



# How to develop Model-based AI software for AURIX™ TC4x in MATLAB/Simulink

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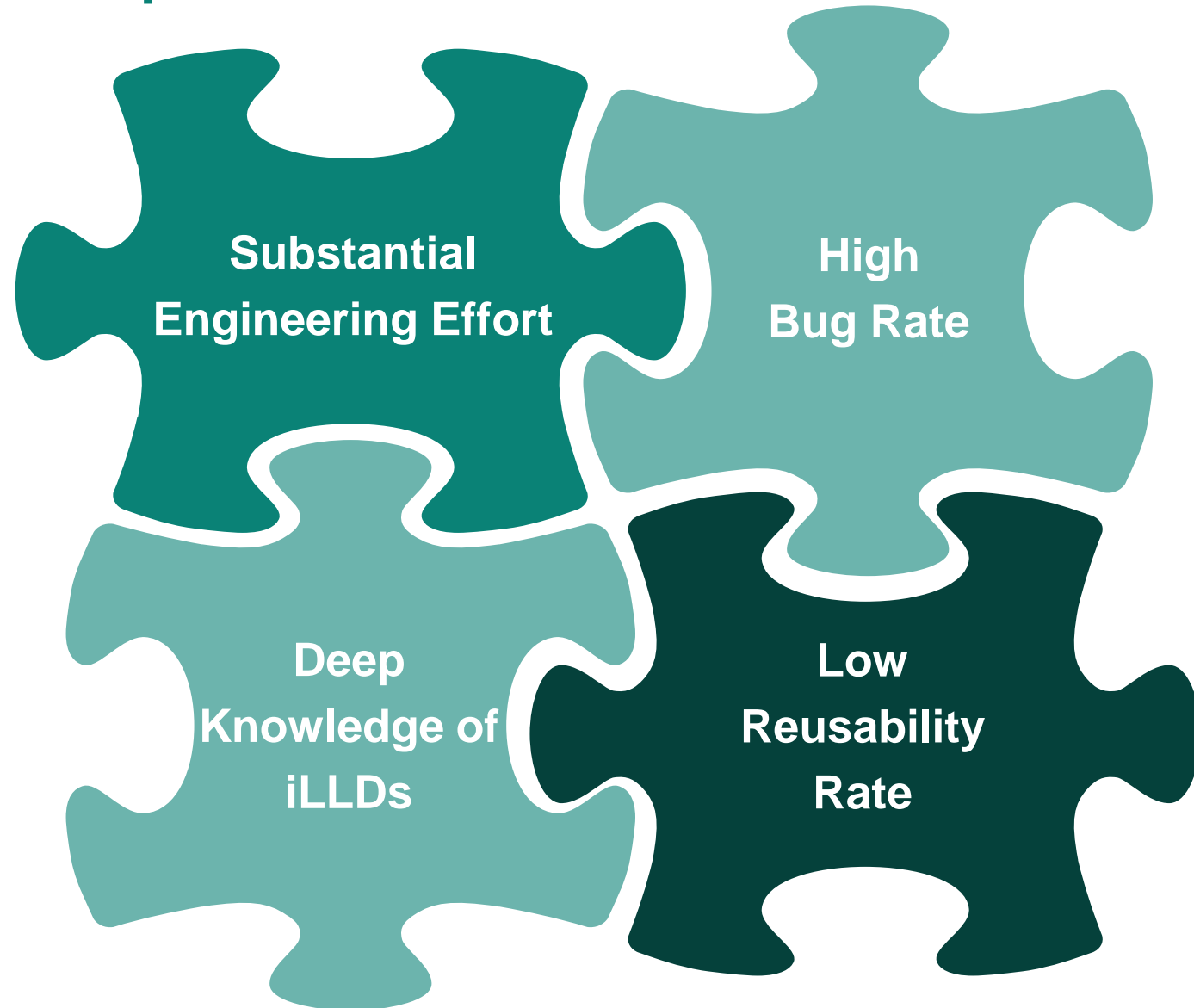
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# Problem Statement: Embedded SW Development on AURIX™

