normal Flow**   1. System should display a form with heading Create User, running text form fields Full Name, Email ID and Mobile Number, a dropdown list Role and a button Close. 2. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), hyphens, apostrophes and spaces in the Full Namefield. 3. System should allow actor to enter up to 100 characters consisting of any combination of valid email identifiers in the Email ID field. 4. System should allow actor to enter 10 numbers in the Mobile Number field. 5. System should display two values: *Viewer* and *Designer* in the Role dropdown list. 6. System should allow actor to select one or both values in the Role dropdown list. 7. System should make it mandatory to enter the Full Name, Email ID and Role. 8. Mobile number is not mandatory, but if provided should be exactly 10 numbers for submission. 9. If actor enters valid values in Full Name, Email ID, Mobile Number and at least one value in Role, system should allow actor to save the form. |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action if actor selects the Close button. 2. System should add details of a new user if actor provides valid details. 3. If user has been assigned *Designer* role, System should display the user’s Full Name in the Assign Users pop-up in Manage Projects screen for all projects created by actor. 4. System should allow new user to login with the provided Email ID and default password. |
| **Exceptions**   1. System should not allow form submission if actor does not provide valid Full Name, Email ID or Role. 2. System should not allow form submission if actor enters between 1 and 9 numbers in the Mobile Number field. 3. System should not allow form submission if entered Email ID is found duplicate of an existing user’s Email ID. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.4 Modify User Details

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to modify an existing user’s details. |
| **Pre Conditions**   1. The actor has created at least one user. |
| **Triggers**   1. Actor selects the Edit icon displayed against a user record in the View Users screen. |
| **Normal Flow**   1. System should display a form with heading Modify User Details, running text form fields Full Name, Email ID and Mobile Number, a dropdown list Role and a button Close. 2. System should display the Full Name, Email ID and Role values provided at the time of last form submission. 3. If actor had provided Mobile Number at the time of last submission, system should display it as well. 4. System should allow actor to change the Full Name and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), hyphens, apostrophes and spaces. 5. System should not allow actor to change the Email ID field. 6. System should allow actor to change the Mobile Number and enter 10 numbers. 7. If actor had only selected one Role value at the time of last submission, system should allow actor to add the other Role value as well. 8. If actor had only selected one Role value at the time of last submission and if no project is assigned to the user for that Role value, system should allow actor to change to the other Role value (i.e., System should allow actor to remove the first role and add the second one in the same step before form submission). 9. If actor had selected both Role values at the time of last submission and no project is assigned to the user for either Role value, system should allow actor to remove one (either of the two) of the values and submit the form. 10. If actor had selected both Role values at the time of last submission and a project is assigned to the user for one of the Role values but not the other, system should allow actor to remove the value for which no project is assigned and submit the form. 11. System should make it mandatory to enter the Full Name and Role. 12. Mobile number is not mandatory, but if provided should be exactly 10 numbers for submission. 13. If actor enters valid values in Full Name, Mobile Number and at least one value in Role, system should allow actor to save the form |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action (user details should remain unchanged) if actor selects the Close button. 2. System should update details of the user if actor provides valid details and submits the form. 3. If user has been assigned *Designer* role, system should display the user’s updated Full Name in the Assign Users pop-up in Manage Projects screen for all projects created by actor. 4. No change should happen to user credentials (provided Email ID and password). |
| **Exceptions**   1. System should not allow form submission if actor does not provide valid Full Name or Email ID. 2. System should not allow form submission if actor tries to remove one or both Role values from a user which had one Role value at the time of last submission and a project is already assigned for the Role value(s). |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.5 View User Groups

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to manage user groups. |
| **Pre Conditions**   1. The actor has logged into the system. |
| **Triggers**   1. Actor clicks the User Groups menu option displayed on the left side menu. |
| **Normal Flow**   1. System should display a form with the heading View User Groups and list each user group created by the actor as a large folder icon on the screen. 2. System should display two buttons Add User Group and Close on the right side top and bottom of the screen respectively. 3. System should display the user groups in alphabetical order. 4. Each user group folder icon should display the user group Name below the icon. 5. System should also display action options as ellipsis (3 dots) next to the user group Name. 6. If the actor clicks on the ellipsis, the system should display the options: Manage Users. 7. Actor should be able to select the Manage Users option. 8. If the actor selects Close, the system should close the form and redirect to the actor’s home page. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.6 Create User Group

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to create a new user group. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.7 Edit User Group

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to edit an existing user group. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### 

### UC 3.1.8 Delete User Group

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to delete a user group. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.9 Manage Projects

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to manage projects. |
| **Pre Conditions**   1. The actor has logged into the system. |
| **Triggers**   1. Actor selects the Manage Projects option displayed by right clicking on the Projects menu item. |
| **Normal Flow**   1. System should display a form with the heading Manage Projects and list each project created by the actor as a large folder icon on the screen. 2. System should display a Close button on the right side of the screen. 3. System should display the projects in alphabetical order. 4. Each project folder icon should display the Project Name below the icon. 5. System should also display project options as ellipsis (3 dots) next to the Project Name. 6. If the actor clicks on the ellipsis, the system should display the options: Status, Assign Users, Assign User Groups and Page Order and Status. 7. Actor should be able to select any of the options 8. If the actor selects Close, the system should close the form and redirect to the actor’s home page. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.10 Create New Project

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to create a new project. |
| **Pre Conditions**   1. The actor has logged into the system. |
| **Triggers**   1. Actor selects the Create New Project option displayed by right clicking on the Projects menu item. |
| **Normal Flow**   1. System should display a form with the heading Create Project, 2 running text fields Project Nameand Project Description and 3 buttons Create, Reset and Cancel. 2. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces in the Project Namefield. 3. System should allow actor to enter up to 1000 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens, single quotes, double quotes, round brackets, dots, commas and spaces in the Project Description field. 4. If the actor selects the Create button after entering a value in the Project Namefield which does not conflict with points 5 and 6 above, the system should save the project, close the form, and display the created project in the appropriate alphabetical position under the Projects menu item. 5. If the actor clicks the Reset button, system should display a pop-up message “Are you sure you want to reset the form?” with buttons Yes and No. 6. If the actor selects No, the system should retain the form with entered details. 7. If the actor selects Yes, the system should clear the form. 8. If the actor clicks the Cancel button, system should display a pop-up message “Are you sure you want to cancel the project creation?” with buttons Yes and No. 9. If the actor selects No, the system should retain the form with entered details. 10. If the actor selects Yes, the system should close the form and not create a new project. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The entered project details should be saved in the database if actor selects the Create button with valid details. 2. Project details should not be saved in the database if actor selects the Close button followed by Yes. |
| **Exceptions**   1. System should not allow form submission if the actor clicks the Create button without entering anything other than space characters in the Project Namefield. 2. If the actor selects the Create button after entering the same value in the Project Namefield as another project (excluding any lagging and leading space characters for matching) created by the same actor, the system should display an error message, “A project with the same name already exists” next to the field. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.11 Edit Project

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to edit a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Edit Project option displayed by right clicking on a project. |
| **Normal Flow**   1. System should display a form with the heading Edit Project, 2 running text fields Project Nameand Project Description and 3 buttons Create, Reset and Cancel. 2. System should display the values in the Project Name and Project Description fields as entered by the actor at the time of last save. The Project Description field can be blank if no value was entered by the actor at the time of the last save. 3. System should allow actor to change the Project Name field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. System should allow actor to change the Project Description field and enter up to 1000 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens, single quotes, double quotes, round brackets, dots, commas and spaces. 5. If the actor clicks the Save button after entering a value in the Project Name field which does not conflict with points 5 and 6 above, the system should save the project, close the form, and display the edited project in the appropriate alphabetical position under the Projects menu item. 6. If the actor clicks the Reset button, system should display a pop-up message “Are you sure you want to reset the form?” with buttons Yes and No. 7. If the actor selects No, the system should reset the form and display the values in the Project Name and Project Description fields as entered by the actor at the time of last save. 8. If the actor selects Yes, the system should clear the form. 9. If the actor clicks the Cancel button, system should display a pop-up message “Are you sure you want to cancel the changes?” with buttons Yes and No. 10. If the actor selects No, the system should retain the form with entered details. 11. If the actor selects Yes, the system should close the form and leave the project as it is. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The modified project details should be saved in the database if actor selects the Save button with valid details. 2. Project details should not be modified in the database if actor selects the Close button followed by Yes. |
| **Exceptions**   1. If the actor clicks the Save button without entering anything other than space characters in the Project Name field, the system should display an error message, “Please enter a name for the project” next to the field. 2. If the actor clicks the Save button after entering the same value in the Project Name field as another project (excluding any lagging and leading space characters for matching) created by the same actor, the system should display an error message, “A project with the same name already exists” next to the field. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.12 Delete Project

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to delete a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Delete Project option displayed by right clicking on a project. |
| **Normal Flow**   1. System should display a pop-up message “Warning! Deleting the project will also delete associated visuals, pages and connections to underlying data sources / data sets. Are you sure you wanted to proceed?” with buttons Yes and No. The system should also display a Close button on the pop-up. 2. If the actor clicks on the No or Close buttons, the system should not take any action. 3. If the actor selects Yes, the system should delete the project along with associated visuals, pages and connections to associated data sources / data sets. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should not take any action if actor selects the No or Close buttons. 2. The system should delete the project along with associated visuals, pages and associated data sources / data sets from the database if actor selects the Yes button. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.13 Assign Users

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to assign users with *Designer* Role to a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Assign Users option displayed on the ellipsis on a project in the Manage Projects screen. |
| **Normal Flow**   1. System should display a pop-up with the list of users (Displaying their Full Name as in the View Users screen) with the *Designer* Role. 2. System should also display a Save and Close button on the pop-up. 3. System should display an option to select / deselect against each user entry. 4. System should display the list in alphabetical order. 5. System should not display any user as selected if the actor has not assigned any *Designer* users to the project earlier. 6. System should display the assigned user(s) as selected if the actor has assigned at least one *Designer* user to the project in the previous submission. 7. System should allow actor to select / deselect any of the users. 8. System should allow actor to close the form without selecting any user if the actor has not assigned any *Designer* users to the project earlier. 9. System should allow actor to Save the form after selecting at least one user if the actor has assigned at least one *Designer* user to the project already in the previous submission. 10. If the actor clicks on the Save button after making allowed changes, the system should save any changes made by the actor. 11. System should not make any change if actor selects the Close buttons. |
| **Alternative Flow**  None |
| **Post Conditions**   1. For the assigned users, system should display the assigned project in the menu tree hierarchy. |
| **Exceptions**   1. System should not allow actor to close the form without selecting at least one user if the actor has assigned at least one *Designer* user to the project already in the previous submission. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.14 Change Page Order

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to change displayed order of pages in a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Page Order option displayed on the ellipsis on a project in the Manage Projects screen. |
| **Normal Flow**   1. System should display a pop-up with the list of pages in the project. 2. System should also display a Close button on the pop-up. 3. System should display a message ‘No Pages” if no page exists for the project. 4. If actor has not opened the Page Order option at all before this time, system should display the list in alphabetical order. 5. If more than one page exists for the project and actor has opened the Page Order option at least once earlier, system should display the list in order set by actor at the time of last close. 6. If more than one page exists for the project and actor has opened the Page Order option at least once earlier but added new pages since the last time, system should display the list in order set by actor at the time of last close for the pages that were already existed at that time and list any new pages in alphabetical order below the already existing pages. 7. If more than one page exists for the project, actor should be able to drag and move any of the pages up or down as desired. 8. If the actor clicks on the Close button after making allowed changes, the system should save any changes made by the actor. 9. System should not take any action if actor selects the Close buttons without making any change. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should not take any action if actor selects the Close button without making any change. 2. In project preview, system should display the project pages in order set by actor. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.15 Assign User Groups to Project

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to assign user groups to a project. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### 

### UC 3.1.16 Change Project Status

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to change the status of a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Assign Users option displayed on the ellipsis on a project in the Manage Projects screen. |
| **Normal Flow**   1. System should display a pop-up with the options *Activate, Deactivate, Publish, Unpublish*. 2. System should also display a Close button on the pop-up. 3. System should display the option that was selected by actor at the time of last close. 4. System should allow actor to select any single value from the listed options. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should set the project status as per actor’s selection. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.1.17 Set Group Permissions

|  |
| --- |
| **Actor(s)**  Project Admin |
| **Description**  This use case allows the actor to change the status of a project. |
| **Pre Conditions**   1. The actor has logged into the system and created at least one project. |
| **Triggers**   1. Actor selects the Assign Users option displayed on the ellipsis on a project in the Manage Projects screen. |
| **Normal Flow**   1. System should display a pop-up with the options *Activate, Deactivate, Publish, Unpublish*. 2. System should also display a Close button on the pop-up. 3. System should display the option that was selected by actor at the time of last close. 4. System should allow actor to select any single value from the listed options. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should set the project status as per actor’s selection. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

## 3.2 Designer Use Cases

### UC 3.2.1 Designer Home Page

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to view the home page on login. |
| **Pre Conditions**   1. The actor has a valid login. |
| **Triggers**   1. The actor has logged into the system. |
| **Normal Flow**   1. System should display the BI Tool name on the top left corner and 2 menu item buttons below it: Home and Projects. 2. On top of the main section (right), system should display one icon on the left side (a 3 line menu icon) and 2 icons on the right side (theme and user name). 3. At the centre of the main section (right), system should display the following message:   *Welcome*  *Get going with a complete range of graphical and SQL data preparation capabilities to join, filter and aggregate data. A plethora of chart types support a wide variety of visualizations and dashboards. User group security enables seamless control of access rights over data and visuals.*   1. Clicking on the 3 line menu item should toggle display of the left side menu items. 2. On the theme icon, the system should display the current selected theme. 3. On clicking the same, the system should display the alternative options available for theme and allow actor to select any of the same. 4. If actor selects any theme, system should update the theme of all elements on the screen. 5. On next and subsequent logins, system should display last updated themes. 6. On clicking the user name icon, the system should display 3 options: Profile, Change Password and Logout. 7. On clicking the Profile option, the system should display the user profile (full name, email id, mobile number) and allow user to change details other than email id. 8. On clicking the Change Password option, the system should ask user to enter the current password for confirmation followed by entering the new password two times for confirmation. 9. Password characters should not be visible. 10. If the password criteria are fulfilled, system should allow password to be reset. 11. On next and subsequent logins, system should allow actor to login only on entry of new password. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**   1. System should not allow password reset if actor enters incorrect current password or enters new password same as current password or does not provide new password of adequate strength or enters mismatched values for the two new password fields. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.2 Navigate Menu

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to navigate through the projects hierarchy.  System should display all existing projects, their hierarchical data sources, visuals and pages.  Actor should get options to add new data sources, visuals and pages.  Actor should also get options to edit data sources, visuals and pages. |
| **Pre Conditions**   1. The actor has a valid login. |
| **Triggers**   1. Actor logs in to the system. |
| **Normal Flow**   1. System should display the Projectsmenu tree hierarchy item on the left hand side of the screen.   Projects   1. The Projects menu item should be contracted by default. 2. Actor should be able to contract and expand the Projects menu item. 3. On expanding the Projects menu item, the system should display in alphabetical order all projects for which the actor is assigned as a *Designer*. 4. On expanding any project, the system should display the Data Preparation, Visuals and Pages menu items.   Data Preparation   1. The Data Preparation menu item should be contracted by default. 2. Actor should be able to expand and contract the Data Sources menu item. 3. System should display the Connection, Data Joining Wizard, Query Wizard, Advanced Query and Data Sets options if the actor expands the Data Sources menu item.   Visuals   1. The Visuals menu item should be contracted by default. 2. System should display the Create New Visual and Paste Copied Visual options if the actor right clicks on the Visuals menu item. 3. The Paste Copied Visual option should be disabled if no visual has been copied to the clipboard from within the project. 4. Actor should be able to expand and contract the Visuals menu item. 5. On expanding the Visuals menu item, the system should display all visuals created under the project in alphabetical order. 6. System should display the Edit Visual, Copy Visual and Delete Visual options if the actor right clicks on any visual.   Pages   1. The Pages menu item should be contracted by default. 2. System should display the Create New Page and Paste Copied Page options if the actor right clicks on the Pages menu item. 3. The Paste Copied Page option should be disabled if no page has been copied to the clipboard from within the project. 4. Actor should be able to expand and contract the Pages menu item. 5. On expanding the Pages menu item, the system should display all pages created under the project in alphabetical order. 6. System should display the Edit Page, Copy Page and Delete Page options if the actor right clicks on any page. |
| **Alternative Flow**  None |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.3 View Data Connections

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to connect to data. |
| **Pre-Conditions**   1. Actor must log into the system with the valid Login ID and password and the actor should have access to at least 1 project into the tool. |
| **Triggers**   1. Actor selects the *Connect to Data* option under the *Data Preparation* in a respective PROJECT from the left-hand side menu. |
| **Normal Flow**  The system would prompt the actor to do the following tasks.   1. The Actor chooses the desired project from Left Menu in which user wants to upload the DATA PREPARATION 🡪 UPLOAD DATA 🡪 RIGHT CLICK🡪 CONNECT 2. As the actor clicks on the CONNECT, the actor would be able to see the various connection types fields on the Data Upload screen. 3. Three different tabs to distinguish the upload data type. i.e. SQL Connection, Flat File connection and HDFS. 4. As the actor selects the **SQL Connection** tab, the actor must be able to see and perform various operations. These are 5. A Search box to search any existing connection from already created connections. 6. The actor would be able to see the details of already connected data source in a tabular format such as:  |  |  |  |  |  | | --- | --- | --- | --- | --- | | Server Name | Data Base Name | User Name | Status  (Active/Inactive) | Edit Data Source | |  |  |  |  |  |  1. The actor should be able to see a button on the screen for ADDING A NEW DATA SOURCE. |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules** |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.4 Connect to Data

