Functional

Requirements

Specifications

Of the Eclipse inkstone Plugin

Document version : 2.0

Document date : 25/09/2012

Author : Ofer Calvo

Version remarks : Change “INK Kiosk View” requirements to work with INK model (in the memory) and not with INK files (\*.ink).

Content List:

1 Abstract 1

1.1 Abbreviations list 1

1.2 Definitions 1

1.3 Applicable Documents 1

2 Requirements 1

2.1 Development Environment 1

2.2 Coding Conventions 1

2.3 Data Repositories 1

3 Requirements Entities & Context 1

3.1 Participated Entities 1

3.2 Context diagram 1

4 Use cases & Scenarios details 1

4.1 Use Case: Manage INK Diagrams 1

4.1.1 Scenario: Add New Empty INK Diagram 1

4.1.2 Scenario: Remove INK Diagram 1

4.1.3 Scenario: Add/Remove INK Diagram Fails 1

4.2 Use Case: Edit INK Diagram 1

4.2.1 Scenario: Add INK Element 1

4.2.2 Scenario: Add INK Relation 1

4.2.3 Scenario: Add INK File 1

4.2.4 Scenario: Delete INK Notations 1

4.2.5 Scenario: Define Diagram Filter 1

4.2.6 Scenario: Diagram Edit Fail 1

4.3 Use Case: Manage INK Kiosk 1

4.3.1 Scenario: Show INK Kiosk View 1

4.3.2 Scenario: Add INK file 1

4.3.3 Scenario: Remove INK file 1

4.3.4 Scenario: Add/Remove INK File Fails 1

4.4 Use Case: Manage INK Properties 1

4.4.1 Scenario: Show INK Properties View 1

4.4.2 Scenario: Update Properties 1

4.4.3 Scenario: Update INK Properties Fails 1

Figure List:

[Figure 1 - Context Diagram 1](#_Toc325892933)

[Figure 2 - Use Case Diagram 1](file:///C:\Users\OC\Documents\אופ%20תואר%20שני\פרויקט%20מתקדם%20במדעי%20המחשב%20-%2022997\הצעה\FRS\InkStone%20-%20FRS.docx#_Toc325892934)

# Abstract

The inkstone project (the plugin) is about extending INK workbench project to enable graphical editing of INK metadata, using diagram drawing of notations (INK elements and relations between them).

The project goal is to simplify DSL design with INK, to domain specialists that are not programmers, and to enable modeling visual language between people that uses INK.

This paper is a specification document that lists the functional requirements of inkstone.

## Abbreviations list

|  |  |
| --- | --- |
| **DSL** | Domain Specific Language |
| **SDL** | Simple Declarative Language |
| **SVG** | Scalable Vector Graphics |

## Definitions

|  |  |
| --- | --- |
| **INK Element** | It’s one of the following types : INK meta-class, INK class or INK Object |
| **INK File** | A text file with “\*.ink” suffix. Written in SDL format. |

## Applicable Documents

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Document Name** | **Version** | **Date** |
|  | inkstone ORS | 2.0 | 25/09/2012 |

# Requirements

General requirements ordered by sub-categories.

## Development Environment

The coding will be done with the Eclipse Plugin Development Environment (PDE) as enhancement plugin of the ink-core archive.

The developed plugin will be a “view based Plugin”. Meaning the Plugin views should have functional interaction between them.

It will add the “Ink Diagram, “Ink kiosk” and the “Ink Properties” views, under the category named “INK’, as enhancement to the INK framework plugin.

## Coding Conventions

Coding artifacts naming convention should be: “ink.inkstone.\*”, as an add-in to the INK framework.

## Data Repositories

The “INK Diagram” graphical data should be saved into a “\*.svg” files, using SVG syntax per diagram.

Diagrams (INK) elements data will persist in the “\*.ink” files, using INK syntax, as usual done in the INK framework.

Each INK element shell be defined only in one INK file, but could be drawn in one or more INK diagrams (0…m).

Change in one data representation of INK element should have an update effect to all other graphic representations of the INK element.

# Requirements Entities & Context

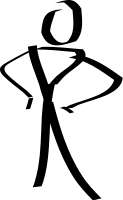
Define the project scope by definition of the participated entities in the scenarios of chapter ‎4.