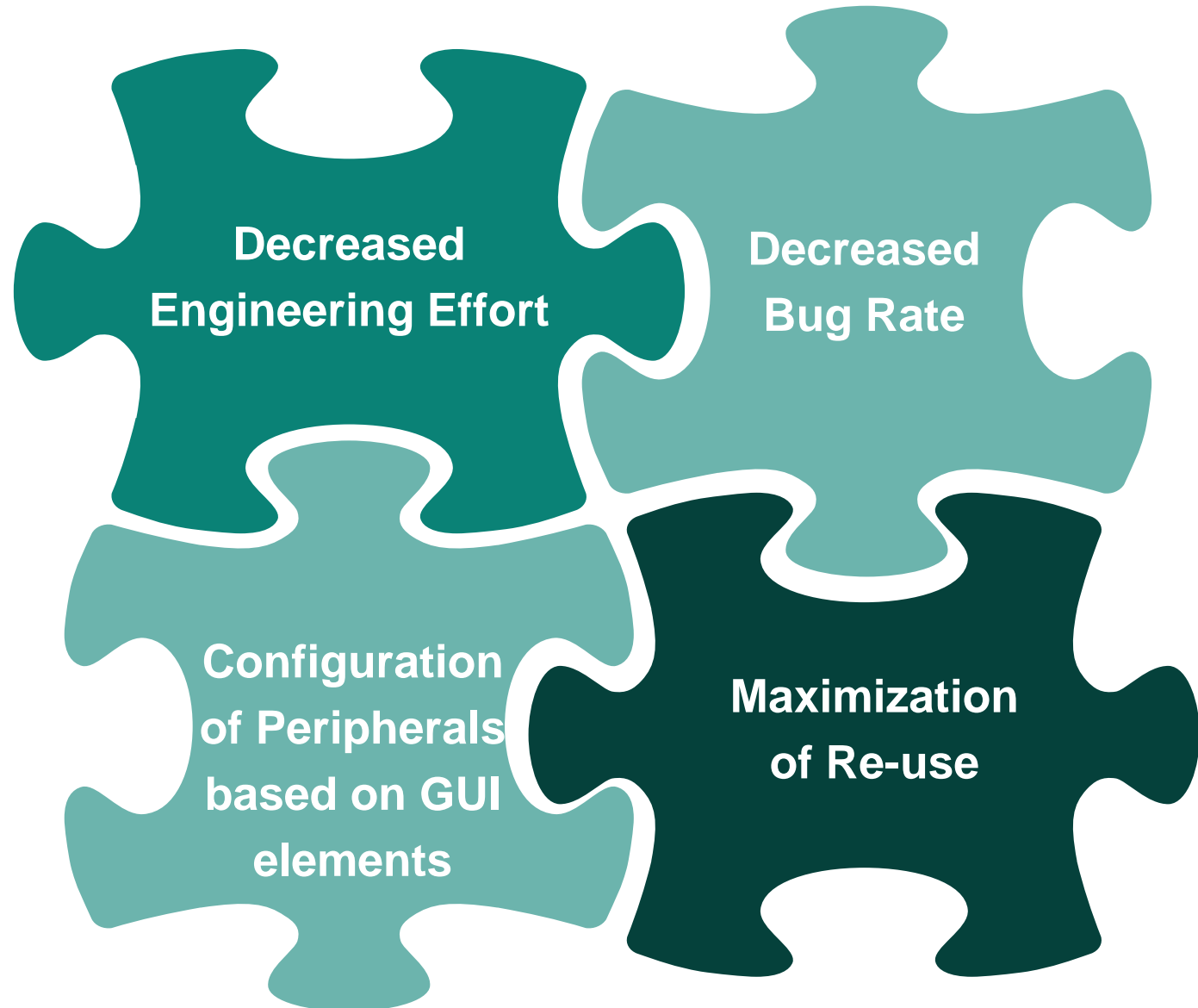


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# Solution: Model-based SW Development

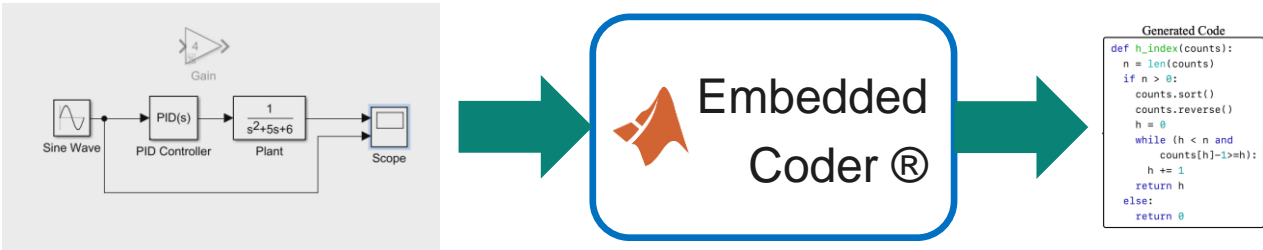
**Vision:**  
Customer downloads a complete system with Infineon components, simulates and auto-generates SW