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to connect with the SQL/Flat file data sources into ACIES BI tool and allows the user to perform various operations. The actor would specify the connection type as SQL connection, Flat File connection, HADOOP distributed File System etc. In SQL connection. In the connection of flat file, the actor would be able to upload data either from csv, xls, json or xml files. In HDFS, the actor would be able to connect with HDFS and can upload the data. The uploaded data sets can be used in the visual creation by the visual designer. |
| **Pre-Conditions**   1. Actor must log into the system with the valid Login ID and password and the actor should have access to at least 1 project into ACIES. |
| **Triggers**   1. Actor selects the *Connect to Data* option under the *Data Preparation* in a respective PROJECT from the left hand side menu. |
| **Normal Flow**  The system would prompt the actor to do the following tasks.   1. The Actor chooses the desired project from Left Menu in which user wants to upload the DATA PREPARATION 🡪 UPLOAD DATA 🡪 RIGHT CLICK🡪 CONNECT 2. As the actor clicks on the CONNECT, the actor would be able to see the various connection types fields on the Data Upload screen. 3. Three different tabs to distinguish the upload data type. i.e. SQL Connection, Flat File connection and HDFS 4. As the actor selects the **SQL Connection** tab, the actor must be able to see and perform various operations. These are 5. A Search box to search any existing connection from already created connections. 6. The actor would be able to see the details of already connected data source in a tabular format such as:  |  |  |  |  |  | | --- | --- | --- | --- | --- | | Server Name | Data Base Name | User Name | Status  (Active/Inactive) | Edit Data Source | |  |  |  |  |  |  1. The actor should be able to see a button on the screen for ADDING A NEW DATA SOURCE 2. The Actor chooses the desired project from Left Menu in which user wants to upload the DATA PREPARATION 🡪 UPLOAD DATA 🡪 RIGHT CLICK🡪 CONNECT 3. As the actor clicks on the CONNECT, the actor would be able to see the various connection types fields on the Data Upload screen. 4. Three different tabs to distinguish the upload data type. i.e. SQL Connection, Flat File connection and HDFS. 5. As the actor selects the **SQL Connection** tab, the actor must be able to see and perform various operations. These are 6. A Search box to search any existing connection from already created connections. 7. The actor would be able to see the details of already connected data source in a tabular format such as:  |  |  |  |  |  | | --- | --- | --- | --- | --- | | Server Name | Data Base Name | User Name | Status  (Active/Inactive) | Edit Data Source | |  |  |  |  |  |  1. The actor should be able to see a button on the screen for ADDING A NEW DATA SOURCE 2. As the actor clicks on the Add new Data Source, it will redirect the actor on the adding data source connection page and user should get asked the below mentioned fields  * **Source Type:** The actor should be able to select the Source Type from the source type drop down such as MySQL, POSTGRESQL and SQL SERVER * **Server Name:** The user should be able to enter the valid server details * **Database Name:** The actor should be able to enter the database name * **Port Number:** The actor should be able to enter the port number maximum length of 4 characters * **User Name:** The actor must able to enter the valid user name * **Password:** The actor should be able to enter the password and the password should not be visible to end user  1. If actor selects the **Flat File Connection**, the system should display the following options to connect the data  * *CSV / Text*: * *Excel* * *JSON* * *XML*   If actor selects the CSV/TEXT file from the drop down, then:   1. System should display additional form elements Browse (browse to system files option), Column names in first row (checkbox), Delimiter (dropdown list) and Encoding (dropdown list) between the Data Source Type and Connect fields. 2. The Browse field should be displayed with a field that allows typing a file path and name or browsing to select a file of either “.txt” or “.csv” format. 3. The Column names in first row checkbox should be selected by default. Actor should be able to uncheck or check the checkbox. 4. System should allow actor to select one value from a dropdown list displaying 5 values: *Comma*, *Pipe*, *Semicolon*, *Space*, and *Tab* in the Delimiter field. *Comma* should be selected by default. 5. If the actor clicks the Connect button without selecting a file with valid extension using the Browse field, the system should display an error message, “Please select a valid file source” next to the field. 6. If the actor clicks the Execute button without selecting a value in the Delimiter field, the system should display an error message, “Please select the file delimiter” next to the field. 7. If the selected file is not readable by the system (due to a corrupt file or a file having invalid encoding), the system should display an error message, “The selected file is not readable” next to the Browse field. 8. If the connection fails due to any other error (such as a network error), system should display an error message, “File was not accessible due to network or other error. Please try again.”   If actor selects *Microsoft Excel*:   1. System should display additional form elements Browse (browse to system files option) and Column names in first row (checkbox) between the Data Source Type and Connect fields. 2. The Browse field should be marked as mandatory with a \* mark. 3. The Browse field should be displayed with a field that allows typing a file path and name or browsing to select a file of either “.xls”, “.xlsx”, or “.xlsm” formats. 4. The Column names in first row checkbox should be selected by default. Actor should be able to uncheck or check the checkbox. 5. If the actor clicks the Connect button without selecting a file with valid extension using the Browse field, the system should display an error message, “Please select a valid file source” next to the field. 6. If the selected file is not readable by the system (due to a corrupt file), the system should display an error message, “The file is not readable” next to the Browse field. 7. If the connection fails due to any other error (such as a network error), system should display an error message, “File was not accessible due to network or other error. Please try again.”   **If actor selects *JSON*:**   1. System should display additional form elements Browse (browse to system files option) and Column names in first row (checkbox) between the Data Source Type and Connect fields. 2. The Browse field should be marked as mandatory with a \* mark. 3. The Browse field should be displayed with a field that allows typing a file path and name or browsing to select a file of JSON format   **If actor selects *XML*:**   1. System should display additional form elements Browse (browse to system files option) and Column names in first row (checkbox) between the Data Source Type and Connect fields. 2. The Browse field should be marked as mandatory with a \* mark. 3. The Browse field should be displayed with a field that allows typing a file path and name or browsing to select a file of XML format      1. At any time, the actor should be able to clear all the entered details by clicking on the RESET button 2. The actor should be able to cancel the transaction by clicking on the Cancel button and the actor should redirect on the Manage screen. 3. If actor clicks on the SAVE button, all the details should get saved in the database and the connection should be available to further necessary actions like TESTING of connection, |
| **Alternative Flow**  None |
| **Post Conditions**   1. If the actor clicked the Save button, & if all the mandatory fields have been entered, then The System would respond with the message, “**Data Source saved successfully**” and the actor would be brought to the View screen 2. All information related to the audit configuration been defined would be stored in the database. 3. The audit configuration details would be available for further modification/view through the **Modify/ View Data Source connection** use cases respectively. 4. If the Actor clicks **Close**, the System would respond with the message “Are you sure you want to close this form?” If the actor responds in affirmative, then the System would discard the entered details and close the form and the actor would be brought back to **Pre-Condition**; otherwise, the actor would be brought back to where it was before clicking the **Close** button. 5. If the actor clicks the **Clear** button, then the System would respond with the message, “All details entered in the form would be lost. Do you wish to clear the form?” If the actor responds in affirmative, then the System would clear the form details and the actor would be presented with a blank Add Data Source form; otherwise, the actor would be brought back to where it was before clicking the **Clear** button |
| **Exceptions**   1. **The Actor attempts to save the details without entering all the mandatory fields.**   The system would respond with a message, “This field is required” and the field should get highlighted with red color   1. **The actor attempts to save the details with the same Data source which already exists.**   The system would respond with the message, “for the selected Data Source, connection already exists”.   1. **The actor attempts to upload a file type of different type and selected the different type from the data upload drop down.**   The system would respond with a message, “Please upload the correct file type.”   1. **The actor attempts to save the details without executing of query.**   The system would respond with a message, “No query found”.   1. **The actor attempts to save the data by clicking on Export to excel button without execution of query.**   The system would respond with a message, “No Data found”.   1. **The actor attempts to save the data by clicking on Export to csv button without execution of query.**   The system would respond with a message, “No Data found”.   1. **In case of Random sampling, if the actor attempts to enter the number which is greater than the actual record set.**   The system would respond with a message, “Sample size can not be greater than total number of records.”   1. **If the actor attempts to click on Submit button without selecting any record in Judgmental sampling.**   The system would respond with a message, “Select at least 1 record.”   1. **In case of stratified sampling, if the actor attempts to click on the step 2 without entering the details in step 1 such as Type and Field**   The system would respond with a message, “This field is required”.   1. **If the actor selects the wrong type of data type in Data filter option and try to apply any operation**   The system would respond with a message, “No records found. Please check the filter conditions”. |
| **Business Rules**   1. The mandatory fields are:  * Select Data Source Type from the Drop Down * Server Name * Database Name * Port Number * User Name * Password |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.32 Save / Replace Dataset

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to save or replace a dataset and provide information of required storage and connection modes. |
| **Pre Conditions**   1. The actor has logged into the system and uploaded a flat file data or prepared a query join, filter or advanced query using tables from a SQL data source. |
| **Triggers**   1. Actor clicks on the Save Data icon after uploading a flat file data or preparing a query join, filter or advanced query using tables from a SQL data source. |
| **Normal Flow**   1. System should display a pop-up with the heading “Save Data” and 5 form fields: 2. A dropdown with values New and Existing. New should be selected by default. 3. Text box Dataset name where actor can enter upto 99 Unicode characters. System should display this field only if first dropdown was selected as New. System should clear and hide this textbox if actor selected Existing in the first dropdown. 4. Dropdown Dataset where actor can select any single dataset from the list of datasets already saved in the current project. System should display the list in ascending alphabetical order. System should display this field only if first dropdown was selected as Existing. System should clear and hide this textbox if actor selected New in the first dropdown. 5. Dropdown Mode of Connection with values Direct, Cache, Schedule, Stored. System should not display the Schedule option for flat file data. In case actor had selected an existing dataset, system should display the value as entered at the time of last save. 6. Dropdown Schedule Time with values Hourly, Daily, Weekly, Monthly. System should display this dropdown only if Schedule was selected above. In case actor had selected an existing dataset which had mode of connection as Schedule at the time of last save, system should display the Schedule Time value as entered at the time of last save. 7. Text box Description where actor can enter upto 250 Unicode characters. 8. System should also display Save and Close buttons on the pop-up. 9. If actor clicks on the Save button for an existing dataset, system should display a message, “Warning! Overwriting an existing dataset may affect any visuals and pages currently using the dataset. Confirm” with “Yes” and “No” buttons. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should save the dataset along with entered storage and connection modes. 2. If actor had selected Existing option, then system should overwrite the selected existing dataset with the new dataset and also update any visuals and pages using the existing dataset. 3. If actor had selected Direct as the Mode of Connection, system should only save the logic (filter, join or query) used to create the dataset in the BI tool and not save any actual data itself. System should fetch the data from the **client data source** as per the logic while working on the visual or page. 4. If actor had selected Cache as the Mode of Connection, system should save the logic similar to the Direct option. While working on the visual or page, system should fetch data from the in-memory database if it was connected any time in the last hour. Otherwise it should fetch it from the client data source directly. 5. If actor had selected Schedule as the Mode of Connection, system should save the data in json format in the BI tool database in an encrypted form. System should update this data from the client source as per the schedule time selected by the actor. 6. If actor had selected Stored as the Mode of Connection, system should save the data in json format in the BI tool database in an encrypted form. While working on the visual or page, system should fetch from the BI tool database. The data should not change irrespective of any change in original client data. 7. In all the cases, the data stored / displayed in the BI tool should be encrypted and should not be accessible over the client machine in any form without valid permissions. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.5 Edit Data Source

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| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to update the connection with the SQL/Flat file data sources into ACIES BI tool and allows the user to perform various operations. For editing and updating, the actor would specify the connection type as SQL connection, Flat File connection, HADOOP distributed File System etc. In SQL connection. In the connection of flat file, the actor would be able to upload data either from csv, xls, json or xml files. In HDFS, the actor would be able to connect with HDFS and can upload the data. The uploaded data sets can be used in the visual creation by the visual designer. |
| **Pre Conditions**   1. Actor must log into the system with the valid Login ID and password and the actor should have access to at least 1 project into ACIES. 2. At least 1 project should be created for Updation. |
| **Triggers**   1. Actor selects the Edit Data Source option displayed by right clicking on a data source. |
| **Normal Flow**   1. System should display a form with the heading Edit Data Source   System should display the following form elements based on the data source type selected by the actor at the time of adding the data source:  If actor had selected *SQL Data Source*:   1. As the actor selects the EDIT S**QL Connection** tab, the actor must be able to see and perform various operations. These are 2. The actor would be able to see the details of already connected data source in a tabular format such as: 3. The actor should be able to see a button on the screen for updating existing DATA SOURCE 4. As the actor clicks on the Add new Data Source, it will redirect the actor on the adding data source connection page and user should get asked the below mentioned fields  * **Source Type:** The actor should be able to update the Source Type from the source type drop down such as MySQL, POSTGRESQL and SQL SERVER * **Server Name:** The user should be able to update the valid server details * **Database Name:** The actor should be able to update the database name * **Port Number:** The actor should be able to update the port number maximum length of 4 characters * **User Name:** The actor must able to update the valid user name * **Password:** The actor should be able to enter the password and the password should not be visible to end user   If actor had selected *CSV / Text*:   1. System should display form elements Name (text box)**,** Data Source Type (label), File Path (label), Column names in first row (label), Delimiter (dropdown list) and Encoding (dropdown list) and the Save button. The system should also display Maximise and Close buttons on the form. 2. The Name, Delimiter and Encoding fields should be marked as mandatory with \* marks. 3. System should display the value in the Name field as entered by the actor at the time of last save. System should allow actor to change the field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. The Data Source Type field should display a label *CSV / Text*. It should not be editable. 5. The File Path field should display as label the entire file path of the file uploaded at the time of data source creation. It should not be editable. 6. The Column names in first row field should display as label either *Yes* or *No* (depending on whether the actor had selected the checkbox or not selected the checkbox at the time of data source creation). It should not be editable. 7. System should display the Delimiter field as selected by the actor at the time of last save. System should allow actor to modify the field and select one value from a dropdown list displaying 5 values: *Comma*, *Pipe*, *Semicolon*, *Space*, and *Tab*. 8. System should display the Encoding field as selected by the actor at the time of last save. System should allow actor to modify the field and select one value from a dropdown list displaying 2 values: *Unicode* and *US-ASCII*. 9. If the actor clicks the Save button without entering anything other than space characters in the Name field, the system should display an error message, “Please enter a name for the data source” next to the field. 10. If the actor clicks the Save button after entering the same value in the Name field as another project (excluding any lagging and leading space characters for matching) created by the same actor, the system should display an error message, “A data source with the same name already exists” next to the field. 11. If the actor clicks the Save button without selecting a value in the Delimiter field, the system should display an error message, “Please select the file delimiter” next to the field. 12. If the actor clicks the Save button without selecting a value in the Encoding field, the system should display an error message, “Please select the file encoding” next to the field. 13. If the selected file is not readable by the system due to file having invalid encoding, the system should display an error message, “The selected file is not readable” next to the Browse field.   If actor had selected *Microsoft Excel*:   1. System should display form elements Name (text box)**,** Data Source Type (label), File Path (label), Column names in first row (label) and the Save button. The system should also display Maximise and Close buttons on the form. 2. The Name field should be marked as mandatory with \* marks. 3. System should display the value in the Name field as entered by the actor at the time of last save. System should allow actor to change the field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. The Data Source Type field should display a label *Microsoft Excel*. It should not be editable. 5. The File Path field should display as label the entire file path of the file uploaded at the time of data source creation. It should not be editable. 6. The Column names in first row field should display as label either *Yes* or *No* (depending on whether the actor had selected the checkbox or not selected the checkbox at the time of data source creation). It should not be editable. 7. If the actor clicks the Save button without entering anything other than space characters in the Name field, the system should display an error message, “Please enter a name for the data source” next to the field. 8. If the actor clicks the Save button after entering the same value in the Name field as another project (excluding any lagging and leading space characters for matching) created by the same actor, the system should display an error message, “A data source with the same name already exists” next to the field.   If actor had selected *PostgreSQL*:   1. System should display form elements Name (text box)**,** Data Source Type (label), Server (label), Port Number (label), Database (label), User Name (text box), Password (text box) and the Save button. The system should also display Maximise and Close buttons on the form. 2. The Name, User Name and Password fields should be marked as mandatory with \* marks. 3. System should display the value in the Name field as entered by the actor at the time of last save. System should allow actor to change the field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. The Data Source Type field should display a label *PostgreSQL*. It should not be editable. 5. The Server field should display as label the value entered at the time of data source creation. It should not be editable. 6. The Port Number field should display as label the value entered at the time of data source creation. It should not be editable. 7. The Database field should display as label the value entered at the time of data source creation. It should not be editable. 8. System should display the value in the User Name field as entered by the actor at the time of last save. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, spaces and special characters in the User Name field. 9. System should display the Password field as blank. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, spaces and special characters in the Password field. The password characters should not be visible. 10. If the actor clicks the Save button without entering anything other than space characters in the User Name field, the system should display an error message, “Please enter the user name” next to the field. 11. If the actor clicks the Save button without entering anything in the Password field, the system should display an error message, “Please enter the password” next to the field. 12. If the actor clicks the Save button with invalid credentials, system should display an error message, “Connection could not be made with provided credentials. Please try again.” 13. If the database server is not accessible from the client machine or the connection fails due to any other error (such as a network error), system should display an error message, “Server was not accessible due to network or other error. Please try again.”   If actor had selected *Microsoft SQL Server*:   1. System should display form elements Name (text box)**,** Data Source Type (label), Server (label), Port Number (label), Database (label), User Name (text box), Password (text box) and the Save button. The system should also display Maximise and Close buttons on the form. 2. The Name, User Name and Password fields should be marked as mandatory with \* marks. 3. System should display the value in the Name field as entered by the actor at the time of last save. System should allow actor to change the field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. The Data Source Type field should display a label *Microsoft SQL Server*. It should not be editable. 5. The Server field should display as label the value entered at the time of data source creation. It should not be editable. 6. The Port Number field should display as label the value entered at the time of data source creation. It should not be editable. 7. The Database field should display as label the value entered at the time of data source creation. It should not be editable. 8. System should display the value in the User Name field as entered by the actor at the time of last save. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, spaces and special characters in the User name field. 9. System should display the Password field as blank. System should allow actor to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, spaces and special characters in the Password field. The password characters should not be visible. 10. If the actor clicks the Save button without entering anything other than space characters in the User Name field, the system should display an error message, “Please enter the user name” next to the field. 11. If the actor clicks the Save button without entering anything in the Password field, the system should display an error message, “Please enter the password” next to the field. 12. If the actor clicks the Save button with invalid credentials, system should display an error message, “Connection could not be made with provided credentials. Please try again.” 13. If the database server is not accessible from the client machine or the connection fails due to any other error (such as a network error), system should display an error message, “Server was not accessible due to network or other error. Please try again.” 14. If the actor clicks the Save button after entering valid values in all displayed mandatory fields, the system should display a message, “Warning! Changing data source can impact associated data sets, columns and visuals. Are you sure you wanted to proceed?” with buttons Yes and No. The system should also display a Close button on the pop-up. 15. If the actor selects the No or Close buttons, the system should not take any action. 16. If the actor selects Yes, the system should save the data source and display it in the appropriate alphabetical position under the Data Sources menu item under the current project. 17. System should cascade the changes made to the data source to its associated data sets, columns and visuals. In case any data set / column or visual is caused to be invalid due to the change, system should display an error message “Data Set not available due to change in data source <data source name>” / “Column not available due to change in data source <data source name>” / “Visual not available due to change in data source <data source name>”. 18. System should display the Add New Data Set screen for the actor to select a data set. 19. If the actor clicks the Close button, system should display a pop-up message “Are you sure you want to cancel the changes?” with buttons Yes and No. 20. If the actor selects No, the system should retain the form with entered details. 21. If the actor selects Yes, the system should close the form and not add the data source. 22. If the actor clicks the Maximise button, system should expand the form to cover the entire screen and replace the Maximise button with the Minimise button. 23. If the actor clicks the Minimise button, system should restore the form to its original size and replace the Minimise button with the Maximise button. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The modified data source details should be saved in the database if actor selects the Save button (and modified details are valid and working). 2. Data source details should not be changed in the database if actor selects Close button followed by Yes. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.6 Delete Data Source

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to delete a data source. |
| **Pre Conditions**   1. The actor has logged into the system and connected to a data source within a project. |
| **Triggers**   1. Actor selects the Delete Data Source option displayed by right clicking on a data source. |
| **Normal Flow**   1. System should display a pop-up message “Warning! Deleting the data source will delete associated data sets and columns. It will also impact visuals and pages using the data source. This action cannot be reversed. Are you sure you wanted to proceed?” with buttons Yes. The system should also display a Close button on the pop-up. 2. If the actor clicks on the Close buttons, the system should not take any action. 3. If the actor selects Yes, the system should delete the data source along with associated data sets and columns. 4. System should cascade the impact of the data source deletion to any visual using the data source. In case any visual is caused to be invalid due to the deletion, system should display an error message, “Visual not available due to change in data source <data source name>”. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should not take any action if actor selects the No or Close buttons. 2. The system should delete the data source along with associated data sets and columns from the database if actor selects the Yes button. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.7 Activate / Deactivate Data Source

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to activate or deactivate a data source for connection. |
| **Pre Conditions**   1. The actor has logged into the system and saved at least one data source within a project. |
| **Triggers**   1. Actor clicks the Change Connection icon displayed on a saved data source. |
| **Normal Flow**   1. System should display a screen with option to *Activate* or *Deactivate* the data source. 2. If the actor selects on *Activate*, the system should set the status of the data source to *Activated* and set the status of all other data sources to *Deactivated*. 3. If the actor selects on *Deactivate*, the system should set the status of the data source to *Deactivated* without affecting the status of any other data source. |
| **Alternative Flow**  None |
| **Post Conditions**   1. The system should make only the activated data source available in Data Joining Wizard, Query Wizard and Advanced Query screens. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.8 Data Joining Wizard

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| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to apply the joins on different tables and to extract the data. |
| **Pre-Conditions**   1. Actor must log into the system with the valid Login ID and password. |
| **Triggers**   1. Actor selects the Data joining Wizard from the left hand side menu. |
| **Normal Flow**  The system would prompt the actor to do the following tasks.   1. Actor should be able to select the schema from the drop down.. 2. As actor selects the schema from the drop down, the actor must be able to see all the tables in the tables drop down. 3. After selecting the tables from the drop down, the table name should be visible in the data joining grid. 4. Actor must be able to select another table on which the join condition has to be applied. 5. Post selection of tables, actor should be able to select the common columns from both the tables on which join has to be applied. 6. Post selection the columns, the actor should be able to select the type of joins from the UI. i.e. Inner join, Outer Join, Left Outer join and right Outer join. 7. AS actor clicks on the Execute button, the output should be displayed in the output panel window. 8. At any time, user should be able to click on the Reset Button to clear all the fields. |
| **Alternative Flow**  None |
| **Post Conditions**   1. If the actor clicks on the execute button , then user should be able to view the result set in the output panel window and also the actor should be able to see all the previously executed queries in the HISTORY tab. 2. If the user aborts the operation by clicking on the cancel query button, then the execution of qeury should get stopped and user should return to previous step. 3. If the actor clicks on the Save Query button , the actor should be allowed to provide the detail to save the query such as: 4. Should be able to enter the query name 5. Should be able to select the category of query from the category drop down. 6. Actor should be able to enter the description of the query 7. Actor should be able to select the key area of the query from the drop down. 8. If Actor clicks on the Save button, the actor should be able to save the query and the query should get saved in the database. 9. If user clicks on the Save and Freeze button, the actor should be able to save the resultset which should be of error free and the data should get saved in the database. 10. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 11. If the user clicks on the Save data  button, then the user should able to save the resultset and the data should get saved in the database. Actor should allow to enter the description of save data and should be able to select the key area from the drop down. The data should get saved in database based on the key area selected by the actor. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 12. If the user clicks on Export to Excel  button, user should be able to save the result set in excel file(xls) and by default the same excel file should get opened 13. Post clicking on the export to csv  button, all the result ser should get saved in the csv file and by default the same excel file should get opened. 14. After receiving the result set, if the actor clicks on the Sampling button, the actor should be able to perfrom the various types of sampling on the output such as 15. **Random Sampling:** User should be able to fetched the number of records based on a seed number. Same record can be fetched in future using the same seed number. Records in the seed number should get changed if records in orignal record set changes. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 16. **Judgment Sampling:** The actor should be able to select the records based on their knowledge and professional judgment by clicking on the check box. The actor should be allowed to select the record by clicking on the check box which should be in front of each record. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 17. **Stratified Sampling:** The actor should be able to divide the population into separate groups from each group using stratified sampling. Stratified sampling can be applied on character and numeric datatypes.     1. As the actor selects the Numeric from the drop down, All the columns with numeric values should come in FIELD drop down. After selecting the column, in the next step, the actor should be able to see the minimum and maximum values as pre calculated in read only format. Actor should be able to enter the interval which should be in between of minimum and maximum values. In the final step, the actor should be able to see below mentioned table:  |  |  |  |  | | --- | --- | --- | --- | | **Lower limit** | **Upper limit** | **No of records sample** | **Sample size** | |  |  |  |  |   Lower limit, upper limit and should come as pre calculated as input given by the actor in step 2. **Number of records samples** field should show the count of records from the dataset which lies in the specified range. Actor should be able to enter the sample size in desired range. Post click on the Finish button, user should see the total number of records from the data set. At any time, the actor can click on the Back button to go back and make the correction.   * 1. As the actor selects the character from the drop down, all the columns with character field should come in the FIELD drop down. As actor clicks on the Next button, below mentioned table should be display:  |  |  |  | | --- | --- | --- | | **Lower limit** | **No of records sample** | **Sample size** | |  |  |  |   All the distinct values should display in the grid along with the number of records sample as pre calculated in read only format. The actor should be able to enter the number of records from each distinct values. At any time, the actor can click on the Back button to go back and make the correction.   1. As the actor clicks on the Graphical Analysis  button, the actor should be able to perform the graphical analysis. Detailed is mentioned in visualization use cases. 2. As the actor clicks on the Filter data  button after query execution, then the actor should be able to filter the data such as 3. Filteration of records by selecting ALL and ANY. If actor selects ALL option, AND condition will work in the filteration criteria. If actor select the ANY option, OR condition should work in the filteration criteria. 4. Actor should be able to see all the columns in the SELECT COLUMN drop down of the table. Actor should be able to select only 1 column in a single filter condition. 5. After selection of column, the system should automatically identify the datatype of the column. Also, if the actor wants to change the datatype of the column in filteration critieria, the should be able to change the data type of the column. 6. Post selection datatype, Actor should be able to select the data operator such as, NULL, NOT NULL, EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH. 7. If actor selects the any of the data operator from EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH operator, the actor should allow to provide the input value for the filter condition. 8. The actor should be allowed to enter more filter condition by clicking on Add button. At any time, the actor should be able to remove the filter condition by clicking on the “-“  button. 9. If the actor clicks on the Import Data into Table  button, the actor should be able to import the output resultset data into a table.Following details should get provided by the actor before importing the data into the table. 10. Actor should be able to see a popup model on the screen along with a title stating “Import Data”. 11. Actor has to provide the table name. 12. Actor should be able to select the primary key column from the available list of columns of the table. 13. Actor should be able to see all the columns on the popup model in read only format and along with each field, the actor should be able to select the datatype. 14. After providing the details, user should be able to click on the submit button to see the output. At any time, the actor should be able to click on the Cancel button to discard all the changes. 15. At any time, the actor should be able to refresh the data by clicking on Refresh  button. As the actor clicks on the refresh button, a pop up window should appear on the screen with a message that “ Do you want to Refresh the data” with two button with a label of YES and NO. If the actor clicks on the YES button, the actor should be able to refresh the data. On clicking of NO button, data should not get refreshed and actor should get returned to previous screen. |
| **Exceptions**   1. **The actor attempts to execute a query without writing the query in Advance query wizard.**   The system would respond with a message, “No query found for execution.”   1. **The actor attempts to execute the query with an invalid query.**   The system would respond with a message, “Something went wrong. Please check the syntax”.   1. **The actor attempts to click on Cancel button to abort the result in blank window.**   The system would respond with a message, “No query found for execution.”   1. **The actor attempts to submit the details without entering any data in the mandatory fields.**   The system would respond with a message, “This field is required” and the field should get highlighted with red color   1. **The actor attempts to save the details without executing of query.**   The system would respond with a message, “No query found”.   1. **The actor attempts to save the data by clicking on Export to excel button without execution of query.**   The system would respond with a message, “No Data found”.   1. **The actor attempts to save the data by clicking on Export to csv button without execution of query.**   The system would respond with a message, “No Data found”.   1. **In case of Random sampling, if the actor attempts to enter the number which is greater than the actual record set.**   The system would respond with a message, “Sample size can not be greater than total number of records.”.   1. **If the actor attempts to click on Submit button without selecting any record in Judgmental sampling.**   The system would respond with a message, “Select at least 1 record.”   1. **In case of stratified sampling, if the actor attempts to click on the step 2 without entering the details in step 1 such as Type and Field**   The system would respond with a message, “This field is required”.   1. **If the actor slect the wrong type of data type in Data filter option and try to apply any operation**   The system would respond with a message, “No records found. Please check the filter conditions”. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.9 Query Wizard

