

Improving the User Interface of the DeepLynx Data Warehouse

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Changing the World's Energy Future



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Introduction

What is DeepLynx?

DeepLynx is an open-source ontology-based data warehouse created by INL to support the creation, life cycle of digital engineering projects, with a particular emphasis on digital twins [1]. Digital twins are systems that represent physical assets and process in a real-time digital environment [1]. With DeepLynx users can store and combine data from different data sources, create ontology, run analytics, along with other features [1]. Given the nature of the projects stored in DeepLynx, users can store files like images, videos and several other assets including ontological organization and ease of visualization between nodes[1].

General information of data warehouses and target users

Data warehouses are data management systems that support business activities, in particular queries and analysis of vast amount of data [2]. Most well-known commercial data warehouses use Graphical User Interfaces (GUIs) for users to interact with their systems [3]. Limited publications have addressed the design of these interfaces and understanding of their target users. By contrast, DeepLynx is accessed by end users on a perproject basis to manage and view their ontology and data. Because there is a broader audience of target users for DeepLynx than a typical data warehouse, it is essential that DeepLynx has a useable and intuitive user interface.

Problem

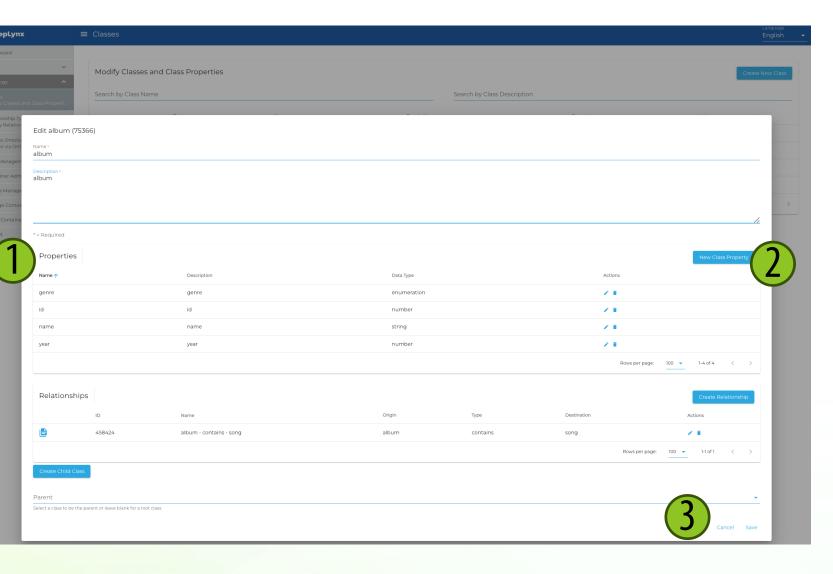
The current users and development team acknowledge the need to improve the current UI, not just for aesthetics but to improve functionality and workflow of DeepLynx. Traditional data warehouse users are developers, data scientists and business analysts [2]. DeepLynx users have a vast range of experience using data warehouses, and diverse roles, including engineers, scientists and management positions. This unique target audience requires a deeper understanding of their users to improve the current UI design.