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# Embedded Coder®, SoC Blockset™



Generated Code

```

def h_index(counts):
    n = len(counts)
    if n > 0:
        counts.sort()
        counts.reverse()
        h = 0
        while (h < n and
              counts[h]-1>=h):
            h += 1
        return h
    else:
        return 0
  
```



## What is Embedded Coder ?

- efficient C/C++ code
- AUTOSAR, MISRA C ®
- **code is portable** and can be compiled and executed **on any processor**

## What is SoC Blockset ?

- enables simulation and analysis of the performance of **algorithms on multicore SoC**
- **assists the code generation** for the target SoC

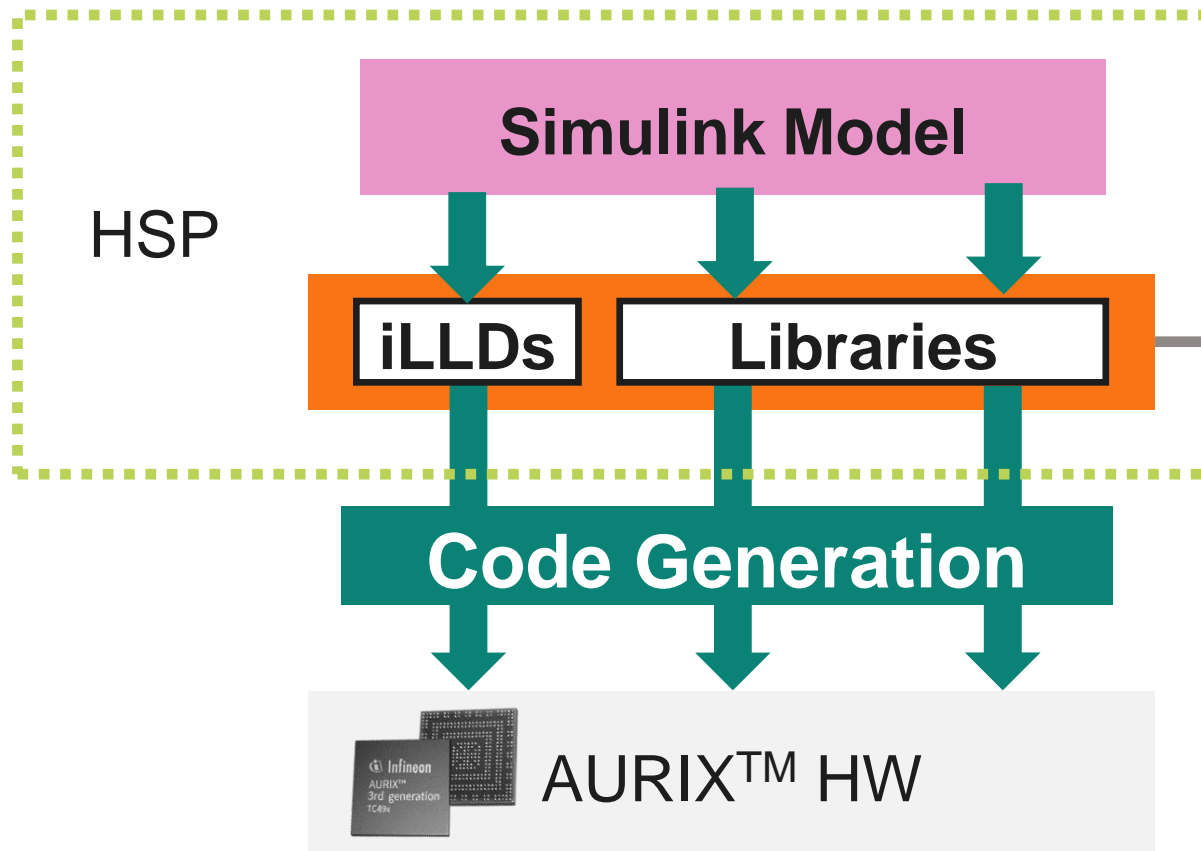


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# What is TC4x Hardware Support Package (HSP)

MATLAB/  
Simulink  
Environment



**AURIX™ HSP**

- Plugin for Embedded Coder and SoC Blockset
- Translates Simulink models into executable code
- Generated Code Optimized for AURIX™ TC4x
- Support for new peripherals added successively in new releases

iLLD – Infineon Low Level Drivers

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# AURIX™ Software Development Ecosystem