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| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to create or built the SQL query by a novice user and allows the user to perform various operations. |
| **Pre-Conditions**   1. Actor must log into the system with the valid Login ID and password. |
| **Triggers**   1. Actor selects the Query wizard option from the left hand side menu. |
| **Normal Flow**  The system would prompt the actor to do the following tasks.   1. Actor can view the schema, table and column name in the left hand side menu of advance query. 2. Actor should be able to select the schema from the schema drop down. 3. After selecting the Schema, the actor should be able to see all the tables available in the respective schema. Actor should be able to search the table name from the list of the tables. 4. After selecting the table, the actor should be able to select the multiple columns from the tables. Also, the actor should be able to select all the columns of a table by selecting ALL columns. 5. The actor should be able to apply the filter condition by selecting the 6. The actor should be able to select the column(s) in Order by filter option. All the columns should be available in the drop down. The actor should be able to select the multiple columns. 7. The actor should be able to provide the Order by type from the order by drop down. 8. The actor should be able to select the columns and should be able to view the column name with their respective data type. 9. The actor should be able to provide the input. User should be allowed to enter the input name in the text box. 10. The actor should be able to apply more than 1 filter by clicking on Add more  button. 11. The actor should be able to see 3 buttons on the screens i.e. Execute, Reset and Cancel. After clicking on Execute button, the actor should be able to see the output in the output panel window. 12. As actor clicks on the Reset button, all the fields should get reset. 13. If actor clicks on the Cancel button to abort the operation, then the actor should back on the previous screen. |
| **Alternative Flow**  None |
| **Post Conditions**   1. If the actor clicks on the execute button , then user should be able to view the result set in the output panel window and also the actor should be able to see all the previously executed queries in the HISTORY tab. 2. If the user aborts the operation by clicking on the cancel query button, then the execution of qeury should get stopped and user should return to previous step. 3. If the actor clicks on the Save Query button , the actor should be allowed to provide the detail to save the query such as: 4. Should be able to enter the query name 5. Should be able to select the category of query from the category drop down. 6. Actor should be able to enter the description of the query 7. Actor should be able to select the key area of the query from the drop down. 8. If Actor clicks on the Save button, the actor should be able to save the query and the query should get saved in the database. 9. If user clicks on the Save and Freeze button, the actor should be able to save the resultset which should be of error free and the data should get saved in the database. 10. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 11. If the user clicks on the Save data  button, then the user should able to save the resultset and the data should get saved in the database. Actor should allow to enter the description of save data and should be able to select the key area from the drop down. The data should get saved in database based on the key area selected by the actor. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 12. If the user clicks on Export to Excel  button, user should be able to save the result set in excel file(xls) and by default the same excel file should get opened 13. Post clicking on the export to csv  button, all the result ser should get saved in the csv file and by default the same excel file should get opened. 14. After receiving the result set, if the actor clicks on the Sampling button, the actor should be able to perfrom the various types of sampling on the output such as 15. **Random Sampling:** User should be able to fetched the number of records based on a seed number. Same record can be fetched in future using the same seed number. Records in the seed number should get changed if records in orignal record set changes. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 16. **Judgment Sampling:** The actor should be able to select the records based on their knowledge and professional judgment by clicking on the check box. The actor should be allowed to select the record by clicking on the check box which should be in front of each record. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 17. **Stratified Sampling:** The actor should be able to divide the population into separate groups from each group using stratified sampling. Stratified sampling can be applied on character and numeric datatypes.     1. As the actor selects the Numeric from the drop down, All the columns with numeric values should come in FIELD drop down. After selecting the column, in the next step, the actor should be able to see the minimum and maximum values as pre calculated in read only format. Actor should be able to enter the interval which should be in between of minimum and maximum values. In the final step, the actor should be able to see below mentioned table:  |  |  |  |  | | --- | --- | --- | --- | | **Lower limit** | **Upper limit** | **No of records sample** | **Sample size** | |  |  |  |  |   Lower limit, upper limit and should come as pre calculated as input given by the actor in step 2. **Number of records samples** field should show the count of records from the dataset which lies in the specified range. Actor should be able to enter the sample size in desired range. Post click on the Finish button, user should see the total number of records from the data set. At any time, the actor can click on the Back button to go back and make the correction.   * 1. As the actor selects the character from the drop down, all the columns with character field should come in the FIELD drop down. As actor clicks on the Next button, below mentioned table should be display:  |  |  |  | | --- | --- | --- | | **Lower limit** | **No of records sample** | **Sample size** | |  |  |  |   All the distinct values should display in the grid along with the number of records sample as pre calculated in read only format. The actor should be able to enter the number of records from each distinct values. At any time, the actor can click on the Back button to go back and make the correction.   1. As the actor clicks on the Graphical Analysis  button, the actor should be able to perform the graphical analysis. Detailed is mentioned in visualization use cases. 2. As the actor clicks on the Filter data  button after query execution, then the actor should be able to filter the data such as 3. Filteration of records by selecting ALL and ANY. If actor selects ALL option, AND condition will work in the filteration criteria. If actor select the ANY option, OR condition should work in the filteration criteria. 4. Actor should be able to see all the columns in the SELECT COLUMN drop down of the table. Actor should be able to select only 1 column in a single filter condition. 5. After selection of column, the system should automatically identify the datatype of the column. Also, if the actor wants to change the datatype of the column in filteration critieria, the should be able to change the data type of the column. 6. Post selection datatype, Actor should be able to select the data operator such as, NULL, NOT NULL, EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH. 7. If actor selects the any of the data operator from EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH operator, the actor should allow to provide the input value for the filter condition. 8. The actor should be allowed to enter more filter condition by clicking on Add button. At any time, the actor should be able to remove the filter condition by clicking on the “-“  button. 9. If the actor clicks on the Import Data into Table  button, the actor should be able to import the output resultset data into a table.Following details should get provided by the actor before importing the data into the table. 10. Actor should be able to see a popup model on the screen along with a title stating “Import Data” 11. Actor has to provide the table name. 12. Actor should be able to select the primary key column from the available list of columns of the table. 13. Actor should be able to see all the columns on the popup model in read only format and along with each field, the actor should be able to select the datatype. 14. After providing the details, user should be able to click on the submit button to see the output. At any time, the actor should be able to click on the Cancel button to discard all the changes. 15. At any time, the actor should be able to refresh the data by clicking on Refresh  button. As the actor clicks on the refresh button, a pop up window should appear on the screen with a message that “ Do you want to Refresh the data” with two button with a label of YES and NO. If the actor clicks on the YES button, the actor should be able to refresh the data. On clicking of NO button, data should not get refreshed and actor should get returned to previous screen. |
| **Exceptions**   1. **The actor attempts to submit the details without entering any data in the mandatory fields.**   The system would respond with a message, “This field is required” and the field should get highlighted with red color.   1. **The actor attempts to save the details without executing of query.**   The system would respond with a message, “No query found”.   1. **The actor attempts to save the data by clicking on Export to excel button without execution of query.**   The system would respond with a message, “No Data found”.   1. **The actor attempts to save the data by clicking on Export to csv button without execution of query.**   The system would respond with a message, “No Data found”.   1. **In case of Random sampling, if the actor attempts to enter the number which is greater than the actual record set.**   The system would respond with a message, “Sample size can not be greater than total number of records.”.   1. **If the actor attempts to click on Submit button without selecting any record in Judgmental sampling.**   The system would respond with a message, “Select at least 1 record.”   1. **In case of stratified sampling, if the actor attempts to click on the step 2 without entering the details in step 1 such as Type and Field**   The system would respond with a message, “This field is required”.   1. **If the actor selects the wrong type of data type in Data filter option and try to apply any operation**   The system would respond with a message, “No records found. Please check the filter conditions”. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.10 Advanced Query

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| **Actor(s)**  Designer |
| **Description**  This use case would allow the actor to write and execute the SQL query and allows the user to perform various operations. |
| **Pre-Conditions**   1. Actor must log into the system with the valid Login ID and password. |
| **Triggers**   1. Actor selects the Advance Query from the left hand side menu. |
| **Normal Flow**  The system would prompt the actor to do the following tasks.   1. Actor can view the schema, table and column name in the left hand side menu of advance query. 2. Actor should be able to write the SQL query and able to execute the written query. |
| **Alternative Flow**  None |
| **Post Conditions**   1. If the actor clicks on the execute button , then user should be able to view the result set in the output panel window and also the actor should be able to see all the previously executed queries in the HISTORY tab. 2. If the user aborts the operation by clicking on the cancel query button, then the execution of qeury should get stopped and user should return to previous step. 3. If the actor clicks on the Save Query button , the actor should be allowed to provide the detail to save the query such as: 4. Should be able to enter the query name 5. Should be able to select the category of query from the category drop down. 6. Actor should be able to enter the description of the query 7. Actor should be able to select the key area of the query from the drop down. 8. If Actor clicks on the Save button, the actor should be able to save the query and the query should get saved in the database. 9. If user clicks on the Save and Freeze button, the actor should be able to save the resultset which should be of error free and the data should get saved in the database. 10. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 11. If the user clicks on the Save data  button, then the user should able to save the resultset and the data should get saved in the database. Actor should allow to enter the description of save data and should be able to select the key area from the drop down. The data should get saved in database based on the key area selected by the actor. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 12. If the user clicks on Export to Excel  button, user should be able to save the result set in excel file(xls) and by default the same excel file should get opened 13. Post clicking on the export to csv  button, all the result ser should get saved in the csv file and by default the same excel file should get opened. 14. After receiving the result set, if the actor clicks on the Sampling button, the actor should be able to perfrom the various types of sampling on the output such as 15. **Random Sampling:** User should be able to fetched the number of records based on a seed number. Same record can be fetched in future using the same seed number. Records in the seed number should get changed if records in orignal record set changes. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 16. **Judgment Sampling:** The actor should be able to select the records based on their knowledge and professional judgment by clicking on the check box. The actor should be allowed to select the record by clicking on the check box which should be in front of each record. After clicking on the submit button, the actor should be able to see the output in the output panel. At any time, the user should be able to click on the Close button. After clicking on the close button the user should be able to go on the step 1. 17. **Stratified Sampling:** The actor should be able to divide the population into separate groups from each group using stratified sampling. Stratified sampling can be applied on character and numeric datatypes.     1. As the actor selects the Numeric from the drop down, All the columns with numeric values should come in FIELD drop down. After selecting the column, in the next step, the actor should be able to see the minimum and maximum values as pre calculated in read only format. Actor should be able to enter the interval which should be in between of minimum and maximum values. In the final step, the actor should be able to see below mentioned table:  |  |  |  |  | | --- | --- | --- | --- | | **Lower limit** | **Upper limit** | **No of records sample** | **Sample size** | |  |  |  |  |   Lower limit, upper limit and should come as pre calculated as input given by the actor in step 2. **Number of records samples** field should show the count of records from the dataset which lies in the specified range. Actor should be able to enter the sample size in desired range. Post click on the Finish button, user should see the total number of records from the data set. At any time, the actor can click on the Back button to go back and make the correction.   * 1. As the actor selects the character from the drop down, all the columns with character field should come in the FIELD drop down. As actor clicks on the Next button, below mentioned table should be displayed:  |  |  |  | | --- | --- | --- | | **Lower limit** | **No of records sample** | **Sample size** | |  |  |  |   All the distinct values should display in the grid along with the number of records sample as pre calculated in read only format. The actor should be able to enter the number of records from each distinct values. At any time, the actor can click on the Back button to go back and make the correction.   1. As the actor clicks on the Graphical Analysis  button, the actor should be able to perform the graphical analysis. Detailed is mentioned in visualization use cases. 2. As the actor clicks on the Filter data  button after query execution, then the actor should be able to filter the data such as 3. Filteration of records by selecting ALL and ANY. If actor selects ALL option, AND condition will work in the filteration criteria. If actor select the ANY option, OR condition should work in the filteration criteria. 4. Actor should be able to see all the columns in the SELECT COLUMN drop down of the table. Actor should be able to select only 1 column in a single filter condition. 5. After selection of column, the system should automatically identify the datatype of the column. Also, if the actor wants to change the datatype of the column in filteration critieria, the should be able to change the data type of the column. 6. Post selection datatype, Actor should be able to select the data operator such as, NULL, NOT NULL, EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH. 7. If actor selects the any of the data operator from EQUALS, NOT EQUALS, INCLUDES, NOT INCLUDES, BEGINS WITH and ENDS WITH operator, the actor should allow to provide the input value for the filter condition. 8. The actor should be allowed to enter more filter condition by clicking on Add button. At any time, the actor should be able to remove the filter condition by clicking on the “-“  button. 9. If the actor clicks on the Import Data into Table  button, the actor should be able to import the output resultset data into a table.Following details should get provided by the actor before importing the data into the table. 10. Actor should be able to see a popup model on the screen along with a title stating “Import Data” 11. Actor has to provide the table name. 12. Actor should be able to select the primary key column from the available list of columns of the table. 13. Actor should be able to see all the columns on the popup model in read only format and along with each field, the actor should be able to select the datatype. 14. After providing the details, user should be able to click on the submit button to see the output. At any time, the actor should be able to click on the Cancel button to discard all the changes. 15. At any time, the actor should be able to refresh the data by clicking on Refresh  button. As the actor clicks on the refresh button, a pop up window should appear on the screen with a message that “ Do you want to Refresh the data” with two button with a label of YES and NO. If the actor clicks on the YES button, the actor should be able to refresh the data. On clicking of NO button, data should not get refreshed and actor should get returned to previous screen. |
| **Exceptions**   1. **The actor attempts to execute a query without writing the query in Advance query wizard.**   The system would respond with a message, “No query found for execution.”   1. **The actor attempts to execute the query with an invalid query.**   The system would respond with a message, “Something went wrong. Please check the syntax”.   1. **The actor attempts to click on Cancel button to abort the result in blank window.**   The system would respond with a message, “No query found for execution.”   1. **The actor attempts to submit the details without entering any data in the mandatory fields.**   The system would respond with a message, “This field is required” and the field should get highlighted with red color   1. **The actor attempts to save the details without executing of query.**   The system would respond with a message, “No query found”.   1. **The actor attempts to save the data by clicking on Export to excel button without execution of query.**   The system would respond with a message, “No Data found”.   1. **The actor attempts to save the data by clicking on Export to csv button without execution of query.**   The system would respond with a message, “No Data found”.   1. **In case of Random sampling, if the actor attempts to enter the number which is greater than the actual record set.**   The system would respond with a message, “Sample size can not be greater than total number of records.”.   1. **If the actor attempts to click on Submit button without selecting any record in Judgmental sampling.**   The system would respond with a message, “Select at least 1 record.”   1. **In case of stratified sampling, if the actor attempts to click on the step 2 without entering the details in step 1 such as Type and Field**   The system would respond with a message, “This field is required”.   1. **If the actor slect the wrong type of data type in Data filter option and try to apply any operation**   The system would respond with a message, “No records found. Please check the filter conditions”. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.13 Set Relationship

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to create a hierarchy from a dataset field. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.11 Create New Visual

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to create a new visualisation. |
| **Pre Conditions**   1. Actor has created a project. |
| **Triggers**   1. Actor selects the Create New Visual option displayed by right clicking on the Visuals menu item under a project. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 2 form fields Name and Dataset, and 2 buttons Create and Close. 2. Actor should be able to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces in the Name field. 3. System should truncate any lagging and leading space characters from the Name field. 4. In the Dataset field, system should display a list of all the datasets created and activated in the current project. 5. Actor should be able to select any single dataset. 6. System should allow action on Create button only if both fields are provided. 7. If actor clicks the Create button after entering the same value in the Name field as another visual in the same project, the system should display an error message, “A visual with this name already exists in this project”. 8. System should close the form and not create a new visual if actor clicks the Close button. 9. If actor selects the Create button after entering a value in the Name field which does not match another visual name in the same project and after selecting an activated dataset, the system should close the form, save the visual, list the visual name in the appropriate alphabetical position under the left side Visuals menu item (hierarchically under the current project), and display 3 panes: Dataset Fields, Visual Properties and a blank pane, 4 buttons: Save, and in the right side screen. 10. In the Dataset Fields pane, system should display the fields of the dataset selected in point 7 organized into 2 section: Dimensions and Measures. 11. In the Dimensions section, system should display all non-numeric fields in alphabetical order. 12. In the Measures section, system should display all numeric fields in alphabetical order. 13. System should allow actor to move any field between the two sections. 14. In the Visual Properties pane, system should display a list of all available visual types (each as a single icon): Bar chart, Line chart, Area chart, Pie chart, Scatter plot, Table and Slicer. 15. Under the visual types, system should also display the properties of the selected visual type categorized into 3 sections: Data, Formatting and Analytics, each of which should display options to provide inputs as relevant for the selected visual type. 16. In the blank pane, system should display the selected type of visual with provided data, formatting and analytic features. |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action if actor clicks the Close button. 2. System should create the visual if actor selects the Create button after entering valid values. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.12 Edit Visual

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to edit an existing visualisation. |
| **Pre Conditions**   1. Actor has created a visual or edited an existing visual. |
| **Triggers**   1. Actor selects the Edit Visual option displayed by right clicking on the visual. |
| **Normal Flow**   1. System should display a form with the heading Edit Visual, 2 form fields Name and Dataset, and 2 buttons Update and Close. 2. System should display the values in the Name and Dataset fields as entered by actor at the time of last save. 3. Actor should be able to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces in the Visual Name field. 4. System should truncate any lagging and leading space characters from the Visual Name field. 5. In the Dataset field, system should display a list of all the datasets created and activated in the current project. 6. Actor should be able to select any single dataset. 7. System should allow action on Update button only if both fields are provided. 8. If actor clicks the Update button after entering the same value in the Name field as another visual in the same project, the system should display an error message, “A visual with this name already exists in this project”. 9. System should close the form and not create a new visual if actor clicks the Close button. 10. If actor selects the Update button after entering a value in the Name field which does not match another visual name in the same project and after selecting an activated dataset, the system should close the form, save the visual, list the visual name in the appropriate alphabetical position under the left side Visuals menu item (hierarchically under the current project), and display 3 panes: Dataset Fields, Visuals, and a blank pane in the right side screen. 11. In the Dataset Fields pane, system should display the fields of the dataset selected in point 7 organized into 2 section: Dimensions and Measures. 12. In the Dimensions section, system should display all non-numeric fields in alphabetical order. 13. In the Measures section, system should display all numeric fields in alphabetical order. 14. In the Visuals pane, system should display a list of all available visual types: Bar chart, Line chart, Area chart, Pie chart, Scatter plot, Table and Slicer. 15. Under the visual types, system should also display the properties of the selected visual type categorized into 3 sections: Data, Formatting and Analytics, each of which should display options to provide inputs as relevant for the selected visual type. 16. In the blank pane, system should display the selected type of visual with provided data, formatting and analytic features. |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action if actor clicks the Close button. 2. System should create the visual if actor selects the Create button after entering valid values. |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.13 Create Hierarchy

