

# Automation of 22FDX OpAmps by Using ID-Xplore™ of Intento Design with IIP of Fraunhofer IIS/EAS

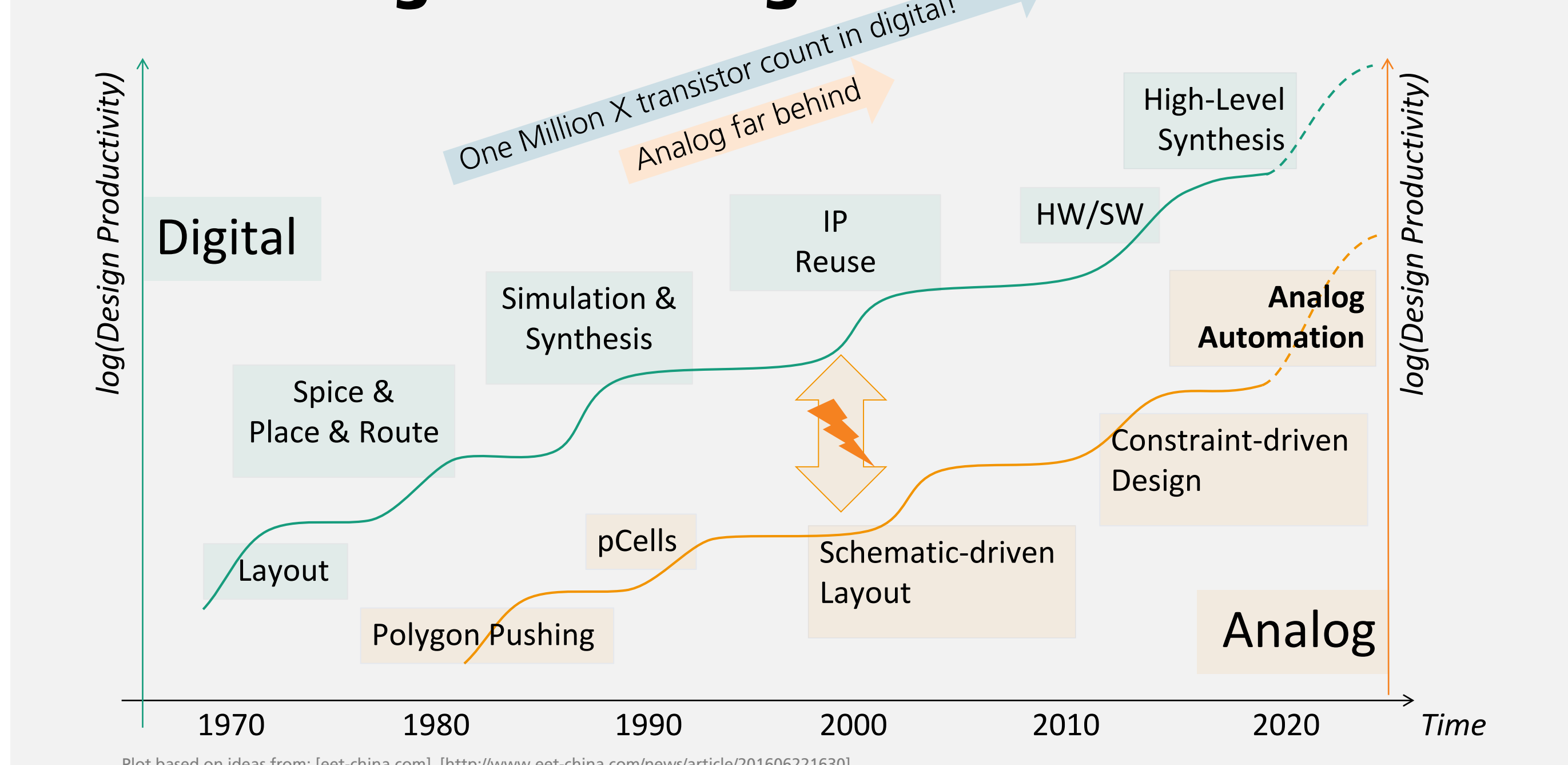


Benjamin Prautsch<sup>1</sup>, Uwe Eichler<sup>1</sup>, Ramy Iskander<sup>2</sup>, Jose Bonan<sup>2</sup>, Antoine Simonelli<sup>2</sup>, and Gilles Wright<sup>2</sup>

