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# A Prototype of a Crowd-sourcing Platform for Classification and Integration of Analysis Tools in Product Line Engineering

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# Who are we...

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# Motivation for a Cookbook

## How to identify the most suitable analysis methods for fulfilling a given goal?

- The context in which an analysis tool is developed is seldomly documented
- What if the need is overly complex, and no single analysis tool can provide the answer?
  - Alteration: What if the required input data is not available?

### Thus, from an PL practitioner's perspective

- Is there a combination of tools (i.e. toolchain) that fulfils my need?
  - Complex Analysis Toolchains
- What data do I need – What data & insights will I gain?
- Which tool helps me fulfil my needs (i.e. contributes to my goals)?



# Illustrative Overview of Feasible Transitions between Quadrants

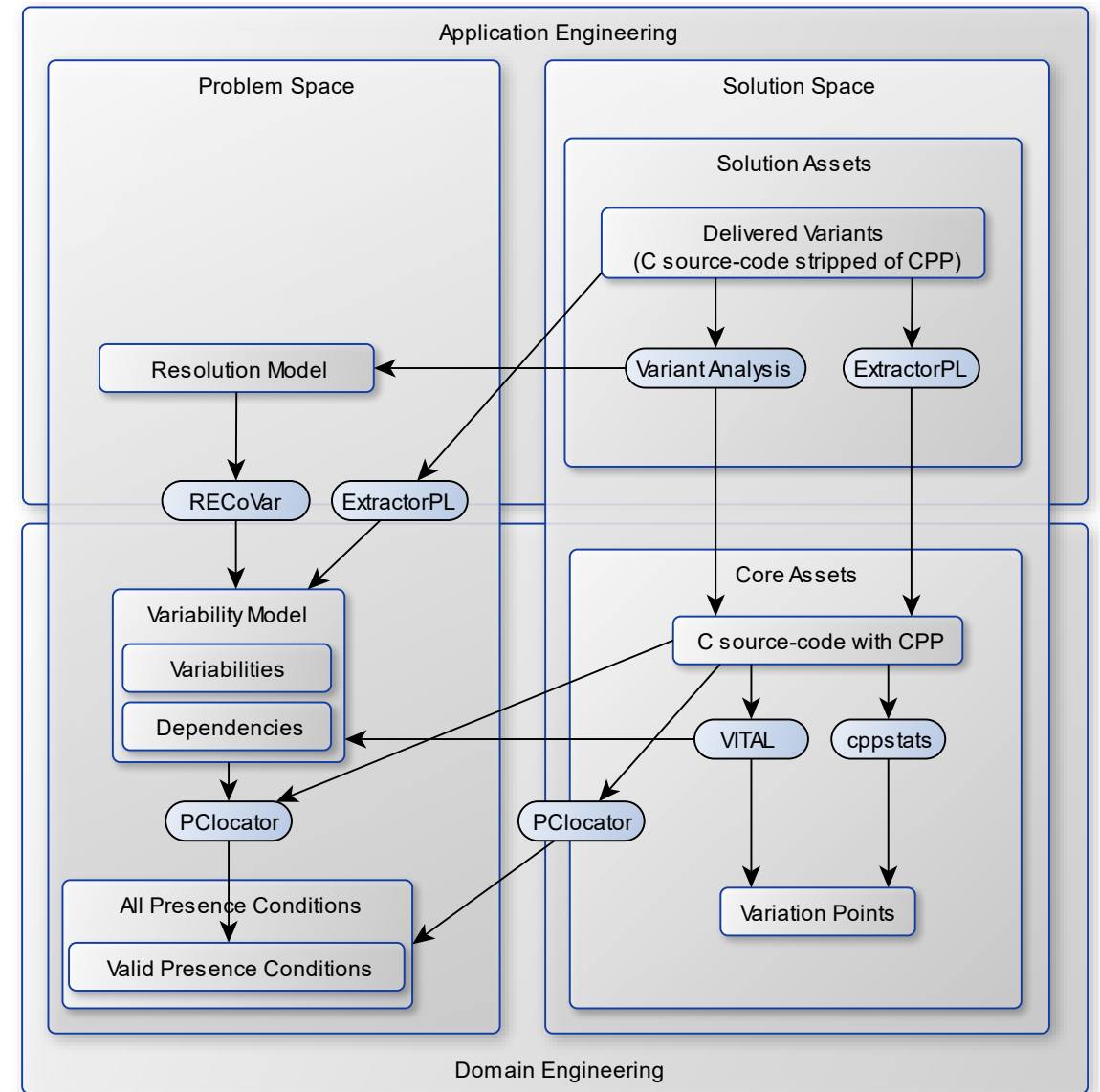
- Tools enable transitions along the PL process model
- As the cookbook improves, a transition roadmap emerges
- A path of two+ transitions can be described as a toolchain

