Agenda

- ## Direct Modeling Strategy
  - – PTC Creo Elements/Direct
  - – PTC Creo

- ## PTC Creo – Current Direct Modeling Capabilities & Outlook
  - – PTC Creo Direct 3.0
  - – PTC Creo Parametric 3.0 Flexible Modeling Extention (FMX)

- ## PTC Creo Elements/Direct
  - – PTC Creo/Elements Direct 19.0 & 20.0
  - – Product Adoption Strategy for PTC Creo Elements/Direct
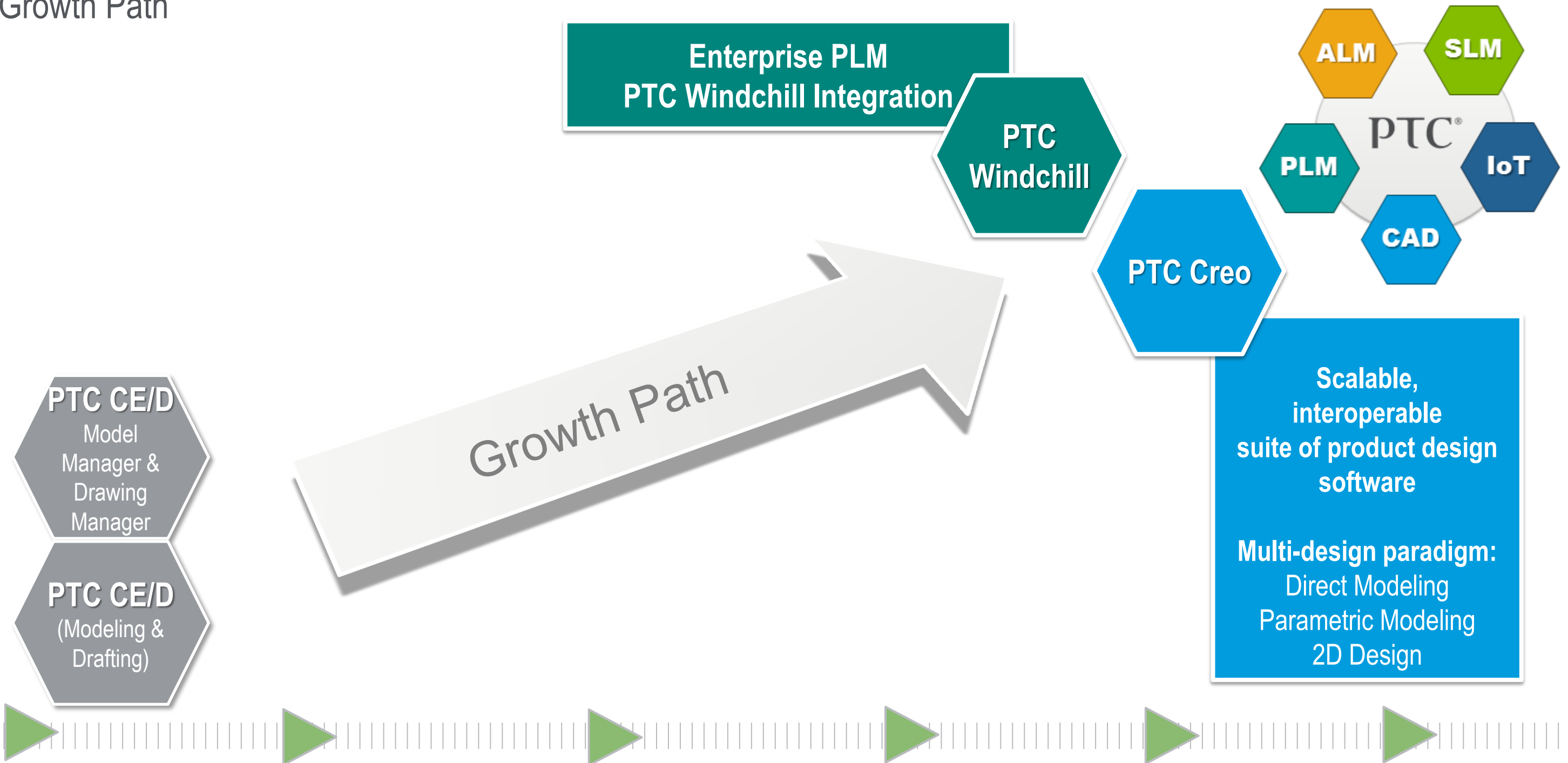
Overview

PTC Creo Direct

PTC Creo Parametric
Flexible Modeling
Extension (FMX)
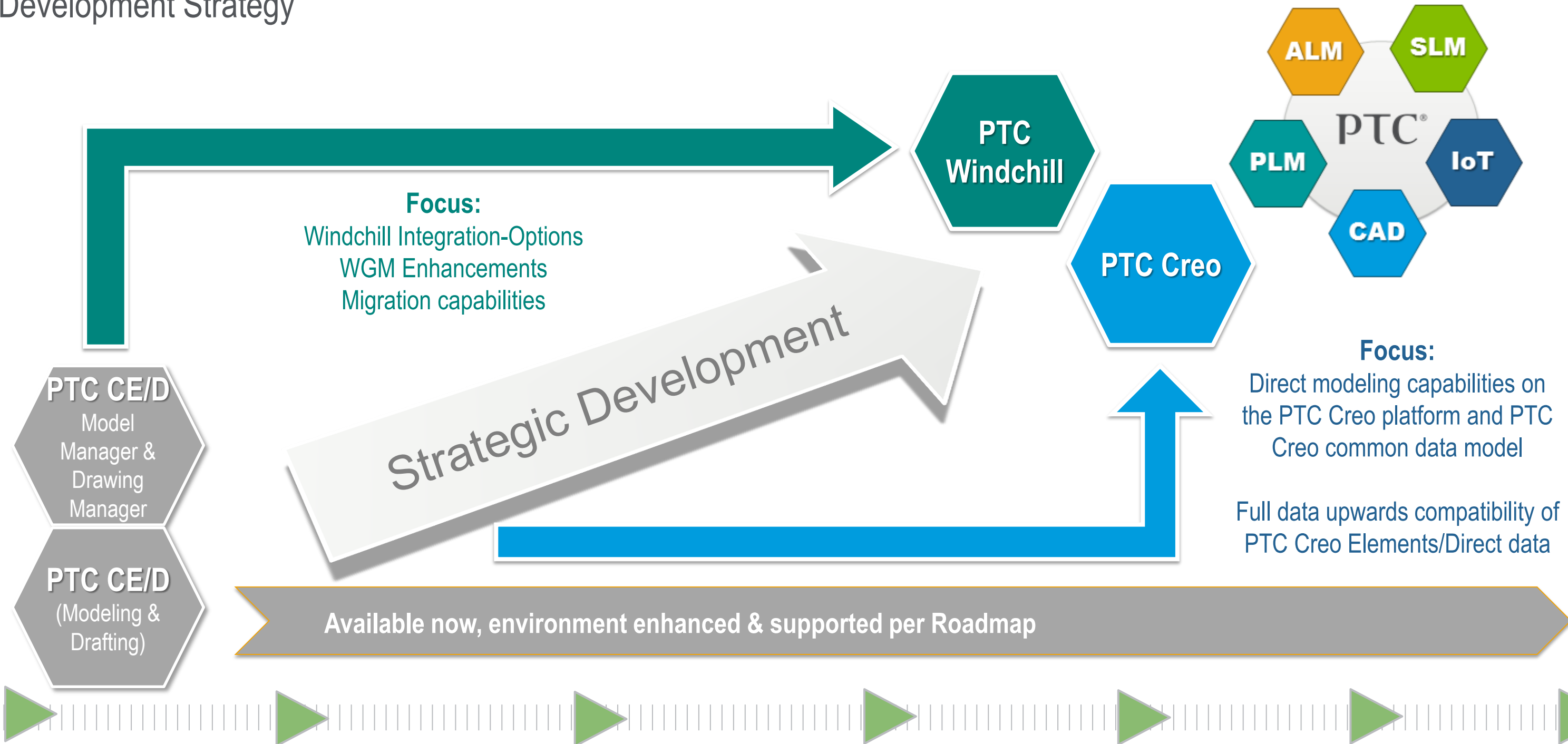
PTC Creo