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to create a hierarchy from a dataset field. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.14 Add Field to Hierarchy

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to add a field to an existing hierarchy. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.15 Manage Hierarchy

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to manage an existing hierarchy by renaming it or rearranging order of fields. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.16 Delete Hierarchy

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a donut visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.17 Design Visual: Pie chart

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a pie chart visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Pie chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 4 sections: Axis, Legend, Value and Tooltip. 2. In each of the Data section, actor should be able to drop any one field from any section under the Dataset Fields pane. 3. System should allow the actor to repeat the same field across multiple sections. 4. System should not allow the actor to repeat the same field across the same section. 5. System should display an ellipsis (3 dots) next to each field dropped in the Value section. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If a field has been dropped in each of the Axis and Value sections, system should display a pie chart in the right-hand side pane. 8. Each distinct values of the field dropped in the Axis section should form a separate piece of the pie chart, i.e. there should be any many pie pieces as there are distinct value of the Axis field. 9. In case any distinct value of the Axis field has aggregated Value as 0, it should not be displayed as a piece in the pie chart. 10. The pieces should be in ascending alphabetical order of the distinct values of the Axis field. 11. Each piece of the pie chart should have a different colour to distinguish one distinct Axis field value from the other. 12. Each individual colour should be displayed with the corresponding name as legend on the chart. 13. The angle of each piece of pie chart in degrees should be equal to   360 \* aggregation of the Value field for the particular value of the Axis field / aggregation of the Value field for all values of the Axis field   1. By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis field. 2. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 3. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 4. On clicking the Aggregation option for a Dimension field, system should display the options: Count, Count (Distinct). 5. Actor should be able to select from any of the available aggregation options for the field. 6. System should update the bar chart to display the aggregated value as per selected aggregation option.   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Pie chart or Scatter plot) and convert it to a Pie chart, system should remove all fields on the Data section except the first field on the Axis section. 2. System should display the Pie chart based on the remaining Axis and Value fields. 3. In case original visual was a Slicer, system should only display the pie chart if at least one Value field has been added. |
| **Post Conditions**  None |
| **Exceptions**   1. No visual should be displayed on screen in case each distinct value of the Axis field has aggregated Value as 0. Instead selected Title and Background with a message saying “All Axis values are 0” should be displayed. 2. No visual should be displayed on screen in case any distinct value of the Axis field has aggregated Value as negative. Instead selected Title and Background with a message saying “At least one Axis value is negative” should be displayed. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.18 Design Visual: Donut

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a donut visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.19 Design Visual: Clustered Column Chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a clustered ~~bar~~ column chart visual. |
| **Pre-Conditions**   1. The actor has created a new visual or edited an existing visual. 2. The data set should be prepared by the data designer and available for creation of the visual |
| **Triggers**   1. Actor selects *Clustered* *~~bar~~ column* *chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. After right click on the Visualization link available in left hand menu, the actor should be able to see the option for Create New Visualization or Delete All Visualizations. 2. After clicking on the Delete All Visualization, user should be able to delete all the visualizations under the respective projects. 3. After clicking on the Create New Visualization, System should display a pop up with the heading Create Visual, 3 form fields Visual Name, Visual Title and drop down for Dataset, and 2 buttons Create and Close. 4. After click on the Close button, the pop up should get closed and the details should not get saved in the database. 5. After clicking on the Create button, the visual should be created and available under the Visualizations menu under a respective project and the details should get saved in the database. 6. The actor should be able to see all the columns of the used dataset with categorization of Dimensions and Measures under the Dataset Field option. All the discrete values should be categorized as the dimensions and continuous values should be categorized as the measures. 7. The actor should be able to change any dimension into measure or measure into the dimensions by dragging and dropping the respective column name to desired grid. 8. The actor should be able to format the visual using the properties options. These options should be: **Fields, Formatting, Analytics** 9. The actor should be able to see the below mentioned options under the **Fields** tab.    1. **Data**   **a.** Under the Data section, system should display 4 sections: Axis, Legend, Values and Tooltip.  **b.** In the Axis section, actor should be able to drag and drop one or more field(s) from Dimension section under the Dataset Fields pane.  **b.** In the Legend section, actor should be able to drag and drop a field from Dimension section under the Dataset Fields pane.  **c.** In the Value section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **c.** In the Tooltip section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **h.** Against every field dropped in any section, system should display an option to remove the field.  **d.** At any time, the actor should be able to remove fields from any of the Dataset Fields section.  **e.** System should allow the actor to repeat the same field across multiple sections.  **f.** System should not allow the actor to repeat the same field in the same section.  **g.** System should display an ellipsis (3 dots) next to each field dropped in the Value and Tooltip sections.  **i.** If at least one field has been dropped in the Value section, system should display a bar chart in the right-hand side pane.  **j.** The X-axis of the bar chart should be constituted from the distinct values of the field dropped in the Axis section.  **k.** By default, the X-axis should display the values in ascending alphabetical order of the Axis dimension. System should allow actor to change the order of Axis values.  In case the actor added multiple fields in Value sections (with no field in Legend section)  **l.** System should display a separate bar for each dropped Value field and each distinct Axis value, e.g. if the Axis section field has 5 distinct values and 3 fields were dropped in the Value section, system should display 5 x 3 = 15 different *~~bars~~ columns* on the visual.  **j.** *~~Bars~~ Columns* for different Value fields for the same distinct Axis value should be clustered together, i.e., the legend values for each distinct Axis value should be clustered together.  **k.** The order of each cluster from left to right should be the same as the order of the fields placed in the Value section from top to bottom. Actor should be able to rearrange the position of the fields on the Value section, and system should rearrange the cluster accordingly.  **m.** Each unique Value’s *~~bar~~ column* within a clustered Axis should have a different colour to distinguish one Value field from another. System should display the same corresponding colour in the Legends formatting property.  **r.** Y-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class.  **s.** Y-axis marks should end at the maximum aggregated value from all Value-Axis combinations rounded up to a nearest mark class.  In case the actor added a single field each in Legend and Value sections  **l.** System should display a separate *~~bar~~ column* for each distinct value of Legend and each distinct Axis value, e.g. if the Axis section field has 5 distinct values and Legend field has 4 distinct values, system should display 5 x 4 = 20 different *~~bars~~ columns* on the visual.  **j.** Bars for different Value fields for the same distinct Axis value should be clustered together, i.e., the Legend *~~bars~~ columns* for each distinct Axis value should be clustered together.  **k.** The order of legends *~~bars~~ columns* in each cluster from left to right by default should be in ascending alphabetical order of Legend dimension. System should allow actor to change the order of Legend values.  **m.** Each unique Legend value’s *~~bars~~ columns* within a clustered Axis should have a different colour to distinguish one legend value from another. System should display the same corresponding colour in the Legends formatting property.  **r.** Y-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Legend-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class.  **s.** Y-axis marks should end at the maximum aggregated value from all Value-Legend-Axis combinations rounded up to a nearest mark class.  **n.** *~~Bars~~ Columns* for different Axis values should have same colour.  **p.** The width of each *~~bar~~ column* should be equal in the graph. System should allow actor to change the width in the formatting properties.  **q.** The length of each *~~bar~~ column* as projected from the Y-axis marks should be equal to the aggregation of the corresponding Value field.  **t.** By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis (or Axis-Legend) field.  **u.** On clicking the ellipsis (3 dots) next to any field in the Value or Tooltip sections, system should display a context menu item: Aggregation.  **y.** System should update the *~~bar~~ column* chart to display the aggregated value as per selected aggregation option.   * 1. **Formatting**  1. Under the Formatting section, system should display the following sections: 2. If actor selects the **Title** section to update the title, system should ask for the following:    * 1. Check box for showing the title, If the actor selects the check box, then the title should get displayed in the graph and should be invisible after unselect the check box. System should display the Text field as blank by default.      2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.      3. Title Alignment: Whether the title to be displayed with be at left, centre, right.      4. Distance from Top: How far from the top of the visual space does the title need to be.      5. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when the chart is selected for the first time in the Visual Properties Pane).      6. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      7. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      8. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      9. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      10. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.      11. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.      12. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.      13. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 3. If actor selects the **X Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Top/Bottom position to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. If actor clicked on the **Show ticks** check box, following sub-options should become visible:         1. **Major Tick Marks**: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.         2. **Minor Tick Marks**: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.      5. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      6. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      7. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      8. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      10. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      11. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      12. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      13. The actor should be able to either select or manually enter the inner padding between the different sets of clustered *~~bars~~ columns*. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.      14. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 4. If actor selects the **Y Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Left/Right positions to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. If actor clicked on the **Show ticks** check box, following sub-options should become visible:         1. **Major Tick Marks**: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.         2. **Minor Tick Marks**: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.      5. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      6. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      7. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      8. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, and Oblique**. It should be **Normal** by default.      10. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      11. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      12. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      13. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 5. If actor selects the **Legend** section to update the Axis, system should ask for the following:    * 1. **Show Legends:** As the actor selects the check box, the legends should be visible in the graph      2. **Position:** The actor should be able to select the position of the legends from the drop down values. In the drop down, the actor should be able to see the 8 different values i.e. Top, Bottom, Left, Right, Top Center, Bottom Center, Left Center and Right Center. Top should be selected by default.      3. Drop down to select the **font size** of the font. The actor should be able to select the font size of the legend of graph. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane).      4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      5. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      7. Actor should be able to change the **font colour** of the legend by selecting the colour from the palette      8. User should be able to select the width of the **border** of legend      9. Actor should be able to change the **Border Colour** of the legend by selecting the colour from the palette      10. Actor should be able to change the **Background colour** of the legend by selecting the colour from the palette. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      11. The actor should be able to add/edit the title of the legend. The Check box should be visible for showing the title of legend, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the legend. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          5. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          6. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          7. Actor should be able to change the **font colour** of the title by selecting the colour from the palette 6. If actor selects the **GRID** section to update the Axis, system should ask for the following:    * 1. **~~Contains Labels:~~** ~~As the actor selects the check box, the labels should be visible in the graph~~      2. **~~Height:~~** ~~The Actor should be able to adjust the height of the graph with in the grid.~~      3. **~~Width:~~** ~~The Actor should be able to adjust the width of the graph with in the grid.~~      4. **~~Top:~~** ~~The Actor should be able to adjust the Top of the graph with in the grid~~      5. **~~Bottom:~~** ~~The Actor should be able to adjust the bottom of the graph with in the grid~~      6. **~~Left:~~** ~~The Actor should be able to adjust the left alignment of the graph with in the grid~~      7. **~~Right:~~** ~~The Actor should be able to adjust the right alignment of the graph with in the grid~~      8. **Background Colour:** The actor should be able to change the background colour of the grid by changing the colour of grid. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. **Alt Text:** The actor should be able to enter the text which should be visible when no data is available on the graph or data set is broken. By default, system should show “Error! Please check that selected fields are present in dataset”. 7. If actor selects the **Colour Palette** section to update the Axis, system should ask for the following    * 1. **Custom Colour Palette:** The actor should be able to select the colour of the graph by its own.      2. **Random:** If actor select the random colour palette, the graph colour should be changed randomly.      3. **Default:** On the selection of Default, the default colours should be visible 8. **Conditional Colours:** As the actor selects the check box, the conditional colour formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the conditional colours should get back to default.    * 1. Types: The actor should be able to select any value from the drop down. The values in the drop down are: **Colour Scale and Rules.** As the actor selects colour scale, then colour scale formatting properties should be visible in the screen. If actor unselects it, then all the option should not visible on the screen and all the selected values under it get back to the default.   Below mentioned options should be visible for **Colour Scale** option.   * + - 1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set.       2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section.       3. **Diverging:** The actor should be able to select the checkbox for indicating whether 2 point colour scale is required or 3 colour scale with 2 separate sections for minimum and maximum values       4. **Stepped Colours:** The actor should be able to select the checkbox whether stepped values are required. If actor checks the box, then the actor should be able to enter any integer number between 2 to 10. Post entering the number by the actor, the system should create the colours in the number of steps from minimum to maximum       5. **Minimum:** The actor should be able to select the whether minimum value will be identified by **lowest** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In Lowest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.       6. **Center:** The actor should be able to select the whether center value will be identified by **center** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In **center**, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette. The Center option should be visible if actor selects the **Diverging** option.       7. **Maximum:** The actor should be able to select the whether maximum value will be identified by **maximum** value of the aggregated field or by a **Static** number. If static fields are selected, then actor should be able to enter any number in the text box. In highest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.   Below mentioned options should be visible for **Rules** option.   1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set. 2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section. 3. **Add rule:** The actor should be select this icon to add a new rule.   If actor selects add rule, the following options should be displayed:   1. **Condition**: System should allow actor to select one option from “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “is not blank”, “is not blank”, “is first”, “is last”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. The “is first” and “is last” options should only be displayed if the “Based on Field” is a dimension. 2. **Value**: System should display an option to enter value if actor selected “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. 3. **Colour**: In any case, actor should be able to select the required colour from the colour palette.   If any particular data point does not satisfy above colour scale or rules conditions, the system should display the default colours as set by the actor through colour palette section.   1. **Data labels:** As the actor selects the check box, the data labels formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the data labels should get back to default.    * 1. **Customize Label:** The actor should be able to select the checkbox to indicate whether they want customize the label by making it dynamic.      2. Option to enter dynamic label. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic label is not selected.      3. **Colour:** The actor should be able to change the colour of the data labels used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. **Position**: The actor should be able to select the position of the label within each visual object from the drop down. The drop down should display 4 different values i.e. Inside and Outside. Inside should be selected as the by default.      7. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of -90 degree to 90 degree with an interval of 10-10 degrees      8. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the default position (Center, if Inside is selected or just above the bar if actor has selected Outside). Margin value should have the negative range to positive range( -90 to 90 px).      9. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      10. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      11. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      12. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      13. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      14. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      15. **Overflow action**: The actor should be able to select the system behaviour if the label overflows its designated area from one of the following options: Truncate, Wrap words, None.      16. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default. 2. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%. 3. **Tooltip:** As the actor selects the check box, the tooltip formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values should get back to default.    * 1. **Customize Tooltip:** The actor should be able to select the checkbox to indicate whether they want customize it by making it dynamic.      2. Option to enter dynamic tooltip. System should provide options to the actor to create a dynamically generated tooltip using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic tooltip is not selected.      3. **Colour:** The actor should be able to change the colour of the tooltip used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      7. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      8. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      9. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      10. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      11. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default.      12. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%.    1. **Analytics** 4. Under the Analytics section, system should display 3 sections: Order By, Order and limit. 5. If actor select the Order by, a drop down should appear with a details of dimensions which has been used in the visual. 6. In the Order option, the actor should be able to re-arrange the data either in increasing or decreasing option. 7. **Limit:** The actor must be able to select the limit of bars to be displayed in the graph. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Clustered *~~bar~~ column* chart or Scatter plot) and convert it to a Clustered *~~bar~~ column* chart, system should remove all fields on the Data section except the first field on the Axis section. 2. In case actor tries to edit an existing visual which is Scatter plot and convert it to a Clustered *column* chart, system should remove all fields on the Data section. 3. System should display the Clustered *~~bar~~ column* chart based on the remaining Axis and Value fields. 4. In case original visual was a Slicer, system should only display the clustered *~~bar~~ column* chart if at least one Value field has been added. 5. The actor should be able to perform all the features in the Updation of clustered *~~bar~~ column* chart |
| **Post Conditions**   1. If the actor clicked the **Save** button, & if all the mandatory fields have been entered, then 2. The System would respond with the message, “<Visual Name> saved successfully” ~~and the actor would be brought to the blank screen~~. 3. All information related to the visual been defined would be stored in the database. 4. The visual details would be available for further modification/view. 5. If the Actor clicks Close, the System would respond with the message “Are you sure you want to close this form?” If the actor responds in affirmative, then the System would discard the entered details and close the form and the actor would be brought back to Pre-Condition; otherwise, the actor would be brought back to where it was before clicking the Close button. |
| **Exceptions**  **The Actor attempts to save the Visual without entering all the visual name.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without entering all the visual Title.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without Selecting all the Data set.**  The System would respond with the message – “This field is required.”  **The actor attempts to save the visual details with the same name which already exists in the same project.**  The system would respond with the message, “Visual <Visual Name> already exists in this project. Please select another name”.  **The actor attempts to save the Visual without selecting all required fields.**  The system would respond with a message,” Please fill all required fields”.  **Visual Name and visual title should accept 99 characters.**  The system would respond with a message,” Maximum 99 characters are allowed in the name and title”.  **~~Same dimension should not get added more than a once.~~**  ~~The system should respond with a message that “ Dimension is already added”~~  **Title should accept the Unicode characters in visual title**  System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field  **Font size should be in integer and in between 4 to 64**  Actor should be able to change the Font Size to any integer value between 4 and 64.  **Font size should be visible as set by the actor**   1. System should display the font size of the title as per value provided by the actor. 2. System should display the title background colour as per value provided or colour selected by the actor. 3. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 5. System should display the visual background colour as per value provided or colour selected by the actor 6. Aggregation rules    1. **Axis:** Only dimension allowed: Aggregation ellipsis should not be displayed    2. **Value:** If dimension: then Count, Count Distinct, First, Last    3. **Value:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    4. **Legend:** Only dimension allowed: Aggregation ellipsis should not be displayed    5. **Tooltip:** If dimension: then Count, Count Distinct, First, Last    6. **Tooltip:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    7. **Colour formatting:** If dimension: then Count, Count Distinct, ~~First, Last~~    8. **Colour formatting:** If dimension: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile |
| **Business Rules**   1. System should allow actor to add any number of fields to Axis section. Any value below the first value should become drill down. 2. System should allow actor to add a field to Legend section if Value section has one or no fields added. 3. System should not allow actor to add a field to Legend section if a field is already present in this section or if the Value section has two or more fields added. 4. System should allow actor to add a field to Value section if no field is already present in this section. 5. System should allow actor to add a field to Value section if no field is present in the Legend section. 6. System should not allow actor to add a field to Value section if a field is already present in this section and a field is also present in the Legend section. 7. System should allow actor to add any number of fields to Axis section. |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.32 Design Visual: Clustered Bar Chart

