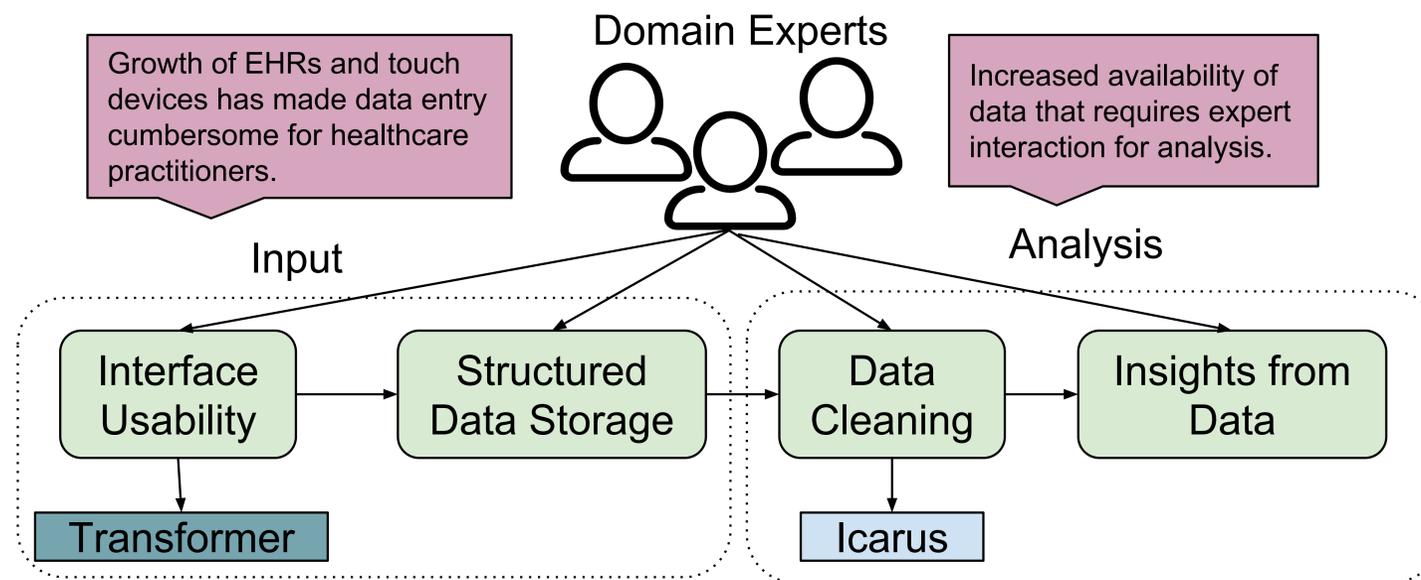


# Enabling Effective Data Interaction for Domain Experts

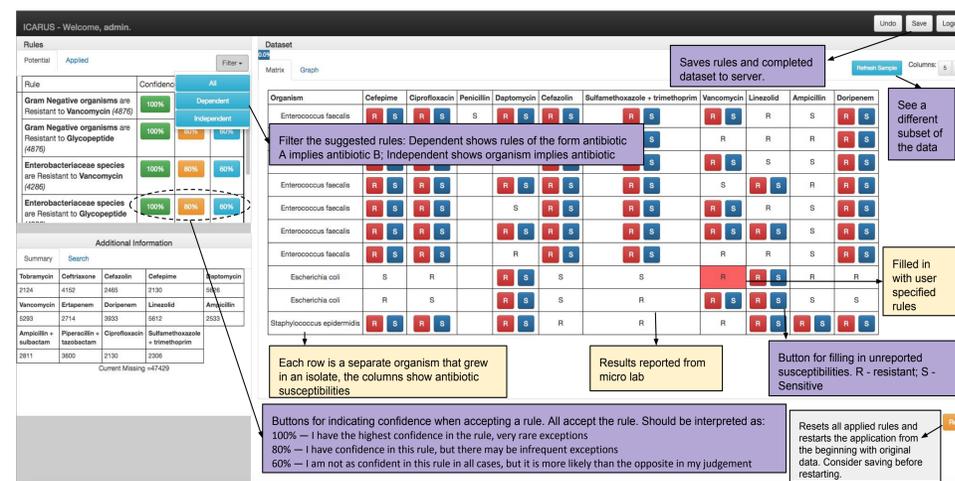
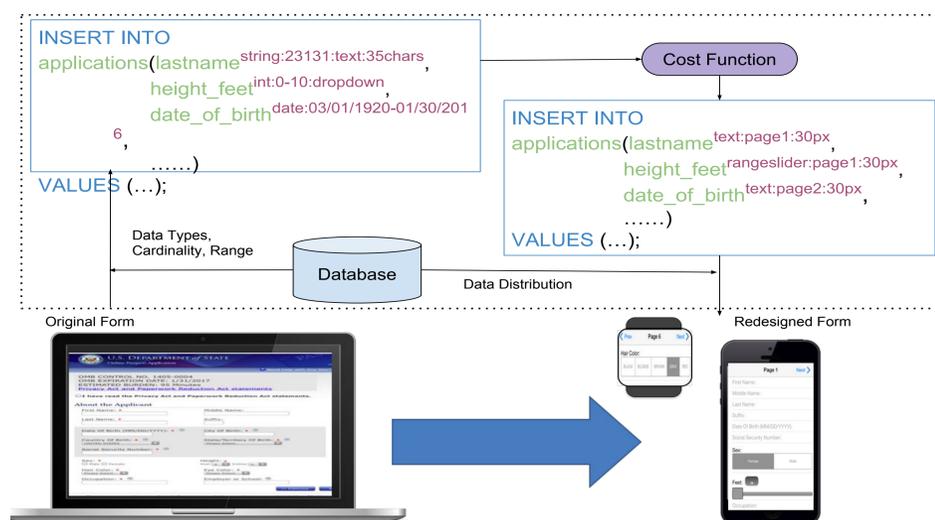
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Increase in EHRs has led to an increase in availability of data which require interaction from domain experts. This introduces two key challenges: reducing expert burden during input and allowing effective expert interaction during analysis.



**Transformer** – A system that finds the ideal form layout for the specified screen size by modeling the human input cost using features of the database including data distribution, data type and cardinality

**Icarus** – Data completion system that allows users to quickly fill in large datasets iteratively editing digestible subsets. Each edit is generalized to a rule applicable to multiple cells using the database schema.



**Results:** On average there is 27.5% reduction in form completion time between the original and automatically redesigned forms.

**Results:** Domain experts are on average able to fill in 56,000 cells in just 148 edits, within an hour, while the manual process took weeks.

## Future Work

### Structured Data Storage

- Annotations outside form fields are stored as unstructured text and not available for querying
- Opportunities for automatically structuring annotations using statistics and database schema.
- These signals could also be used to update database and form design.

### Guiding experts to Insights

- Raw data is difficult to digest.
- Exploratory visualizations are iterative and tedious.
- Small changes are not necessarily perceivable on visualizations.
- Optimal visualization for a given dataset
- Provide cues to expert on possible insights