<sup>1</sup> Fraunhofer IIS/EAS, <sup>2</sup> Intento Design

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## The Challenge of Analog



## The Solution Approach and its Results

A designer-driven and automated design flow for analog IC design is presented for 22FDX®

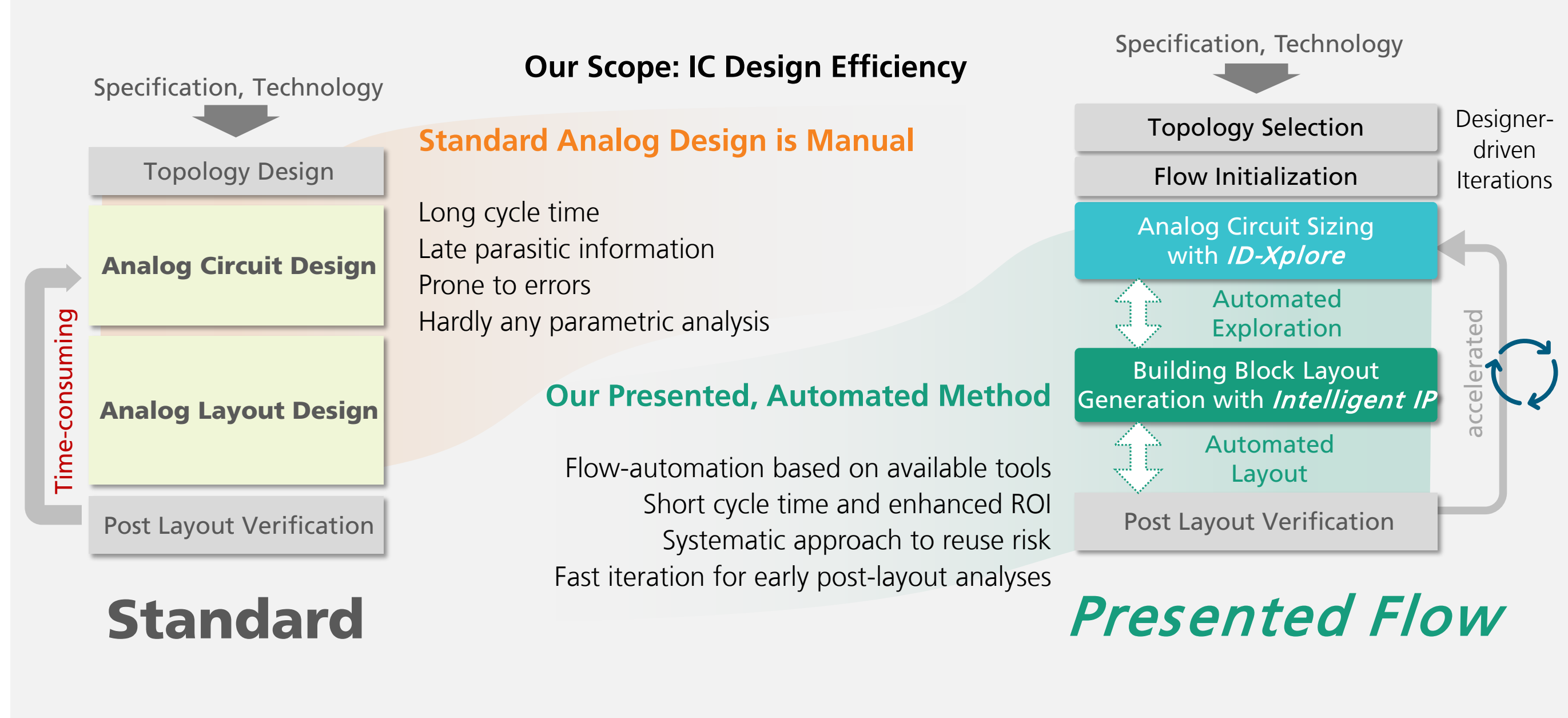
- Automatic sizing with ID-Xplore™ from Intento Design based on user guidelines (days → minutes)
- User-driven layout with IIP Generators from Fraunhofer IIS/EAS (days → seconds)
- A scripted, user-driven flow using Cadence® SKILL, IPC, and Python-based open source tools (manual → automated)

