The Digital Transformation

In the Tortilla and Flatbread industry

Eduard Marfà

Global Marketing Director, CP&R

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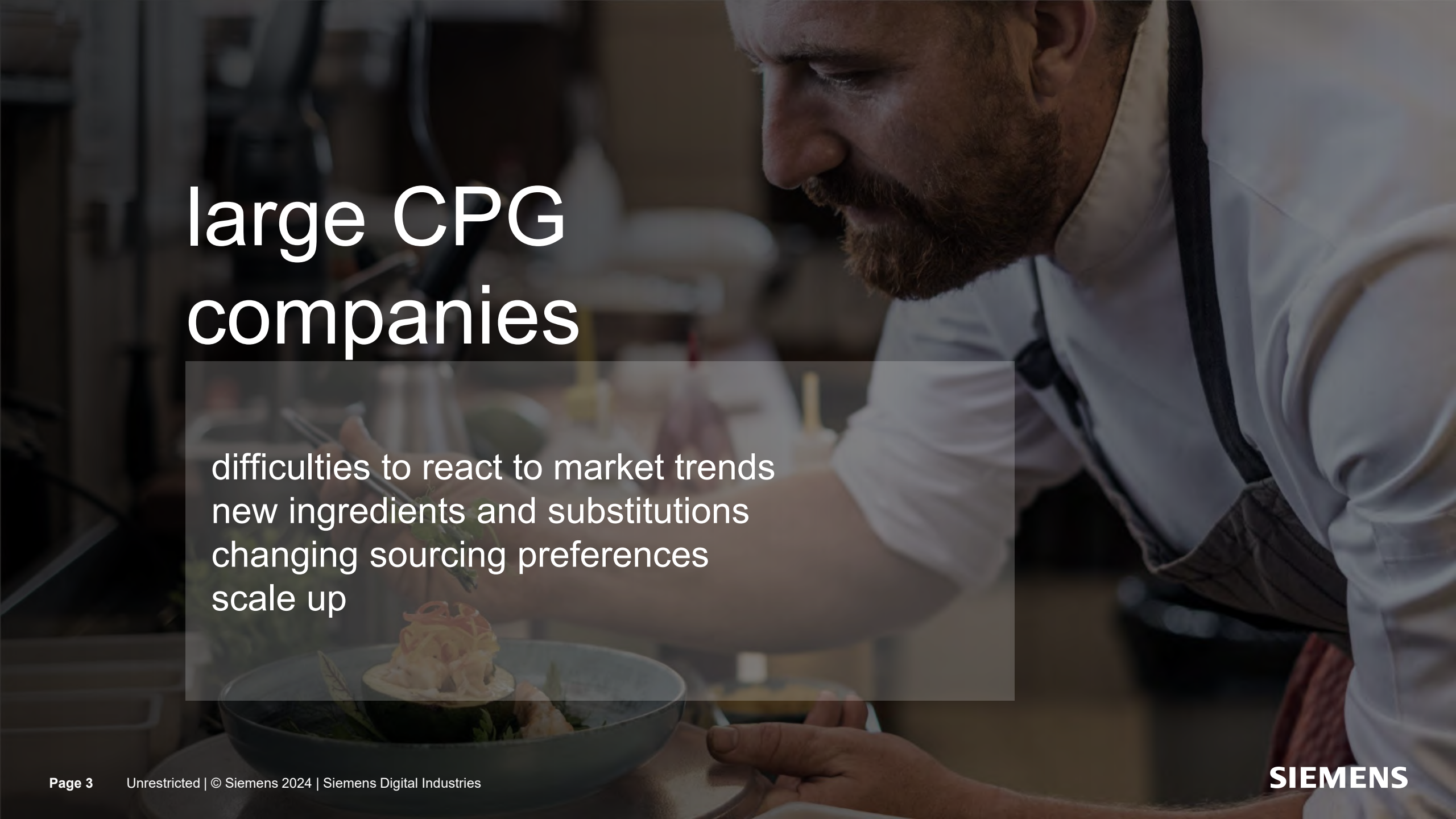
large CPG companies



difficulties to react to market trends
new ingredients and substitutions
changing sourcing preferences
scale up

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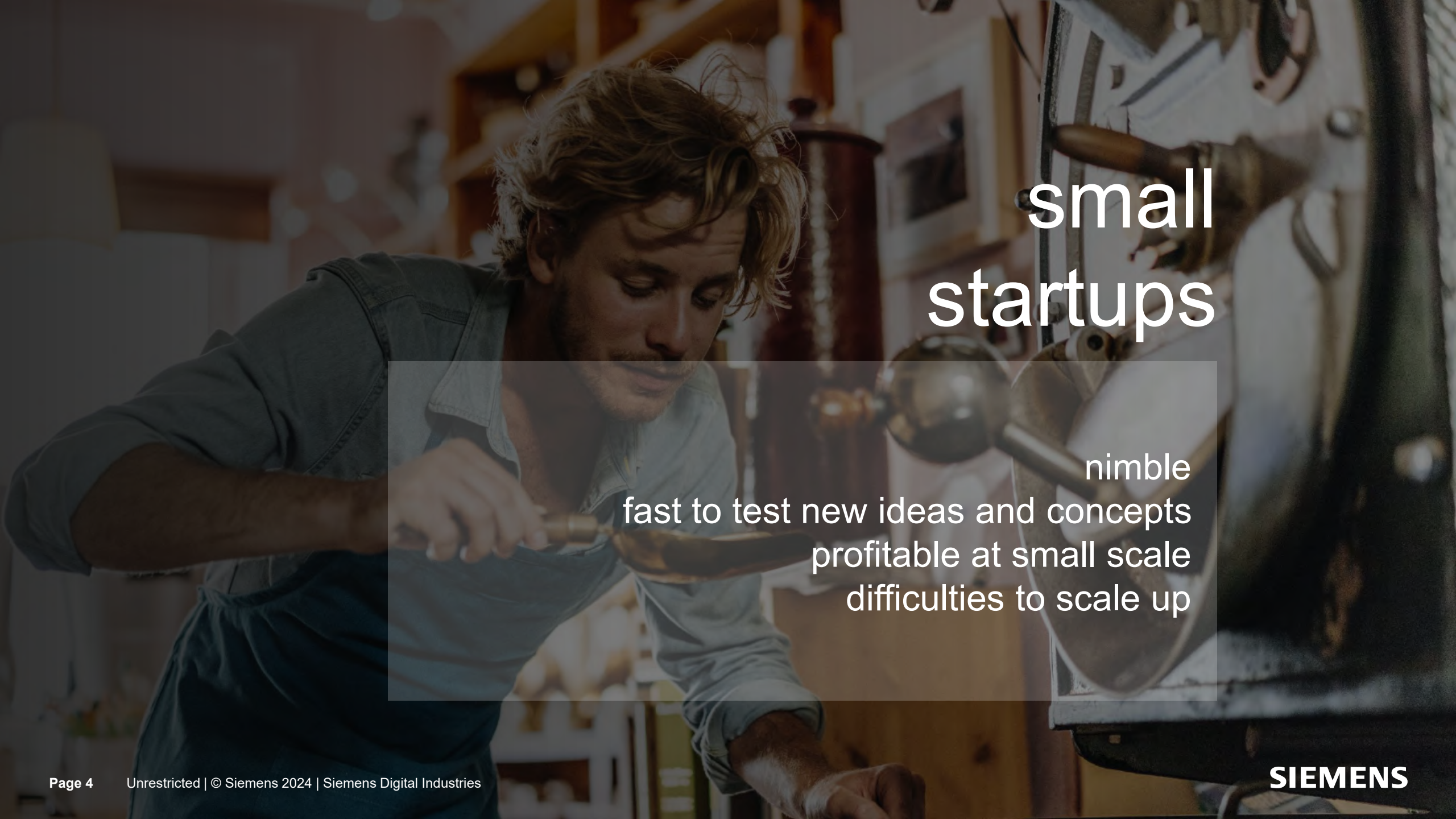

small startups

nimble
fast to test new ideas and concepts
profitable at small scale
difficulties to scale up

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How to get the best of both worlds?

large CPG companies

difficulties to react to market trends
new ingredients and substitutions
changing sourcing preferences
scale up worldwide

small startups

nimble
fast to test new ideas and concepts
profitable at small scale
difficulties to scale up

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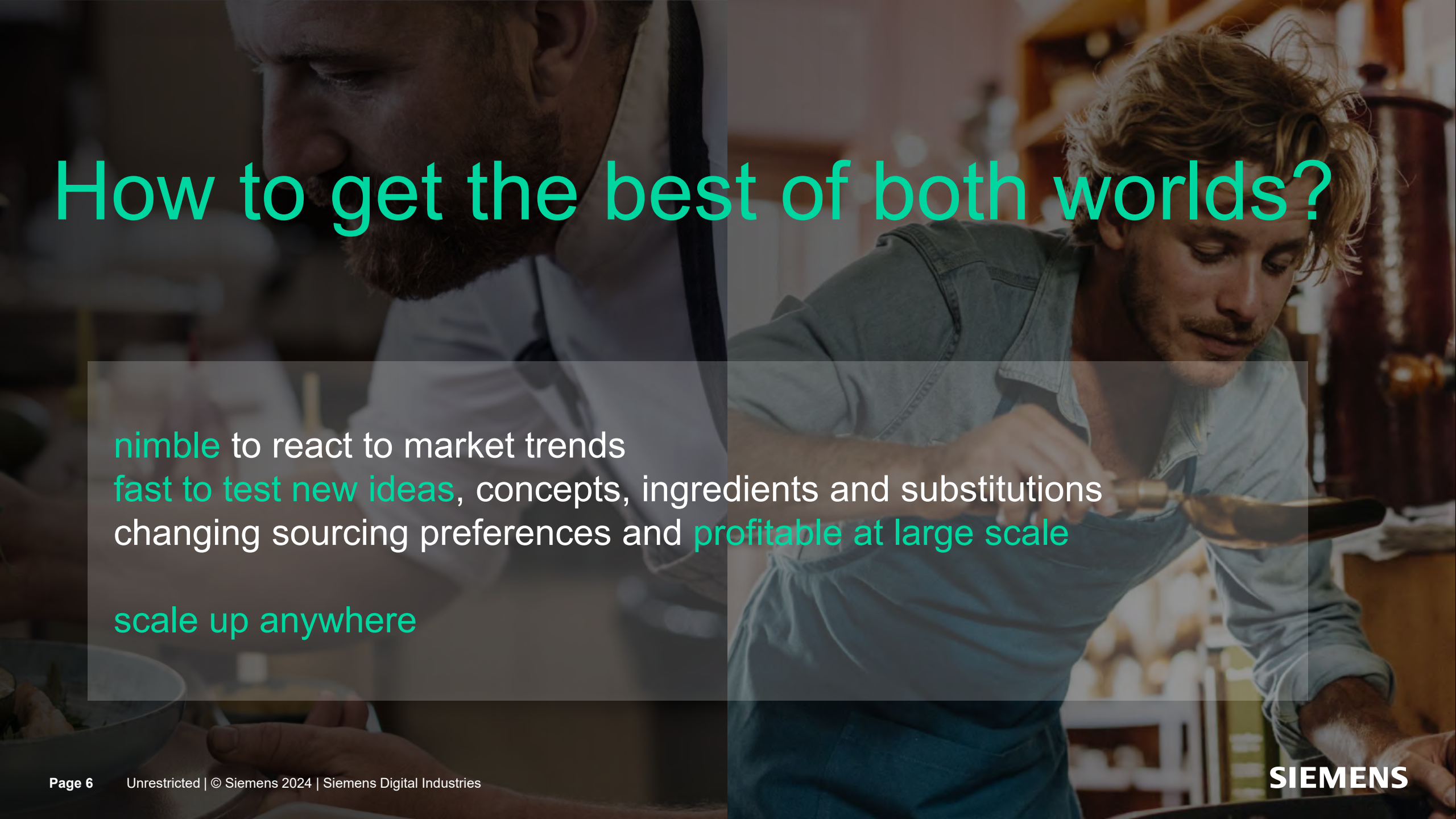