## Participated Entities

* Human entities :
  + The **User** (code programmer / designer / domain specialist)
    - The user is the human that use this plugin project.
* Eclipse workbench entities :
  + **INK Diagram View**
    - Graphic editor to draw INK diagrams.
  + **INK Model**
    - The INK-core dynamic data model in eclipse. Updated by the INK programmer who save it’s work using the INK editor view (part of the INK framework plugin).
  + **INK Kiosk View**
    - A toolbar with graphical notations of INK elements and INK relations to pick from.
  + **INK Properties View**
    - A part tree, part grid view for display and edit of INK elements attributes and values.
  + **INK Preference page**
    - A page to control some of the behavior of the plugin through user preferences.
* Other :
  + **Plugin Core**
    - Inner logic of the inkstone plugin (Actions, events and other logic).

## Context diagram

Interaction context between the participated entities in the plugin scenarios:



User

Uses

Figure 1 - Context Diagram

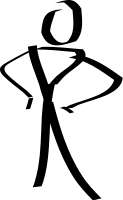
# Use cases & Scenarios details

The requested scenarios are ordered by use cases.

Each scenario is a functional requirement of the plugin.

The Plugin Use-Cases are:

Figure - Use Case Diagram



User

Uses

## Use Case: Manage INK Diagrams

|  |  |
| --- | --- |
| Goal/Brief description | Adding or removing diagrams from a project. |
| Include use cases | None |
| Triggering Entity | The User |
| Triggering Event | Plugin action command. |
| Precondition | n/a |
| Success post-condition | INK diagram added or removed. |
| Failed post-condition | File I/O error. |
| Remarks | None |

### Scenario: Add New Empty INK Diagram

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Adding new INK diagram to the project. |
| Scenario precondition | User selects the add INK diagram command. |
| Scenario post-condition | New empty INK diagram. |
| Remarks | n/a |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Selects the add INK diagram command, and write the selected name to the diagram.  Also the user should associate the diagram to a new \*.ink file, or to the default <diagram-name>.ink file, for new INK elements created on the diagram. | See ORS. |
|  | Plugin core | Get the project default INK diagrams folder. If empty pop a selection dialog, create folder if it’s new and save folder path in the plugin preference page. | Without a project diagrams folder the scenario will be cancelled. |
|  | Plugin core | Pop a question dialog to set default INK file for new elements. If it’s a new file create an empty INK file. | Without a default INK file the scenario will be cancelled. |
|  | Plugin core | If the plugin perspective is not set, ask the user if he want to display that perspective. |  |
|  | Plugin core | Add new INK Diagram view to the workbench. |  |
|  | INK Diagram view | Saves a new empty “\*.svg” file and clears the properties view. And a new | On I/O file error go to “Add/Remove INK Diagram Fails” scenario. |

### Scenario: Remove INK Diagram

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Deletes the INK diagram file, with optional action off deleting all the linked INK files with it. |
| Scenario precondition | User deletes the INK diagram file. |
| Scenario post-condition | Diagram deletion. |
| Remarks | Deleting linked INK files should have double safety UI to prevent erroneous deletion. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Selects an INK diagram (“\*.svg”) file from the Package Explorer view and hit the DELETE key. |  |
|  | Plugin core | Listen to delete event (resource change in the project). Check if the resource change is a deletion of INK diagram file. If so, pops a warning dialog and let the user cancel the deletion, or to confirm deletion. The dialog shall have an empty check box to confirm deletion plus related INK files elements deletion. |  |
|  | User | If selects “Cancel” the scenario will be cancelled. | End of scenario. |
|  | User | If selects “Delete”, and the check box is not set, the selected “\*.svg” file will be deleted, and its diagram view will be close (if shown). | On I/O file error go to “Add/Remove INK Diagram Fails” scenario. |
|  | User | If selects “Delete”, and the check box is set, all INK elements in the diagram will be deleted first from their INK files (“\*.ink”).  After that the selected “\*.svg” file will be deleted, and its diagram view will be close (if shown). |

### Scenario: Add/Remove INK Diagram Fails

|  |  |
| --- | --- |
| Scenario type | Secondary |
| Brief description | Handle errors of adding or removing diagrams. |
| Scenario precondition | Add/Remove INK Diagram scenario has an error. |
| Scenario post-condition | An error message display. |
| Remarks | none |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | Any entity of the current use case. | On error check if it a file/folder I/O error.  If so jump to step 3. |  |
|  | Display message with the general error data and exit the current scenario. |  |
|  | Display message with The I/O error data and let the user to perform a reselection or exit the current scenario. |  |