An OpAmp was characterized using the flow in 22FDX®

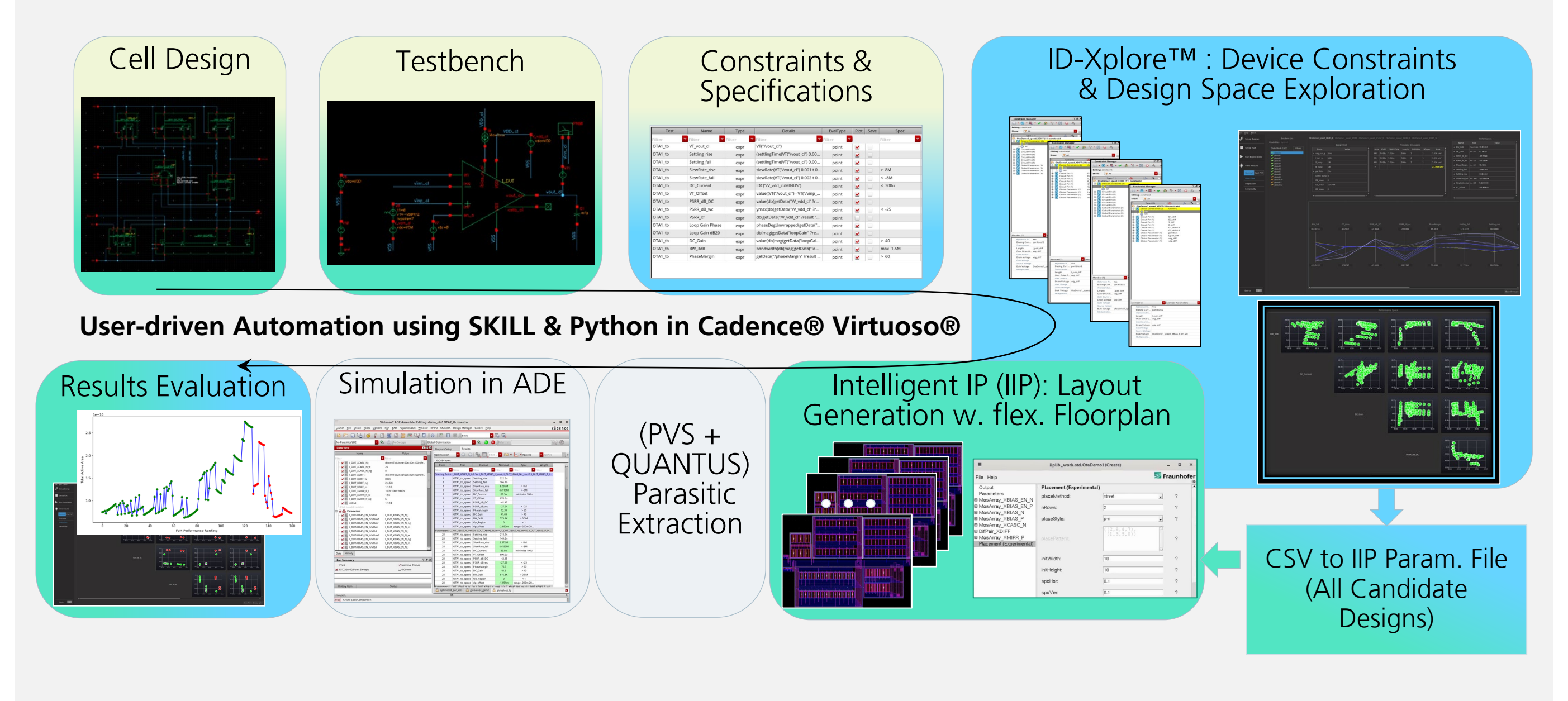
- Initial Implementation of the whole flow took about six month – the flow is now available and reusable!
- Initial setup and design of the flexible OpAmp took about one month
- Full 127 variant generation using ID-Xplore and IIP takes less than 30 minutes

Fast design exploration incl. layout generation is successfully achieved for  
→ faster design and post-layout analysis (for given topology) and  
→ secured tapeout