How to get the best of both worlds?

nimble to react to market trends
fast to test new ideas, concepts, ingredients and substitutions
changing sourcing preferences and profitable at large scale

scale up anywhere

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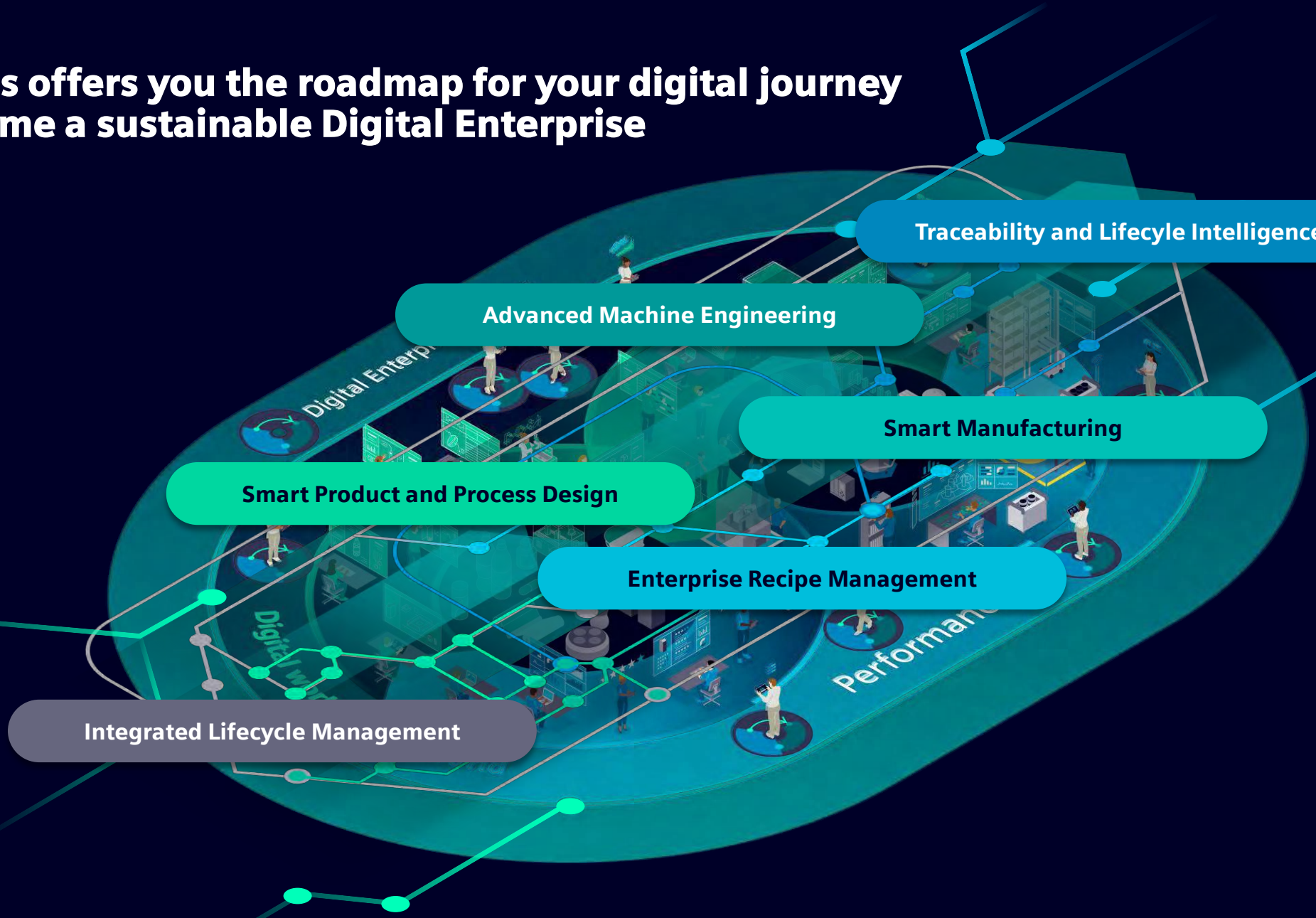
Siemens offers you the roadmap for your digital journey to become a sustainable Digital Enterprise



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How can you scale-up across 100’s of manufacturing points?

Enterprise Recipe Management

Sustainable product design

Centralize recipe authoring knowledge

Move all recipe knowledge and product information currently spread across the company to a digital platform. Effectively manage Formula, Recipe lifecycles, Recipe Procedures, and production asset capabilities worldwide, from a central point

Validate virtually recipes in a fraction of time

Reduce tests and trials, this brings companies the possibility to virtually validate recipes in a fraction of the time usually necessary during tests. Reduce trials and setup times

Manufacture anywhere

Proactively look for the best manufacturing options anywhere in the world. Move production flexibly and dynamically from one facility to another or change the product mix at an existing facility to match demand

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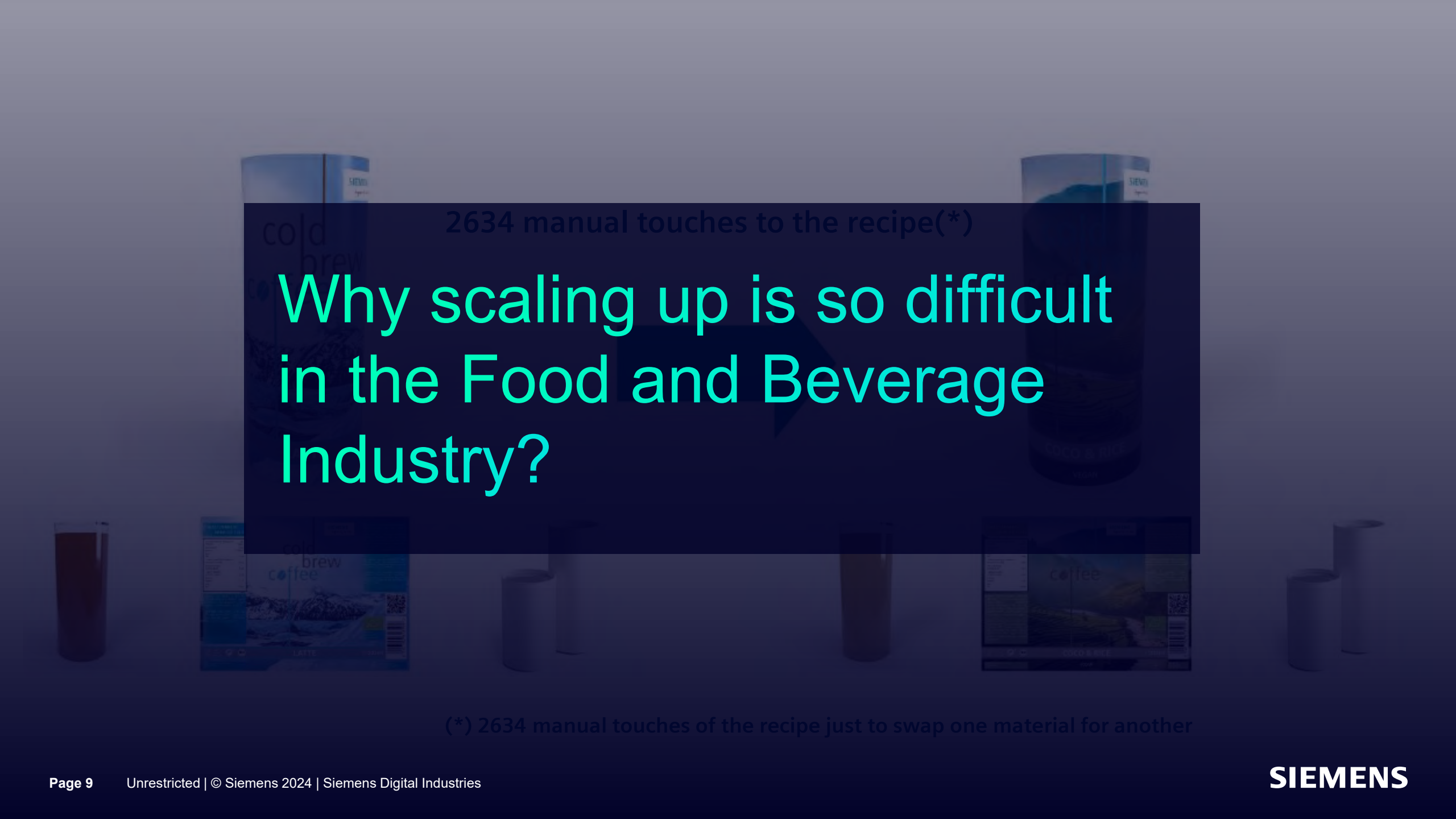

Why scaling up is so difficult in the Food and Beverage Industry?