## A cookbook is useful for documenting

- Typical and complex analysis tasks
- The overall analysis tool landscape

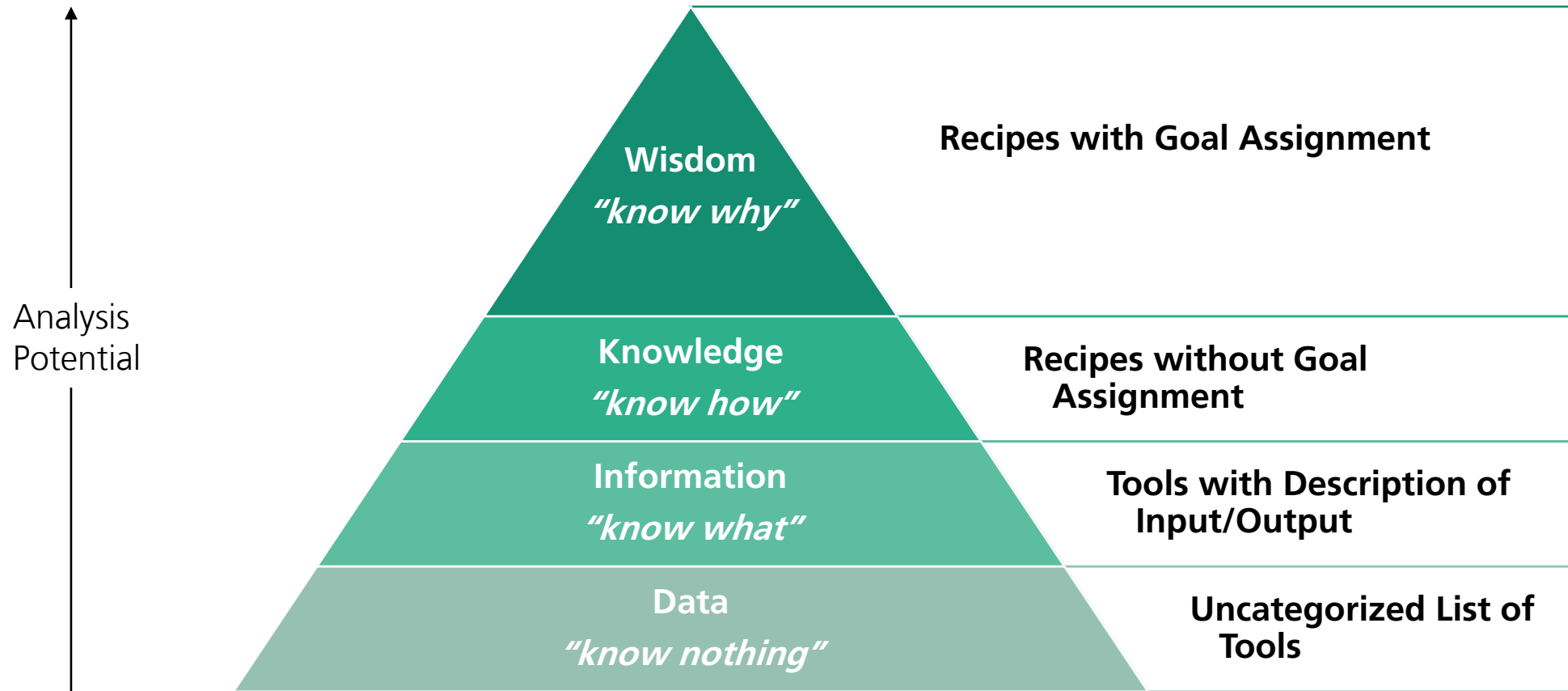
## A cookbook promotes a goal-driven analysis methodology