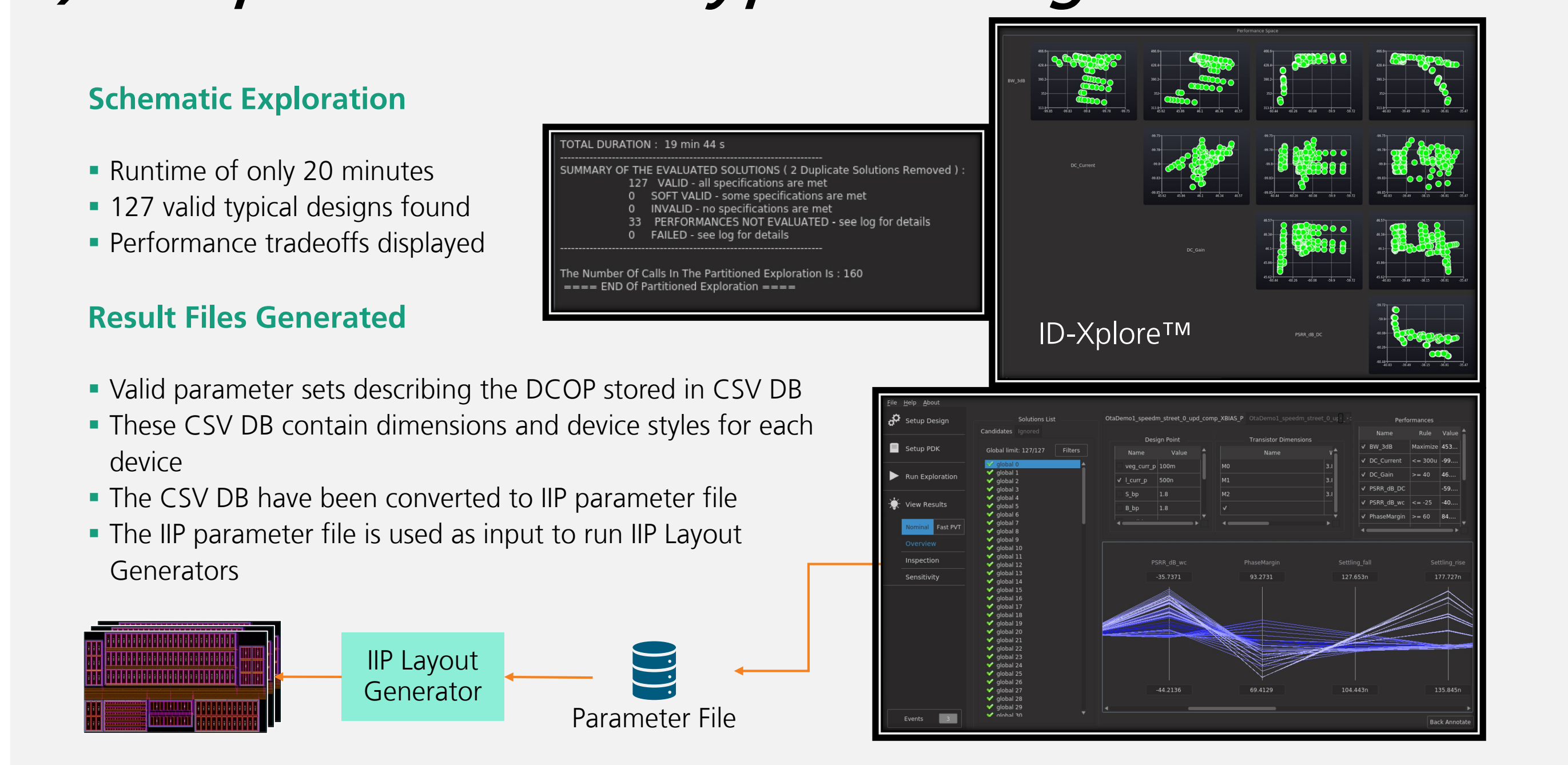
## 1) Standard Flow vs. Presented Automated Flow