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The Concept

Introduction of a new product for the summer

2634 manual touches to the recipe(*)

(*) 2634 manual touches of the recipe just to swap ingredients

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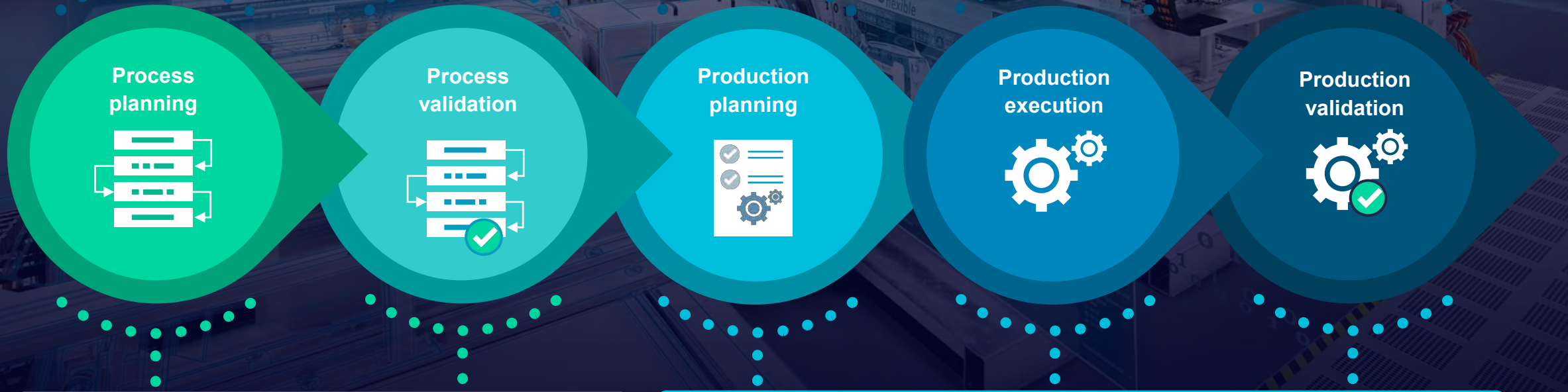
Smart Manufacturing for Automotive

Rapid Factory Evolution



Virtual Development of Manufacturing

Intelligent Production Excellence

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Smart Manufacturing for Electronics

DESIGN VERIFICATION

MANUF. PLANNING

PROCESS ENGINEERING

MANUF. ANALYTICS

SCHEDULING

MANUF. EXECUTION

PLM

MES

Right-first-time production

Consolidated, collaborative digitalization platform

Fast, scalable, global NPI

Continuous improve-ment; Intelligent decision making

Optimized production plans

Improved performance, utilization, material turnover

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Am I going to be able to produce this SKU in this factory?

How long it will take to produce this new batch?

2634 manual touches to the recipe(*)

How many ingredients do I have to change?

What is the new process setup?

Will it be the same mixing time?

Do the filling and packaging line have to be adapted?

Everyone would like to predict rather than use trial and error

(*) 2634 manual touches of the recipe just to swap one material for another

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How can you

scale-up across 100’s of manufacturing points?

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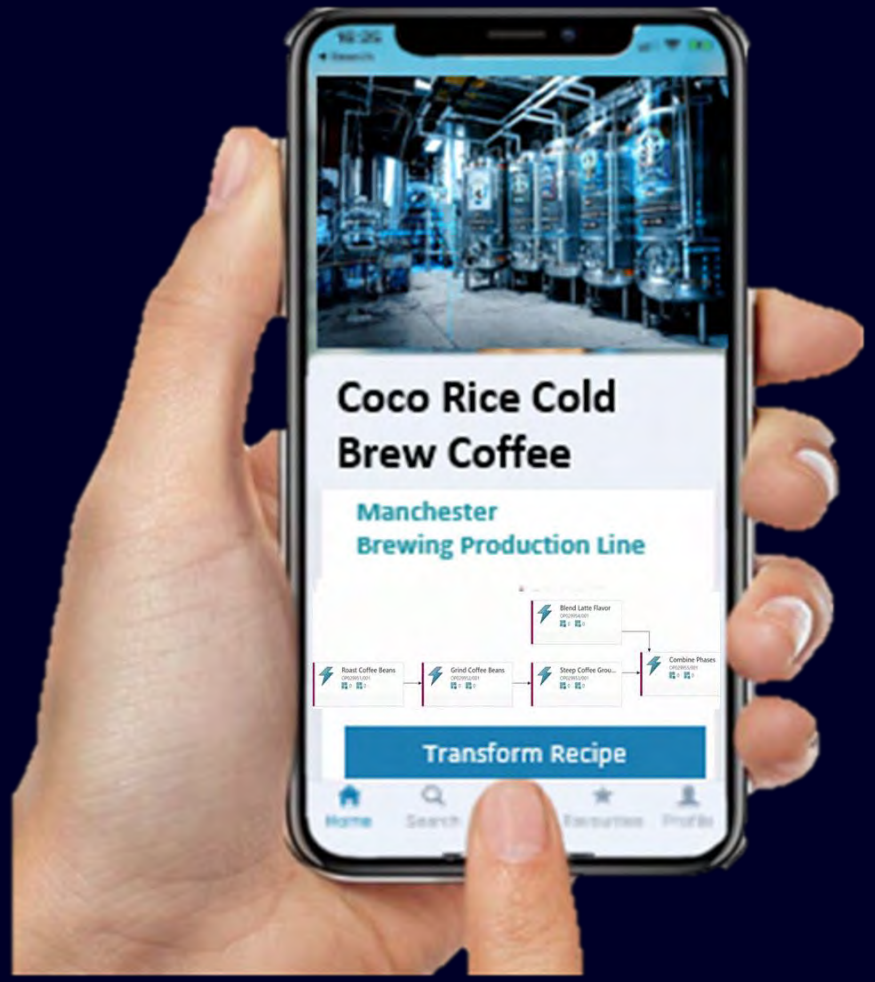
The Concept

Virtualize your recipes

- Centralize Recipe Authoring Knowledge
- Manage Recipe Life Cycles
- Access Product Bill Of Materials, Making Instructions, Recipe Procedures and Asset capabilities worldwide
- Validate virtually recipes in a fraction of the time usually during trials
- Distribute and execute anywhere



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Virtualize a recipe?

A recipe has a lifecycle from concept to production

Formula for launch

A product formula as defined in the R&D laboratory.

General Recipe

Adding a generic recipe, manufacturing process.

Site Recipe

Recipe transformed for a specific production site.

Master Recipe

Adding manufacturing cell information.

Control Recipe

Adding Batch ID, size, operation process and system information.

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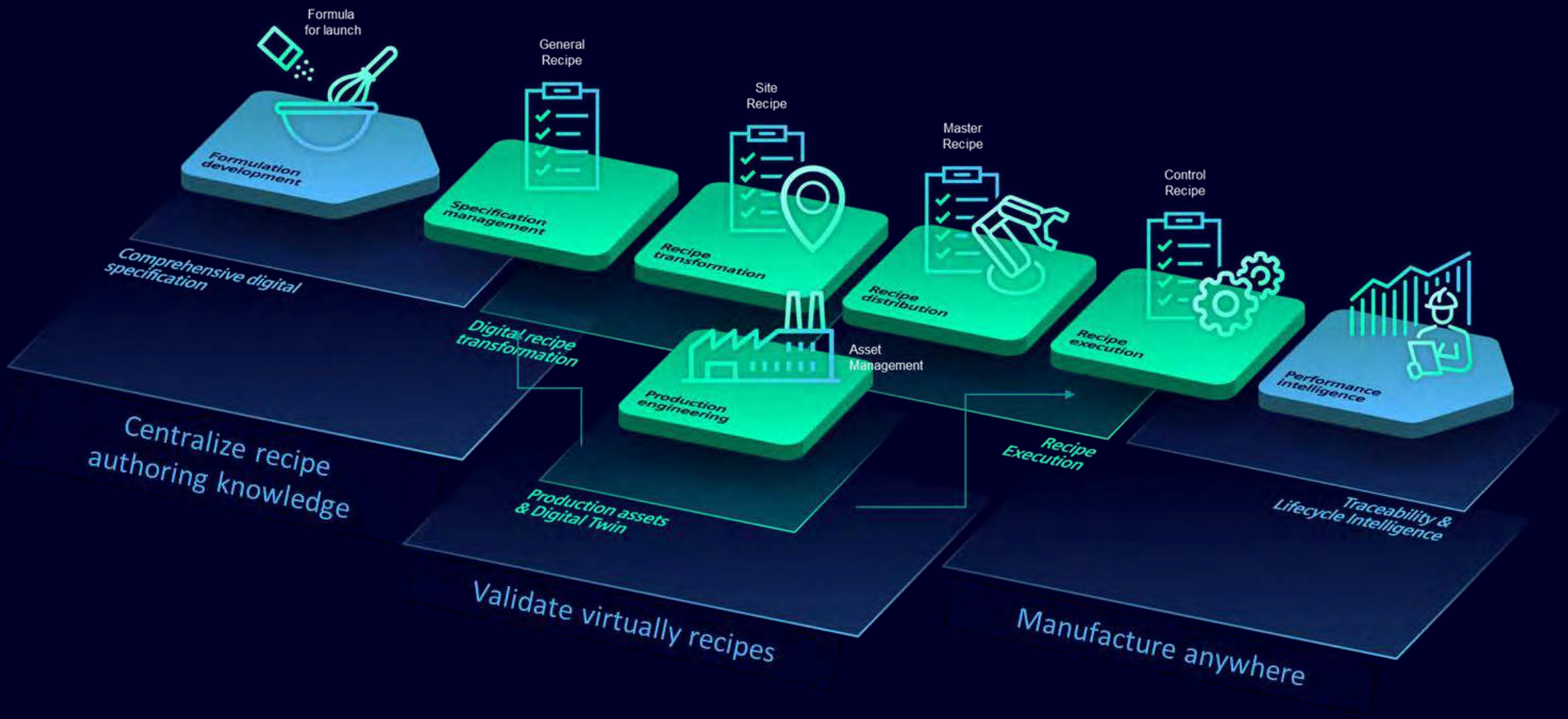
Enterprise Recipe Management

A digital thread to virtualize and execute recipes digitally, anywhere, anytime.