## Use Case: Edit INK Diagram

|  |  |
| --- | --- |
| Goal/Brief description | Handle all edit activities of an INK diagram. |
| Include use cases | None |
| Triggering Entity | User |
| Triggering Event | User selections. |
| Precondition | n/a |
| Success post-condition | Desire diagram change in the view and in the diagram “\*.svg” file. |
| Failed post-condition | File I/O error. |
| Remarks |  |

### Scenario: Add INK Element to Diagram

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Add a graphics notation of INK element from INK Kiosk. |
| Scenario precondition | An INK element (from the INK Kiosk view) dropped on the INK diagram. |
| Scenario post-condition | Adding the INK element to the diagram. |
| Remarks | The INK model is automatically updated. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Drop an INK element from the INK Kiosk view. |  |
|  | INK Diagram view | If the element is a basic INK element, do:   * Save the element in the diagram file with the dropped location and a default name. * Save element in default INK file with a default name and default properties values. * Make the element the selected one in the diagram. | Basic INK element is defined in the INK Kiosk view requirements. See ORS. |
|  | INK Diagram view | If the element is a linked INK element, and it’s not currently displayed in the diagram, do:   * Save the element in the diagram file with the dropped location (manual usage mode) and the element name. **[!]** Also support auto location mode for applicative usage by the Kiosk view. * Add relation if exist and the target element exist in the diagram. * Make the element the selected one in the diagram.   If the linked element already in the diagram, display error message: “The added element already exists in the targeted INK diagram.” | Linked INK element is defined in the INK Kiosk view requirements. See ORS.  On error call “Diagram Edit Fail” scenario. |
|  | INK properties view | Show the selected element properties. |  |

### Scenario: Add INK Relation to Diagram

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Add a graphics notation of INK relation from INK Kiosk. |
| Scenario precondition | An INK relation (from the INK Kiosk view) dropped on the INK diagram. |
| Scenario post-condition | Adding the INK relation to the diagram. |
| Remarks | The INK model is automatically updated. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Drop an INK relation from the INK Kiosk view. |  |
|  | INK Diagram view | Allow the user to connect the relation from source element to target element in the diagram (as described in the ORS). | See ORS “INK diagram interactions” table. |
|  | INK Diagram view | Save changes to the SVG and the source element INK files only if the user completes the connection.  If user aborts the connection operation, the diagram will not show the new relation.  Set the source element as selected in the diagram. |  |
|  | INK properties view | Show the selected element properties. |  |

### Scenario: Delete INK Notations

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Deletes a graphics notation of INK element/relation from the INK diagram. |
| Scenario precondition | User presses the Delete key. |
| Scenario post-condition | Current selected element deleted. |
| Remarks | The INK model is automatically updated. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | User presses the Delete key when the INK Diagram view is in focus. |  |
|  | INK Diagram view | If there is a selected INK element do:   * Remove the element from the SVG file. * Remove relation notation from/to the element (if exists) in the SVG file. |  |
|  | INK Diagram view | If there is a selected INK relation do:   * Remove relation notation from/to the element (if exists) in the SVG file. |  |
|  | INK properties view | Clear properties. |  |

### Scenario: Add INK library (DSL) to a Diagram

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Add a graphics notation of INK elements and relation as describe in the INK model. |
| Scenario precondition | User drops an INK Kiosk library bar into the diagram view. |
| Scenario post-condition | The INK library elements are scanned and added to the diagram. |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Select a library expand bar in the Kiosk view, and drag & drops it into the view diagram view. |  |
|  | INK Diagram view | Gets INK elements list from the Kiosk view. |  |
|  | INK Diagram view | Preform the next algorithm:   * Order all input elements in a topological sorted list (ignoring relations to element neither in the input group nor in the current diagram). * Pass every element from the list to the Diagram view, starting elements without relations first.   + Position elements according to the sorted list (left-to-right, top-to-bottom) at the bottom of the diagram (under most lowered existing element). Using the diagram view auto location mode. | Multiple calls to scenario: “Add INK Element to Diagram”. |
|  | User | Can fix manually elements positions in the diagram. |  |

### Scenario: Define Diagram Filter

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Update the layers filter of current INK diagram view. |
| Scenario precondition | User opens layers filter. |
| Scenario post-condition | Diagram layers displayed or hidden. |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Open the Diagram filter list and reselect the INK notation to show or hide. | See “Diagram filter” at the ORS. |
|  | INK Diagram view | Updates all relevant graphic notations in the diagram SVG file to be shown or hidden.  Then refresh the diagram display. |  |
|  | INK Diagram view | Save the filter options in the SVG file. |  |