## TC4x HSP

- TC4x HSP is developed under partner model
- Collaboration with MathWorks

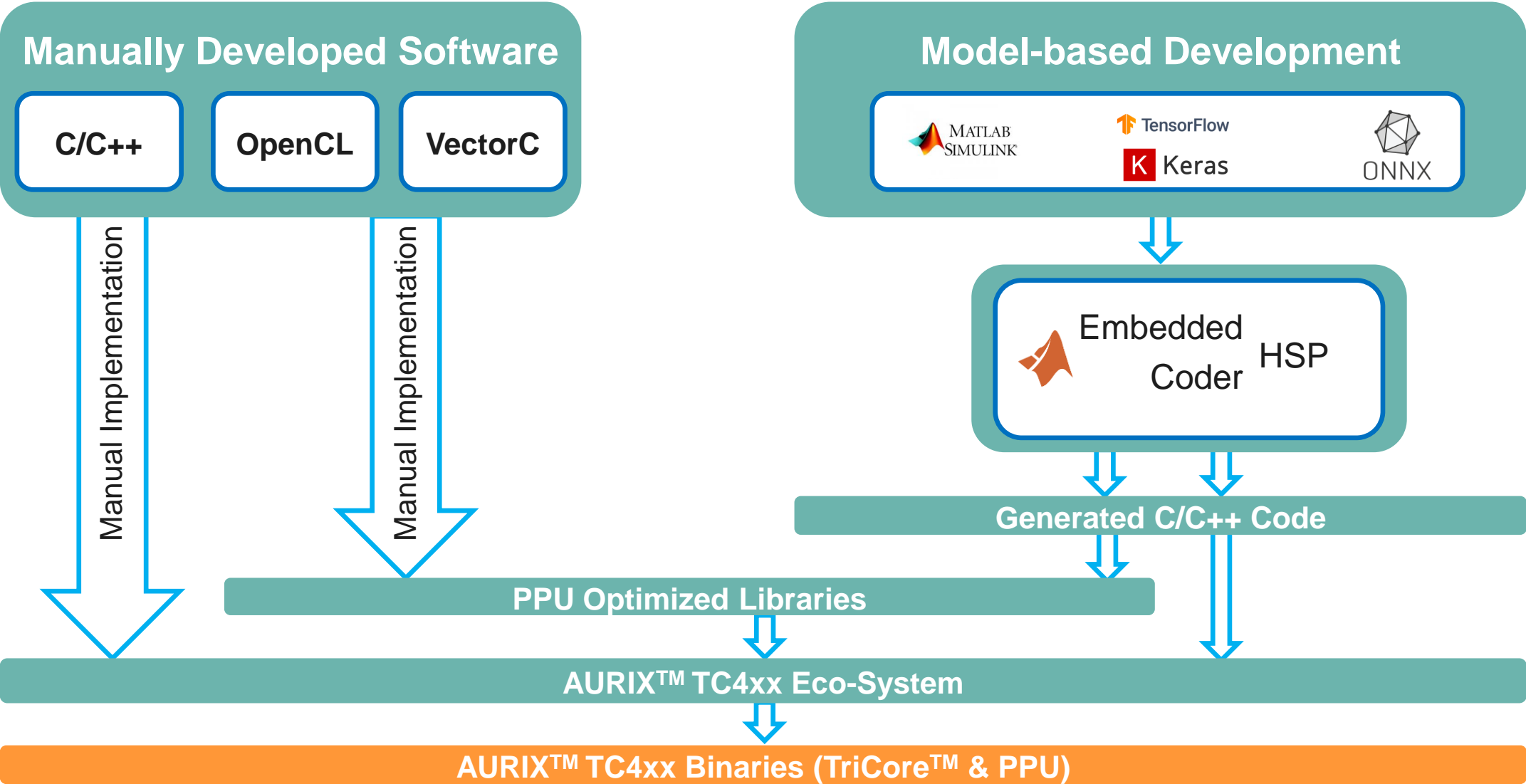
- Half yearly release cycle together with MATLAB, Simulink products
- Based up TC4x iLLDs



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# Manual vs Model-based Approach



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# Model-based SW Development Flow

**Compatible Toolchain**

SoC Blockset with TC4x HSP

**Application Model**

↑  
Load model

**Generate Code**

```

Generated Code
def h_index(counts):
    n = len(counts)
    if n > 0:
        counts.sort()
        counts.reverse()
        h = 0
        while (h < n and counts[h]-1>=h):
            h += 1
        return h
    else:
        return 0
    
```

**Build and Flash**



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# Future Outlook

## R2023a & before

- Single-core target in R2022b
- Multicore target in 2023a
  - Feature on PPU
  - IPC



## Future

- Support more peripherals
- Support more MDB workflows
- Support more algorithms