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| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a clustered bar chart visual. |
| **Pre-Conditions**   1. The actor has created a new visual or edited an existing visual. 2. The data set should be prepared by the data designer and available for creation of the visual |
| **Triggers**   1. Actor selects *Clustered* *bar chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. After right click on the Visualization link available in left hand menu, the actor should be able to see the option for Create New Visualization or Delete All Visualizations. 2. After clicking on the Delete All Visualization, user should be able to delete all the visualizations under the respective projects. 3. After clicking on the Create New Visualization, System should display a pop up with the heading Create Visual, 3 form fields Visual Name, Visual Title and drop down for Dataset, and 2 buttons Create and Close. 4. After click on the Close button, the pop up should get closed and the details should not get saved in the database. 5. After clicking on the Create button, the visual should be created and available under the Visualizations menu under a respective project and the details should get saved in the database. 6. The actor should be able to see all the columns of the used dataset with categorization of Dimensions and Measures under the Dataset Field option. All the discrete values should be categorized as the dimensions and continuous values should be categorized as the measures. 7. The actor should be able to change any dimension into measure or measure into the dimensions by dragging and dropping the respective column name to desired grid. 8. The actor should be able to format the visual using the properties options. These options should be: **Fields, Formatting, Analytics** 9. The actor should be able to see the below mentioned options under the **Fields** tab.    1. **Data**       1. Under the Data section, system should display 4 sections: Axis, Legend, Values and Tooltip.       2. In the Axis section, actor should be able to drag and drop one or more field(s) from Dimension section under the Dataset Fields pane.       3. In the Legend section, actor should be able to drag and drop a field from Dimension section under the Dataset Fields pane.       4. In the Value section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.       5. In the Tooltip section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.       6. Against every field dropped in any section, system should display an option to remove the field.       7. At any time, the actor should be able to remove fields from any of the Dataset Fields section.       8. System should allow the actor to repeat the same field across multiple sections.       9. System should not allow the actor to repeat the same field in the same section.       10. System should display an ellipsis (3 dots) next to each field dropped in the Value and Tooltip sections.       11. If at least one field has been dropped in the Value section, system should display a bar chart in the right-hand side pane.       12. The Y-axis of the bar chart should be constituted from the distinct values of the field dropped in the Axis section.       13. By default, the Y-axis should display the values from top to bottom in ascending alphabetical order of the Axis dimension. System should allow actor to change the order of Axis values.       14. System should allow actor to either i) add multiple fields in the Value section if no field has been added in the Legend section, or ii) add a single field each in the Legend and Value sections           1. In case the actor added multiple fields in Value sections (with no field in Legend section) 10. System should display a separate bar for each dropped Value field and each distinct Axis value, e.g. if the Axis section field has 5 distinct values and 3 fields were dropped in the Value section, system should display 5 x 3 = 15 different bars on the visual. 11. Bars for each distinct Axis value, i.e. the bars of each field on the Value section should be clustered together. 12. The order of each cluster from bottom to top should be the same as the order of the fields placed in the Value section from top to bottom.     * + 1. In case the actor added a single field each in Legend and Value sections 13. System should display a separate bar for each distinct value of Legend and each distinct Axis value, e.g. if the Axis section field has 5 distinct values and Legend field has 4 distinct values, system should display 5 x 4 = 20 different bars on the visual. 14. Bars for each distinct Axis value, i.e. the bars of each distinct value of the Legend field should be clustered together. 15. The order of legends bars in each cluster from left to right by default should be in ascending alphabetical order of Legend dimension. System should allow actor to change the order of Legend values.     * 1. Actor should be able to rearrange the position of the fields on the Value section, and system should rearrange the cluster accordingly.       2. Each unique bar within a clustered Axis should have a different colour to distinguish one bar field from another. System should display the same corresponding colour in the Legends formatting property.       3. X-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class.       4. X-axis marks should end at the maximum aggregated value from all Value-Axis combinations rounded up to a nearest mark class.       5. The colour of bars within each cluster should be consistent across the different Axis values.       6. The width of each bar should be equal in the graph.       7. The length of each bar as projected from the X-axis marks should be equal to the aggregation of the corresponding Value field.       8. By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis (or Axis-Legend) field.       9. On clicking the ellipsis (3 dots) next to any field in the Value or Tooltip sections, system should display a context menu item: Aggregation. Actor should be able to select any value from the listed aggregation options. System should update the bar chart to display the aggregated value as per selected aggregation option.     1. **Formatting**        1. Under the Formatting section, system should display the following sections:        2. If actor selects the Title section, system should ask for the following:           1. Check box for showing the Title text, If the actor selects the check box, then the title should get displayed in the graph and should be invisible after unselect the check box. System should display the Text field as blank by default.           2. Text field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.           3. Title Alignment: Whether the title to be displayed with be at left, centre, right.           4. Distance from Top: How far from the top of the visual space does the title need to be.           5. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).           6. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default.           7. Actor should be able to select the Font weight to be bold or not. It should be bold by default.           8. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default.           9. Actor should be able to change the Font colour of the title by selecting the colour from the palette           10. Actor should be able to change the Background colour of the title by selecting the colour from the palette. System should display the background colour as None by default.           11. User should be able to select the Border width of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.           12. Actor should be able to change the Border Colour of the title by selecting the colour from the palette. It should be black (#000000) by default.           13. User should be able to select the Padding width of title border from the title text. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default.        3. If actor selects the Y-Axissection, system should ask for the following:           1. Show labels: As the actor selects the check box, the labels should be visible on the axis of the graph           2. Position: The actor should be able select between Top/Bottom position to set the axis in a visual.           3. Show ticks: As the actor selects the check box, the ticks should be visible on the axis of the graph           4. Rotation Angle: The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees           5. Margin: Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis           6. Label Max Length: User should be able to select the maximum length of the label by selecting the number of characters from the drop down.           7. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).           8. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default.           9. Actor should be able to select the Font weight to be bold or not. It should be bold by default.           10. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default.           11. Actor should be able to change the Font colour of the title by selecting the colour from the palette           12. The actor should be able to either select or manually enter the inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.           13. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed. 16. Title should be invisible if the check box is unselected. System should display the Text field as blank by default. 17. Field to enter the Title text of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. 18. Title Alignment: Whether the title to be displayed with be at left, centre, right. 19. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane). 20. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default. 21. Actor should be able to select the Font weight to be bold or not. It should be bold by default. 22. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default. 23. Actor should be able to change the Font colour of the title by selecting the colour from the palette 24. Actor should be able to change the Background colour of the title by selecting the colour from the palette. System should display the background colour as None by default. 25. User should be able to select the Border width of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default. 26. Actor should be able to change the Border colour of the title by selecting the colour from the palette. It should be black (#000000) by default. 27. User should be able to select the Padding width of title border from the title text. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default.     * 1. If actor selects the X-Axissection, system should ask for the following:          1. Show labels**:** If the actor selects the check box, the labels should be visible on the axis of the graph          2. Position: The actor should be able select between Left/Right positions to set the axis in a visual.          3. Show ticks: As the actor selects the check box, the ticks should be visible on the axis of the graph          4. If actor clicked on the Show ticks check box, following sub-options should become visible:          5. Major Tick Marks: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.          6. Minor Tick Marks: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.          7. Rotation Angle: The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees          8. Margin: Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis          9. Label Max Length: User should be able to select the maximum length of the label by selecting the number of characters from the drop down.          10. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          11. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default.          12. Actor should be able to select the Font weight to be bold or not. It should be bold by default.          13. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default.          14. Actor should be able to change the Font colour of the title by selecting the colour from the palette          15. The actor should be able to either select or manually enter the Inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.          16. The actor should be able to add/edit the Title text of the axis. The Check box should be visible for showing the title of axis. If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed. 28. Title should be invisible if the check box is unselected. System should display the Text field as blank by default. 29. Field to enter the Title text of the axis. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. 30. Title Alignment: Whether the title to be displayed with be at left, centre, right. 31. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane). 32. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default. 33. Actor should be able to select the Font weight to be bold or not. It should be bold by default. 34. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default. 35. Actor should be able to change the Font colour of the title by selecting the colour from the palette 36. Actor should be able to change the Background colour of the title by selecting the colour from the palette. System should display the background colour as None by default. 37. User should be able to select the Border width of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default. 38. Actor should be able to change the Border colour of the title by selecting the colour from the palette. It should be black (#000000) by default. 39. User should be able to select the Padding width of title border from the title text. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default.     * 1. If actor selects the Legendsection, system should ask for the following:          1. Show Legends**:** As the actor selects the check box, the legends should be visible in the graph          2. Position**:** The actor should be able to select the position of the legends from the dropdown values. In the drop down, the actor should be able to see the 8 different values i.e. Top, Bottom, Left, Right, Top Center, Bottom Center, Left Center and Right Center. Top should be selected by default.          3. Drop down to select the Font size of the font. The actor should be able to select the font size of the legend of graph. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane).          4. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default.          5. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be Serif by default.          6. Actor should be able to select the Font weight to be bold or not. It should be bold by default.          7. Actor should be able to change the Font colour of the legend by selecting the colour from the palette          8. User should be able to select the width of the Legend border.          9. Actor should be able to change the Border colour of the legend by selecting the colour from the palette.          10. Actor should be able to change the Background colour of the legend by selecting the colour from the palette. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).          11. The actor should be able to add/edit the title of the legend. The Check box should be visible for showing the title of legend, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed. 40. Title should be invisible if the check box is unselected. System should display the Text field as blank by default. 41. Field to enter the Title text of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. 42. Title Alignment: Whether the title to be displayed with be at left, centre, right. 43. Drop down to select the Font size of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane). 44. Actor should be able to select the Font style from the drop down. 3 possible values should be in the drop down as Normal, Italic, Oblique. It should be Normal by default. 45. Actor should be able to select the Font weight to be bold or not. It should be bold by default. 46. Actor should be able to select the Font family with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be Serif by default. 47. Actor should be able to change the Font colour of the title by selecting the colour from the palette 48. If actor selects the **GRID** section to update the Axis, system should ask for the following:     * 1. **~~Contains Labels:~~** ~~As the actor selects the check box, the labels should be visible in the graph~~       2. **~~Height:~~** ~~The Actor should be able to adjust the height of the graph with in the grid.~~       3. **~~Width:~~** ~~The Actor should be able to adjust the width of the graph with in the grid.~~       4. **~~Top:~~** ~~The Actor should be able to adjust the Top of the graph with in the grid~~       5. **~~Bottom:~~** ~~The Actor should be able to adjust the bottom of the graph with in the grid~~       6. **~~Left:~~** ~~The Actor should be able to adjust the left alignment of the graph with in the grid~~       7. **~~Right:~~** ~~The Actor should be able to adjust the right alignment of the graph with in the grid~~       8. **Background Colour:** The actor should be able to change the background colour of the grid by changing the colour of grid. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).       9. **Alt Text:** The actor should be able to enter the text which should be visible when no data is available on the graph or data set is broken. By default, system should show “Error! Please check that selected fields are present in dataset”. 49. If actor selects the **Colour Palette** section to update the Axis, system should ask for the following     * 1. **Custom Colour Palette:** The actor should be able to select the colour of the graph by its own.       2. **Random:** If actor select the random colour palette, the graph colour should be changed randomly.       3. **Default:** On the selection of Default, the default colours should be visible 50. **Conditional Colours:** As the actor selects the check box, the conditional colour formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the conditional colours should get back to default.     * 1. Types: The actor should be able to select any value from the drop down. The values in the drop down are: **Colour Scale and Rules.** As the actor selects colour scale, then colour scale formatting properties should be visible in the screen. If actor unselects it, then all the option should not visible on the screen and all the selected values under it get back to the default.   Below mentioned options should be visible for **Colour Scale** option.   * + - 1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set.       2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section.       3. **Diverging:** The actor should be able to select the checkbox for indicating whether 2 point colour scale is required or 3 colour scale with 2 separate sections for minimum and maximum values       4. **Stepped Colours:** The actor should be able to select the checkbox whether stepped values are required. If actor checks the box, then the actor should be able to enter any integer number between 2 to 10. Post entering the number by the actor, the system should create the colours in the number of steps from minimum to maximum       5. **Minimum:** The actor should be able to select the whether minimum value will be identified by **lowest** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In Lowest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.       6. **Center:** The actor should be able to select the whether center value will be identified by **center** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In **center**, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette. The Center option should be visible if actor selects the **Diverging** option.       7. **Maximum:** The actor should be able to select the whether maximum value will be identified by **maximum** value of the aggregated field or by a **Static** number. If static fields are selected, then actor should be able to enter any number in the text box. In highest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.   Below mentioned options should be visible for **Rules** option.   1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set. 2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section. 3. **Add rule:** The actor should be select this icon to add a new rule.   If actor selects add rule, the following options should be displayed:   1. **Condition**: System should allow actor to select one option from “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “is not blank”, “is not blank”, “is first”, “is last”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. The “is first” and “is last” options should only be displayed if the “Based on Field” is a dimension. 2. **Value**: System should display an option to enter value if actor selected “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. 3. **Colour**: In any case, actor should be able to select the required colour from the colour palette.   If any particular data point does not satisfy above colour scale or rules conditions, the system should display the default colours as set by the actor through colour palette section.   1. **Data labels:** As the actor selects the check box, the data labels formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the data labels should get back to default.    * 1. **Customize Label:** The actor should be able to select the checkbox to indicate whether they want customize the label by making it dynamic.      2. Option to enter dynamic label. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic label is not selected.      3. **Colour:** The actor should be able to change the colour of the data labels used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. **Position**: The actor should be able to select the position of the label within each visual object from the drop down. The drop down should display 4 different values i.e. Inside and Outside. Inside should be selected as the by default.      7. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of -90 degree to 90 degree with an interval of 10-10 degrees      8. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the default position (Center, if Inside is selected or just above the bar if actor has selected Outside). Margin value should have the negative range to positive range( -90 to 90 px).      9. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      10. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      11. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      12. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      13. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      14. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      15. **Overflow action**: The actor should be able to select the system behaviour if the label overflows its designated area from one of the following options: Truncate, Wrap words, None.      16. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default. 2. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%. 3. **Tooltip:** As the actor selects the check box, the tooltip formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values should get back to default.    * 1. **Customize Tooltip:** The actor should be able to select the checkbox to indicate whether they want customize it by making it dynamic.      2. Option to enter dynamic tooltip. System should provide options to the actor to create a dynamically generated tooltip using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic tooltip is not selected.      3. **Colour:** The actor should be able to change the colour of the tooltip used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      7. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      8. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      9. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      10. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      11. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default.      12. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%.    1. **Analytics** 4. Under the Analytics section, system should display 3 sections: Order By, Order and limit. 5. If actor select the Order by, a drop down should appear with a details of dimensions which has been used in the visual. 6. In the Order option, the actor should be able to re-arrange the data either in increasing or decreasing option. 7. **Limit:** The actor must be able to select the limit of bars to be displayed in the graph. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Clustered bar chart or Scatter plot) and convert it to a Clustered bar chart, system should remove all fields on the Data section except the first field on the Axis section. 2. In case actor tries to edit an existing visual which is Scatter plot and convert it to a Clustered bar chart, system should remove all fields on the Data section. 3. System should display the Clustered bar chart based on the remaining Axis and Value fields. 4. In case original visual was a Slicer, system should only display the clustered bar chart if at least one Value field has been added. 5. The actor should be able to perform all the features in the Updation of clustered bar chart |
| **Post Conditions**   1. If the actor clicked the **Save** button, & if all the mandatory fields have been entered, then 2. The System would respond with the message, “<Visual Name> saved successfully” ~~and the actor would be brought to the blank screen~~. 3. All information related to the visual been defined would be stored in the database. 4. The visual details would be available for further modification/view. 5. If the Actor clicks Close, the System would respond with the message “Are you sure you want to close this form?” If the actor responds in affirmative, then the System would discard the entered details and close the form and the actor would be brought back to Pre-Condition; otherwise, the actor would be brought back to where it was before clicking the Close button. |
| **Exceptions**  **The Actor attempts to save the Visual without entering all the visual name.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without entering all the visual Title.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without Selecting all the Data set.**  The System would respond with the message – “This field is required.”  **The actor attempts to save the visual details with the same name which already exists in the same project.**  The system would respond with the message, “Visual <Visual Name> already exists in this project. Please select another name”.  **The actor attempts to save the Visual without selecting all required fields.**  The system would respond with a message,” Please fill all required fields”.  **Visual Name and visual title should accept 99 characters.**  The system would respond with a message,” Maximum 99 characters are allowed in the name and title”.  **~~Same dimension should not get added more than a once.~~**  ~~The system should respond with a message that “ Dimension is already added”~~  **Title should accept the Unicode characters in visual title**  System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field  **Font size should be in integer and in between 4 to 64**  Actor should be able to change the Font Size to any integer value between 4 and 64.  **Font size should be visible as set by the actor**   1. System should display the font size of the title as per value provided by the actor. 2. System should display the title background colour as per value provided or colour selected by the actor. 3. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 5. System should display the visual background colour as per value provided or colour selected by the actor 6. Aggregation rules    1. **Axis:** Only dimension allowed: Aggregation ellipsis should not be displayed    2. **Value:** If dimension: then Count, Count Distinct, First, Last    3. **Value:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    4. **Legend:** Only dimension allowed: Aggregation ellipsis should not be displayed    5. **Tooltip:** If dimension: then Count, Count Distinct, First, Last    6. **Tooltip:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    7. **Colour formatting:** If dimension: then Count, Count Distinct, ~~First, Last~~    8. **Colour formatting:** If dimension: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile |
| **Business Rules**   1. System should allow actor to add any number of fields to Axis section. Any value below the first value should become drill down. 2. System should allow actor to add a field to Legend section if Value section has one or no fields added. 3. System should not allow actor to add a field to Legend section if a field is already present in this section or if the Value section has two or more fields added. 4. System should allow actor to add a field to Value section if no field is already present in this section. 5. System should allow actor to add a field to Value section if no field is present in the Legend section. 6. System should not allow actor to add a field to Value section if a field is already present in this section and a field is also present in the Legend section. 7. System should allow actor to add any number of fields to Axis section. |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.33 Design Visual: Stacked Bar Chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a stacked bar chart visual. |
| **Pre-Conditions**   1. The actor has created a new visual or edited an existing visual. 2. The data set should be prepared by the data designer and available for creation of the visual |
| **Triggers**   1. Actor selects *Stacked* *bar chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. After right click on the Visualization link available in left hand menu, the actor should be able to see the option for Create New Visualization or Delete All Visualizations. 2. After clicking on the Delete All Visualization, user should be able to delete all the visualizations under the respective projects. 3. After clicking on the Create New Visualization, System should display a pop up with the heading Create Visual, 3 form fields Visual Name, Visual Title and drop down for Dataset, and 2 buttons Create and Close. 4. After click on the Close button, the pop up should get closed and the details should not get saved in the database. 5. After clicking on the Create button, the visual should be created and available under the Visualizations menu under a respective project and the details should get saved in the database. 6. The actor should be able to see all the columns of the used dataset with categorization of Dimensions and Measures under the Dataset Field option. All the discrete values should be categorized as the dimensions and continuous values should be categorized as the measures. 7. The actor should be able to change any dimension into measure or measure into the dimensions by dragging and dropping the respective column name to desired grid. 8. The actor should be able to format the visual using the properties options. These options should be: **Fields, Formatting, Analytics** 9. The actor should be able to see the below mentioned options under the **Fields** tab.    1. **Data**   **a.** Under the Data section, system should display 4 sections: Axis, Legend, Values and Tooltip.  **b.** In the Axis section, actor should be able to drag and drop one or more field(s) from Dimension section under the Dataset Fields pane.  **b.** In the Legend section, actor should be able to drag and drop a field from Dimension section under the Dataset Fields pane.  **c.** In the Value section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **c.** In the Tooltip section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **h.** Against every field dropped in any section, system should display an option to remove the field.  **d.** At any time, the actor should be able to remove fields from any of the Dataset Fields section.  **e.** System should allow the actor to repeat the same field across multiple sections.  **f.** System should not allow the actor to repeat the same field in the same section.  **g.** System should display an ellipsis (3 dots) next to each field dropped in the Value and Tooltip sections.  **i.** If at least one field has been dropped in the Value section, system should display a bar chart in the right-hand side pane.  **j.** The Y-axis of the bar chart should be constituted from the distinct values of the field dropped in the Axis section.  **k.** By default, the Y-axis should display the values from top to bottom in ascending alphabetical order of the Axis dimension. System should allow actor to change the order of Axis values.  In case the actor added multiple fields in Value sections (with no field in Legend section)  **l.** System should display a bar with multiple stacks (one for each dropped Value field) for each distinct Axis value, e.g. if the Axis section field has 5 distinct values and 3 fields were dropped in the Value section, system should display 5 different bars (with 3 stacks on each bar) on the visual.  **m**. The stack portion for each field dropped in the Value section should have a different colour to distinguish one Value field from another. System should display the same corresponding colour in the Legends formatting property. Bar colours should not vary across each Axis value.  **n**. The order of each stack from bottom to top should be the same as the order of the fields in the Value section from top to bottom. Actor should be able to rearrange the position of the fields on the Value section, and system should rearrange the stack order accordingly.  In case the actor added a single field each in Legend and Value sections  **l.** System should display a bar with multiple stacks (one for each distinct value of Legend) for each distinct Axis value, e.g. if the Axis section field has 5 distinct values and Legend field has 4 distinct values, system should display 5 x 4 = 20 different bars on the visual.  **m.** Each unique Legend value’s bar within a stacked bar should have a different colour to distinguish one legend value from another. System should display the same corresponding colour in the Legends formatting property.  **n.** The order of legend bars in each stack from bottom to top by default should be in ascending alphabetical order of Legend dimension. System should allow actor to change the order of Legend values.  **o.** Bars for different Axis values should have same colour composition for the equivalent stacks.  **p.** The width of each bar should be equal in the graph. System should allow actor to change the width in the formatting properties.  **r.** The total length of each stacked bar should be equal to the aggregation of all Value fields for the particular Axis value.  **t.** X-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Legend-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class.  **u.** X-axis marks should end at the maximum aggregated value from all Value-Legend-Axis combinations rounded up to a nearest mark class.  **v.** By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis (or Axis-Legend) field.  **w.** On clicking the ellipsis (3 dots) next to any field in the Value or Tooltip sections, system should display a context menu item: Aggregation.  **x.** System should update the bar chart to display the aggregated value as per selected aggregation option.   * 1. **Formatting**  1. Under the Formatting section, system should display the following sections: 2. If actor selects the **Title** section to update the title, system should ask for the following:    * 1. Check box for showing the title, If the actor selects the check box, then the title should get displayed in the graph and should be invisible after unselect the check box. System should display the Text field as blank by default.      2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.      3. Title Alignment: Whether the title to be displayed with be at left, centre, right.      4. Distance from Top: How far from the top of the visual space does the title need to be.      5. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      6. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      7. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      8. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      9. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      10. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.      11. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.      12. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.      13. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 3. If actor selects the **Y-Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Top/Bottom position to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. If actor clicked on the **Show ticks** check box, following sub-options should become visible:         1. **Major Tick Marks**: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.         2. **Minor Tick Marks**: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.      5. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      6. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      7. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      8. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      10. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      11. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      12. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      13. The actor should be able to either select or manually enter the inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.      14. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 4. If actor selects the **X Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Left/Right positions to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. If actor clicked on the **Show ticks** check box, following sub-options should become visible:         1. **Major Tick Marks**: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.         2. **Minor Tick Marks**: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.      5. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      6. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      7. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      8. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, and Oblique**. It should be **Normal** by default.      10. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      11. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      12. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      13. The actor should be able to either select or manually enter the inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.      14. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 5. If actor selects the **Legend** section to update the Axis, system should ask for the following:    * 1. **Show Legends:** As the actor selects the check box, the legends should be visible in the graph      2. **Position:** The actor should be able to select the position of the legends from the drop down values. In the drop down, the actor should be able to see the 8 different values i.e. Top, Bottom, Left, Right, Top Center, Bottom Center, Left Center and Right Center. Top should be selected by default.      3. Drop down to select the **font size** of the font. The actor should be able to select the font size of the legend of graph. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane).      4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      5. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      7. Actor should be able to change the **font colour** of the legend by selecting the colour from the palette      8. User should be able to select the width of the **border** of legend      9. Actor should be able to change the **Border Colour** of the legend by selecting the colour from the palette      10. Actor should be able to change the **Background colour** of the legend by selecting the colour from the palette. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      11. The actor should be able to add/edit the title of the legend. The Check box should be visible for showing the title of legend, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the legend. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          5. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          6. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          7. Actor should be able to change the **font colour** of the title by selecting the colour from the palette 6. If actor selects the **GRID** section to update the Axis, system should ask for the following:    * 1. **~~Contains Labels:~~** ~~As the actor selects the check box, the labels should be visible in the graph~~      2. **~~Height:~~** ~~The Actor should be able to adjust the height of the graph with in the grid.~~      3. **~~Width:~~** ~~The Actor should be able to adjust the width of the graph with in the grid.~~      4. **~~Top:~~** ~~The Actor should be able to adjust the Top of the graph with in the grid~~      5. **~~Bottom:~~** ~~The Actor should be able to adjust the bottom of the graph with in the grid~~      6. **~~Left:~~** ~~The Actor should be able to adjust the left alignment of the graph with in the grid~~      7. **~~Right:~~** ~~The Actor should be able to adjust the right alignment of the graph with in the grid~~      8. **Background Colour:** The actor should be able to change the background colour of the grid by changing the colour of grid. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. **Alt Text:** The actor should be able to enter the text which should be visible when no data is available on the graph or data set is broken. By default, system should show “Error! Please check that selected fields are present in dataset”. 7. If actor selects the **Colour Palette** section to update the Axis, system should ask for the following    * 1. **Custom Colour Palette:** The actor should be able to select the colour of the graph by its own.      2. **Random:** If actor select the random colour palette, the graph colour should be changed randomly.      3. **Default:** On the selection of Default, the default colours should be visible 8. **Conditional Colours:** As the actor selects the check box, the conditional colour formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the conditional colours should get back to default.    * 1. Types: The actor should be able to select any value from the drop down. The values in the drop down are: **Colour Scale and Rules.** As the actor selects colour scale, then colour scale formatting properties should be visible in the screen. If actor unselects it, then all the option should not visible on the screen and all the selected values under it get back to the default.   Below mentioned options should be visible for **Colour Scale** option.   * + - 1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set.       2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section.       3. **Diverging:** The actor should be able to select the checkbox for indicating whether 2 point colour scale is required or 3 colour scale with 2 separate sections for minimum and maximum values       4. **Stepped Colours:** The actor should be able to select the checkbox whether stepped values are required. If actor checks the box, then the actor should be able to enter any integer number between 2 to 10. Post entering the number by the actor, the system should create the colours in the number of steps from minimum to maximum       5. **Minimum:** The actor should be able to select the whether minimum value will be identified by **lowest** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In Lowest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.       6. **Center:** The actor should be able to select the whether center value will be identified by **center** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In **center**, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette. The Center option should be visible if actor selects the **Diverging** option.       7. **Maximum:** The actor should be able to select the whether maximum value will be identified by **maximum** value of the aggregated field or by a **Static** number. If static fields are selected, then actor should be able to enter any number in the text box. In highest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.   Below mentioned options should be visible for **Rules** option.   1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set. 2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section. 3. **Add rule:** The actor should be select this icon to add a new rule.   If actor selects add rule, the following options should be displayed:   1. **Condition**: System should allow actor to select one option from “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “is not blank”, “is not blank”, “is first”, “is last”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. The “is first” and “is last” options should only be displayed if the “Based on Field” is a dimension. 2. **Value**: System should display an option to enter value if actor selected “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. 3. **Colour**: In any case, actor should be able to select the required colour from the colour palette.   If any particular data point does not satisfy above colour scale or rules conditions, the system should display the default colours as set by the actor through colour palette section.   1. **Data labels:** As the actor selects the check box, the data labels formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the data labels should get back to default.    * 1. **Customize Label:** The actor should be able to select the checkbox to indicate whether they want customize the label by making it dynamic.      2. Option to enter dynamic label. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic label is not selected.      3. **Colour:** The actor should be able to change the colour of the data labels used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. **Position**: The actor should be able to select the position of the label within each visual object from the drop down. The drop down should display 4 different values i.e. Inside and Outside. Inside should be selected as the by default.      7. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of -90 degree to 90 degree with an interval of 10-10 degrees      8. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the default position (Center, if Inside is selected or just above the bar if actor has selected Outside). Margin value should have the negative range to positive range( -90 to 90 px).      9. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      10. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      11. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      12. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      13. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      14. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      15. **Overflow action**: The actor should be able to select the system behaviour if the label overflows its designated area from one of the following options: Truncate, Wrap words, None.      16. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default. 2. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%. 3. **Tooltip:** As the actor selects the check box, the tooltip formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values should get back to default.    * 1. **Customize Tooltip:** The actor should be able to select the checkbox to indicate whether they want customize it by making it dynamic.      2. Option to enter dynamic tooltip. System should provide options to the actor to create a dynamically generated tooltip using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic tooltip is not selected.      3. **Colour:** The actor should be able to change the colour of the tooltip used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      7. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      8. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      9. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      10. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      11. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default.      12. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%.    1. **Analytics** 4. Under the Analytics section, system should display 3 sections: Order By, Order and limit. 5. If actor select the Order by, a drop down should appear with a details of dimensions which has been used in the visual. 6. In the Order option, the actor should be able to re-arrange the data either in increasing or decreasing option. 7. **Limit:** The actor must be able to select the limit of bars to be displayed in the graph. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than stacked bar chart or scatter plot) and convert it to a stacked bar chart, system should remove all fields on the Data section except the first field on the Axis section. 2. In case actor tries to edit an existing visual which is scatter plot and convert it to a stacked bar chart, system should remove all fields on the Data section. 3. System should display the stacked bar chart based on the remaining Axis and Value fields. 4. In case original visual was a slicer, system should only display the stacked bar chart if at least one Value field has been added. 5. The actor should be able to perform all the features to update the stacked bar chart. |
| **Post Conditions**   1. If the actor clicked the **Save** button, & if all the mandatory fields have been entered, then 2. The System would respond with the message, “<Visual Name> saved successfully” ~~and the actor would be brought to the blank screen~~. 3. All information related to the visual been defined would be stored in the database. 4. The visual details would be available for further modification/view. 5. If the Actor clicks Close, the System would respond with the message “Are you sure you want to close this form?” If the actor responds in affirmative, then the System would discard the entered details and close the form and the actor would be brought back to Pre-Condition; otherwise, the actor would be brought back to where it was before clicking the Close button. |
| **Exceptions**  **The Actor attempts to save the Visual without entering all the visual name.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without entering all the visual Title.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without Selecting all the Data set.**  The System would respond with the message – “This field is required.”  **The actor attempts to save the visual details with the same name which already exists in the same project.**  The system would respond with the message, “Visual <Visual Name> already exists in this project. Please select another name”.  **The actor attempts to save the Visual without selecting all required fields.**  The system would respond with a message,” Please fill all required fields”.  **Visual Name and visual title should accept 99 characters.**  The system would respond with a message,” Maximum 99 characters are allowed in the name and title”.  **~~Same dimension should not get added more than a once.~~**  ~~The system should respond with a message that “ Dimension is already added”~~  **Title should accept the Unicode characters in visual title**  System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field  **Font size should be in integer and in between 4 to 64**  Actor should be able to change the Font Size to any integer value between 4 and 64.  **Font size should be visible as set by the actor**   1. System should display the font size of the title as per value provided by the actor. 2. System should display the title background colour as per value provided or colour selected by the actor. 3. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 5. System should display the visual background colour as per value provided or colour selected by the actor 6. Aggregation rules    1. **Axis:** Only dimension allowed: Aggregation ellipsis should not be displayed    2. **Value:** If dimension: then Count, Count Distinct, First, Last    3. **Value:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    4. **Legend:** Only dimension allowed: Aggregation ellipsis should not be displayed    5. **Tooltip:** If dimension: then Count, Count Distinct, First, Last    6. **Tooltip:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    7. **Colour formatting:** If dimension: then Count, Count Distinct, ~~First, Last~~    8. **Colour formatting:** If dimension: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile |
| **Business Rules**   1. System should allow actor to add any number of fields to Axis section. Any value below the first value should become drill down. 2. System should allow actor to add a field to Legend section if Value section has one or no fields added. 3. System should not allow actor to add a field to Legend section if a field is already present in this section or if the Value section has two or more fields added. 4. System should allow actor to add a field to Value section if no field is already present in this section. 5. System should allow actor to add a field to Value section if no field is present in the Legend section. 6. System should not allow actor to add a field to Value section if a field is already present in this section and a field is also present in the Legend section. 7. System should allow actor to add any number of fields to Axis section. |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.34 Design Visual: Stacked Column Chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a stacked bar chart visual. |
| **Pre-Conditions**   1. The actor has created a new visual or edited an existing visual. 2. The data set should be prepared by the data designer and available for creation of the visual |
| **Triggers**   1. Actor selects *Stacked* *column chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. After right click on the Visualization link available in left hand menu, the actor should be able to see the option for Create New Visualization or Delete All Visualizations. 2. After clicking on the Delete All Visualization, user should be able to delete all the visualizations under the respective projects. 3. After clicking on the Create New Visualization, System should display a pop up with the heading Create Visual, 3 form fields Visual Name, Visual Title and drop down for Dataset, and 2 buttons Create and Close. 4. After click on the Close button, the pop up should get closed and the details should not get saved in the database. 5. After clicking on the Create button, the visual should be created and available under the Visualizations menu under a respective project and the details should get saved in the database. 6. The actor should be able to see all the columns of the used dataset with categorization of Dimensions and Measures under the Dataset Field option. All the discrete values should be categorized as the dimensions and continuous values should be categorized as the measures. 7. The actor should be able to change any dimension into measure or measure into the dimensions by dragging and dropping the respective column name to desired grid. 8. The actor should be able to format the visual using the properties options. These options should be: **Fields, Formatting, Analytics** 9. The actor should be able to see the below mentioned options under the **Fields** tab.    1. **Data**   **a.** Under the Data section, system should display 4 sections: Axis, Legend, Values and Tooltip.  **b.** In the Axis section, actor should be able to drag and drop one or more field(s) from Dimension section under the Dataset Fields pane.  **b.** In the Legend section, actor should be able to drag and drop a field from Dimension section under the Dataset Fields pane.  **c.** In the Value section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **c.** In the Tooltip section, actor should be able to drop one or more fields from measure(s) section under the Dataset Fields pane.  **h.** Against every field dropped in any section, system should display an option to remove the field.  **d.** At any time, the actor should be able to remove fields from any of the Dataset Fields section.  **e.** System should allow the actor to repeat the same field across multiple sections.  **f.** System should not allow the actor to repeat the same field in the same section.  **g.** System should display an ellipsis (3 dots) next to each field dropped in the Value and Tooltip sections.  **i.** If at least one field has been dropped in the Value section, system should display a column chart in the right-hand side pane.  **j.** The Y-axis of the column chart should be constituted from the distinct values of the field dropped in the Axis section.  **k.** By default, the Y-axis should display the values from top to bottom in ascending alphabetical order of the Axis dimension. System should allow actor to change the order of Axis values.  In case the actor added multiple fields in Value sections (with no field in Legend section)  **l.** System should display a column with multiple stacks (one for each dropped Value field) for each distinct Axis value, e.g. if the Axis section field has 5 distinct values and 3 fields were dropped in the Value section, system should display 5 different columns (with 3 stacks on each column) on the visual.  **m**. The stack portion for each field dropped in the Value section should have a different colour to distinguish one Value field from another. System should display the same corresponding colour in the Legends formatting property. Column colours should not vary across each Axis value.  **n**. The order of each stack from left to right should be the same as the order of the fields in the Value section from top to bottom. Actor should be able to rearrange the position of the fields on the Value section, and system should rearrange the stack order accordingly.  In case the actor added a single field each in Legend and Value sections  **l.** System should display a column with multiple stacks (one for each distinct value of Legend) for each distinct Axis value, e.g. if the Axis section field has 5 distinct values and Legend field has 4 distinct values, system should display 5 x 4 = 20 different columns on the visual.  **m.** Each unique Legend value’s column within a stacked column should have a different colour to distinguish one legend value from another. System should display the same corresponding colour in the Legends formatting property.  **n.** The order of legend columns in each stack from bottom to top by default should be in ascending alphabetical order of Legend dimension. System should allow actor to change the order of Legend values.  **o.** Columns for different Axis values should have same colour composition for the equivalent stacks.  **p.** The width of each column should be equal in the graph. System should allow actor to change the width in the formatting properties.  **r.** The total length of each stacked column should be equal to the aggregation of all Value fields for the particular Axis value.  **t.** Y-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Legend-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class.  **u.** Y-axis marks should end at the maximum aggregated value from all Value-Legend-Axis combinations rounded up to a nearest mark class.  **v.** By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis (or Axis-Legend) field.  **w.** On clicking the ellipsis (3 dots) next to any field in the Value or Tooltip sections, system should display a context menu item: Aggregation.  **x.** System should update the column chart to display the aggregated value as per selected aggregation option.   * 1. **Formatting**  1. Under the Formatting section, system should display the following sections: 2. If actor selects the **Title** section to update the title, system should ask for the following:    * 1. Check box for showing the title, If the actor selects the check box, then the title should get displayed in the graph and should be invisible after unselect the check box. System should display the Text field as blank by default.      2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.      3. Title Alignment: Whether the title to be displayed with be at left, centre, right.      4. Distance from Top: How far from the top of the visual space does the title need to be.      5. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      6. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      7. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      8. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      9. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      10. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.      11. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.      12. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.      13. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 3. If actor selects the **X-Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Top/Bottom position to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      5. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      6. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      7. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      8. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      9. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      10. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      11. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      12. The actor should be able to either select or manually enter the inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.      13. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 4. If actor selects the **Y-Axis** section, system should ask for the following:    * 1. **Show labels:** As the actor selects the check box, the labels should be visible on the axis of the graph      2. **Position:** The actor should be able select between Left/Right positions to set the axis in a visual.      3. **Show ticks:** As the actor selects the check box, the ticks should be visible on the axis of the graph      4. If actor clicked on the **Show ticks** check box, following sub-options should become visible:         1. **Major Tick Marks**: System should display tick mark with corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.         2. **Minor Tick Marks**: System should display tick mark without corresponding value of the Axis. Actor should be able to select a single value from Automatic / Fixed / None. Automatic should be selected by default and should be displayed as per the optimal pixel spacing identified by the underlying graphics. If actor selects Fixed, system should display option to enter integer values in the Tick Origin and Tick Interval fields. If actor selects None, system should not display tick marks.      5. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of 0 degree to 90 degree with an interval of 10-10 degrees      6. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the axis      7. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      8. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, and Oblique**. It should be **Normal** by default.      10. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      11. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      12. Actor should be able to change the **font colour** of the title by selecting the colour from the palette      13. The actor should be able to either select or manually enter the inner padding between the different sets of clustered bars. Actor should be able to enter the numeric values in percentage starting from 15% to 50% by an interval of 1%.      14. The actor should be able to add/edit the title of the axis. The Check box should be visible for showing the title of axis, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the graph. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Title Alignment: Whether the title to be displayed with be at left, centre, right.          4. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          5. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          7. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          8. Actor should be able to change the **font colour** of the title by selecting the colour from the palette          9. User should be able to select the width of the **border** of title. The actor should be able to either select or manually enter the font size of the title of graph between 0 and 20 pt (points). System should display the width as 0 pt by default.          10. Actor should be able to change the **Border Colour** of the title by selecting the colour from the palette. It should be black (#000000) by default.          11. Actor should be able to change the **Background colour** of the title by selecting the colour from the palette. System should display the Background Colour as None by default.          12. User should be able to select the padding width of title. The actor should be able to either select or manually enter the font size of the title of graph between 2 and 20 pt (points). System should display the width as 8 pt by default. 5. If actor selects the **Legend** section to update the Axis, system should ask for the following:    * 1. **Show Legends:** As the actor selects the check box, the legends should be visible in the graph      2. **Position:** The actor should be able to select the position of the legends from the drop down values. In the drop down, the actor should be able to see the 8 different values i.e. Top, Bottom, Left, Right, Top Center, Bottom Center, Left Center and Right Center. Top should be selected by default.      3. Drop down to select the **font size** of the font. The actor should be able to select the font size of the legend of graph. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane).      4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      5. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, and Sans-Serif. It should be **Serif** by default.      6. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      7. Actor should be able to change the **font colour** of the legend by selecting the colour from the palette      8. User should be able to select the width of the **border** of legend      9. Actor should be able to change the **Border Colour** of the legend by selecting the colour from the palette      10. Actor should be able to change the **Background colour** of the legend by selecting the colour from the palette. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      11. The actor should be able to add/edit the title of the legend. The Check box should be visible for showing the title of legend, If the actor selects the check box, then the title should get displayed in the graph and below mentioned options should be displayed.          1. Title should be invisible after unselect the check box. System should display the Text field as blank by default.          2. Text Field to enter the title of the legend. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting.          3. Drop down to select the **font size** of the font. The actor should be able to either select or manually enter the font size of the title of graph between 6 and 72 pt (points). System should display the Font Size as 12 pt by default (when bar chart is selected for the first time in the Visual Properties Pane).          4. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.          5. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.          6. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.          7. Actor should be able to change the **font colour** of the title by selecting the colour from the palette 6. If actor selects the **GRID** section to update the Axis, system should ask for the following:    * 1. **~~Contains Labels:~~** ~~As the actor selects the check box, the labels should be visible in the graph~~      2. **~~Height:~~** ~~The Actor should be able to adjust the height of the graph with in the grid.~~      3. **~~Width:~~** ~~The Actor should be able to adjust the width of the graph with in the grid.~~      4. **~~Top:~~** ~~The Actor should be able to adjust the Top of the graph with in the grid~~      5. **~~Bottom:~~** ~~The Actor should be able to adjust the bottom of the graph with in the grid~~      6. **~~Left:~~** ~~The Actor should be able to adjust the left alignment of the graph with in the grid~~      7. **~~Right:~~** ~~The Actor should be able to adjust the right alignment of the graph with in the grid~~      8. **Background Colour:** The actor should be able to change the background colour of the grid by changing the colour of grid. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane).      9. **Alt Text:** The actor should be able to enter the text which should be visible when no data is available on the graph or data set is broken. By default, system should show “Error! Please check that selected fields are present in dataset”. 7. If actor selects the **Colour Palette** section to update the Axis, system should ask for the following    * 1. **Custom Colour Palette:** The actor should be able to select the colour of the graph by its own.      2. **Random:** If actor select the random colour palette, the graph colour should be changed randomly.      3. **Default:** On the selection of Default, the default colours should be visible 8. **Conditional Colours:** As the actor selects the check box, the conditional colour formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the conditional colours should get back to default.    * 1. Types: The actor should be able to select any value from the drop down. The values in the drop down are: **Colour Scale and Rules.** As the actor selects colour scale, then colour scale formatting properties should be visible in the screen. If actor unselects it, then all the option should not visible on the screen and all the selected values under it get back to the default.   Below mentioned options should be visible for **Colour Scale** option.   * + - 1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set.       2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section.       3. **Diverging:** The actor should be able to select the checkbox for indicating whether 2 point colour scale is required or 3 colour scale with 2 separate sections for minimum and maximum values       4. **Stepped Colours:** The actor should be able to select the checkbox whether stepped values are required. If actor checks the box, then the actor should be able to enter any integer number between 2 to 10. Post entering the number by the actor, the system should create the colours in the number of steps from minimum to maximum       5. **Minimum:** The actor should be able to select the whether minimum value will be identified by **lowest** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In Lowest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.       6. **Center:** The actor should be able to select the whether center value will be identified by **center** value of the aggregated field or by a **Static** number. If static fields is selected, then actor should be able to enter any number in the text box. In **center**, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette. The Center option should be visible if actor selects the **Diverging** option.       7. **Maximum:** The actor should be able to select the whether maximum value will be identified by **maximum** value of the aggregated field or by a **Static** number. If static fields are selected, then actor should be able to enter any number in the text box. In highest, the text box should be blank and disabled. In either case, actor should be able to select the required colour from the colour palette.   Below mentioned options should be visible for **Rules** option.   1. **Based on Field:** The actor should be able to see the drop down to select the fields (Dimensions/Measures) from the of the connected data set. 2. **Aggregation:** The actor should be able to set the aggregation based on the type of the field. Details for aggregation for conditional colouring is mentioned in business rules section. 3. **Add rule:** The actor should be select this icon to add a new rule.   If actor selects add rule, the following options should be displayed:   1. **Condition**: System should allow actor to select one option from “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “is not blank”, “is not blank”, “is first”, “is last”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. The “is first” and “is last” options should only be displayed if the “Based on Field” is a dimension. 2. **Value**: System should display an option to enter value if actor selected “is equal to”, “is not equal to”, “is greater than”, “is greater than or equal to”, “is lesser than”, “is lesser than or equal to”, “in top N”, “in bottom N”. “in top N %”, “in bottom N %”. 3. **Colour**: In any case, actor should be able to select the required colour from the colour palette.   If any particular data point does not satisfy above colour scale or rules conditions, the system should display the default colours as set by the actor through colour palette section.   1. **Data labels:** As the actor selects the check box, the data labels formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values under the data labels should get back to default.    * 1. **Customize Label:** The actor should be able to select the checkbox to indicate whether they want customize the label by making it dynamic.      2. Option to enter dynamic label. System should provide options to the actor to create a dynamically generated title using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic label is not selected.      3. **Colour:** The actor should be able to change the colour of the data labels used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. **Position**: The actor should be able to select the position of the label within each visual object from the drop down. The drop down should display 4 different values i.e. Inside and Outside. Inside should be selected as the by default.      7. **Rotation Angle:** The actor should be able to rotate the angle of the axis labels. User should be able to change the angle from a range of -90 degree to 90 degree with an interval of 10-10 degrees      8. **Margin:** Actor should be able to select the margin from the drop down. Higher the margin would result increase the distance of label from the default position (Center, if Inside is selected or just above the bar if actor has selected Outside). Margin value should have the negative range to positive range( -90 to 90 px).      9. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      10. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      11. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      12. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      13. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      14. **Label Max Length:** User should be able to select the maximum length of the label by selecting the number of characters from the drop down.      15. **Overflow action**: The actor should be able to select the system behaviour if the label overflows its designated area from one of the following options: Truncate, Wrap words, None.      16. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default. 2. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%. 3. **Tooltip:** As the actor selects the check box, the tooltip formatting properties should be visible in the screen. If actor unselect the check box, then all the option should not visible on the screen and all the selected values should get back to default.    * 1. **Customize Tooltip:** The actor should be able to select the checkbox to indicate whether they want customize it by making it dynamic.      2. Option to enter dynamic tooltip. System should provide options to the actor to create a dynamically generated tooltip using all fields of the dataset along with standard HTML formatting. The actor should be able to perform the operations like Bold, Italic, font size etc. All below options should be only be displayed if dynamic tooltip is not selected.      3. **Colour:** The actor should be able to change the colour of the tooltip used in the visual.      4. **Display units:** The actor should be able to add the display units in the label by selecting the values from the available drop down. The drop down should have the values like None, Thousands, Lakhs, Millions, Crores, Billions, Trillions      5. **Decimal places:** The actor should be able to enter the decimal places to be displayed in the labels. The field should allow only integer values only and by default the value should be 0 only.      6. Drop down to select the **font size** of the label. The actor should be able to either select or manually enter the font size between 6 and 72 pt (points). System should display the Font Size as 10 pt by default.      7. Actor should be able to select the font style from the drop down. 3 possible values should be in the drop down as **Normal, Italic, Oblique**. It should be **Normal** by default.      8. Actor should be able to select the **Font Weight** to be bold or not. It should be bold by default.      9. Actor should be able to select the **Font Family** with 6 available options: Digital, Cursive, Monospace, Serif, Sans-Serif. It should be **Serif** by default.      10. Actor should be able to change the **font colour** by selecting the colour from the palette. System should display white by default.      11. **Background Colour:** The actor should be able to change the background colour of the data labels. System should display the Background Colour as None by default.      12. **Transparency**: The actor should be able to enter the transparency of the background between 0% and 100%.    1. **Analytics** 4. Under the Analytics section, system should display 3 sections: Order By, Order and limit. 5. If actor select the Order by, a drop down should appear with a details of dimensions which has been used in the visual. 6. In the Order option, the actor should be able to re-arrange the data either in increasing or decreasing option. 7. **Limit:** The actor must be able to select the limit of bars to be displayed in the graph. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than stacked column chart or scatter plot) and convert it to a stacked column chart, system should remove all fields on the Data section except the first field on the Axis section. 2. In case actor tries to edit an existing visual which is Scatter plot and convert it to a stacked column chart, system should remove all fields on the Data section. 3. System should display the stacked column chart based on the remaining Axis and Value fields. 4. In case original visual was a Slicer, system should only display the stacked column chart if at least one Value field has been added. 5. The actor should be able to perform all the features to update the stacked column chart. |
| **Post Conditions**   1. If the actor clicked the **Save** button, & if all the mandatory fields have been entered, then 2. The System would respond with the message, “<Visual Name> saved successfully” ~~and the actor would be brought to the blank screen~~. 3. All information related to the visual been defined would be stored in the database. 4. The visual details would be available for further modification/view. 5. If the Actor clicks Close, the System would respond with the message “Are you sure you want to close this form?” If the actor responds in affirmative, then the System would discard the entered details and close the form and the actor would be brought back to Pre-Condition; otherwise, the actor would be brought back to where it was before clicking the Close button. |
| **Exceptions**  **The Actor attempts to save the Visual without entering all the visual name.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without entering all the visual Title.**  The System would respond with the message – “This field is required.”  **The Actor attempts to save the Visual without Selecting all the Data set.**  The System would respond with the message – “This field is required.”  **The actor attempts to save the visual details with the same name which already exists in the same project.**  The system would respond with the message, “Visual <Visual Name> already exists in this project. Please select another name”.  **The actor attempts to save the Visual without selecting all required fields.**  The system would respond with a message,” Please fill all required fields”.  **Visual Name and visual title should accept 99 characters.**  The system would respond with a message,” Maximum 99 characters are allowed in the name and title”.  **~~Same dimension should not get added more than a once.~~**  ~~The system should respond with a message that “ Dimension is already added”~~  **Title should accept the Unicode characters in visual title**  System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field  **Font size should be in integer and in between 4 to 64**  Actor should be able to change the Font Size to any integer value between 4 and 64.  **Font size should be visible as set by the actor**   1. System should display the font size of the title as per value provided by the actor. 2. System should display the title background colour as per value provided or colour selected by the actor. 3. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 5. System should display the visual background colour as per value provided or colour selected by the actor 6. Aggregation rules    1. **Axis:** Only dimension allowed: Aggregation ellipsis should not be displayed    2. **Value:** If dimension: then Count, Count Distinct, First, Last    3. **Value:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    4. **Legend:** Only dimension allowed: Aggregation ellipsis should not be displayed    5. **Tooltip:** If dimension: then Count, Count Distinct, First, Last    6. **Tooltip:** If measure: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile    7. **Colour formatting:** If dimension: then Count, Count Distinct, ~~First, Last~~    8. **Colour formatting:** If dimension: then Sum, Count, Count (Distinct), Mean, Mean (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile |
| **Business Rules**   1. System should allow actor to add any number of fields to Axis section. Any value below the first value should become drill down. 2. System should allow actor to add a field to Legend section if Value section has one or no fields added. 3. System should not allow actor to add a field to Legend section if a field is already present in this section or if the Value section has two or more fields added. 4. System should allow actor to add a field to Value section if no field is already present in this section. 5. System should allow actor to add a field to Value section if no field is present in the Legend section. 6. System should not allow actor to add a field to Value section if a field is already present in this section and a field is also present in the Legend section. |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.21 Design Visual: Line Chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a line chart visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Line chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 4 sections: Axis, Legend, Value and Tooltip. 2. In the Axis section, actor should be able to drop any one field from any section under the Dataset Fields pane. 3. In the Legend, Value and Tooltip sections, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 4. System should allow the actor to repeat the same field across multiple sections. 5. System should not allow the actor to repeat the same field across the same section. 6. System should display an ellipsis (3 dots) next to each field dropped in the Value section. 7. Against every field dropped in any section, system should display an option to remove the field. 8. If a field has been dropped in the Axis section and at least one field has been dropped in the Value section, system should display a line chart in the right-hand side pane. 9. The X-axis of the line chart should be constituted from the distinct values of the field dropped in the Axis section. 10. The X-axis should display the Axis values in ascending alphabetical order. 11. The line should be created by joining adjacent points captured against each distinct Axis value. 12. System should display a separate line for each Value field. 13. The line corresponding to each field dropped in the Value section should have a different colour to distinguish one Value field from another. 14. The colour should the same across each Axis value for any individual line. 15. Each individual colour should be displayed with the corresponding field name as legend on the chart. 16. The thickness of each individual line should be equal. 17. The position of each Value-Axis combination as measured from the Y-axis mark projections should be equal to the aggregation of the corresponding Value field for the particular Axis value. 18. Y-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class. 19. Y-axis marks should end at the maximum aggregated value from all Value-Axis combinations rounded up to a nearest mark class. 20. By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis field. 21. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 22. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 23. On clicking the Aggregation option for a Dimension field, system should display the options: Count, Count (Distinct). 24. Actor should be able to select from any of the available aggregation options for the field. 25. System should update the bar chart to display the aggregated value as per selected aggregation option.   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when line chart is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when line chart is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when line chart is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Line chart or Scatter plot) and convert it to a Line chart, system should remove all fields on the Data section except the first field on the Axis section. 2. System should display the Line chart based on the remaining Axis and Value fields. 3. In case original visual was a Slicer, system should only display the line chart if at least one Value field has been added. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.22 Design Visual: Area chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design an area chart visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Area chart* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 4 sections: Axis, Legend, Value and Tooltip. 2. In the Axis section, actor should be able to drop any one field from any section under the Dataset Fields pane. 3. In the Legend, Value and Tooltip sections, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 4. System should allow the actor to repeat the same field across multiple sections. 5. System should not allow the actor to repeat the same field across the same section. 6. System should display an ellipsis (3 dots) next to each field dropped in the Value section. 7. Against every field dropped in any section, system should display an option to remove the field. 8. If a field has been dropped in the Axis section and at least one field has been dropped in the Value section, system should display an area chart in the right-hand side pane. 9. The X-axis of the area chart should be constituted from the distinct values of the field dropped in the Axis section. 10. The X-axis should display the Axis values in ascending alphabetical order. 11. The area should be created by joining adjacent points captured against each distinct Axis value to make a line and filling the area between each line and the X-axis. 12. System should display a separate area for each Value field. 13. The area corresponding to each field dropped in the Value section should have a different colour to distinguish one Value field from another. 14. The colour should the same across each Axis value for any individual area. 15. For any area that is common across two or more different values, system should display the colour of the lowest value. 16. Each individual colour should be displayed with the corresponding field name as legend on the chart. 17. The position of each Value-Axis combination as measured from the Y-axis mark projections should be equal to the aggregation of the corresponding Value field for the particular Axis value. 18. Y-axis marks should start either from 0 (in case all aggregated values are positive) or the minimum aggregated value from all Value-Axis combinations (in case any aggregated value is less than 0) rounded down to a nearest mark class. 19. Y-axis marks should end at the maximum aggregated value from all Value-Axis combinations rounded up to a nearest mark class. 20. By default, system should aggregate Value fields to their Sum (in case of a Measure field dropped in the Value section) and to their Count (in case of a Dimension field dropped in the Value section) at the grain of the Axis field. 21. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 22. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 23. On clicking the Aggregation option for a Dimension field, system should display the options: Count, Count (Distinct). 24. Actor should be able to select from any of the available aggregation options for the field. 25. System should update the bar chart to display the aggregated value as per selected aggregation option.   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when line chart is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when line chart is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when line chart is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Area chart or Scatter plot) and convert it to an Area chart, system should remove all fields on the Data section except the first field on the Axis section. 2. System should display the Area chart based on the remaining Axis and Value fields. 3. In case original visual was a Slicer, system should only display the area chart if at least one Value field has been added. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.23 Design Visual: Scatter Plot