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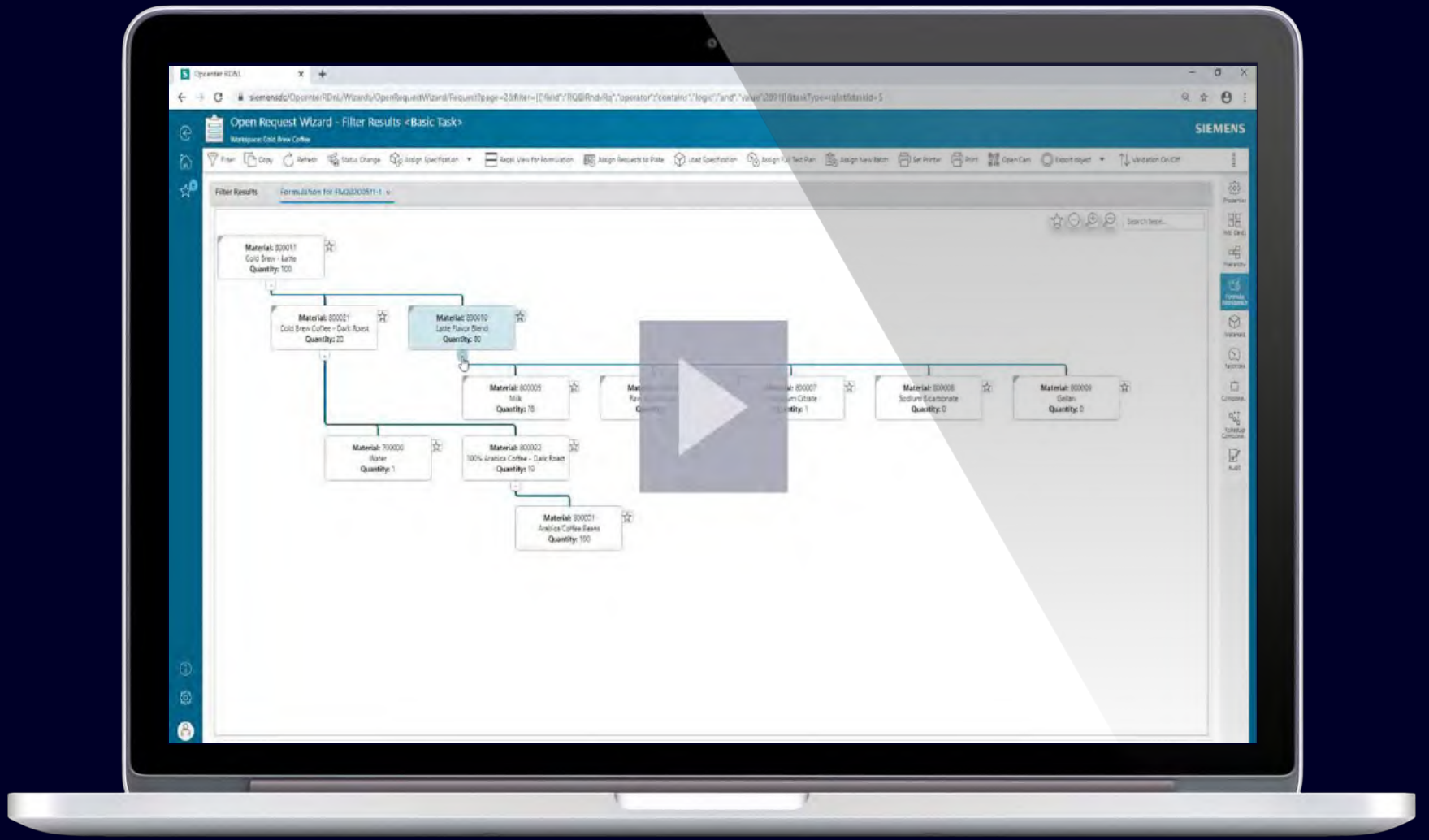
Comprehensive digital specification
Design and optimize the formula

- Manage all product specifications: regulatory, legal, quality, logistical, nutritional, suppliers, environmental, formula, process, …
- Generic and/or Plant Specific
- Template based including calculations & validations
- Flexible and configurable, in a controlled way



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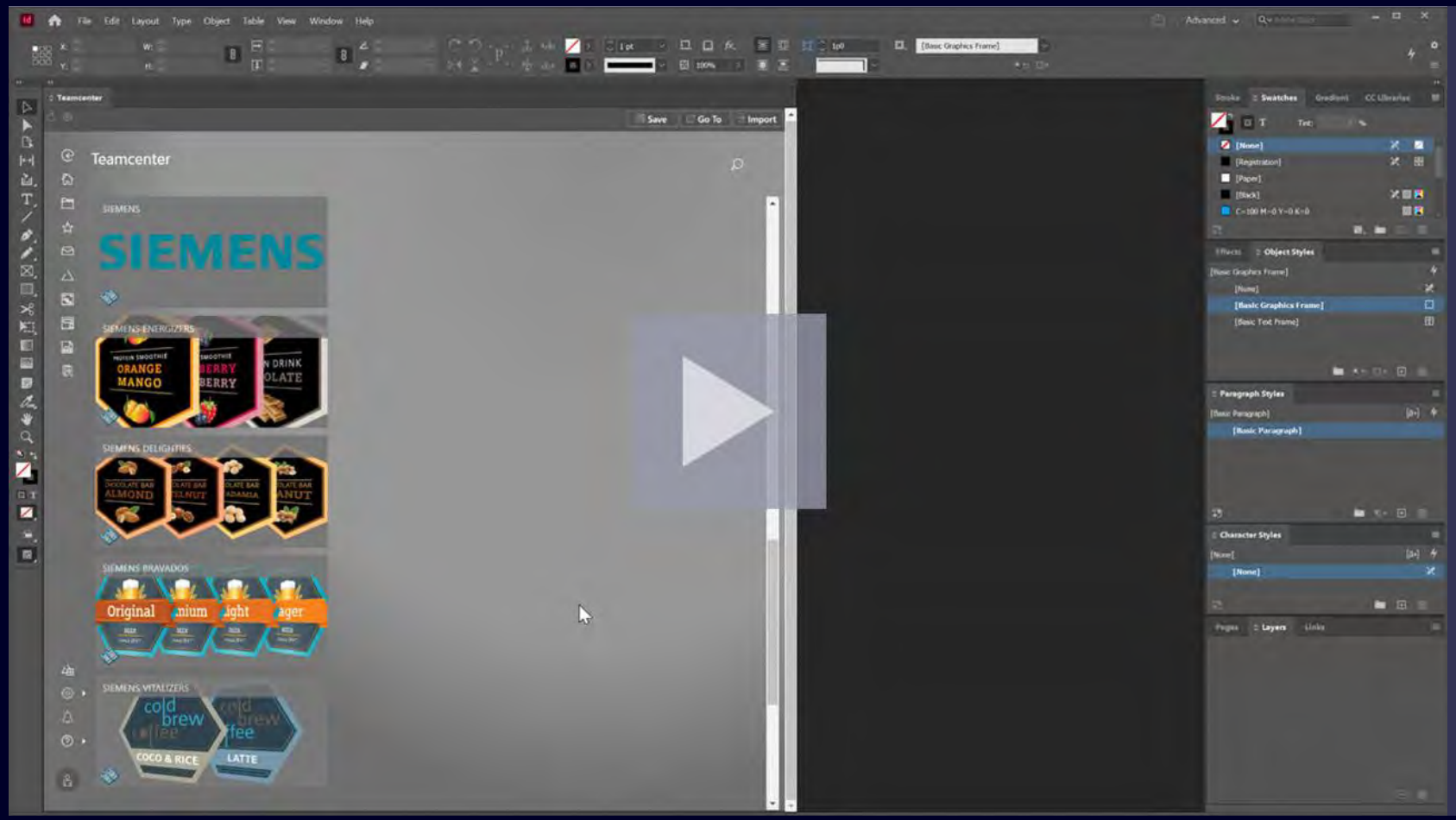


Smart Product and Process Design

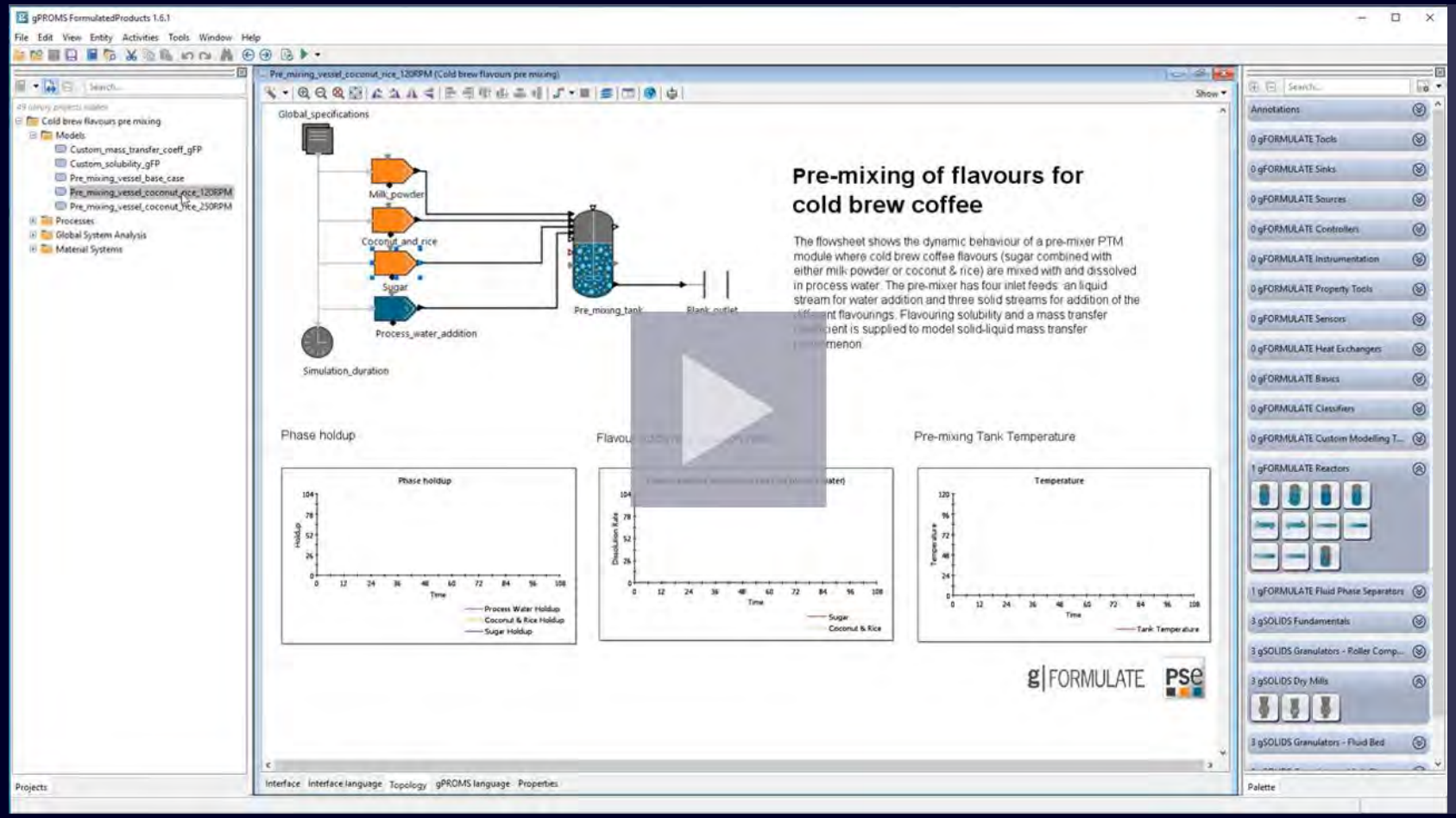
Artwork and Labeling

Label design within market-leading artwork tools

Seamless integration of label design with engineering data management in the Collaboration Platform to allow immediate data exchange across disciplines and ensure data accuracy for every label.

Teamcenter, Adobe CC Extension for Photoshop Illustrator and InDesign

Formula Design
Laboratory Quality Control
Package Design
Artwork and Labeling
Recipe Planning
Recipe Simulation
Packaging Process Planning
Packaging Process Simulation



Smart Product and Process Design

Recipe Simulation (2/2)

Optimize recipe and operating setpoints

Virtual validation of manufacturability and optimization of recipe using multiphysics simulation of plant-specific equipment.

Simcenter STAR-CCM+, gPROMS Formulated Products

Smart Product and Process Design

Formula design

Package design

Packaging process planning and simulation

Recipe planning and simulation

Optimize packaging process planning with simulation

Challenge

- Create a site-specific manufacturing plan
- Make sure that manufacturing processes (filling and packaging in this example) are well defined

Solution

Teamcenter manufacturing Easy plan helps to define the manufacturing process (filling and packaging in this case) as well as all ergonomics and work instructions operations for workers.

Value

- Standardized method to define the filling and packaging processes based on plant-specific capabilities and create straightforward EWI (Electronic Work instructions)
- Bridge the gap between R&D and manufacturing to ensure rapid scale-up
- Validation of manufacturability and optimization of filling and packaging processes using multiphysics simulation of plant-specific equipment and personnel

Products and services

- Teamcenter manufacturing Easyplan
- Tecnomatix process simulate

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How can you know every step in a products' journey to you?

Traceability and Lifecycle Intelligence

Supply chain

Manufacturing intelligence to solve production downtimes

Fix plant problems as quickly as possible. Monitor, collect, analyze, and use manufacturing data across all systems to make decisions faster and keep your business running smoothly. Use data simulations and analyses to predict problems and solve them before they happen

Product performance intelligence to transform the customer experience

Understand more about your product use and performance using the Internet of Things and connected devices

Trusted traceability for increased brand loyalty

Give a clear view of a product's journey and lifecycle, from the materials used and their origin to its production and launch on the market. This, helps consumers have more faith in the supply chain and shows them that products are made safely throughout the whole lifecycle

Overview

Use cases

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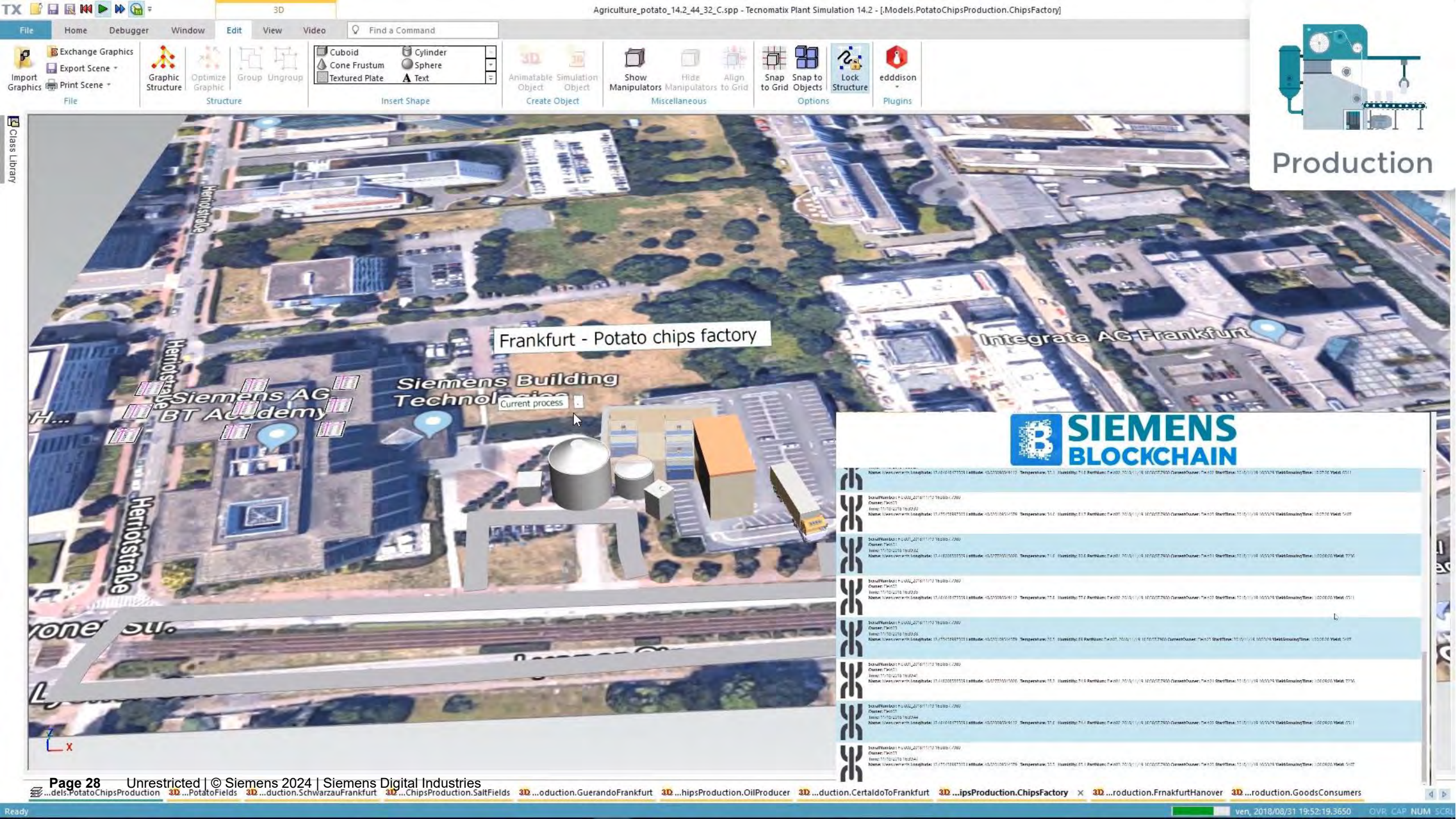

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Digital Enterprise BlockChain MindSphere

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Configure BC

Configure Quality

Product Overview / Check serial number

Traceability

Product Summary

PotatoChips SHOW DETAIL

Hannover - Supermarket 2

ExpirationDate:
01/10/2020

? Is this product legit?

PotatoChips SHOW DETAIL

? Are there any quality violations?

PotatoChips – One violation SHOW DETAIL

Scan me

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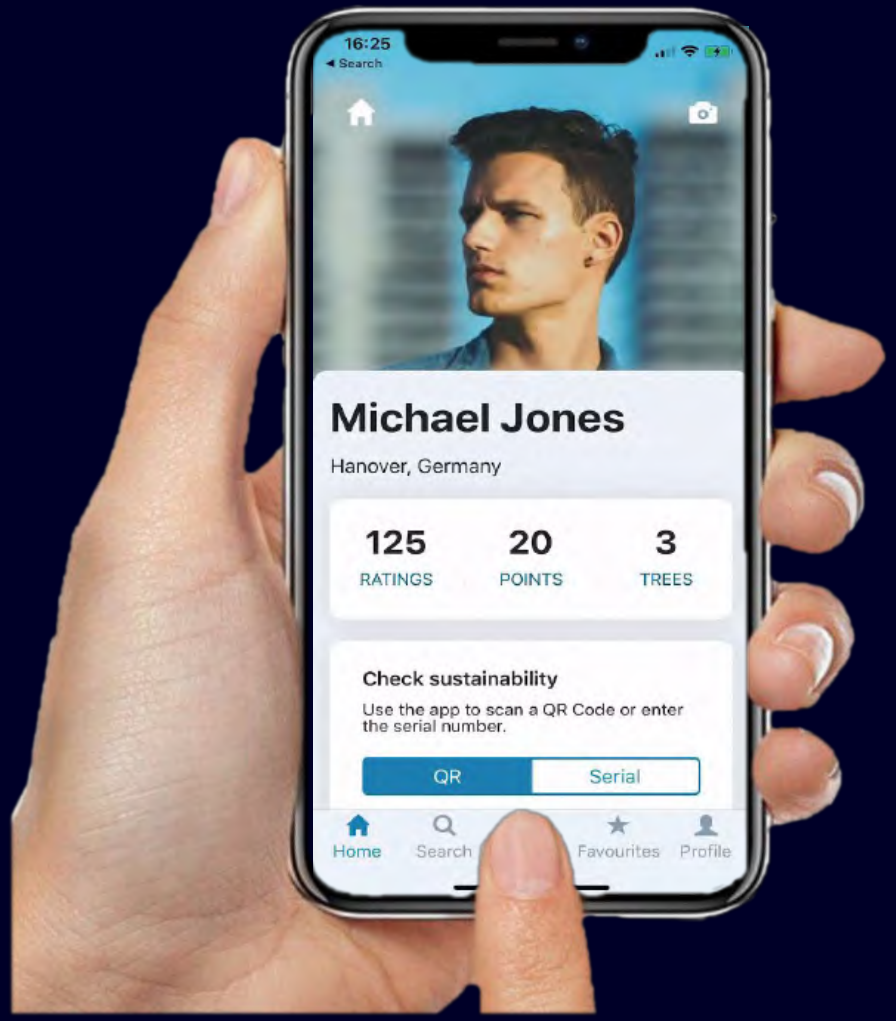
Solution

Linking information to each item sold

Capture and access IOT Data
Full traceability of product / change of ownership
Find quality violations during the process
Visibility across the supply chain
Genuine origin and assuring product safety



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How do you manufacture “lot size X” while maximizing your production efficiency?

Smart Manufacturing for Food and Beverage

Malting and brewing, filling and packaging

Agile manufacturing engineering

Accelerate the design process: adapt factories rapidly while incurring the most negligible costs possible to commission and simulate new machines into your lines and ensure you have the suitable production capacity to meet demand

Flexible and predictable manufacturing

Manage production complexity: quickly reconfigure production lines and operate them flawlessly to meet changing demand, to produce individualized products in any lot size while being efficient and profitable

Optimized, sustainable operations

Leverage sustainable practices: Leveraging the potential of the Internet of Things (IoT), machine learning, and analytics achieves more optimized operations and greater sustainability progress

Overview

Use cases

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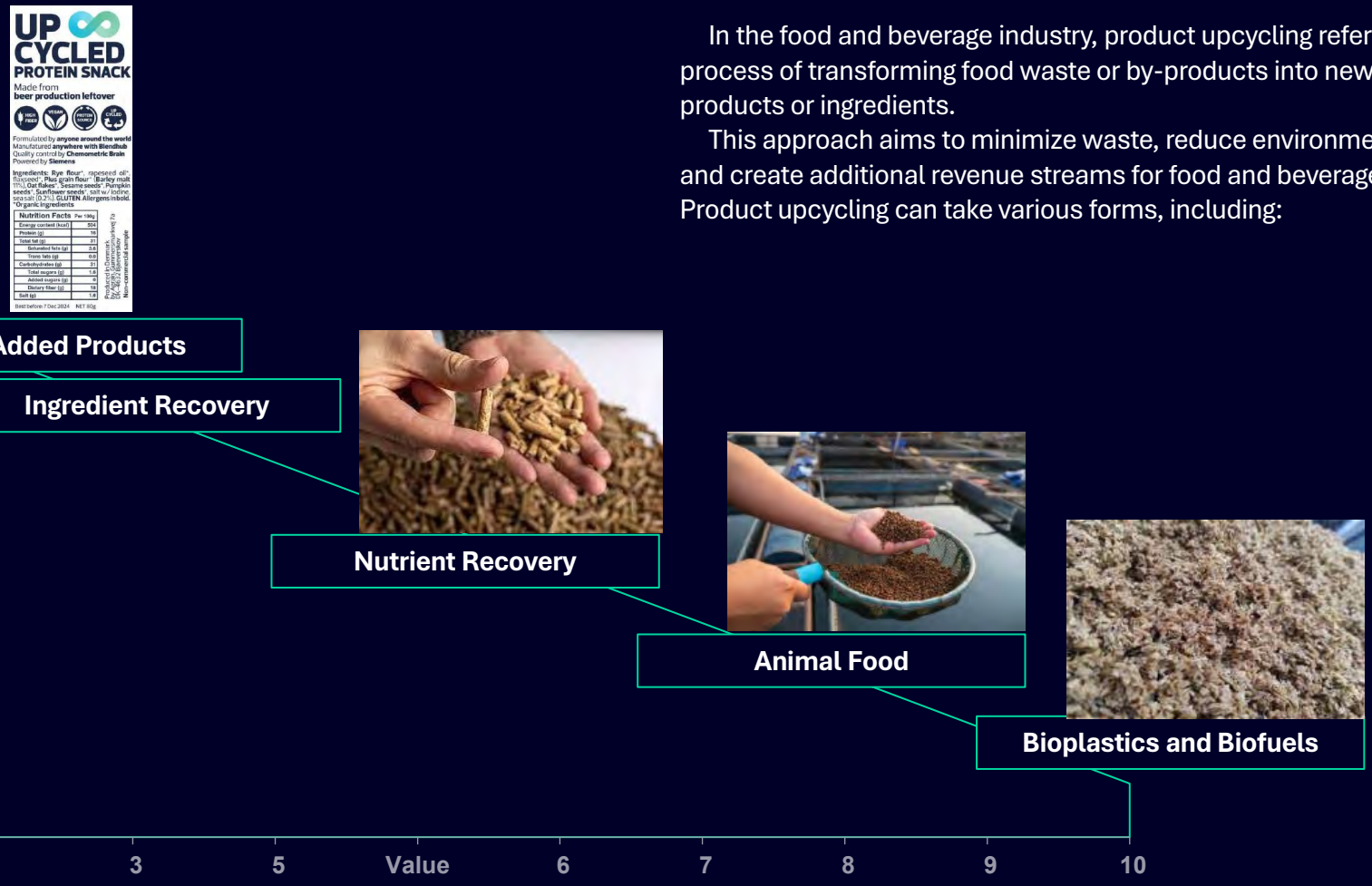
Food and beverage manufacturers need to think of upcycling as something beyond just sending for waste to become feed or fuel and that's it – they need to start thinking about maximizing the value that can be gotten from existing operations.

Florence Leong,
Founder and CEO, KosmodeHealth

From waste to wonder by Pearly Neo FoodNavigator Asia Deep Dive

Upcycling products, a new road to sustainability



In the food and beverage industry, product upcycling refers to the process of transforming food waste or by-products into new, higher-value products or ingredients.

This approach aims to minimize waste, reduce environmental impact, and create additional revenue streams for food and beverage companies. Product upcycling can take various forms, including:

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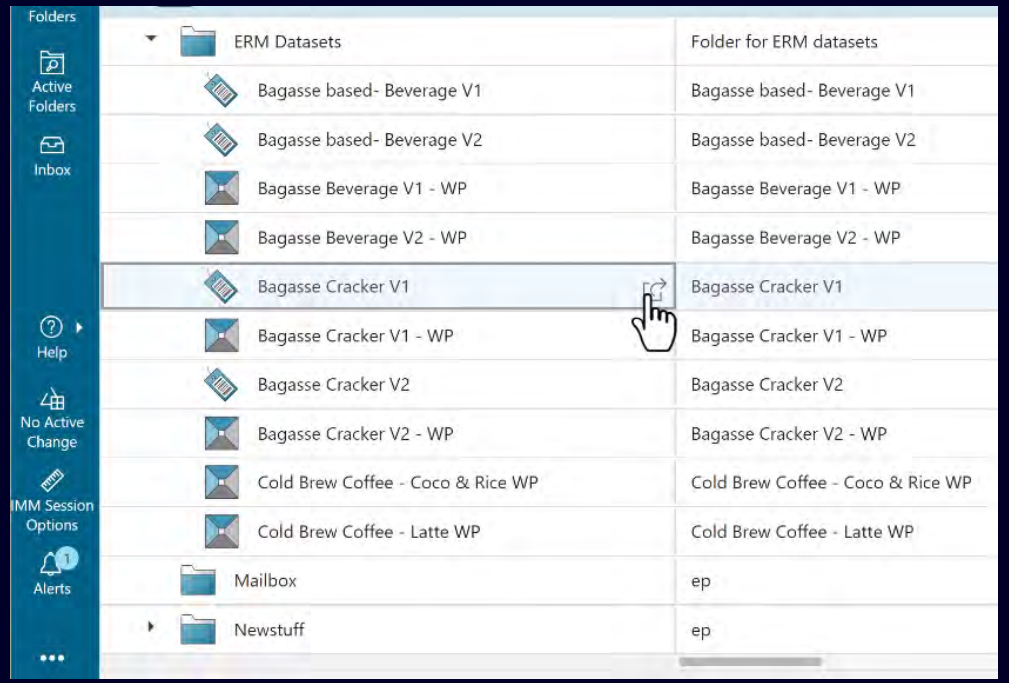
What are we doing?

How do you?

Try new products, from idea to market (digital recipe to final product)
Check the manufacturing feasibility.

Running new recipes in the Industrial Metaverse



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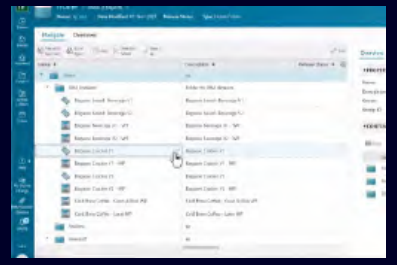
Upcycling process demonstration, how does this work?

4. Grinded

3. Dried

2. Brewing Bagasse



1. New recipes

5. High protein flour pre-mix

6. Siemens Flexible factory

7. Value-Added Products

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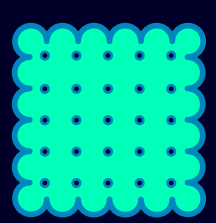
Recipes - Bagasse based



Dose Bagasse Premix → Dose Flavors → Dose Water → Dose Oil → Agitation → Bake and Package

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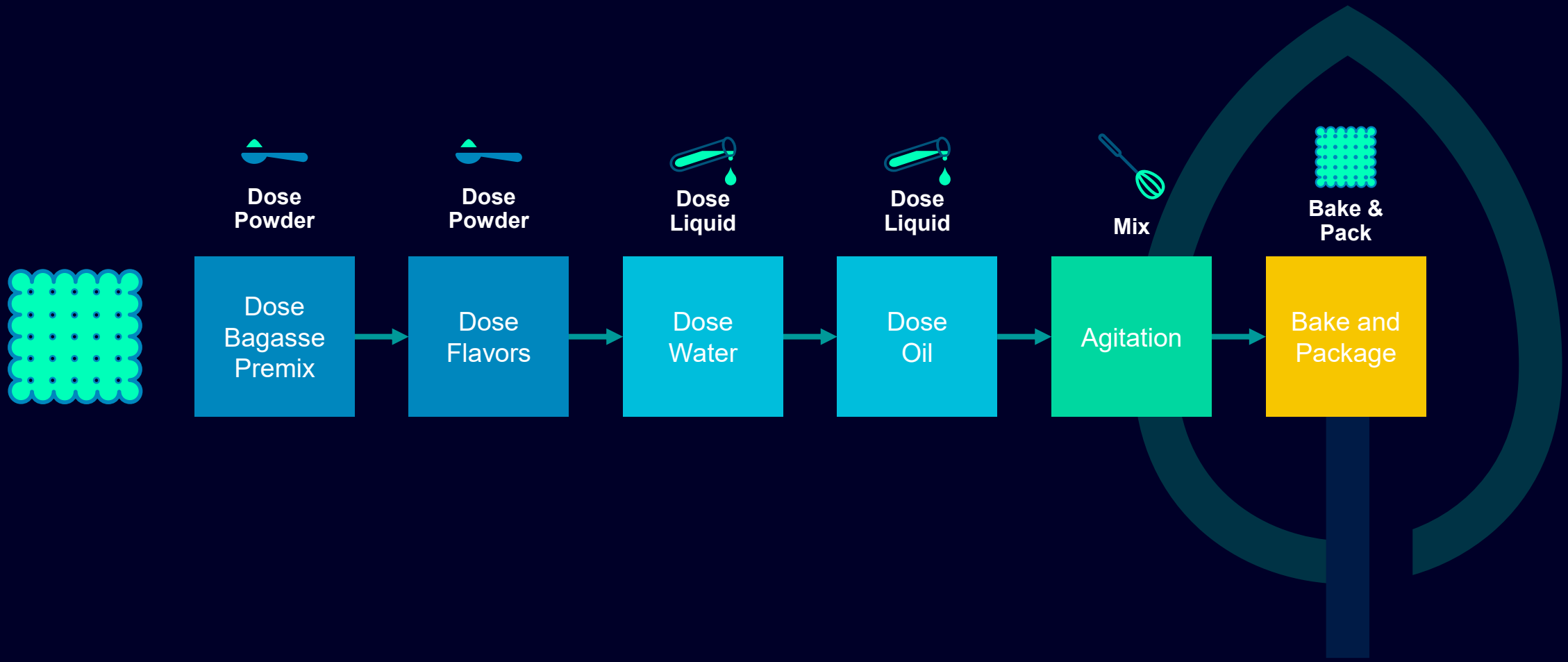
Recipes - Bagasse based



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Recipes - Bagasse based

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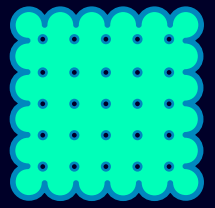
Blendhub PPB – Prepares the Cracker Pre-Mix



Dose Bagasse Premix

Material	kg
Bagasse premix	10

Dose Flavors

Material	kg
Sea Salt	0.2
Sunflower S.	0.03
Sesame S.	0.04
Pumpkin S.	0.26

Dose Water

Material	kg
Water	7.27

Dose Oil

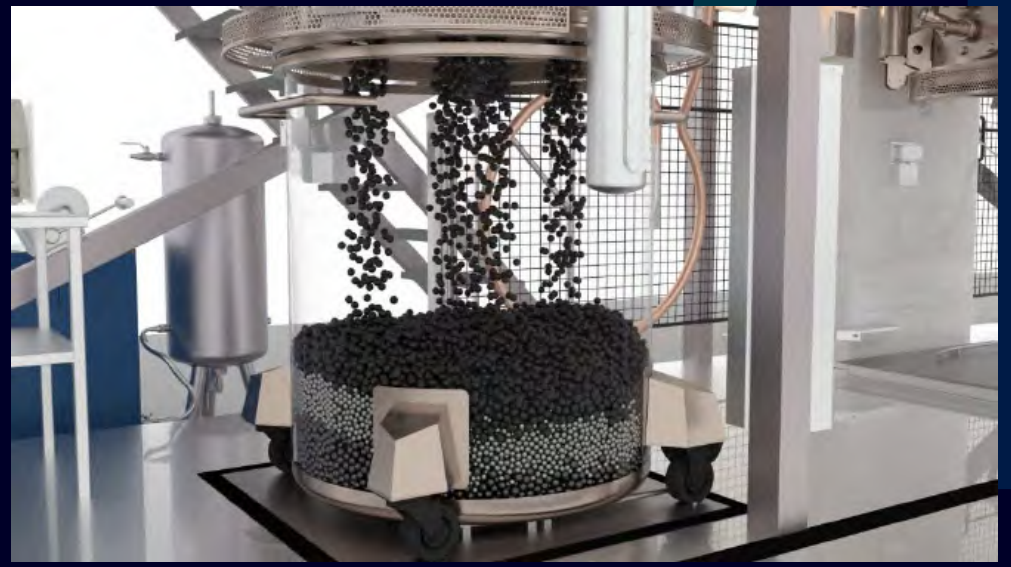
Material	kg
Rapeseed oil	1.15

Agitation

Setpoint	UoM
Time	3 (min)

Bake and Package

Setpoint	UoM
Time	3 (min)
Bake temperature	200 (c)
Bake time	15 (min)
Cooling time	30 (min)
Crackers pack	5 ea
Pack SKU	xyx (ID)



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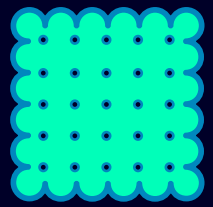
Blendhub – Loading the Premix



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Crackers pack	5 ea
Pack SKU	xyx (ID)

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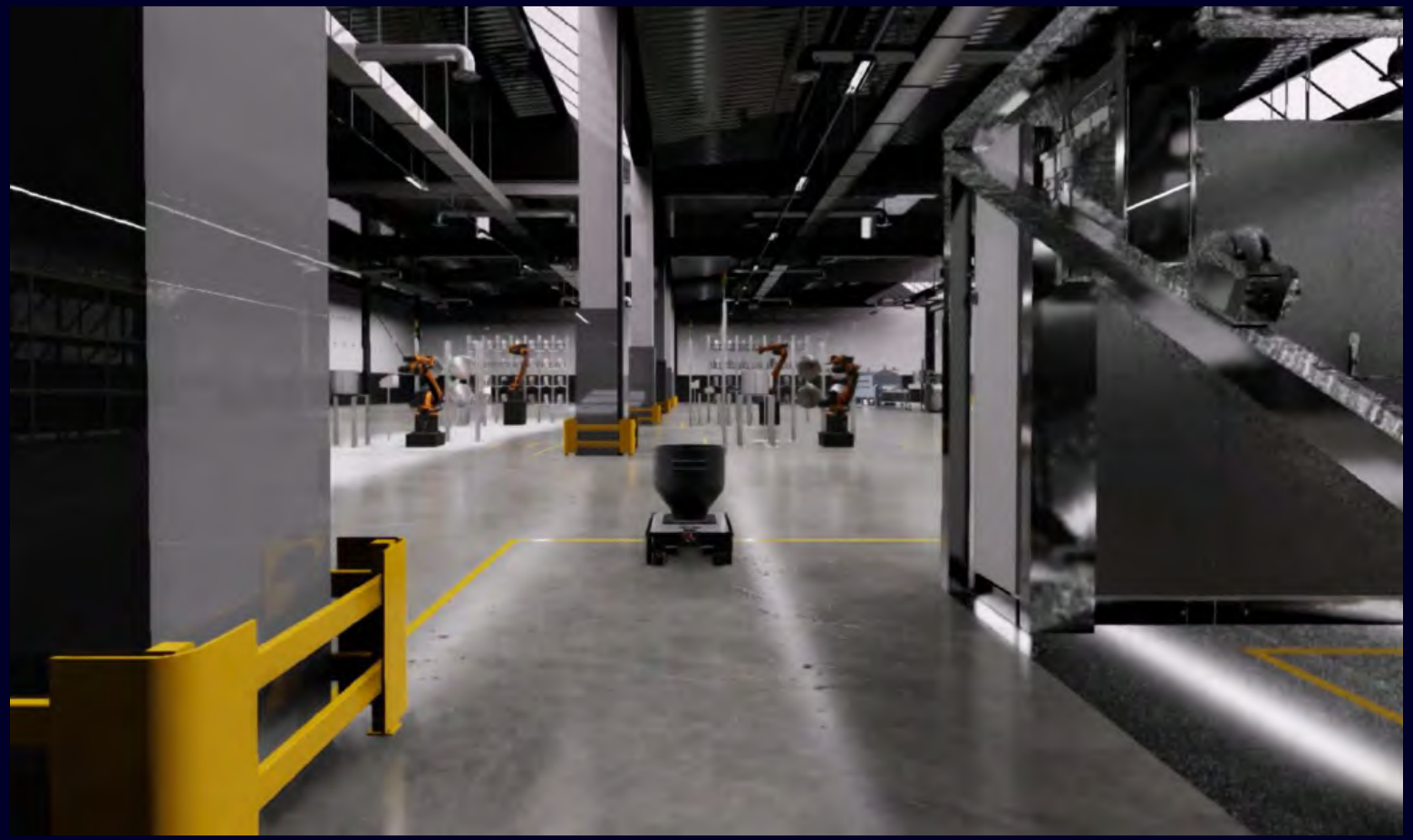
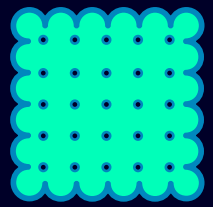
Cracker – Microdosing





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Material	kg
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Agitation

Setpoint	UoM
Time	3 (min)

Bake and Package

Setpoint	UoM
Time	3 (min)
Bake temperature	200 (c)
Bake time	15 (min)
Cooling time	30 (min)
Crackers pack	5 ea
Pack SKU	xyx (ID)

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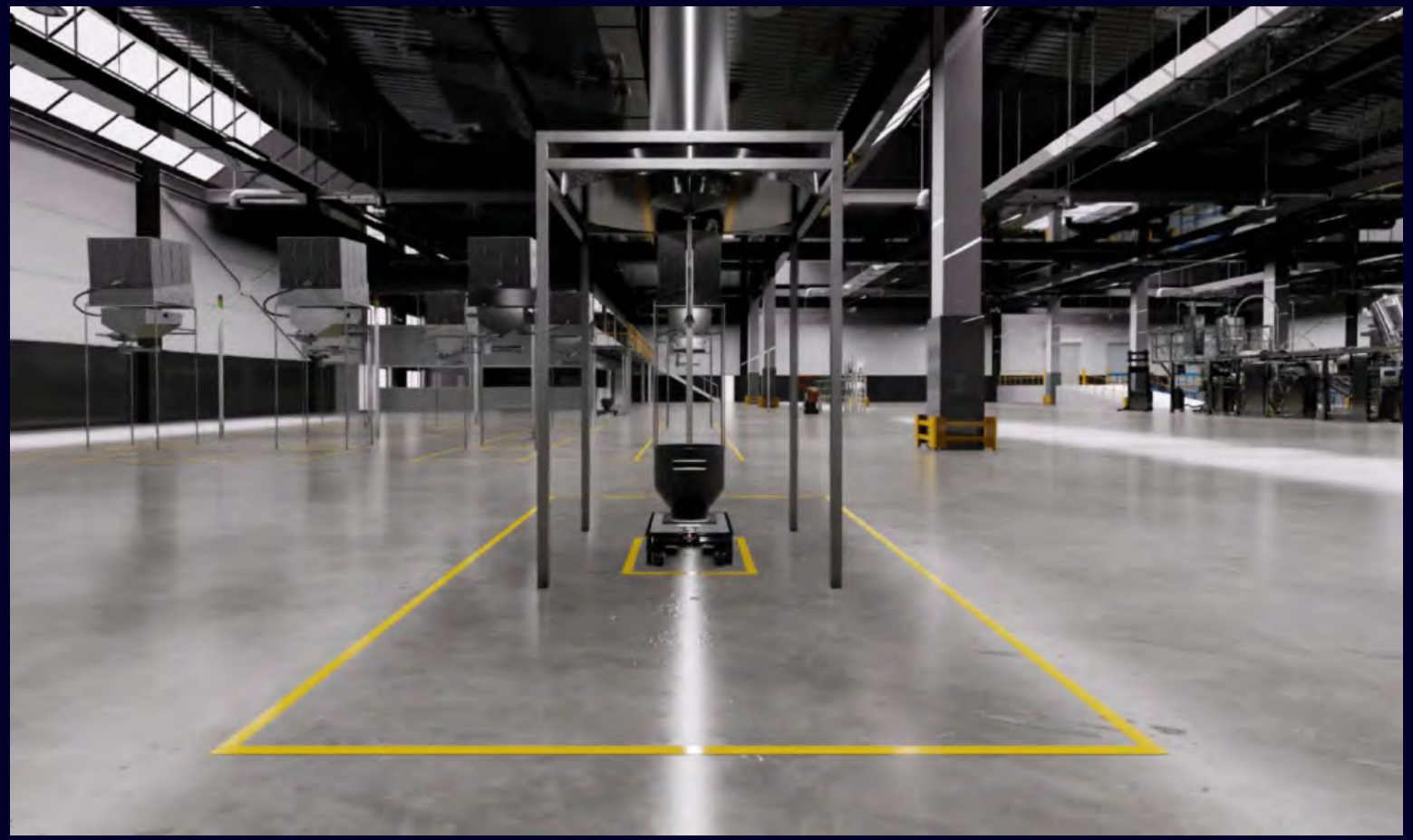
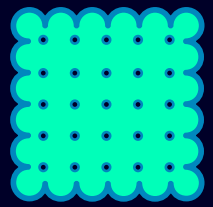
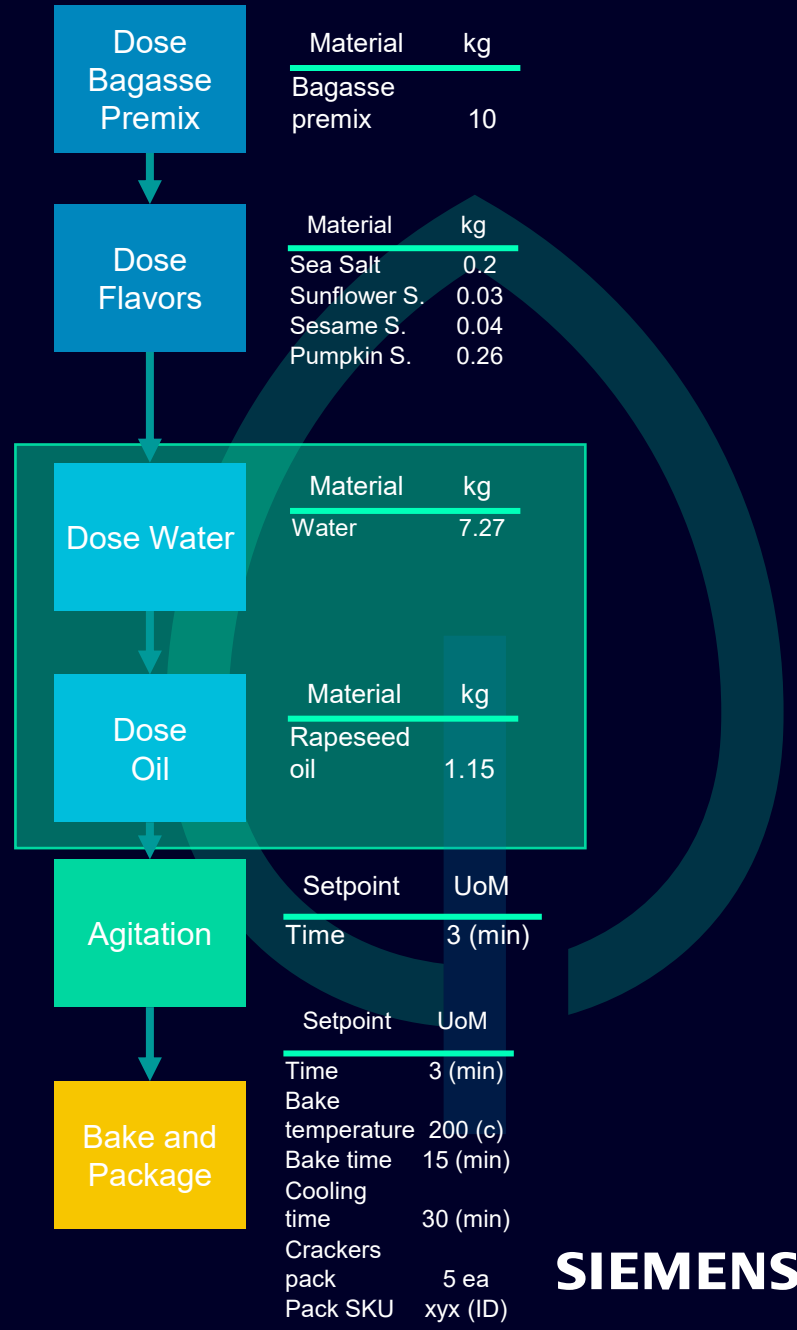
Cracker – adding liquids







