



DVA INITIAL DESIGN REVIEW

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Background

- The semiconductor industry follows a complicated process when it comes to manufacturing products.
- Before the silicon chip is manufactured, design relies upon models and simulation for optimization and correctness.
- Once the design moves into the production stage, the primary focus becomes optimizing manufacturing yield, test cost, and product quality.
- In order to accomplish this, enormous amounts of test data is collected from the chip testing stages.
- The problem that arises is there is no standardization for that data, making the optimization of this whole process difficult.

Product Description

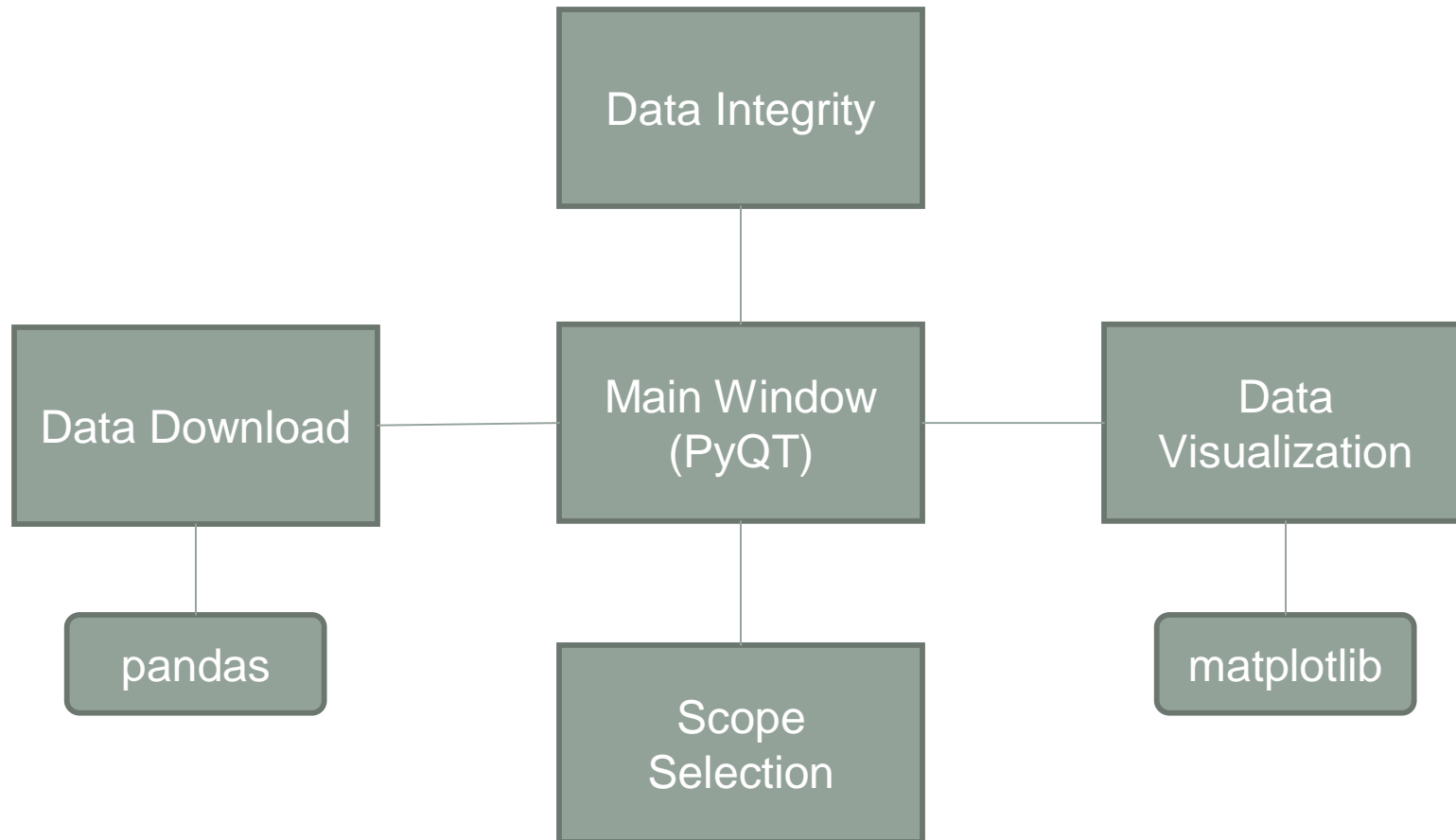
- Due to the design and manufacturing of today's semiconductors being a long and complex process, there is a large amount of data needed to be evaluated in order to determine and improve the overall yield of the semiconductors, as well as to identify where exactly errors are occurring.
- As such, we are creating DVA, which is a software tool targeted at Product Engineers in the semiconductor industry to automate the analysis and visualization of test data and aid in the verification of semiconductor chips.



Application

- Tool for semiconductor manufacturing companies
 - Analyzing manufacturing/test data to detect defects and improve yield

Block Diagram



Functional Requirements

- **Data Download** – Data Download is used to extract information from raw test data and form a Database that can be used to manipulate and analyze the data.
- **Data Integrity** – Data Integrity is used to verify the completeness and validity of the loaded data from Data Download.
- **Scope Selection** – Scope Selection is used to constrain the search space of the product test data.
- **Data Visualization** – Data Visualization is used to plot and view test data in a meaningful way. The test data will be displayed in the form of KDE plots, wafer plots, histograms, and multivariate plots.

Libraries

- **Pandas** – Python software library for data manipulation and analysis. This will be used to create a database from the input data for further manipulation.
- **Matplotlib** – A 2D Python plotting library which will be used to help visualize test data in the form of: KDE plots, wafer plots, histograms, and multivariate plots.
- **PyQt** – A python binding of the cross-platform GUI toolkit which will be used to implement a user friendly GUI for manipulation of test data.



Development Team

- Sam Dowell – Main Window and Data Visualization
- Blake Hall – Scope Selection
- Christopher Hindman – Data Download