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a scatter plot chart visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Scatter plot* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.     Data   1. Under the Data section, system should display 3 sections: X-Axis, Y-Axis and Legend. 2. In the X-Axis and Y-Axis section each, actor should be able to drop any one field from the Measure section under the Dataset Fields pane. 3. In the Legend section, actor should be able to drop any one field from any section under the Dataset Fields pane. 4. System should allow the actor to repeat the same field across multiple sections. 5. System should display an ellipsis (3 dots) next to each field dropped in the X-Axis and Y-Axis sections. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If one field has been dropped in the X-Axis and Y-Axis sections, system should display a scatter plot in the right-hand side pane. 8. The X-axis of the scatter plot should be constituted from the range of the field dropped in the X-Axis section divided into equal classes. 9. The Y-axis of the scatter plot should be constituted from the range of the field dropped in the Y-Axis section divided into equal classes. 10. Both the X-axis and Y-axis should display their respective values in ascending order. 11. System should display a separate point for each distinct value of the Legend field. 12. In case no field has been dropped in the Legend field, system should display a single value. 13. All distinct points for the Legend field should have the same colour and size. 14. The position of each point on the scatter plot should be at the intersection of the projection from the Y-axis mark corresponding the aggregation of the corresponding Y-Axis field at the level of Legend and the projection from the X-axis mark corresponding the aggregation of the corresponding X-Axis field at the level of Legend. 15. Y-axis marks should start either from 0 (in case all aggregated values at the level of the Legend are positive) or the minimum Y-axis field aggregated value (in case any aggregated value at the level of Legend is less than 0) rounded down to a nearest mark class. 16. Y-axis marks should end at the maximum Y-axis field aggregated value rounded up to a nearest mark class. 17. By default, system should aggregate X-axis and Y-axis fields to their Sum values at the grain of the Legend field. 18. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 19. On clicking the Aggregation option for a field dropped in the X-Axis or Y-Axis section, system should display the options: Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 20. Actor should be able to select from any of the available aggregation options for the field. 21. System should update the scatter plot chart to display the aggregated value as per selected aggregation option.   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when bar chart is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when bar chart is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when bar chart is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when bar chart is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Scatter plot) and convert it to a Pie chart, system should remove all fields on the Data section. 2. System should render the Scatter plot only when actor provides Measure fields for X-Axis and Y-Axis columns. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.24 Design Visual: Treemap