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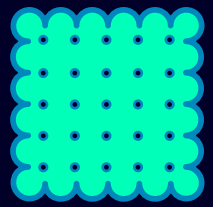
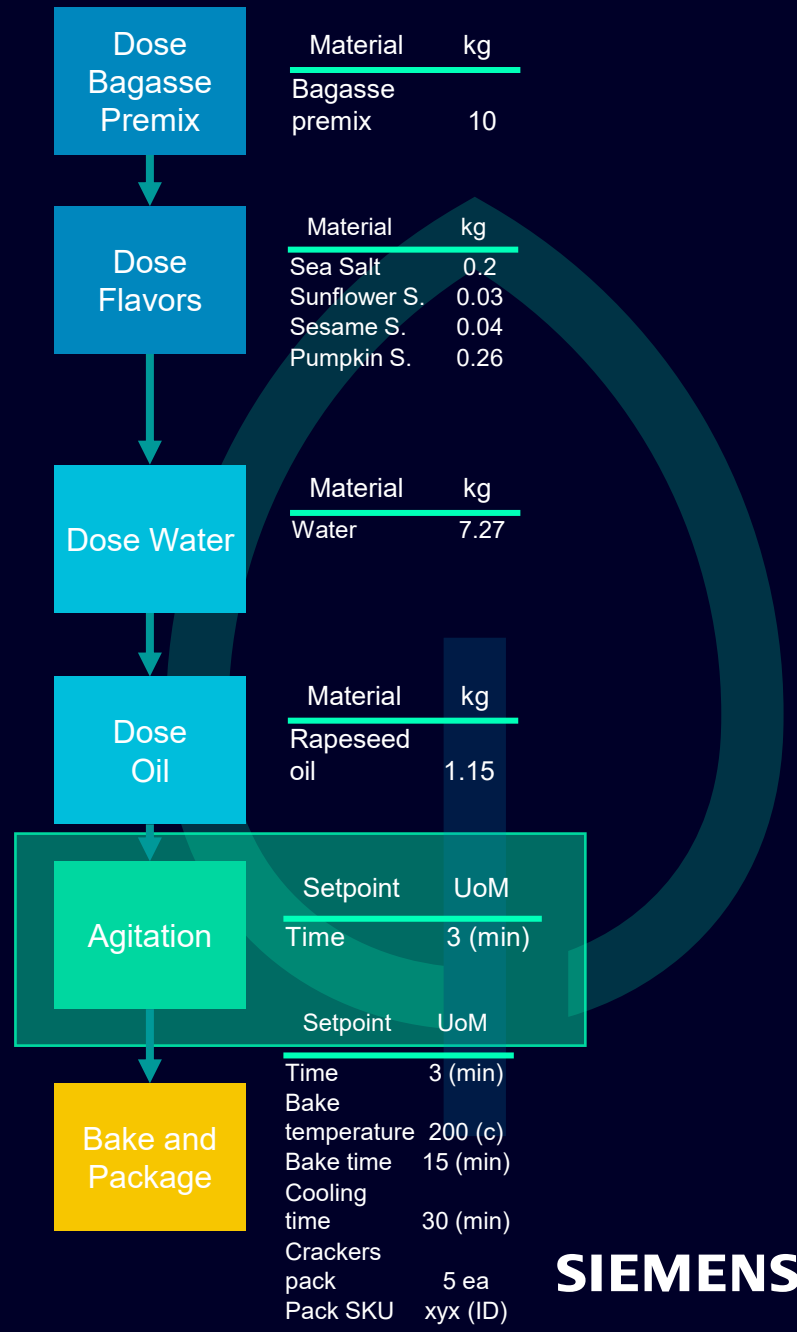
Cracker – Mixing





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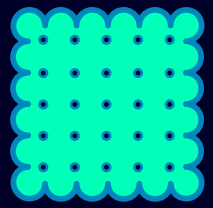
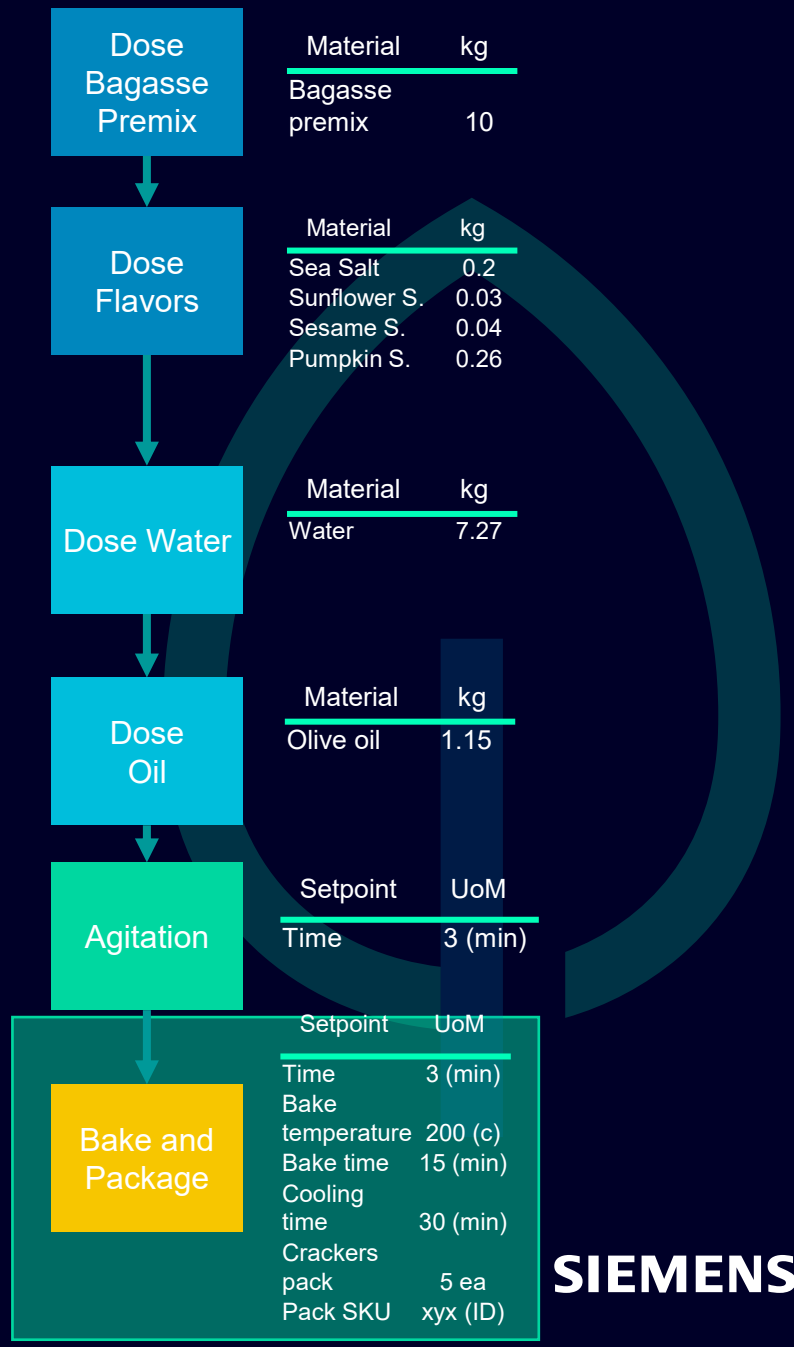
Cracker – Baking and Packaging





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