

"Beep Beep" A Metadata code writer to generate SAS programs

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Inspired by **patients.**
Driven by **science.**





Agenda

1. Issue Statement
2. Navigator's adventure
3. Requirements & Strengths
4. Framework & Architecture
5. Automap
6. Demo
7. Recap



Issue Statement

Code for study milestones is written by **different** programmers using **different** techniques.

This leads to **costly** and **time-consuming** program modifications and limited reuse across studies.



Difficult to **re-use**

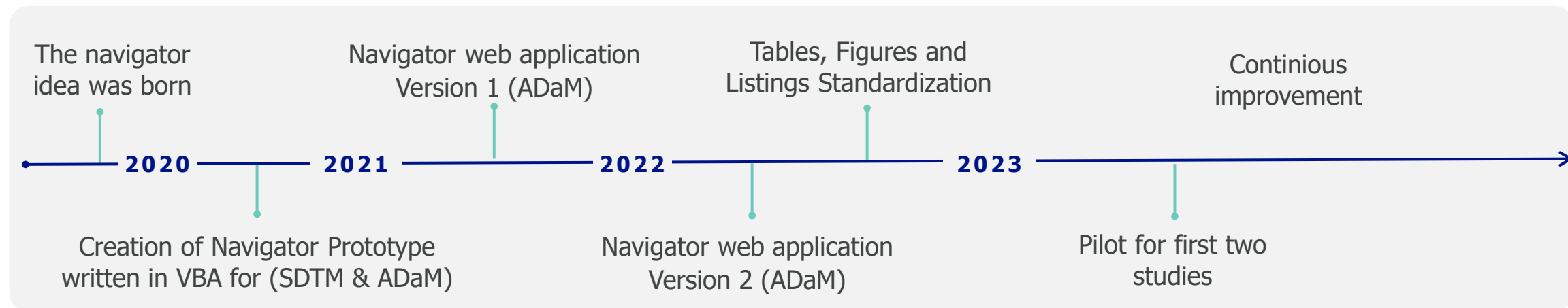


Difficult to **modify**



Difficult to **debug**

Navigator's adventure | Birth of a groundbreaking tool



What?

Metadata-driven code writer that generates standard, well-structured SAS programs to create datasets and TFLs



Facilitate **sharing** of **standardized code** in a standard manner



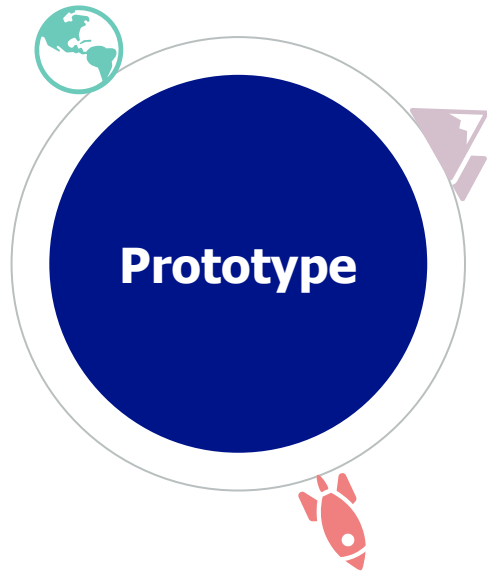
Reduce time-to market and generate cost efficiencies



Who?

Collaboration between SSI (Statistical Science and Innovation) and IT, with input and outside the box views from a large audience throughout UCB

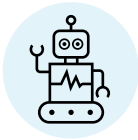
Navigator's adventure | The road to success



Planting seeds: from prototypes, requirement workshops and hackathons to actual implementation



Bumpy road: From speaking a different language to trusted partners



From prototype to qualified computerized system to operational model

What did we learn?



Make sure specification is well understood and don't stop providing feedback.



Combined knowledge and experience in programming and application programming: It helped designing the user interface (UI), evaluate user experience (UX) and implement functionality.

Navigator's adventure | Goals and scope

What is Navigator's ambition?

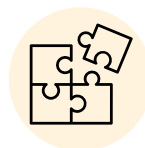


Provide statistical programmers with a **modularized** toolbox which allows them to create *CDISC datasets* and TFL in SAS (**FDA & PMDA requirements**) and facilitate sharing, **re-use, modification and debugging** of dataset code .

What is Navigator's scope?



Main **target audience**: Statistical Programmers



Datasets are built by a **sequence** of **derivations**; each one adds one or more variables/parameter.



