

**MICHIGAN STATE**  

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**UNIVERSITY**

# Project Plan Presentation

## Product Lifestyle Tracing System

### The Capstone Experience

Team MillerKnoll

Keshav Babu

Ashley Jarria

Felix Liang

David Xiong

Mohammad Zaman

Department of Computer Science and Engineering

Michigan State University

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*From Students...  
...to Professionals*

# Project Sponsor Overview

- Previously Herman Miller
- Made-to-Order Customisable Home Furnishing and Goods
- Headquartered in Zeeland, MI



# Project Functional Specifications

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- Search by products or by components and find the relationships between them
- Check what components can be discontinued if a certain product is discontinued
- Allow insight into how utilized certain component are to make improvements to lead times



# Project Design Specifications

- The system features a Parts to Product Dashboard where users can select a product to trigger a detailed pop-up window
- Display includes a product reference card and data model presenting additional product information
- The system identifies components affected by product discontinuation through a dynamic pop-up table
- The system provides a detailed view of product-part connections, highlighting discontinued and low-supply components



# Part to Products

The screenshot shows a web browser window with the MillerKnoll logo and a search bar. The main content area is titled 'Dashboard' and contains a 'Part to Products' table. The table has the following columns: Product Sub Category, Product Line, Description, Base Product Number, First Order Date, and First Ship Date. The table contains 13 rows of data, with the third row highlighted in red.

Product Sub Category	Product Line	Description	Base Product Number	First Order Date	First Ship Date
Storage	Meridian Peds	Meridian Peds	AP	1/24/2024	3/24/2024
Storage	Meridian Towers	Meridian Towers	AP	1/24/2024	3/24/2024
Storage	Meridian Lockers	Meridian Lockers	A/L	3/1/2024	3/1/2024
Seating	Setu (FV)	JH China Frame Finish	JH China (Frame)	4/17/2024	6/17/2024
Upholstery	Bevel (AM)	Bevel Ottoman	AL6C0600	3/18/2024	6/17/2024
Upholstery	Bevel (AM)	Bevel Ottoman	AL6C0400	3/18/2024	6/18/2024
Upholstery	ColourForm (Cu)	ColourForm Ottoman	AJN64006 AJN64007	3/17/2024	7/1/2024
Seating and Dining	James Tables and Dining (F)	Round Power Module	ET981B	2/20/2024	6/20/2024
Occasional	Polygon Tables (S)	Q1 Laminate Finish	PK55001	3/13/2024	6/13/2024
Seating	Setu (FV)	SB Java Frame Finish	SB Java (Frame)	3/18/2024	5/18/2024
Seating	Setu (FV)	4W22 Lyris 2 Suspension	4W22 Lyris 2 Suspension Material	2/24/2024	6/24/2024

Rows Per Page: 11





# Product to Parts

MillerKnoll

Search Product

testuser@millerknoll.com

### Dashboard

#### Product to Parts

Part Name	Part Description	Supplier#	Supplier	Safety Stock	MOQ	On-Hand Inventory
0263/40706	BLANK FOR 151/40706	09910	JREH METAL PRODUCTS	15	200	208
0253/0006-98	57.303*18.375*22 GA SMOOTH	83008	METALS USA	5	180	110
1000M2	COUNTERWEIGHT -15.00	30147	GA RICHARDE PLANT 2	5	0263/40718	113
1031W	COAT ROD ASSEY 14.54	89970	WORLD RESOURCE PARTNERS	5	0263/40725	5
1049W6	BLANK-DRWF FILE 40.458*18	09910	JREH METAL PRODUCTS	5	200	121
10630-300	LOCKBAR C01302 28.8	09910	GA RICHARDE PLANT 2	0	1	0
2914/5128	73.88*23.88*1.00 REFW BASETUBE	30147	CONCEPT METAL PRODUCTS,INC	0	5	8
1001/100	BOX INNER PGMT 17.25*4.71	09910	JREH METAL PRODUCTS	10	940	998
702/706	LOCKBAR ASY/ NEW STYLE 16.83	80084	WEDGE MCKENDE IND MATL,INC	10	250	388
10-1027	PC-SE76C,ANT TANL,1	90370	PPG INDUSTRIES INC	0	40	46.18
10254/0084	18.752*6.782*22 GA SMOOTH	09910	JREH METAL PRODUCTS	5	40	16