**PTC Creo
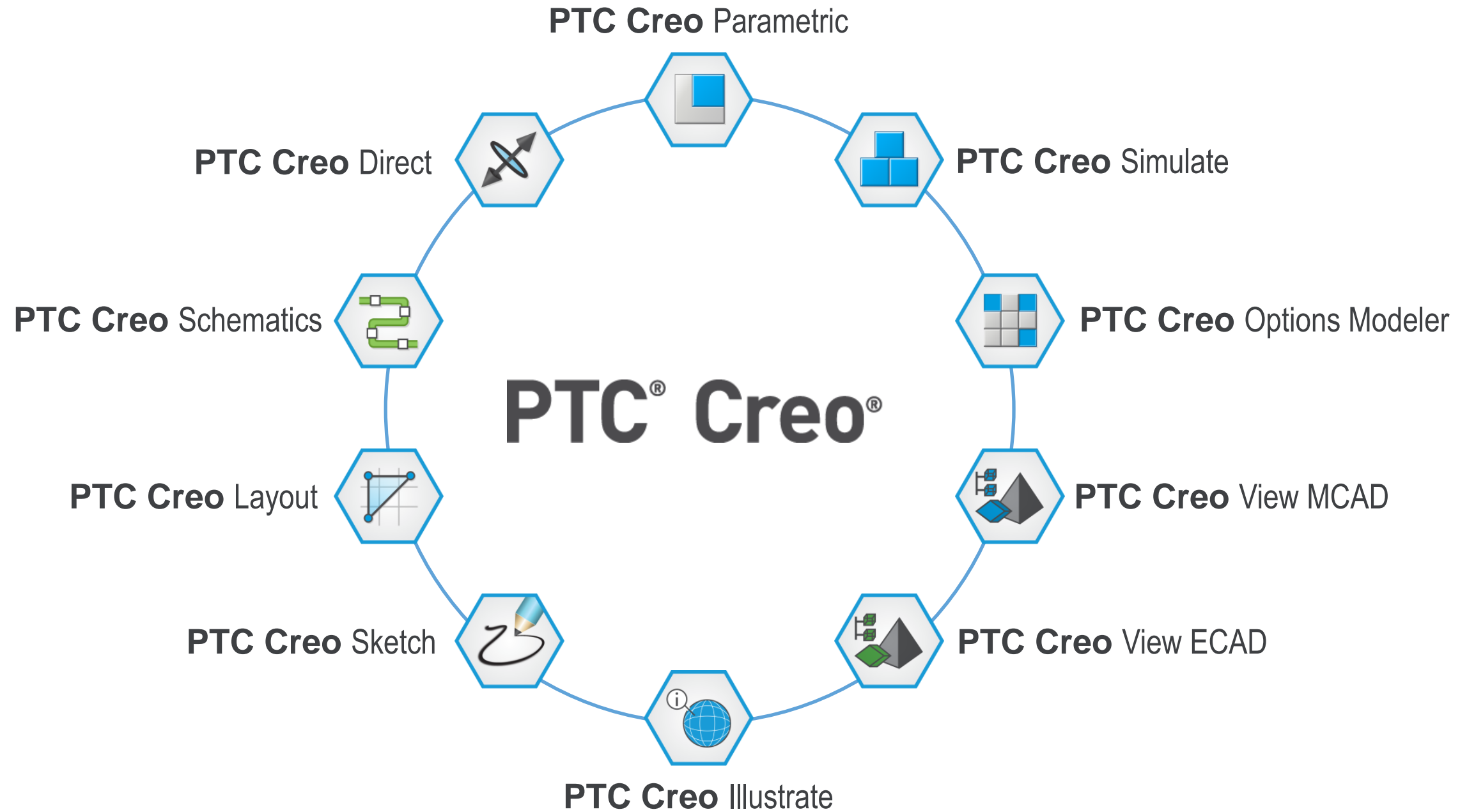Elements/Direct**

Formerly CoCreate

CAD and PLM Strategy for PTC Creo Elements/Direct

PTC® Live Global

Growth Path

**Enterprise PLM
PTC Windchill Integration**

PTC Windchill

PTC Creo

ALM | SLM
PLM | PTC® | IoT
CAD

PTC CE/D
Model Manager & Drawing Manager

PTC CE/D
(Modeling & Drafting)

Growth Path

Scalable, interoperable suite of product design software

Multi-design paradigm:
Direct Modeling
Parametric Modeling
2D Design

CAD and PLM Strategy for PTC Creo Elements/Direct

Development Strategy

PTC Windchill

Focus:
Windchill Integration-Options
WGM Enhancements
Migration capabilities

Strategic Development

PTC Creo

ALM **SLM**

PLM **PTC®** **IoT**

CAD

Focus:
Direct modeling capabilities on the PTC Creo platform and PTC Creo common data model

Full data upwards compatibility of PTC Creo Elements/Direct data

PTC CE/D
Model Manager & Drawing Manager

PTC CE/D
(Modeling & Drafting)

Available now, environment enhanced & supported per Roadmap

Direct Modeling in PTC Creo

Ideation → Concept → Detailed Design → Validation → Tooling → Sustain

Current Use Cases

PTC Creo Parametric

PTC Creo Direct

Full Interoperability

PTC Creo Direct
Pure, dedicated **direct modeling** environment

PTC Creo Flexible Modeling Extension to PTC Creo Parametric
Direct modeling-based capabilities within **parametric** environment

- Creo **platform & architecture**
- Creo **common Data Model**
- Full **interoperability**

Creo Platform

Direct Modeling in PTC Creo

Strategy: Expansion of direct modeling capabilities on the PTC Creo platform

PTC Creo Parametric

PTC Creo Direct

PTC Creo Flexible Modeling Extension to PTC Creo Parametric

Direct modeling-based capabilities within **parametric** environment

PTC Creo Direct

Dedicated **direct modeling** environment

Full Interoperability

Exposure to Apps on multi-design-paradigm platform

Direct Modeling on strategic platform

CoCreate Platform

Mature, purely direct design environment

IP, experiences, capabilities

Data upwards compatibility

- **Creo platform & architecture**
- **Creo common Data Model**
- **Full interoperability**

Creo Platform

Forward looking information subject to change without notice

Direct Modeling in PTC Creo 3.0

Strategy: Expansion of direct modeling capabilities on the PTC Creo platform

PTC Creo Parametric

PTC Creo Direct

PTC Creo Flexible Modeling Extension to PTC Creo Parametric

Direct modeling-based capabilities within **parametric** environment

Full Interoperability

PTC Creo Direct

Dedicated **direct modeling** environment

Exposure to Apps on multi-design-paradigm platform

Direct Modeling technology/capabilities added in Creo 3.0

Rounds & Chamfers with Direct Modeling Design Intent
- Shapes Selection
- Create advanced R/C (*)
- Edit/Remove
- Recognize / Un-recognize
- Rounds & Chamfer Handling/Treatment

Tangency Handling
- Geometry Solver
- Tangency detection & control in Move, Modify Analytic, Offset
- Flexible geometric conditions for tangency control

Geometric Solutions
- Enhanced geometric solutions for move

Pattern
- Flex Pattern w R/C handling

Multi-Color Preview

Substitute (*)

(*) Exposed in PTC Creo Direct 3.0

Creo Platform

Rounds & Chamfers with Direct Modeling Design Intent

Rounds & Chamfers

- Shapes Selection

Support for advanced Round/Chamfer types
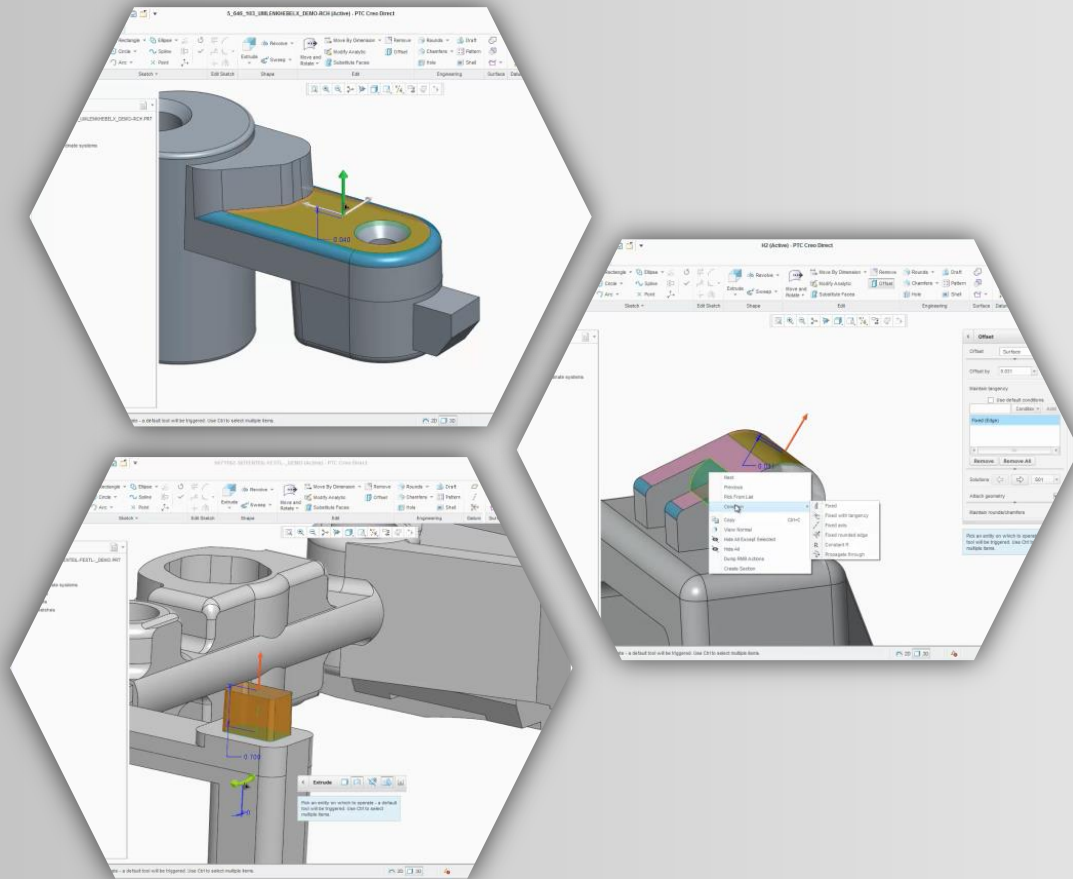
- Creation (*)

- Edit/Remove

- Recognize / Un-recognize

- Rounds & Chamfer Handling/Treatment
  - Removal and recreation of attachment geometry