Each derivation has an **associated mapping**, where a **mapping** is the **result** of the user interaction with the interface.

Requirements & Strengths | The tricky part

The trickiest task is combining datasets together “in an automatic way”.



Combining more datasets together is probably the **most difficult** thing to perform for anyone attempting to **automate** the dataset building process.



This is most likely the **main reason** that many attempts to do this **struggle** or **fail**.



Navigator uses a **special technique** (written in SAS language) for combining datasets.



It can be used **anywhere** and not just in Navigator.



It allows data **traceability**.



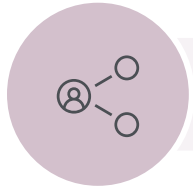
It discovers **potential data issues**.

Requirements & Strengths | A different approach

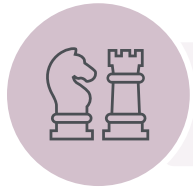
What makes our approach different from others?



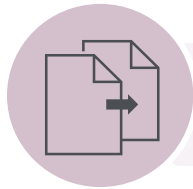
Special technique for combining datasets together.



Share the mapping (Time and costs savings).

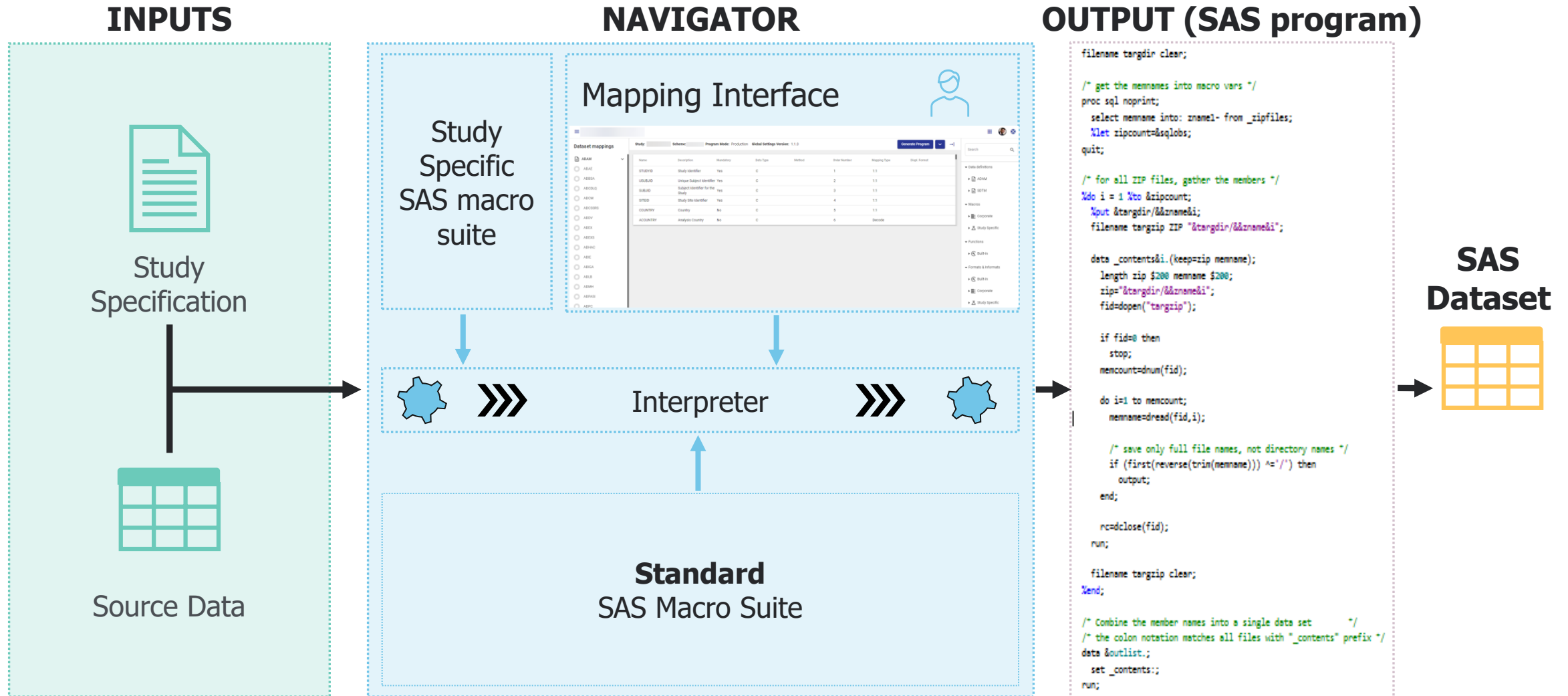


Components have a clear purpose without trying to do numerous derivations.