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a sankey visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.25 Design Visual: Candlestick

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a candlestick visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.26 Design Visual: Slicer

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a Slicer visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Slicer* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 1 section: Axis. 2. In the Axis section, actor should be able to drop any one field from any section under the Dataset Fields pane. 3. System should display an option to remove the field.      1. If a field has been dropped in the Axis section, system should display a slicer (multi selection checkbox list) in the right-hand side pane. 2. The list should be constituted from the distinct values of the field. 3. The values should be displayed in ascending alphabetical order. 4. Actor should be able to select any number of values on the slicer.   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when slicer is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when slicer is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when slicer is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when slicer is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Slicer or Scatter plot) and convert it to a Slicer, system should remove all fields on the Data section except the first field on the Axis section. 2. System should render the Slicer based on the field. 3. In case actor tries to edit an existing Scatter plot visual and convert it to a Slicer, system should remove all fields on the Data section. 4. System should render the Slicer only when actor provides Axis value. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.27 Design Visual: Funnel

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a funnel visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.28 Design Visual: Sankey

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a sankey visual. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.29 Design Visual: Table

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a table visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Table* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 1 section: Columns. 2. In the Columns section, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 3. System should allow the actor to repeat the same field across multiple sections. 4. System should not allow the actor to repeat the same field across the same section. 5. System should display an ellipsis (3 dots) next to each field dropped in the section. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If at least one field has been dropped in the Column section, system should display a table in the right-hand side pane. 8. The heading of the table should be constituted from the names of the fields dropped in the Columns section. 9. The columns should be arranged from left to right in the order of the dropped fields on the Column section from top to bottom. 10. Actor should be able to rearrange the position of the fields on the Column section, and system should rearrange the visual accordingly. 11. Values displayed under each column should be equal to the aggregation of the corresponding Column field. 12. The values should be displayed in ascending alphabetical order of the left most column, then ascending alphabetical order of the next left most column for the matching values in the left most column, and so on. 13. By default, system should aggregate fields to Attribute (Distinct). 14. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 15. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Attribute (Distinct), Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 16. On clicking the Aggregation option for a Dimension field, system should display the options: Attribute (Distinct), Count, Count (Distinct). 17. Actor should be able to select from any of the available aggregation options for the field, subject to the restriction that at least one of the fields have aggregation as Attribute (Distinct). 18. System should update the table to display the aggregated value as per selected aggregation option. 19. The number of rows in the table should be equal to the multiplication of number of distinct values for each field for which aggregation is set as Attribute (Distinct).   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when table is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when table is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when table is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when table is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Table or Scatter plot) and convert it to a table, system should remove all fields. 2. System should render the table only when actor provides at least one field in the Column section. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.30 Design Visual: Radar Chart

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a table visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Table* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 1 section: Columns. 2. In the Columns section, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 3. System should allow the actor to repeat the same field across multiple sections. 4. System should not allow the actor to repeat the same field across the same section. 5. System should display an ellipsis (3 dots) next to each field dropped in the section. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If at least one field has been dropped in the Column section, system should display a table in the right-hand side pane. 8. The heading of the table should be constituted from the names of the fields dropped in the Columns section. 9. The columns should be arranged from left to right in the order of the dropped fields on the Column section from top to bottom. 10. Actor should be able to rearrange the position of the fields on the Column section, and system should rearrange the visual accordingly. 11. Values displayed under each column should be equal to the aggregation of the corresponding Column field. 12. The values should be displayed in ascending alphabetical order of the left most column, then ascending alphabetical order of the next left most column for the matching values in the left most column, and so on. 13. By default, system should aggregate fields to Attribute (Distinct). 14. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 15. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Attribute (Distinct), Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 16. On clicking the Aggregation option for a Dimension field, system should display the options: Attribute (Distinct), Count, Count (Distinct). 17. Actor should be able to select from any of the available aggregation options for the field, subject to the restriction that at least one of the fields have aggregation as Attribute (Distinct). 18. System should update the table to display the aggregated value as per selected aggregation option. 19. The number of rows in the table should be equal to the multiplication of number of distinct values for each field for which aggregation is set as Attribute (Distinct).   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when table is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when table is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when table is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when table is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Table or Scatter plot) and convert it to a table, system should remove all fields. 2. System should render the table only when actor provides at least one field in the Column section. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.29 Design Visual: Box Plot

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a table visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Table* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 1 section: Columns. 2. In the Columns section, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 3. System should allow the actor to repeat the same field across multiple sections. 4. System should not allow the actor to repeat the same field across the same section. 5. System should display an ellipsis (3 dots) next to each field dropped in the section. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If at least one field has been dropped in the Column section, system should display a table in the right-hand side pane. 8. The heading of the table should be constituted from the names of the fields dropped in the Columns section. 9. The columns should be arranged from left to right in the order of the dropped fields on the Column section from top to bottom. 10. Actor should be able to rearrange the position of the fields on the Column section, and system should rearrange the visual accordingly. 11. Values displayed under each column should be equal to the aggregation of the corresponding Column field. 12. The values should be displayed in ascending alphabetical order of the left most column, then ascending alphabetical order of the next left most column for the matching values in the left most column, and so on. 13. By default, system should aggregate fields to Attribute (Distinct). 14. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 15. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Attribute (Distinct), Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 16. On clicking the Aggregation option for a Dimension field, system should display the options: Attribute (Distinct), Count, Count (Distinct). 17. Actor should be able to select from any of the available aggregation options for the field, subject to the restriction that at least one of the fields have aggregation as Attribute (Distinct). 18. System should update the table to display the aggregated value as per selected aggregation option. 19. The number of rows in the table should be equal to the multiplication of number of distinct values for each field for which aggregation is set as Attribute (Distinct).   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when table is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when table is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when table is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when table is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Table or Scatter plot) and convert it to a table, system should remove all fields. 2. System should render the table only when actor provides at least one field in the Column section. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.29 Design Visual: Card

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| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to design a table visual. |
| **Pre Conditions**   1. The actor has created a new visual or edited an existing visual. |
| **Triggers**   1. Actor selects *Table* icon displayed under the Visual Properties pane. |
| **Normal Flow**   1. System should display a form with the heading Create Visual, 3 form fields Visual Name, Visual Title and Dataset, and 2 buttons Create and Close.   Data   1. Under the Data section, system should display 1 section: Columns. 2. In the Columns section, actor should be able to drop one or more fields from any section under the Dataset Fields pane. 3. System should allow the actor to repeat the same field across multiple sections. 4. System should not allow the actor to repeat the same field across the same section. 5. System should display an ellipsis (3 dots) next to each field dropped in the section. 6. Against every field dropped in any section, system should display an option to remove the field. 7. If at least one field has been dropped in the Column section, system should display a table in the right-hand side pane. 8. The heading of the table should be constituted from the names of the fields dropped in the Columns section. 9. The columns should be arranged from left to right in the order of the dropped fields on the Column section from top to bottom. 10. Actor should be able to rearrange the position of the fields on the Column section, and system should rearrange the visual accordingly. 11. Values displayed under each column should be equal to the aggregation of the corresponding Column field. 12. The values should be displayed in ascending alphabetical order of the left most column, then ascending alphabetical order of the next left most column for the matching values in the left most column, and so on. 13. By default, system should aggregate fields to Attribute (Distinct). 14. On clicking the ellipsis (3 dots) next to any field in the Value section, system should display a context menu item: Aggregation. 15. On clicking the Aggregation option for a Measure field dropped in the Value section, system should display the options: Attribute (Distinct), Sum, Count, Count (Distinct), Average, Average (Population), Median, Minimum, Maximum, Range, Midrange, Standard Deviation, Standard Deviation (Population), Variance, Variance (Population), and Percentile. 16. On clicking the Aggregation option for a Dimension field, system should display the options: Attribute (Distinct), Count, Count (Distinct). 17. Actor should be able to select from any of the available aggregation options for the field, subject to the restriction that at least one of the fields have aggregation as Attribute (Distinct). 18. System should update the table to display the aggregated value as per selected aggregation option. 19. The number of rows in the table should be equal to the multiplication of number of distinct values for each field for which aggregation is set as Attribute (Distinct).   Formatting   1. Under the Formatting section, system should display 2 sections: Title, and Background. 2. Under the Title section, system should display 3 form fields: Text, Font Size, and Background Colour. 3. System should display the Text field as blank by default (when table is selected for the first time in the Visual Properties Pane). 4. System should allow actor to enter up to 100 characters consisting of any combination of Unicode characters in the Text field. 5. System should display the title text as per value provided by the actor. 6. System should display the Font Size as 12 by default (when table is selected for the first time in the Visual Properties Pane). 7. Actor should be able to change the Font Size to any integer value between 4 and 64. 8. System should display the font size of the title as per value provided by the actor. 9. System should display the Background Colour as None by default (when table is selected for the first time in the Visual Properties Pane). 10. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 11. System should display the title background colour as per value provided or colour selected by the actor. 12. Under the Background section, system should display 1 form field: Colour. 13. System should display the Background Colour as #666666 by default (when table is selected for the first time in the Visual Properties Pane). 14. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 15. System should display the visual background colour as per value provided or colour selected by the actor. |
| **Alternative Flow**   1. In case actor tries to edit an existing visual (which is other than Table or Scatter plot) and convert it to a table, system should remove all fields. 2. System should render the table only when actor provides at least one field in the Column section. |
| **Post Conditions**  None |
| **Exceptions**  None |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.30 Create Page

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to create a new page. |
| **Pre Conditions**   1. Actor has created a project. |
| **Triggers**   1. Actor selects the Create New Page option displayed by right clicking on the Pages menu item under a project. |
| **Normal Flow**   1. System should display a form with the heading Create Page, a form field Name, and 2 buttons Create and Close. 2. Actor should be able to enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces in the Name field. 3. System should truncate any lagging and leading space characters from the Name field. 4. Name field should be mandatory to create a page. 5. System should close the form and not create a new page if actor clicks the Close button. 6. If actor selects the Create button after entering a value in the Name field which does not match another page name in the same project, the system should close the form, save the page, list the page name in the appropriate alphabetical position under the left side Pages menu item (hierarchically under the current project), and display 2 panes: left-side selection pane (showing the sections Visuals, Objects, and Formatting) and right-side canvas area to create the page. 7. System should display Save, Preview and Close icons on right-side top of the canvas area. 8. In the Visuals section, system should display all visuals (including those of type Slicer) existing in the project in alphabetical order. 9. In the Objects section, system should display 2 items: Button, Label. 10. In the Formatting section, system should display the options, Title and Background Colour. 11. In the right-side canvas area, system should display a blank canvas with gridlines. 12. System should allow actor to drag any item from Visuals and Objects sections and drop on the canvas. 13. When the canvas is empty and the actor tries to drop any item, system should highlight horizontal line markers over the canvas where actor can drop the item. 14. When only one item is present on the canvas, the system should stretch the item to cover the entire canvas. 15. When the canvas has at least one item and the actor tries to drop any other item, system should highlight horizontal line markers above and below the existing item(s) where actor can drop the new item. 16. For the same case when the canvas has at least one item and the actor tries to drop any other item, system should also highlight vertical line markers to the left and below the existing item where actor can drop the new item. 17. System should automatically resize the items on the canvas whenever any new item is added so that each horizontal canvas section is of equal height (= total canvas height / number of horizontal canvas sections), and each vertical canvas section within the horizontal canvas section is of the equal width (= total horizontal canvas section width / number of vertical canvas sections within the horizontal canvas section). 18. System should allow actor to reduce the size of any dropped item and automatically stretch the other horizontal / vertical items accordingly. 19. Actor should be able to drag and drop any item from the Visuals section only once on a page. 20. Actor should be able to drag and drop any item from the Objects section as many times as required. 21. System should display a Remove icon against every item to allow actor to remove the item from the page. 22. If any item is removed, system should automatically stretch the remaining horizontal / vertical items accordingly. 23. When a new Button object is dropped on the canvas, system should display a form with field Text, list Action (with 3 options for selection: *Go to Page, Go to Visual on Page, and Open Link*), two options for Colour and Background Colour and selection Alignment. 24. Actor should be able to enter up to 100 characters consisting of any Unicode characters in the button Text field. 25. Actor should be able to select any single value from the 3 options displayed on the Action list. 26. If actor selects Go to Page, system should display an option to select from a list of the rest of created Pages. 27. If actor selects Go to Visual on Page, system should display an option to select from a list of the rest of created Pages, and then select from a list of Visuals dropped on the selected page. 28. If actor selects Go to Link, system should display an option to provide a valid URL. 29. System should display the Colour as Black by default (when label is dropped for the first time on the canvas). 30. Actor should be able to change the Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 31. System should display the colour as per value provided or colour selected by the actor. 32. System should display the Background Colour as None by default (when label is dropped for the first time on the canvas). 33. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 34. System should display the background colour of the button area as per value provided or colour selected by the actor. 35. Actor should be able to select a single value from *Left*, *Centre* and *Right* (each displayed as an identifiable icon). 36. System should align the Text written within the button to the Left / Centre / Right of the button area as per actor’s selection. 37. When a new Label object is dropped on the canvas, system should display options to enter Text, Colour and Background Colour and selection Alignment. 38. Actor should be able to enter up to 100 characters consisting of any Unicode characters in the label Text field. 39. System should display the Colour as Black by default (when label is dropped for the first time on the canvas). 40. Actor should be able to change the Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 41. System should display the colour as per value provided or colour selected by the actor. 42. System should display the Background Colour as None by default (when label is dropped for the first time on the canvas). 43. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 44. System should display the background colour of the label area as per value provided or colour selected by the actor. 45. Actor should be able to select a single value from *Left*, *Centre* and *Right* (each displayed as an identifiable icon). 46. System should align the Text written within the Label to the Left / Centre / Right of the button area as per actor’s selection. 47. In the Formatting section, system should display one option: Background Colour. 48. System should display the Background Colour as None by default (when label is dropped for the first time on the canvas). 49. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 50. System should display the background colour of the entire page as per value provided or colour selected by the actor. 51. The page background colour should be shown below the background colour of any child item (visual / button / label) dropped on the page. 52. Actor should be able to click on the Save icon to save the page as per items dropped and their configuration. 53. Actor should be able to click on the Preview icon to view a preview of the page without the left side selection pane.   Page Preview   1. System should display each dropped Visual as it is displayed at the time of its last save. 2. If a Slicer and at least one visual have been dropped, system should allow the slicer selections to filter related visual(s), i.e. those visuals that have the same underlying dataset as the Slicer. 3. System should filter the related Visuals data on a OR basis of combination of all selections made on the Slicer. 4. If any slicer selections return no results, the filtered related visual(s) should still be displayed in the canvas area with all formatting, title and axes but without any data. 5. System should allow actor to select slicer selections from multiple Slicers and filter all related visuals on all the slicer selections from the multiple Slicers. 6. System should filter the related Visuals data on an AND basis of different Slicer selections (with an OR basis of combination of all selections made on each individual Slicer). |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action if actor clicks the Close button. 2. System should create the page if actor selects the Create button after entering valid values. 3. System should save the page if actor selects the Save icon. |
| **Exceptions**   1. If actor clicks the Create button after entering the same value in the Name field as another page in the same project, the system should display an error message, “A page with this name already exists in this project”. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.2.31 Modify Page

|  |
| --- |
| **Actor(s)**  Designer |
| **Description**  This use case allows the actor to modify an existing page. |
| **Pre Conditions**   1. Actor has created a page. |
| **Triggers**   1. Actor selects the Modify Page option displayed by right clicking on a page under the Pages menu item under a project. |
| **Normal Flow**   1. System should display a form with the heading Modify Page, a form field Name, and 2 buttons Update and Close. 2. System should display the value entered by the actor at the time of the last page save in the Name field. 3. Actor should be able to change the Name field and enter up to 100 characters consisting of any combination of alphabets (upper and lower cases), numbers, underscores, hyphens and spaces. 4. System should truncate any lagging and leading space characters from the Name field. 5. Name field should be mandatory to modify a page. 6. System should close the form and not make any changes if actor clicks the Close button. 7. If actor selects the Update button after entering a value in the Name field which does not match another page name in the same project, the system should close the form, save the new name of the page, re-list the page name in the appropriate alphabetical position under the left side Pages menu item (hierarchically under the current project), and display 2 panes: left-side selection pane (showing the sections Visuals, Objects, and Formatting) and right-side canvas area to create the page. 8. System should display Save, Preview and Close icons on right-side top of the canvas area. 9. In the Visuals section, system should display all visuals (including those of type Slicer) existing in the project in alphabetical order. 10. In the Objects section, system should display 2 items: Button, Label. 11. In the Formatting section, system should display the options, Title and Background Colour. 12. In the right-side canvas area, system should display a canvas with gridlines and all items dropped and configured as per last save. 13. System should allow actor to drag any item from Visuals and Objects sections and drop on the canvas. 14. When the canvas is empty and the actor tries to drop any item, system should highlight horizontal line markers over the canvas where actor can drop the item. 15. When only one item is present on the canvas, the system should stretch the item to cover the entire canvas. 16. When the canvas has at least one item and the actor tries to drop any other item, system should highlight horizontal line markers above and below the existing item(s) where actor can drop the new item. 17. For the same case when the canvas has at least one item and the actor tries to drop any other item, system should also highlight vertical line markers to the left and below the existing item where actor can drop the new item. 18. System should automatically resize the items on the canvas whenever any new item is added so that each horizontal canvas section is of equal height (= total canvas height / number of horizontal canvas sections), and each vertical canvas section within the horizontal canvas section is of the equal width (= total horizontal canvas section width / number of vertical canvas sections within the horizontal canvas section). 19. System should allow actor to reduce the size of any dropped item and automatically stretch the other horizontal / vertical items accordingly. 20. Actor should be able to drag and drop any item from the Visuals section only once on a page. 21. Actor should be able to drag and drop any item from the Objects section as many times as required. 22. System should display a Remove icon against every item to allow actor to remove the item from the page. 23. If any item is removed, system should automatically stretch the remaining horizontal / vertical items accordingly. 24. System should display any existing Button items with their Text, Action, Colour and Background Colour as entered by the actor at the time of the last save. 25. Actor should be able to change any of these values. 26. When a new Button object is dropped on the canvas, system should display a form with field Text, list Action (with 3 options for selection: *Go to Page, Go to Visual on Page, and Open Link*), two options for Colour and Background Colour and selection Alignment. 27. Actor should be able to enter up to 100 characters consisting of any Unicode characters in the button Text field. 28. Actor should be able to select any single value from the 3 options displayed on the Action list. 29. If actor selects Go to Page, system should display an option to select from a list of the rest of created Pages. 30. If actor selects Go to Visual on Page, system should display an option to select from a list of the rest of created Pages, and then select from a list of Visuals dropped on the selected page. 31. If actor selects Go to Link, system should display an option to provide a valid URL. 32. System should display the Colour as Black by default (when label is dropped for the first time on the canvas). 33. Actor should be able to change the Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 34. System should display the colour as per value provided or colour selected by the actor. 35. System should display the Background Colour as None by default (when label is dropped for the first time on the canvas). 36. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 37. System should display the background colour of the button area as per value provided or colour selected by the actor. 38. Actor should be able to select a single value from *Left*, *Centre* and *Right* (each displayed as an identifiable icon). 39. System should align the Text written within the button to the Left / Centre / Right of the button area as per actor’s selection. 40. System should display any existing Label items with their Text, Action, Colour and Background Colour as entered by the actor at the time of the last save. 41. Actor should be able to change any of these values. 42. When a new Label object is dropped on the canvas, system should display options to enter Text, Colour and Background Colour and selection Alignment. 43. Actor should be able to enter up to 100 characters consisting of any Unicode characters in the label Text field. 44. System should display the Colour as Black by default (when label is dropped for the first time on the canvas). 45. Actor should be able to change the Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 46. System should display the colour as per value provided or colour selected by the actor. 47. System should display the Background Colour as None by default (when label is dropped for the first time on the canvas). 48. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 49. System should display the background colour of the label area as per value provided or colour selected by the actor. 50. Actor should be able to select a single value from *Left*, *Centre* and *Right* (each displayed as an identifiable icon). 51. System should align the Text written within the Label to the Left / Centre / Right of the button area as per actor’s selection. 52. In the Formatting section, system should display one option: Background Colour. 53. System should display the Background Colour as the value selected by actor during the last save. 54. Actor should be able to change the Background Colour either by providing a valid hexadecimal colour code or by selecting from a colour selected popup. 55. System should display the background colour of the entire page as per value provided or colour selected by the actor. 56. The page background colour should be shown below the background colour of any child item (visual / button / label) dropped on the page. 57. Actor should be able to click on the Save icon to save the page as per items dropped and their configuration. 58. Actor should be able to click on the Preview icon to view a preview of the page without the left side selection pane.   Page Preview   1. System should display each dropped Visual as it is displayed at the time of its last save. 2. If a Slicer and at least one visual have been dropped, system should allow the slicer selections to filter related visual(s), i.e. those visuals that have the same underlying dataset as the Slicer. 3. System should filter the related Visuals data on a OR basis of combination of all selections made on the Slicer. 4. If any slicer selections return no results, the filtered related visual(s) should still be displayed in the canvas area with all formatting, title and axes but without any data. 5. System should allow actor to select slicer selections from multiple Slicers and filter all related visuals on all the slicer selections from the multiple Slicers. 6. System should filter the related Visuals data on an AND basis of different Slicer selections (with an OR basis of combination of all selections made on each individual Slicer). |
| **Alternative Flow**  None |
| **Post Conditions**   1. System should not take any action if actor clicks the Close button. 2. System should create the page if actor selects the Update button after entering valid values. 3. System should save the page if actor selects the Save icon. |
| **Exceptions**   1. If actor clicks the Update button after entering the same value in the Name field as another page in the same project, the system should display an error message, “A page with this name already exists in this project”. |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

## 3.3 Viewer Use Cases

### UC 3.3.1 Login

|  |
| --- |
| **Actor(s)**  Viewer |
| **Description**  This use case allows the actor to login to the BI tool view made available to them. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.3.2 View Story

|  |
| --- |
| **Actor(s)**  Viewer |
| **Description**  This use case allows the actor to view pages in form of story. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.3.3 View Visual in Full View

|  |
| --- |
| **Actor(s)**  Viewer |
| **Description**  This use case allows the actor to view a visual in full view. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

### UC 3.3.4 Add Notes

|  |
| --- |
| **Actor(s)**  Viewer |
| **Description**  This use case allows the actor to add notes to a page or visual displayed in a story. |
| **Pre Conditions** |
| **Triggers** |
| **Normal Flow** |
| **Alternative Flow**  None |
| **Post Conditions** |
| **Exceptions** |
| **Business Rules**  None |
| **Relationships**  None |
| **Special Requirements**  None |
| **Assumptions**  None |

# Data Requirements

### Entities in schema: bi\_tool

### users

**Description**: This entity will store the details for each project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | user\_id | integer |  | M | Unique id of the user, auto generated by the system on creation |
|  | name | character varying |  | M | Name entered for the user |
|  | password | character varying |  | M | Hashed string of the password used by user for login |
|  | email | character varying |  | M | Email id provided by user that will also act as login id |
|  | mobile | character varying |  |  | Mobile number provided by user |
|  | created\_by | integer |  | M | Id of the project admin who created the project |
|  | created\_on | timestamp without time zone |  | M | Date and time when the page was created |
|  | last\_updated\_by | integer |  |  | Id of the project admin who last updated the project details |
|  | last\_updated\_on | timestamp without time zone |  |  | Date and time when the project was last updated |

### project

**Description**: This entity will store the details for each project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | project\_id | integer |  | M | Unique id of the project, auto generated by the system on creation |
|  | project\_name | character varying | 100 | M | Project name that will be unique within the BI tool instance |
|  | description | character varying | 1000 | M | Detailed description of the project |
|  | created\_by | integer |  | M | Id of the project admin who created the project |
|  | created\_on | timestamp without time zone |  | M | Date and time when the page was created |
|  | last\_updated\_by | integer |  |  | Id of the project admin who last updated the project details |
|  | last\_updated\_on | timestamp without time zone |  |  | Date and time when the project was last updated |
|  | status | character varying | 2 | M | Current status identifier of the project (Activated / Deactivated / Published / Unpublished) |

### db\_connection

**Description**: This entity will store the details for each data connection created for a project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | connection\_id | integer |  | M | Unique id of the connection\_id, auto generated by the system on creation |
|  | driver\_name | character varying |  | M | Driver of the database  References **project (project\_id)** |
|  | user\_name | character varying |  | M | Unique id of the prepared data set that will be available for creation of visuals within the project |
|  | password | character varying |  | M | Hashed string of the password used for connecting to database server |
|  | connection\_url | character varying |  | M | Connection string |
|  | db\_name | character varying |  | M | Name of database to be connected |
|  | server\_name | character varying |  | M | Name of server to be connected |
|  | port\_number | integer |  | M | Port number of the server to connect to |
|  | created\_by | integer |  | M | Id of the project admin who created the server connection |
|  | created\_on | timestamp without time zone |  | M | Date and time when the connection was created |
|  | last\_updated\_by | integer |  |  | Id of the project admin who created the server connection |
|  | last\_updated\_on | timestamp without time zone |  |  | Date and time when the connection was last updated |
|  | is\_active | boolean |  | M | Whether the connection is currently active, i.e. available for querying.  At any time, only a single database connection can be active. |
|  | db | character varying |  | M | Connection name to be saved as provided by project admin |
|  | project\_id | integer |  | M | Id of the project under which the connection is created  References **project (project\_id)** |

### project\_data\_set

**Description**: This entity will store the details for each data set created for a project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | data\_set\_id | integer |  | M | Unique id of the data set, auto generated by the system on creation |
|  | project\_id | integer |  | M | Id of the project under which dataset is created  References **project (project\_id)** |
|  | sample\_data\_id | integer |  | M | Unique id of the prepared data set that will be available for creation of visuals within the project |

### visuals

**Description**: This entity will store the details for each data set that is created for a project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | visual\_id | integer |  | M | Unique id of the visual, auto generated by the system on creation |
|  | visual\_name | character varying | 100 | M | Name assigned to the visual, unique within the project |
|  | visual\_title | character varying | 100 | M | Title given to the visual as per display requirements |
|  | visual\_type | character varying |  | M | Type of the visual: bar, line, scatter, slicer etc. |
|  | configuration | character varying |  | M | JSON string containing the visual configuration, i.e., data fields with aggregation logic and visual formatting properties |
|  | created\_by | integer |  | M | Id of the designer who created the visual |
|  | created\_on | timestamp without time zone |  | M | Date and time when the visual was created |
|  | last\_updated\_by | integer |  |  | Id of the designer who last updated the visual |
|  | last\_updated\_on | timestamp without time zone |  |  | Date and time when the visual was last updated |
|  | project\_id | integer |  | M | Id of the project under which the visual is created  References **project (project\_id)** |
|  | sample\_data\_id | integer |  | M | Id of the data set used for visual  References **project\_data\_set (sample\_data\_id)** |

### pages

**Description**: This entity will store the details for each page that is created for a project.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | page\_id | integer |  | M | Unique id of the page, auto generated by the system on creation |
|  | page\_name | character varying | 100 | M | Page name that will be unique within the project |
|  | page\_title | character varying | 100 | M | Page title to be displayed |
|  | configuration | character varying |  | M | JSON string containing the page configuration, i.e., sections and section wise details of where each visual is present |
|  | project\_id | integer |  | M | Id of the project under which the page is created  References **project (project\_id)** |
|  | created\_by | integer |  | M | Id of the designer who created the page |
|  | created\_on | timestamp without time zone |  | M | Date and time when the page was created |
|  | last\_updated\_by | integer |  |  | Id of the designer who last updated the page |
|  | last\_updated\_on | timestamp without time zone |  |  | Date and time when the page was last updated |
|  | order\_no | Integer |  | M | Order of page within the project as set by project admin |

### 4.1.6 page\_visuals

**Description**: This entity will store the details for each visual included in a page.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | page\_visual\_id | integer |  | M | Unique id for each visual-page combination, auto generated by the system on inclusion of a visual on a page |
|  | visual\_id | integer |  | M | Id of the visual  References **visuals (visual\_id)** |
|  | project\_id | integer |  | M | Id of the page in which the visual is included  References **pages (page\_id)** |

### 4.1.7 menu

**Description**: This entity will store the details for each menu item.

| S. No. | Attribute | Type | Length | Mandatory / Optional | Remarks |
| --- | --- | --- | --- | --- | --- |
|  | menu\_id | integer |  | M | Unique id for each menu item, auto generated by the system on creation |
|  | name | character varying |  | M | Name of the menu item |
|  | action | character varying |  | M | Action on the menu item |
|  | order\_no | integer |  | M | Order of the menu item in overall menu |

# 5.0 Non-functional Requirements

## Performance Requirements

### **Scalability Requirements**

Scalability refers to the maximum user load on the system. In the current scenario, there would be 2, 50,000 application users of the system at central, state and Panchayat level. At any point of time, no more than 25,000 simultaneous application users would be expected in the system. At any point of time, the software should support a peak load of 2500 concurrent users.

### **Response Time**

The response time should be as follows:

* 90% of the responses should be within 2 sec
* 10 second: For user operation on data (for e.g. sorting of data in a column) or (5 to 50 records per page up to max of 100,000 records).
* 10 to 20 seconds: For user awaiting response from the system upon executing a transaction (for e.g. a query/update).
* 1 minute – Unacceptable response time.

## **Software System Attributes Usability**

The Screens should be designed for ease of use by non-technical users who do not have any computer knowledge. The design should adopt the following principles:

* Use relative font size so that a user can easily change overall font size from the browser interface.
* Text equivalents should be given for all graphics.
* Application should function even if JavaScript, CSS and Frames are turned off.
* **Navigability** –The user should be able to perform operations without having to navigate through multiple pages/links – No operation should require more than 2 to 3 clicks.
* **Familiarity –** The system’s interfaces and navigations should be based on other systems that the users are familiar with.
* **Administration –** The system should not require any administration tasks at the user level. Interfaces should be available for administration/setup operations.
* **Help -** The system should come equipped with Computer based tutorial in English and ten other languages for users to “self-solve” any navigability or operational doubts.
* **Standards Adherence –** The system should adhere to commonly accepted standards of web-design (such as acceptable size of web pages, minimal images, small style sheets etc.)

### **Accessibility**

All the user and normal administration features of software should be available through a browser-based interface. The software should support Internet Explorer 7.0 and above and Mozilla 3.6.6 and above versions.

### **Availability**

Audit Online software shall be up and running and must be available 24x7 and any one should be able to connect to it from anywhere. It should trap all errors and prevent users from accessing unauthorized areas of the software. In case of software or a hardware failure, the system should re-initiate immediately. In case of a possible hardware failure or corruption of database the system admin should immediately restore the backup.

### **Reliability**

Individual Audit Online software may be unavailable for not more than 120 hours in each year. It is expected that there shall not be any bug and the system shall be tested on end cases to offer user a quality and reliable application.

### **Maintainability**

The software would be designed and developed using Open Source Tools and Technologies. The system admin shall take regular back up of the database. Software Code must be modular and well documented.

### **Portability**

The software would be hosted/installed in Linux RHEL 5 and above O/S based server and would be accessed through Windows (XP) based machines using I.E 7.0 or above OR Mozilla 3.5.11 or above browsers.

### **Security**

The system should have protection against -

* Unauthorized creation/modification of data - Through user name and password authentication as defined for relevant user groups.
* Unauthorized viewing of data - through user name and password authentication as defined for relevant user groups.

The software should adhere to security guidelines, standards and policies prescribed by NIC’s Security Division and should be audit& certified for compliance to these standards by Security Division before it is hosted in Production Environment. The software should be protected against any unauthorized access to the software.

### **Language Support**

The application would store data using Unicode representation. The software would provide local language support for all textual descriptions; help messages etc. Only languages where Unicode font file and keyboard manager/driver are available would be supported.

### **Other Requirements**

This section lists the other non-functional requirement related to installation/un-installation /upgrades of Audit Online Software. A non-technical person shall be able to setup and run the Audit Online software.

### **Backup**

A simple manual data backup mechanism shall be provided which would write a backup of the data to one of the system’s disks. From there, the backup date can be manually written to tape if required. The data backup should cover data held in a database and any data held outside of the database such as files uploaded through the software. The Online Data backup as per the script is initiated on every night and stored in SAN.

### **Recovery**

A simple manual data recovery procedure would be provided to recover the data from a data backup. The data backup would be used to recover the data in the event of a disk corruption or database corruption. The disaster recovery procedure would be used in case of failure of primary database.

### **Customer/User Training**

It is proposed that NICSI would conduct a training programme at NIC, HQ to fully train selected Audit Online software Admin on the installation, use, backup, recovery, plan creation/Updation and problem diagnosis. These Admins would become “Audit Online Master Trainers (also known as Trainers of Trainers) who would then train Audit Online users in the use of the software.

### **Audit Trail**

The Software shall offer a comprehensive report on the user actions (changes made with time stamp) through audit trail. The complete method access are also recorded along with detail annotation.

# 6.0 Annexures