Methods

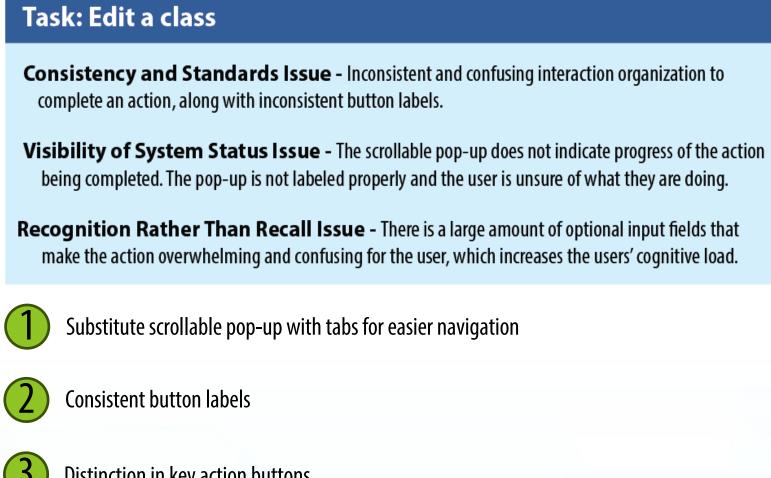


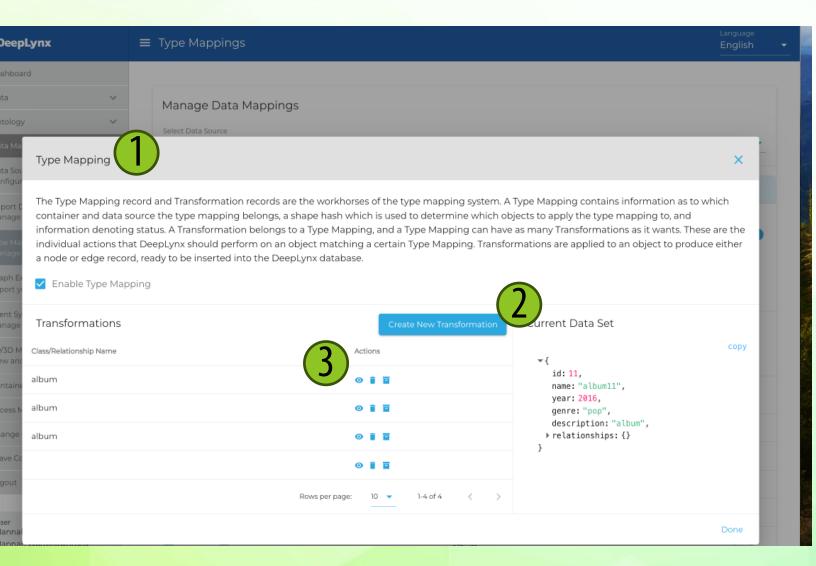
Solution

Existing UI



Nielsen's Heuristic Evaluation





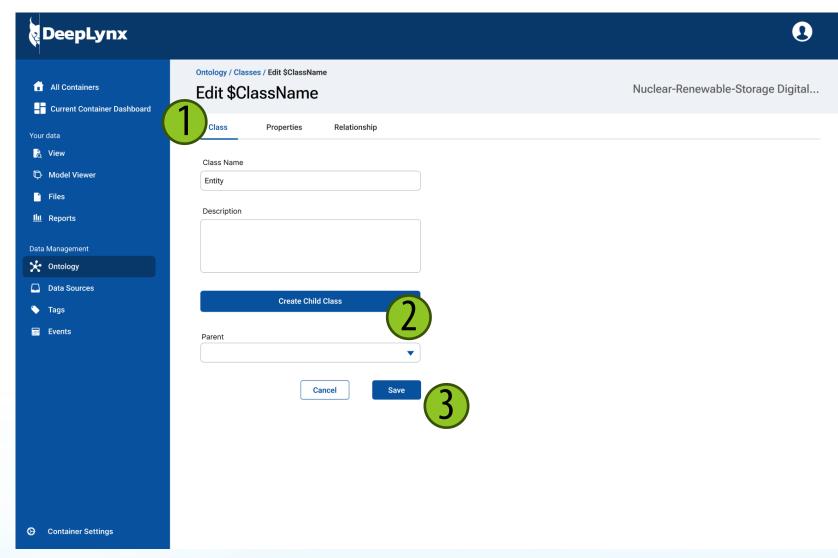
Distinction in key action buttons

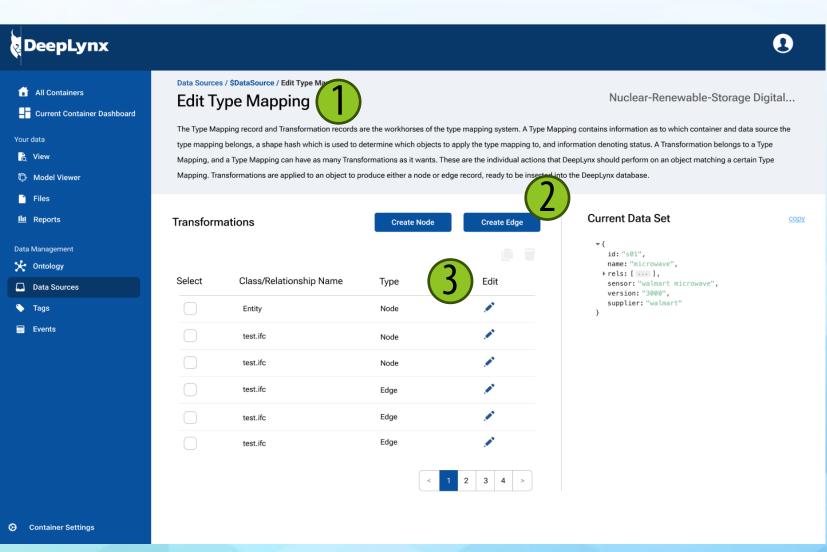
Task: Edit a Type Mapping Consistency and Standards Issue - The current use of the "eye" icon implies edit action. There is a large amount of guidance text, which isn't seen in other pages of the app. Match System and Real World Issue - Icons are not consistent to user's prior knowledge and experiences which disconnects the users' mental model. **Visibilty of System Status Issue** - Required input fields are hidden until a specific action is completed, where optional fields are showing, all resulting in the user being overwhelmed.

Incorporation breadcrumbs so users can know what they are currently editing. Distinct button for the creation of the transformations

Consistent "pencil" icon for edit action

Redesigned UI





Next steps

Finalize personas - Analysis data and develop personas

Complete - Heuristic Evaluation of UI redesign using Neilsen's Usability Heuristic and *Thinking Aloud Test* of new UI with current users

Formalized - List of lessons learned and design implications for future publication

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References:











