



# *Interoperability From Design Technology Perspective*

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## *Interoperability Always Helps*

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- **Interoperability increases design productivity and quality of designs**
- **It also has positive impact on other developmental activities that support design**
  - Design Technology Development
  - Computing infrastructure
  - Application support
  - Etc...



# *Interoperability From Perspective of Design Technology Development*

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- **Design technology:**
  - PDK
  - Design library & IP
  - Design tool, flow & methodology



# PDK

	<u>Vendor1</u>	<u>Vendor2</u>	<u>Vendor3</u>	.....	<u>VendorN</u>
Symbol	✓	✓			
P-cells	✓	✓			
Models	✓	✓			
LVS/DRC	✓	✓	✓		
Para Ext	✓	✓			✓
P&R	✓	✓			✓
DFM	✓	✓	✓		
.	✓	✓			
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.	✓	✓			

- This PDK supports tools specified with “ ✓ ” mark in the table above
- **This PDK supports multiple vendor tools. However, the tools marked with “ ✓ ” should be used during sign-off**
- **Large amount of resource have been allocated to duplicate PDK for different vendors. With Interoperability, duplication can be eliminated and the resource can then be shifted to improve PDK’s accuracy and architecture for increasing design efficiency**



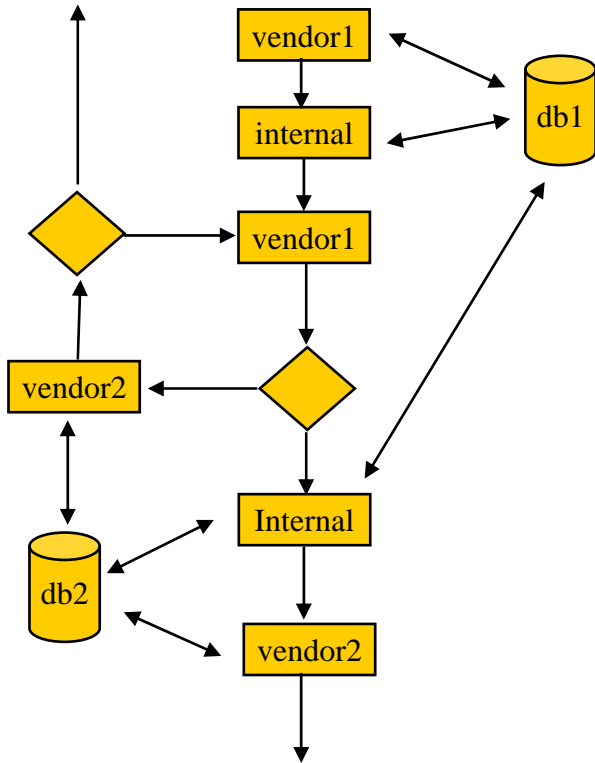
# Design Library & IP

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	<u>Vendor1</u>	<u>Vendor2</u>	<u>Vendor3</u>	.....	<u>VendorN</u>
<u>Timing view</u>	✓	✓			
<u>Power view</u>	✓	✓	✓		
<u>Layout view</u>	✓	✓			
<u>X'talk view</u>			✓		✓
<u>DFT view</u>		✓			
<u>GDS view</u>	✓	✓	✓		✓
<u>DB1 view</u>	✓				
<u>DB2 view</u>		✓			
<u>.</u>		✓			

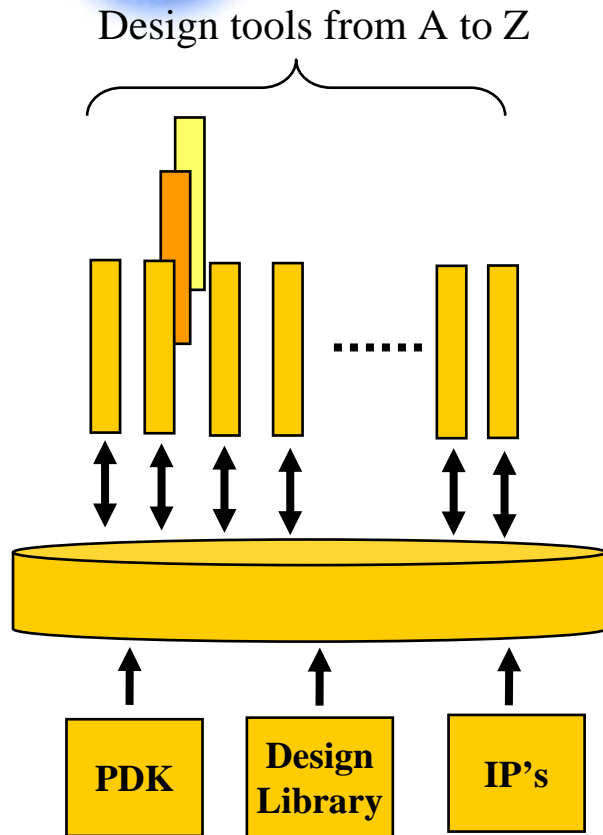
- Like PDK, good portion of library and IP works are to produce various views. The works can be eliminated if interoperability becomes reality.
- Moreover, in many occasions, new design tools or capabilities can not adopted, simply due to lacking of tool view's or PDK's.

# Design Tool, Flow & Methodology



- **Lots of undesired efforts on:**
  - Creating complicated flows for various tools that are not interoperable
  - Developing interface between tools
  - Translating design from one format to another format
- **Unlikely that new tools or capabilities will be readily adopted if they require new flow or interface changes**

# Imagining When This Happens



- **Lots of undesired works can be eliminated**
  - One PDK
  - One set of EDA views for library & IP
  - Simplified flows
  - Easy adoption of the best point tools
- **And resource can be reallocated to focus on design technology solutions with higher accuracy and performance**



## *It's happening, but slowly*

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- **OA presents the opportunity for interoperability to be realized**
- **Interoperability is happening, but slowly**
- **How can it be accelerated? So that everyone can benefit from it ?**



## *Final Thoughts*

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- **Interoperability improves not only productivity and quality of designs, but also all other developmental efforts needed to support design activities**
- **It's not a question of "if" interoperability will happen. It's a question of "when" it will happen.**
- **Collaboration among all in supply chain becomes a necessity for the whole industry to move to next level. I believe that interoperability can play a key role in enhancing the collaboration**
- **Interoperability effort based on OA needs to be accelerated**