Rows Per Page: 11



# Product Reference & Data Model

The screenshot displays the MillerKnoll web application interface. The browser address bar shows 'localhost:8080/ProductToPart'. The MillerKnoll logo is in the top left, and a search bar with 'Search Product' is in the top center. The user is logged in as 'testuser@millerknoll.com'. The main content area is titled 'Dashboard' and contains a 'Product to Part' sidebar on the left. The central focus is a 'Product Reference' window for a 'Blue Setu Chair'. This window is divided into two main sections: 'Product Reference' and 'Data Model'. The 'Product Reference' section includes an image of the chair, its ID (CQ51MA985YC9MP4W25), base product ID (CQ51MA), configured options (985YC9BMP4W25), a description, manufacturing location (Greenhouse Seating Operations), and a component dropdown menu. The 'Data Model' section lists the product, component, and supplier (DATHI Seating). To the right of these sections is an 'On Hand Inventory' table. At the bottom, a table lists product details and a 'Rows Per Page' selector.

On Hand Inventory						
						295
						80
						83
						9
						121
						0
						8
						855
						188
						48,78

00264/0084	18,762*IL783*22	0880	JREH METAL	5	40	95
	GA SMOOTH		PRODUCTS			



# Discontinued Product

The screenshot displays the MillerKnoll web application interface. At the top, the browser address bar shows 'localhost:8080/ProductToPart'. The MillerKnoll logo and a search bar are visible. The main content area is titled 'Dashboard' and includes navigation links for 'Product to Part' and 'Part to Product'. A modal window titled 'Discontinued Product: Blue Setu Chair' is open, showing a table of 'Affected Components' and a table of 'On Hand Inventory'.

Affected Components	
1B0GMZ	34W25
PD-1127	10-02
1B4BXL	
509/104	
893JG-1003	Offen ing
05-M6IWCY	

On Hand Inventory
296
110
110
9
101
0
0
150
100
45.75

Below the modal, a table of product details is visible:

00254/0064	19.752*6.783*22	0990	JREH METAL	5	40	10
	GA SMOOTH		PRODUCTS			

At the bottom, there is a 'Rows Per Page' dropdown set to 11 and a pagination control.



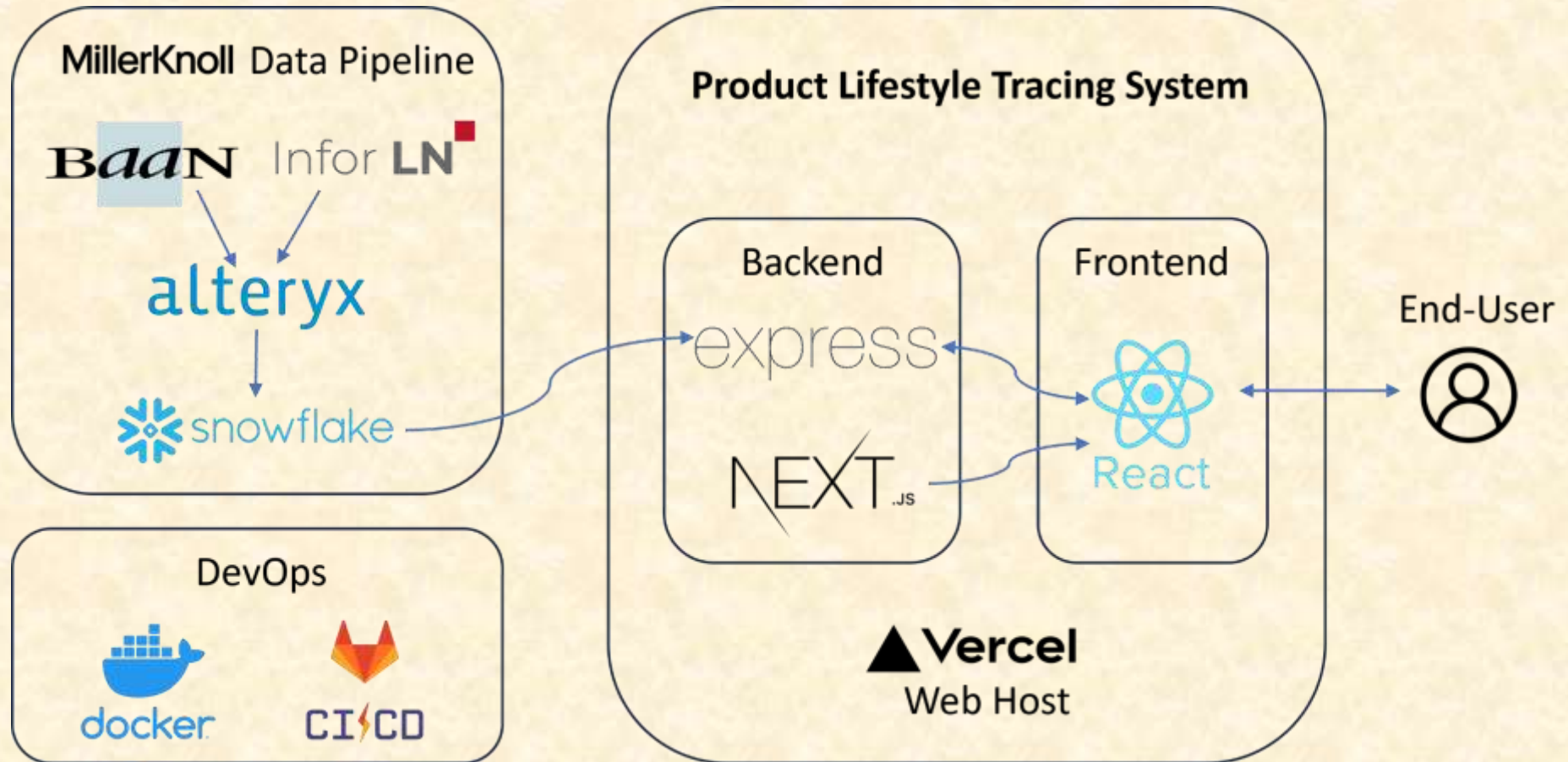


# Project Technical Specifications

- The Product Life Cycle Tracing System will use several different technologies to deliver a feature-rich, seamless experience to the end-user.
- Data moves through a series of pre-processing steps before it is deemed ready for use by the application.
- A backend API will be accessed by the client application to consume data
- Version control and containerization of the backend will streamline development workflows



# Project System Architecture



## • **Data Pre-Processing Pipeline**

- Baan – Database management system used for tracking supply chain + manufacturing data
- Infor LN – Enterprise Resource Planning (ERP) database used to store customer contract data
- Alteryx – Data analysis/processing tool used to refine and aggregate the information from Baan and LN
- Snowflake – Database management system used for storing the processed information in a structured schema



# Project System Components

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- **Development Tools**

- Next.js – Framework enabling server-side rendering on top of React to maximize browser performance
- Express.js – Framework that allows for rapid testing and deployment of a backend API to serve data

- **Dev-Ops**

- Docker – Used to containerize backend application and help facilitate cross-platform development
- GitLab – Version Control system used as a code repository and CI/CD pipeline



# Project Risks

## Complexity of Data

- Complex and unlabeled data in databases ranging from legacy to modern systems
- Limit data to Herman Miller contract sales in North America + Consult data scientist
- **Missing Data in Existing Data Sources**
  - Queried data in the database has missing information
  - Access raw data and parse it ourselves
- **Scalability regarding millions of products**
  - Mapping parts to products that utilize them can generate tons of results
  - Start with smaller dataset + Implement a cache layer that periodically cleans the data into a format that can be queried faster
- **Visualizing Data**
  - Users should easily be able to interpret large quantity of relevant information
  - Researching trending dashboard designs, then revising design with the sponsor



# Questions?

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