PTC Creo Direct

Move and Rotate | 501

Choose a surface, datum, edge or axis to
define a new dragger origin

PTC Creo Flexible Modeling Extension
to PTC Creo Parametric (FMX)
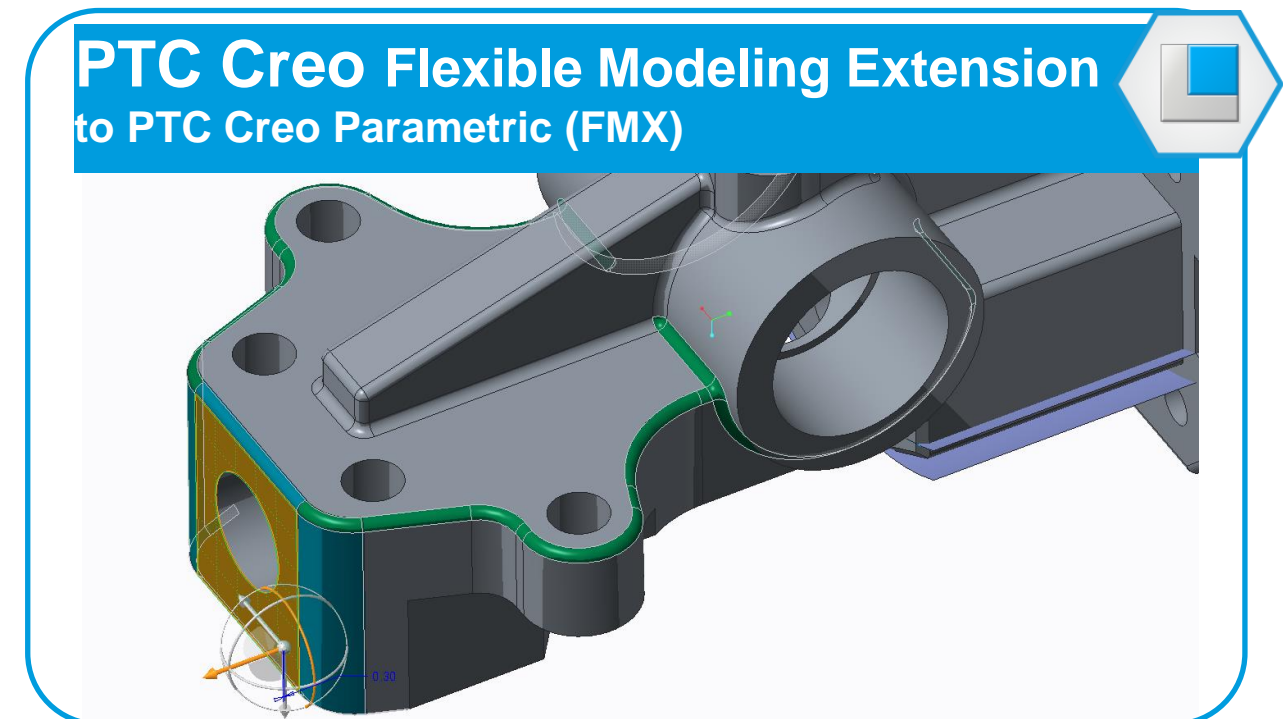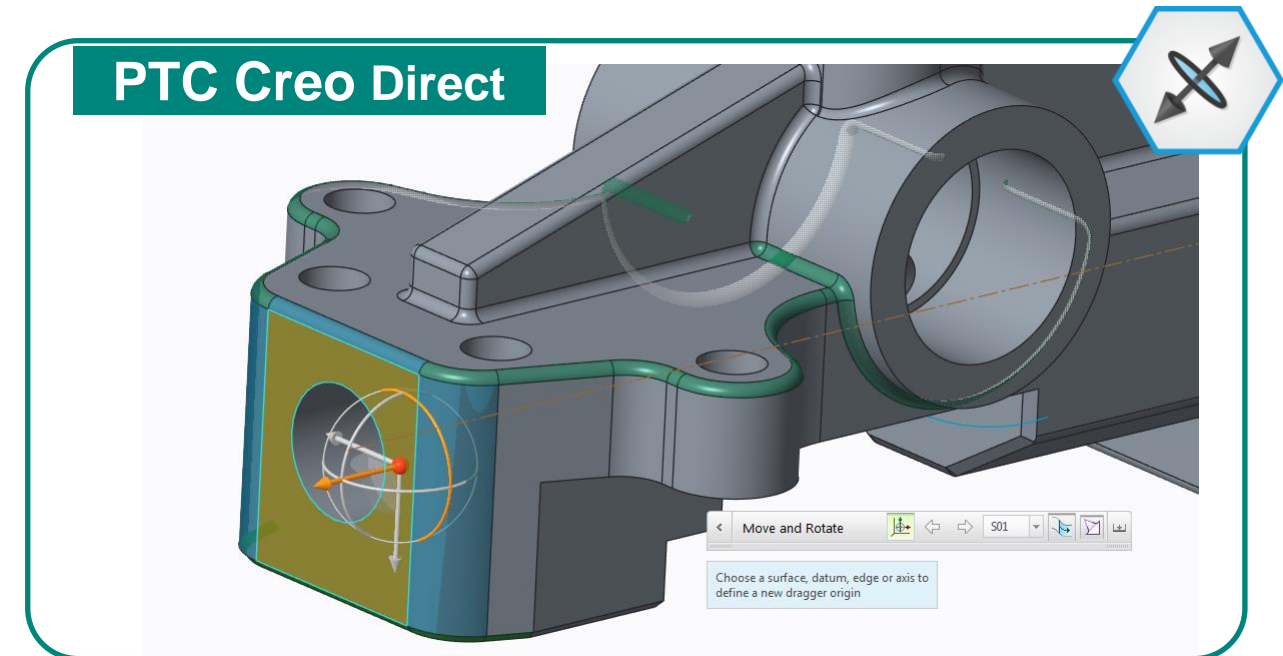
Geometric operations maintaining tangency situations

Tangency Handling

- Geometry Solver

- Tangency detection & control

- Available for Move, Modify Analytic, Offset

- Geometric conditions

PTC Creo Direct

PTC Creo Flexible Modeling Extension to PTC Creo Parametric (FMX)

PTC® Live Global
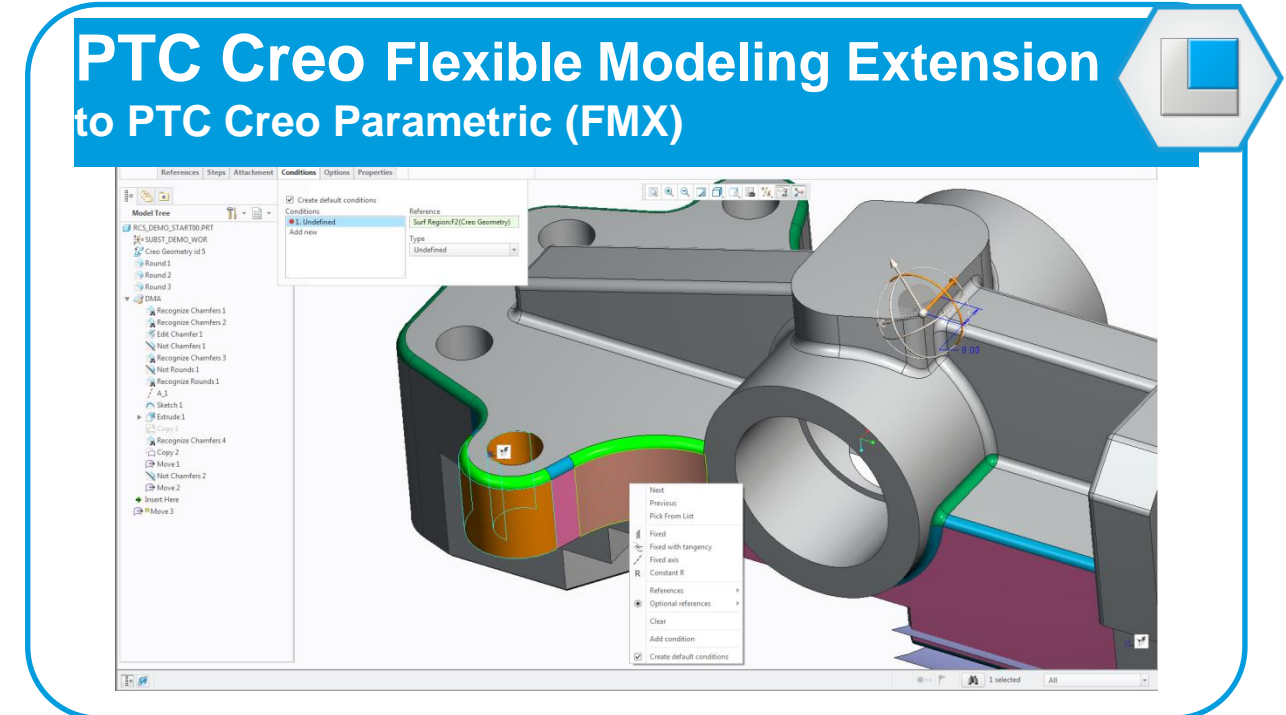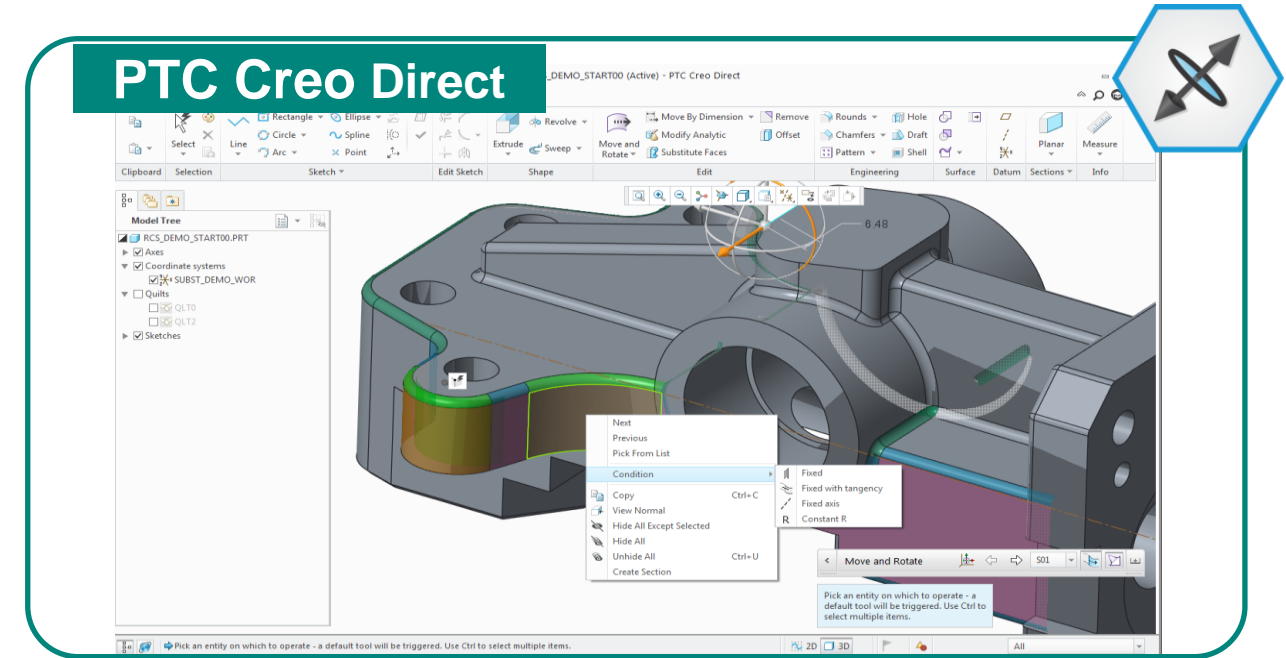
Quickly align surfaces geometrically

Substitute

- Geometrically substitute surfaces with other surfaces

- Including handling of rounds and chamfers

- First introduced in FMX, exposed into PTC Creo Direct in PTC Creo 3.0

PTC Creo Direct

PTC Creo Flexible Modeling Extension to PTC Creo Parametric (FMX)
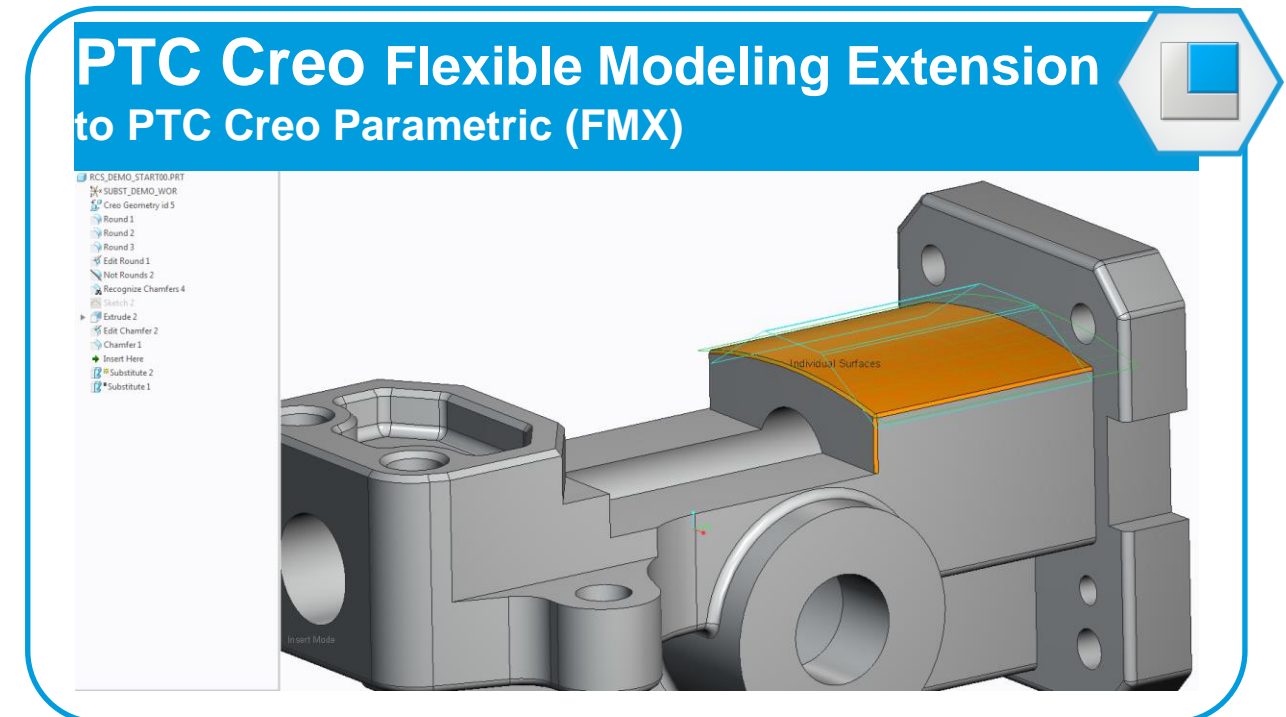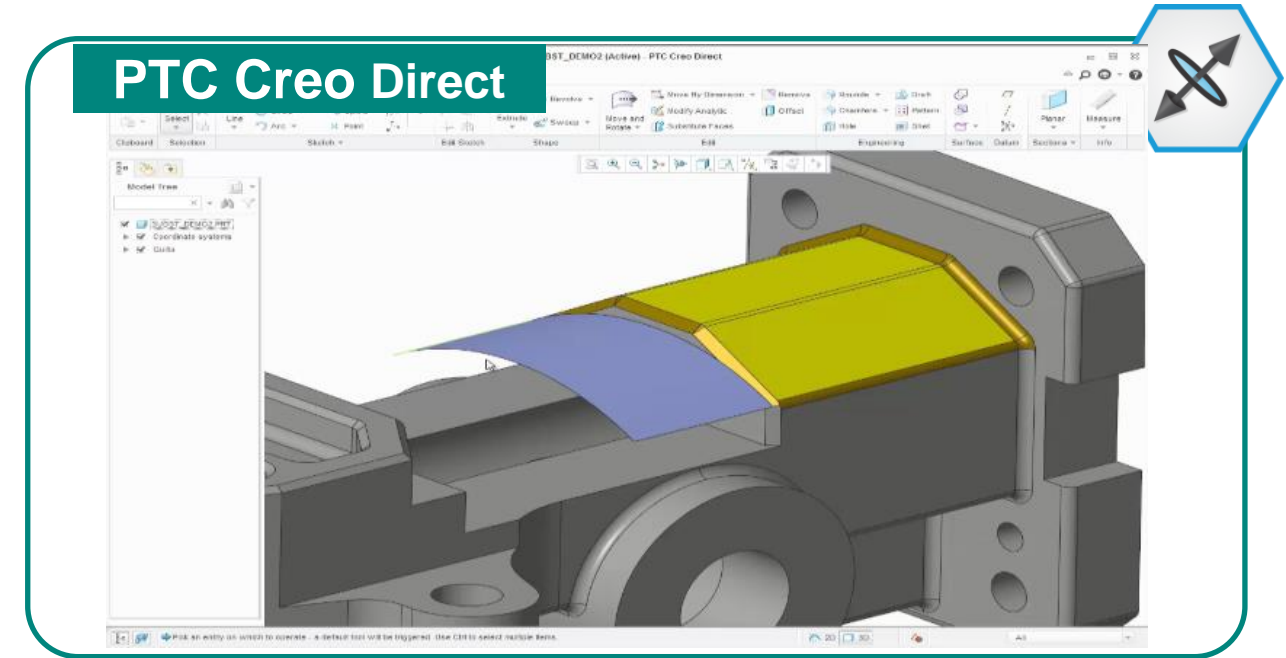
…beyond core 3D geometry capabilities?

- Richer and more intuitive Direct Modeling experience
- More Direct Modeling Power
- Improved Assembly Design Workflows
- Usability Enhancements
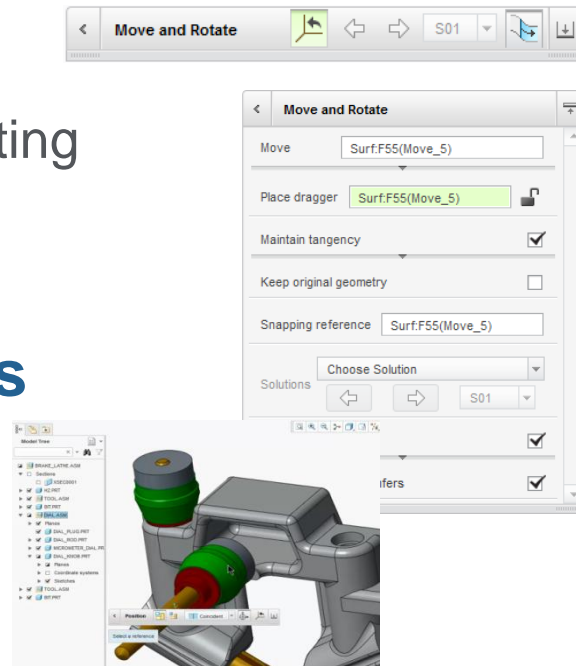- Broadened Import of non-PTC CAD formats

PTC® Live Global

…beyond core 3D geometry capabilities?

More Intuitive Experience
- Improved Live Toolbar with floating dashboards and tool templates
- Enhanced Sketching workflows

Richer and more intuitive Direct Modeling experience

More Direct Modeling Power

Improved Assembly Design Workflows

Usability Enhancements

Broadened Import of non-PTC CAD formats

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PTC® Live Global

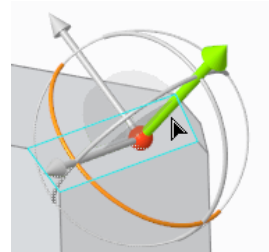## …beyond core 3D geometry capabilities?
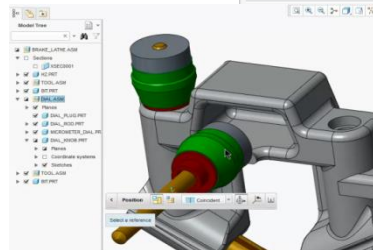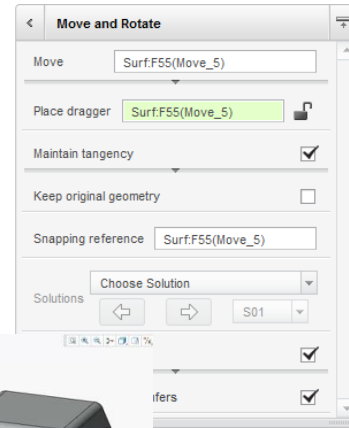
More Intuitive Experience
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Assembly Design Workflows
- Improved visibility control (components/objects)
- Work in cross section mode
- Smooth component/assembly reuse workflow

Richer and more intuitive Direct Modeling experience

More Direct Modeling Power

Improved Assembly Design Workflows

Usability Enhancements

Broadened Import of non-PTC CAD formats

What's new in PTC Creo Direct 3.0…

…beyond core 3D geometry capabilities?
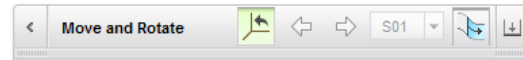
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Assembly Design Workflows
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Usability Enhancements
- Easier component activation workflows
- Overhauled 3D Draggers and 3D Dragger placement workflows
- Enhanced Multi-Color Preview
- Enriched user options