Outputs are consistent, reproducible and structured the same way: This solution facilitates code sharing in a controlled and standard way and it facilitates modification.

Framework | The skeleton of Navigator



Architecture | User interface components

How can user interact
with Navigator
components?



Load study specification and select source data.



Add study specific SAS macro.



Select the **version** of the **Standard** SAS Macro **release**.

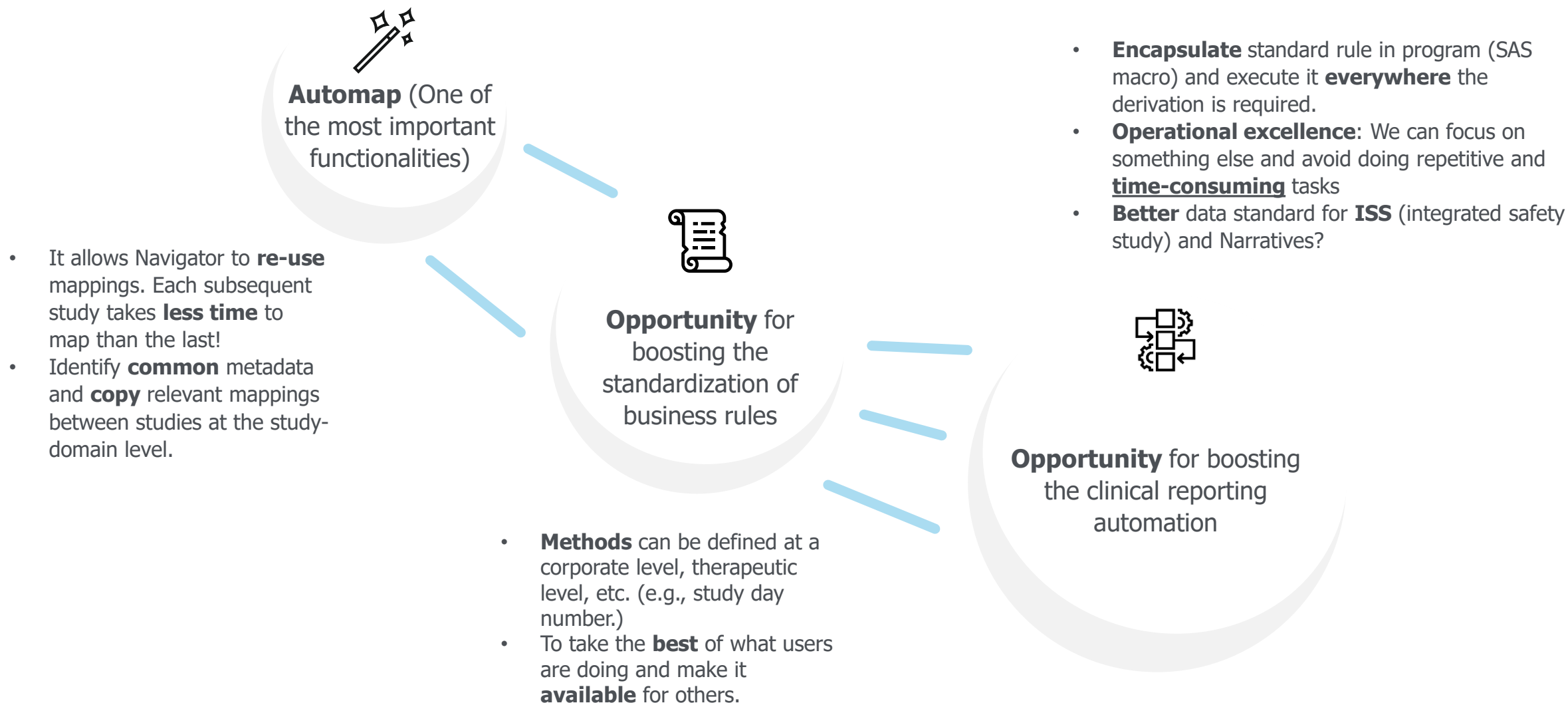


Perform the **mapping**: The result of the user **interaction** with the interface is the so-called mapping.