### Scenario: Diagram Edit Fail

|  |  |
| --- | --- |
| Scenario type | Secondary |
| Brief description | Handle errors of diagram edit actions.  Handle Plugin fatal errors and INK core compilation errors. |
| Scenario precondition | The INK diagram stumbles over a known error and send its description. |
| Scenario post-condition | An error message display. |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | INK Diagram | If fatal error, display the plugin error message description and wait for the user to confirm and cancel current calling scenario. | See ORS’s “general error message” dialog. |
|  | If an INK core error do:   * Display an error icon near the diagram view name. * Mark the relevant elements with a red highlight border. |  |

## Use Case: Manage INK Kiosk

|  |  |
| --- | --- |
| Goal/Brief description | Usage and functionality of the INK Kiosk view. |
| Include use cases | None |
| Triggering Entity | User |
| Triggering Event | Add / Delete actions. |
| Precondition | n/a |
| Success post-condition | Kiosk linked INK file sections updated. |
| Failed post-condition | I/O files error. |
| Remarks | None. |

### Scenario: Show INK Kiosk View

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Open a kiosk view. |
| Scenario precondition | No such view exists in the Eclipse workbench. |
| Scenario post-condition | The Kiosk view is added to the Eclipse workbench. |
| Remarks | The INK Kiosk view should be single view in the workbench. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Activate the Kiosk View. |  |
|  | Plugin core | Check if the Kiosk view not exists in the workbench. | If exist end scenario here. |
|  | INK Kiosk View | Check Project preference for last configuration of the Kiosk view. Add link INK files sections according to configuration. |  |

### Scenario: Add INK Model to Kiosk

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Add (or update) INK model elements to the Kiosk view. |
| Scenario precondition | Users add action on the view. |
| Scenario post-condition | n/a |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Open selection dialog, and select the DSL’s (INK namespaces / libraries) to be added/updated in the Kiosk view display. | User may select only some namespaces, leaving other namespaces out of the Kiosk display. |
|  | INK Kiosk view | Scan selected libraries un the INK model, and add them to the Kiosk display. |  |

### Scenario: Remove INK Model from Kiosk

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Clears the Kiosk view display. |
| Scenario precondition | Users delete action on the view. |
| Scenario post-condition | Kiosk display cleared. |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | P the Delete key. |  |
|  | INK Kiosk view | Clear Kiosk display, from the last selected elements. |  |

## Use Case: Manage INK Properties

|  |  |
| --- | --- |
| Goal/Brief description | Handle INK elements properties. |
| Include use cases | None |
| Triggering Entity | The user and the INK Diagram view. |
| Triggering Event | INK element selection or update. |
| Precondition | None |
| Success post-condition | None |
| Failed post-condition | File I/O error.  INK core compilation error. |
| Remarks |  |

### Scenario: Show INK Properties View

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Open an INK Properties view. |
| Scenario precondition | No such view exists in the Eclipse workbench. |
| Scenario post-condition | The Properties view is added to the Eclipse workbench. |
| Remarks | The INK Properties view should be single view in the workbench. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Activate the INK Properties view. |  |
|  | Plugin core | Check if the properties view not exists in the workbench. | If exist end scenario here. |
|  | INK Properties View | Opens a clear view. |  |

### Scenario: Update Properties

|  |  |
| --- | --- |
| Scenario type | Primary |
| Brief description | Handle edit operation of current element properties. |
| Scenario precondition | Properties view is set on source INK element. |
| Scenario post-condition | INK element properties updated in the INK file. |
| Remarks | None. |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | User | Update or add properties items of the INK elements. |  |
|  | INK properties view | After any data change, save data elements to the linked INK file. | On I/O file error go to “Update INK Properties Fails” scenario. |
|  | INK properties view | Use the INK core logic to compute if the element properties have any error. If so, display an error icon near the properties view name. If not show normal view icon. |  |

### Scenario: Update INK Properties Fails

|  |  |
| --- | --- |
| Scenario type | Secondary |
| Brief description | Handle errors of updating INK file from the INK properties view. |
| Scenario precondition | INK file update fails. |
| Scenario post-condition | An error message display. |
| Remarks | none |

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Entity | Inputs, Actions, Outputs | Remarks |
|  | INK properties view | On error check if it a file/folder I/O error. If so jump to step 3. |  |
|  | Display message with the general error data and exit the current scenario. | See ORS’s “general error message” dialog. |
|  | Display message with the general error data and exit the current scenario. |