Richer and more intuitive Direct Modeling experience

More Direct Modeling Power

Improved Assembly Design Workflows

Usability Enhancements

Broadened Import of non-PTC CAD formats

What's new in PTC Creo Direct 3.0…

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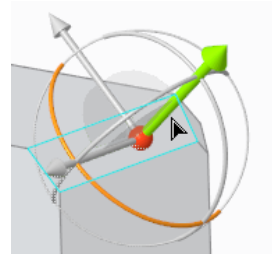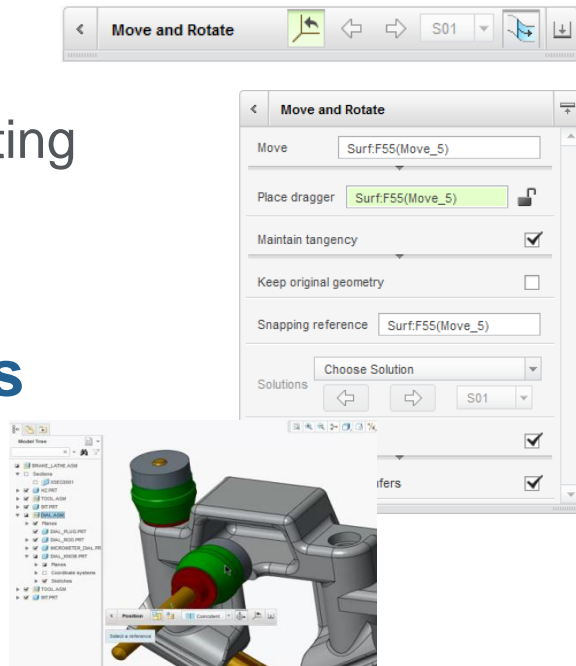
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Usability Enhancements
- Easier component activation workflows
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- Enhanced Multi-Color Preview
- Enriched user options

Import non-PTC Creo CAD formats
- All major formats

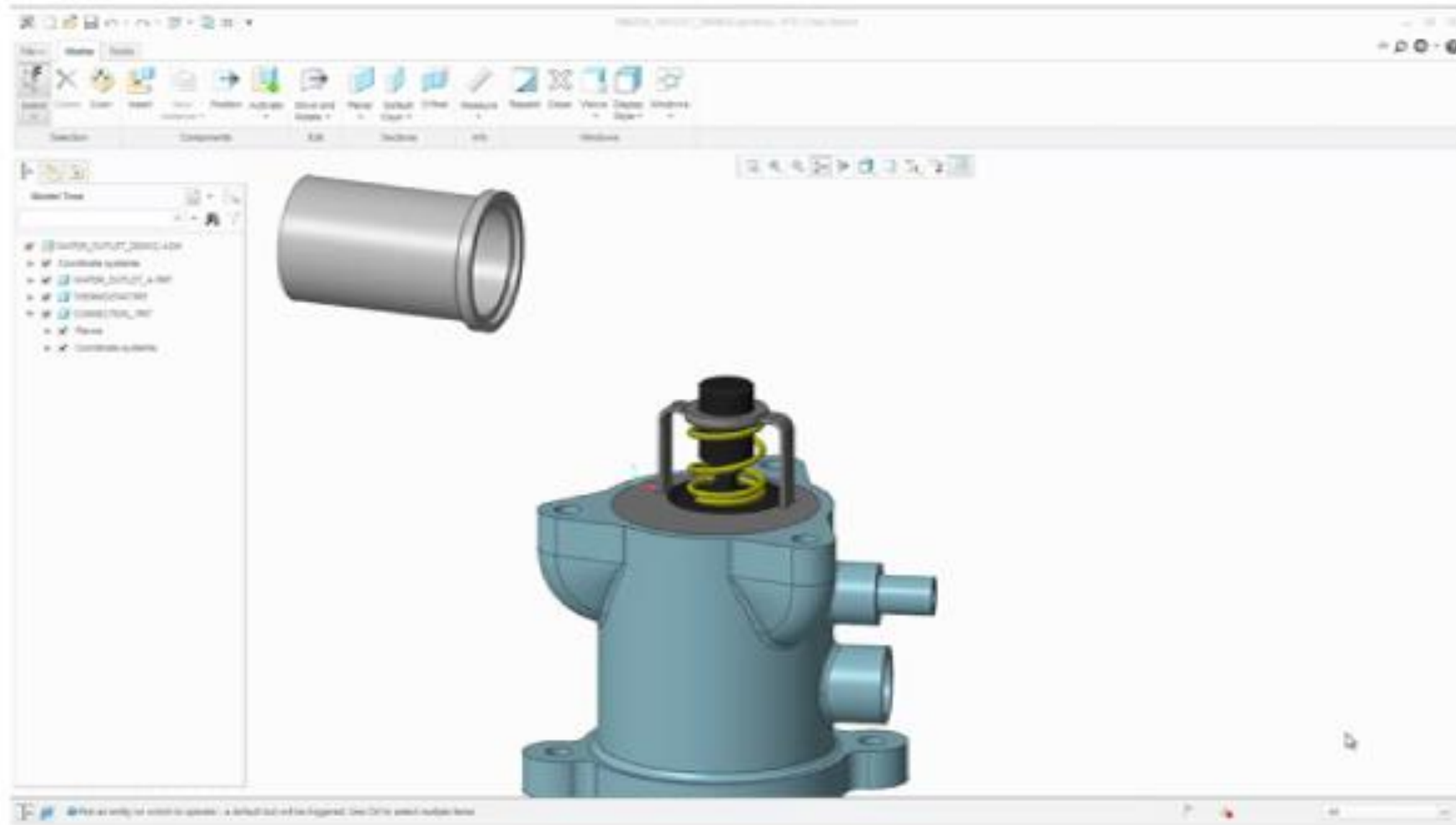**Richer and more intuitive Direct Modeling experience**