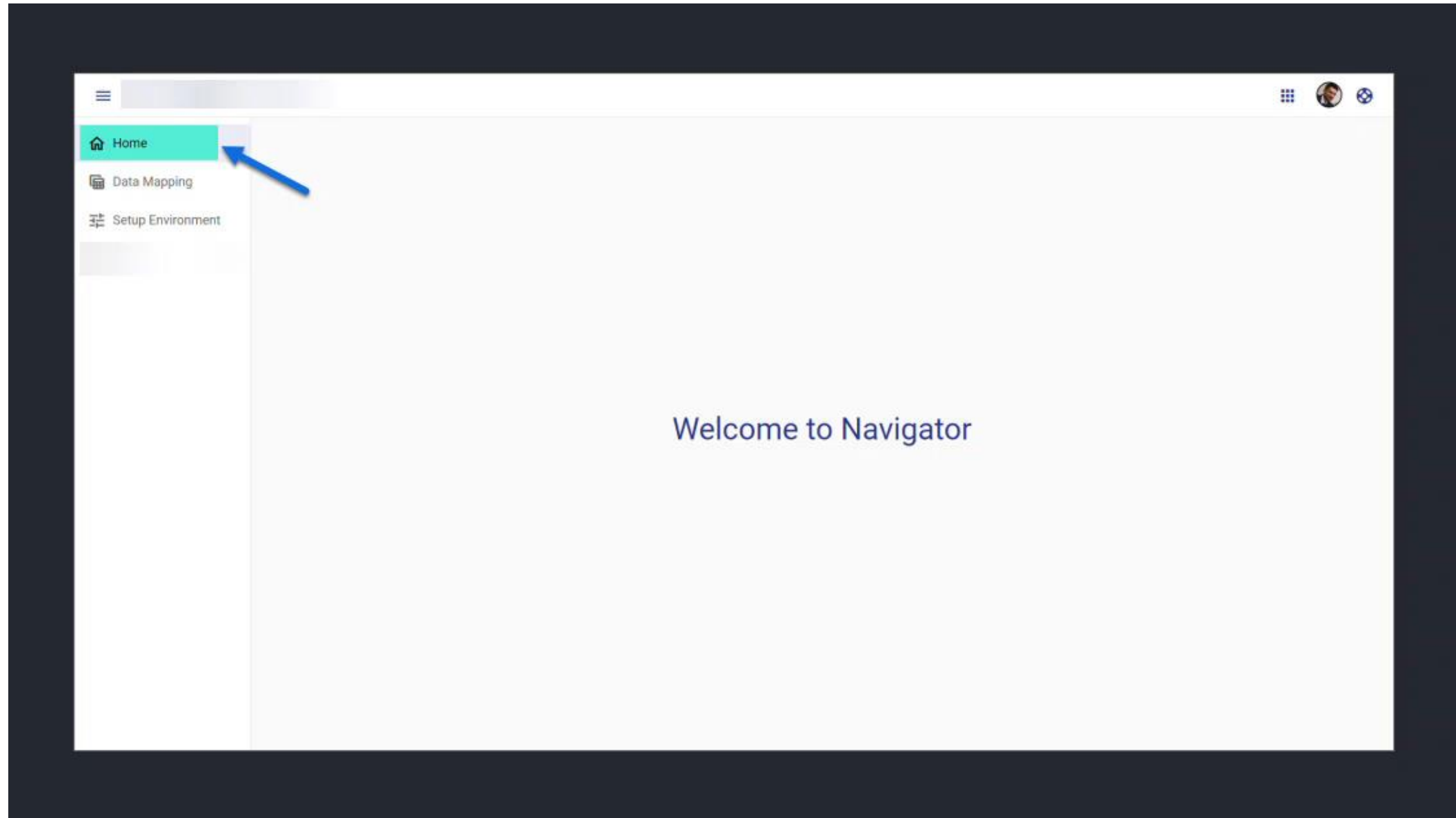


NOTE: **Interpreter** is **not** a User Component!
(User does not interact with the Interpreter)

Automap | A compound effect



Demo



Recap | What did we cover today?



is a **Metadata-Driven Code Writer** that generates code **automatically** based on **metadata** rather than writing code **manually**.



Ensure **consistency, maintainability, sharing, re-use, modification and debugging** of programs while **savings cost** and **improve the quality** of SSI deliverables.



Developed a culture of cross-department **collaboration** from ideation to design to actual production usage.



Special thanks to the SSI and IT teams.



Curious to learn more?

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Do you have any questions?