## An open platform encourages sharing of information regarding PL analyses





# Hierarchical Overview using a DIKW Hierarchy / Wisdom Pyramid

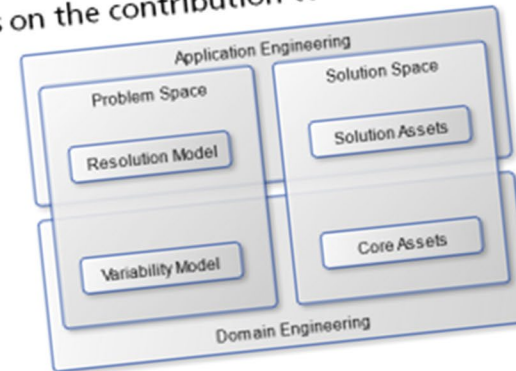


# Previously on REVE 2021

## Product-Line Analysis Cookbook

### Classification System Proposal

- Contributes to Goal(s)
  - Provide list of goals for which the recipe contributes to
  - Enables practitioners to find recipes, depending on which goal they are following
- Short Description
  - Provide context information for the scenario usage and details on the contribution to the aforementioned goals
- Required Data
  - Which assets are required to perform the analysis
- Required Tools
  - Provides insight into which tools must be procured
- Instructions
  - Step-by-step description of how to perform the analysis
  - The Individual analysis approaches are considered an atomic black-box



Presented by

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# Collect Recipes

## A Prototype of a Crowd-sourcing Platform (1/4)

Choose The Goal Your Recipe Fulfills



Earlier Time  
to Market



Improve

Quality

- ☐ Software Product Quality >
- ☐ Achieve desired quality attributes >
- ☐ Quality in Use >
- + Add a new goal to this category



Cost

Selected Goals:	
Reduce Cost> Increase Efficiency> Improve Reuse	
Earlier Time to Market> Master Complexity> Improve Current Variability	

BACK

NEXT

## What is my goal?

### Interactive selection

- Similar to ACM Computing Classification System
- Multiple selection

### Goals Hierarchy

- Initial hierarchy specified by Morais Ferreira [REVE'21]

### Open for contributions of the SPLC community

- Goals
- Recipes

# Give instructions

## A Prototype of a Crowd-sourcing Platform (2/4)

Instructions

Step 1

input... tools... output...

description...

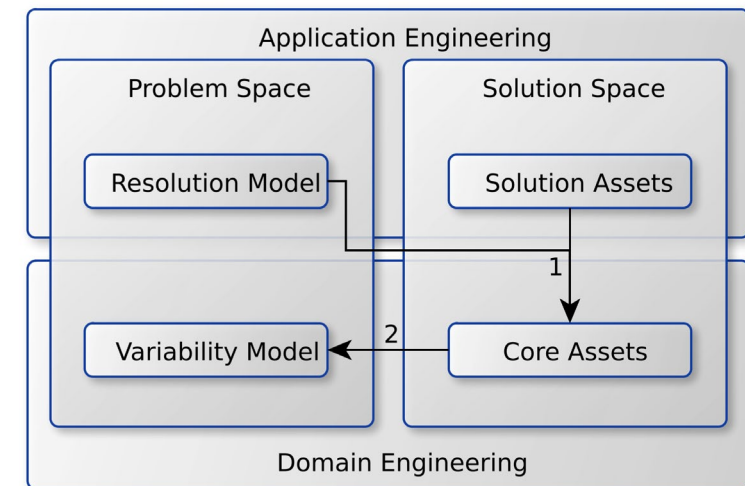
add step

BACK SUBMIT

Is there a combination of tools that fulfils my need?

### Step-by-step instructions

- For every transition along the PL process model
- Input, Output and Tools
- Detailed description





# Select Data and Tools

## A Prototype of a Crowd-sourcing Platform (3/4)

Select What Input Assets are Needed to Achieve the Goals

Variation Points

☒ Source Code

☐ Resolution Model

+ Add a new asset

Selected Input Assets:

Variation Points

Source Code

BACK

NEXT

## What data do I need and will I gain?

### Interactive selection

- Similar to ACM Computing Classification System
- Multiple selection
- Same interface for selecting input, output and tools

### List of data

- Initial list based on ISO/IEC 26550

### Open for contributions of the SPLC community

- Data
- Tools

# Search for Recipes

## A Prototype of a Crowd-sourcing Platform (4/4)

Selected goal(s)

Reduce Possible Configuration Space

Goals	Input Assets	Tools	Output Assets
Reduce Possible Configuration Space	Resolution Model	RECoVar	Variability Model

What tool will help me meet my needs?

Browse for recipes based on

- Goals
- Data
- Tools




Gain from sharing with others



# Product-Line Analysis Cookbook

Soon available for evaluation



-  Useful for documenting
-  Promotes a goal-driven analysis methodology
-  Open Platform encourages sharing of information regarding PL analyses
-  Contact and registration for early access at [vasil.tenev@iese.fraunhofer.de](mailto:vasil.tenev@iese.fraunhofer.de)