More Direct Modeling Power

Improved Assembly Design Workflows

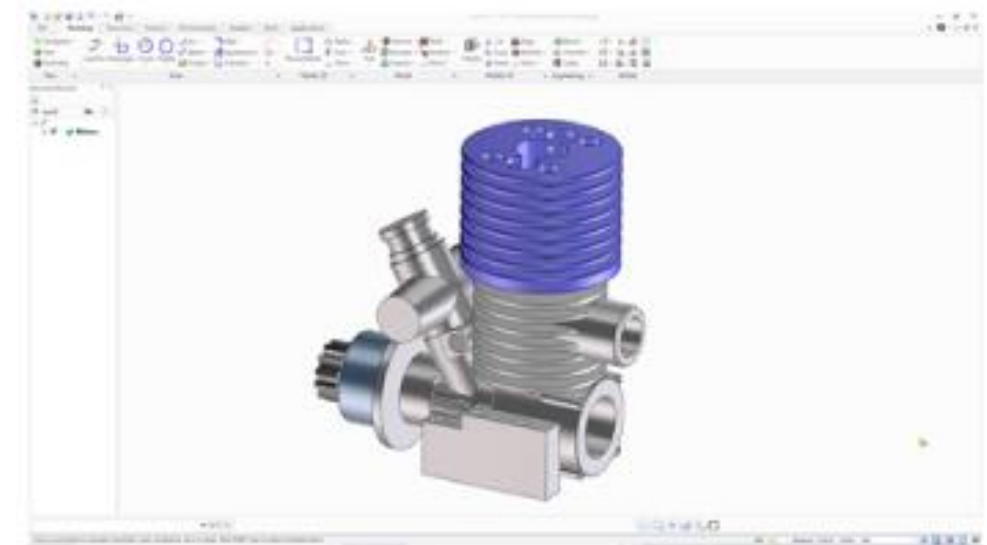**Usability Enhancements**

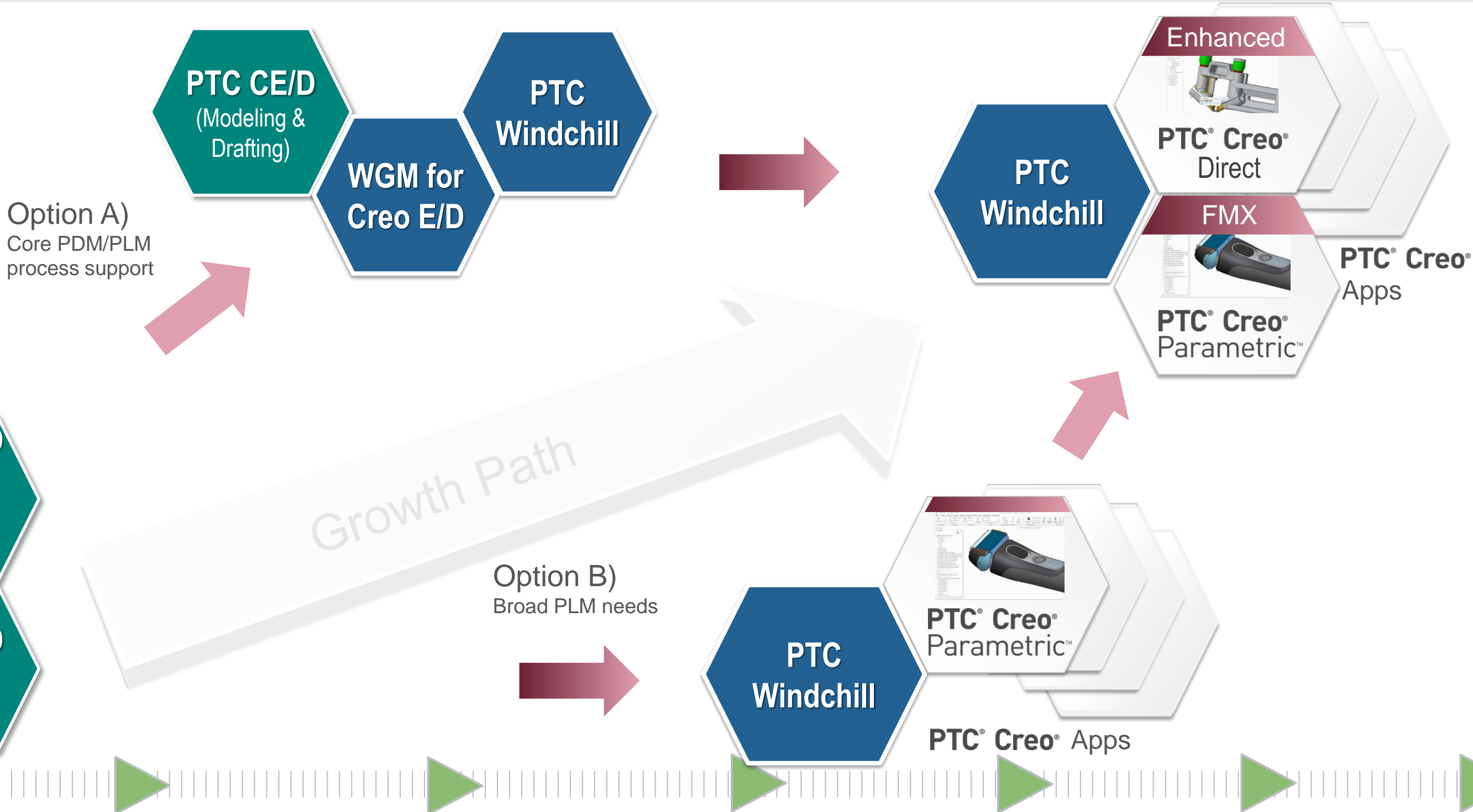**Broadened Import of non-PTC CAD formats**

Working in the Assembly

PTC Creo Elements/Direct 19.0 and planned enhancements for 20.0

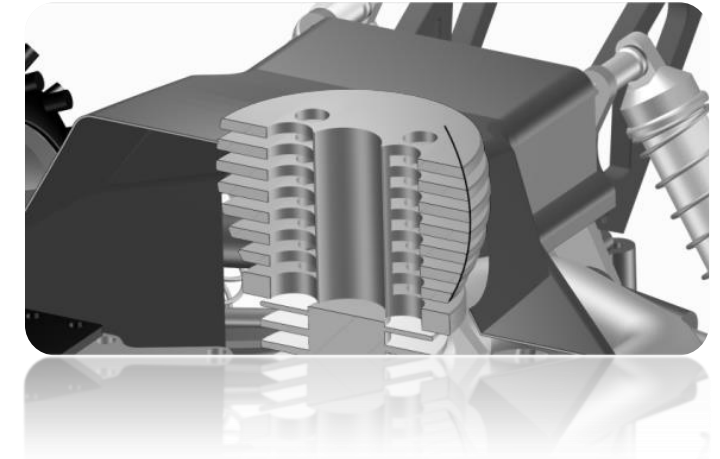- Build on Improved Interoperability delivered in
  PTC Creo Elements/Direct 19.0 and PTC Creo 3.0
  - Enhanced upward compatibility to PTC Creo
    - Cross Section support
    - Semantic PMI transfer
    - PTC Creo Elements/Direct drawing compatibility /
      Import of .mi Drawings
  - Import of SolidWorks and Inventor Files into Modeling

- R&D focus for next release:
  Enhanced upward compatibility to PTC Creo

Product Adoption Strategy

Options

Option A)
Core PDM/PLM process support

- PTC CE/D (Modeling & Drafting)
- WGM for Creo E/D
- PTC Windchill

→ PTC Windchill

PTC Creo Direct — Enhanced
PTC Creo Parametric — FMX
PTC Creo Apps

- PTC CE/D Model Manager & Drawing Manager
- PTC CE/D (Modeling & Drafting)

Growth Path

Option B)
Broad PLM needs

→ PTC Windchill

PTC Creo Parametric
PTC Creo Apps

- ## Direct modeling remains a key element of PTC's CAD strategy
  - PTC is committed to continued investment in direct modeling in PTC Creo
  - PTC will provide upward data compatibility from PTC Creo Elements/Direct to the PTC Creo platform

- ## PTC is committed to continuing to support and enhance PTC Creo Elements/Direct for many years
  - PTC Creo Elements/Direct 19.0 delivers high customer value through improved productivity & interoperability
  - Release 20.0 development is underway now

PTC® Creo®
Elements/Direct®
Modeling™ 19.0

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- ## PTC Windchill provides best-in-class Data Management capabilities
  - PTC is committed to providing Migration tools from PTC Creo Elements/Direct Model Manager to PTC Windchill