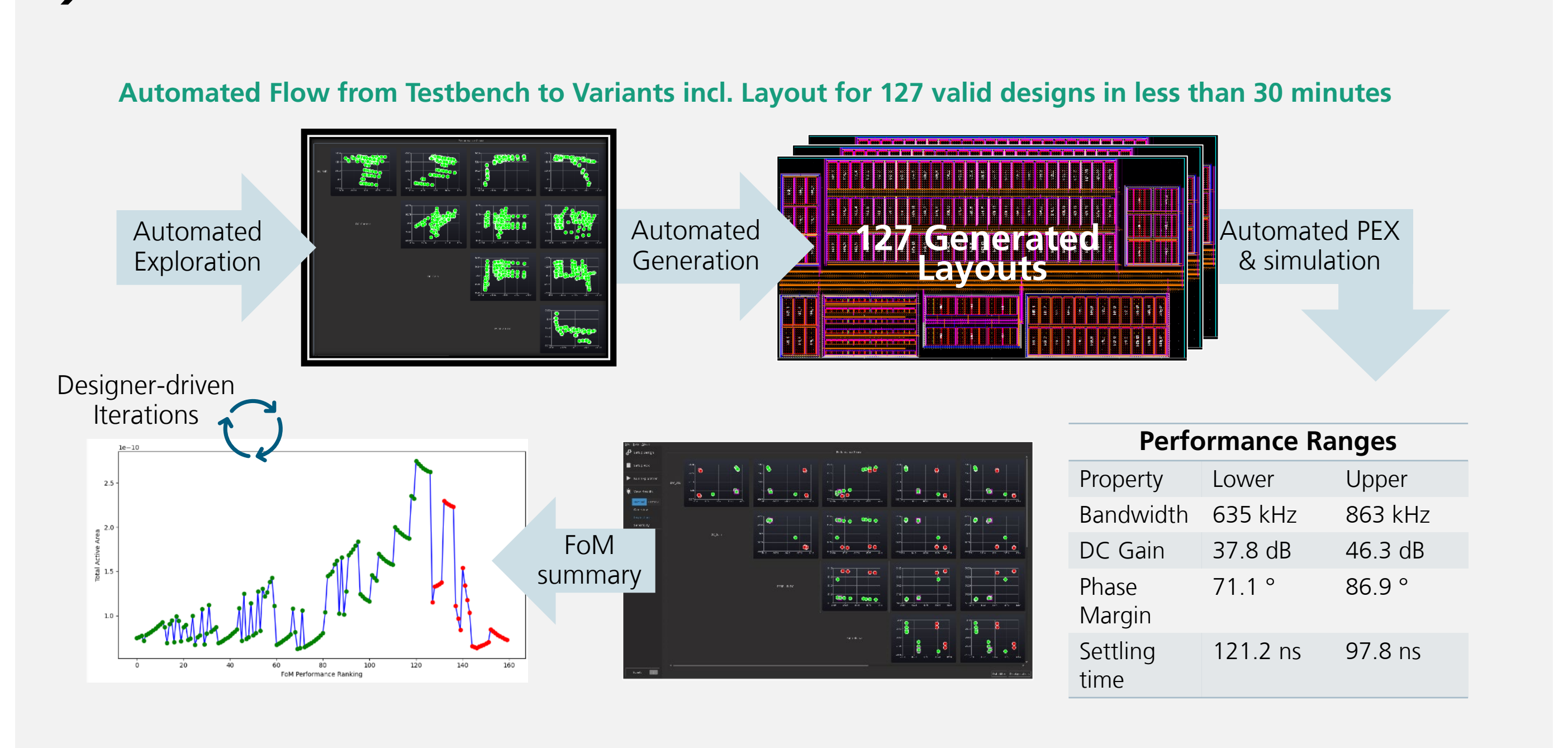
## 2) Putting the Steps Together



## 3) ID-Xplore Run For Typical Design



## 4) Generated Results & Performances



In Cooperation with:





# Automation of 22FDX OpAmps by Using ID-Xplore™ of Intento Design with IIP of Fraunhofer IIS/EAS



Benjamin Prautsch(1), Uwe Eichler(1), Ramy Iskander(2), Jose Bonan(2), Antoine Simonelli(2), and Gilles Wright(2)  
(1) Fraunhofer IIS/EAS, (2) Intento Design

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## Standard Flow vs. Presented Automated Flow

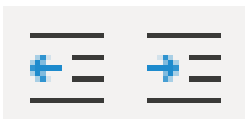
### Second level

**Third level**  
Fourth level  
■ Fifth level  
    – Sixth level  
1. Seventh level  
    – Eighth level  
*Ninth level*

With the use of a placeholder (not a normal text field), you can indent automatically.

This is done with steps higher/lower

(or shift key + Alt + ←/→)



## Edit master text format

### Second level

**Third level**  
Fourth level  
■ Fifth level  
    – Sixth level  
1. Seventh level  
    – Eighth level  
*Ninth level*

## Edit master text format

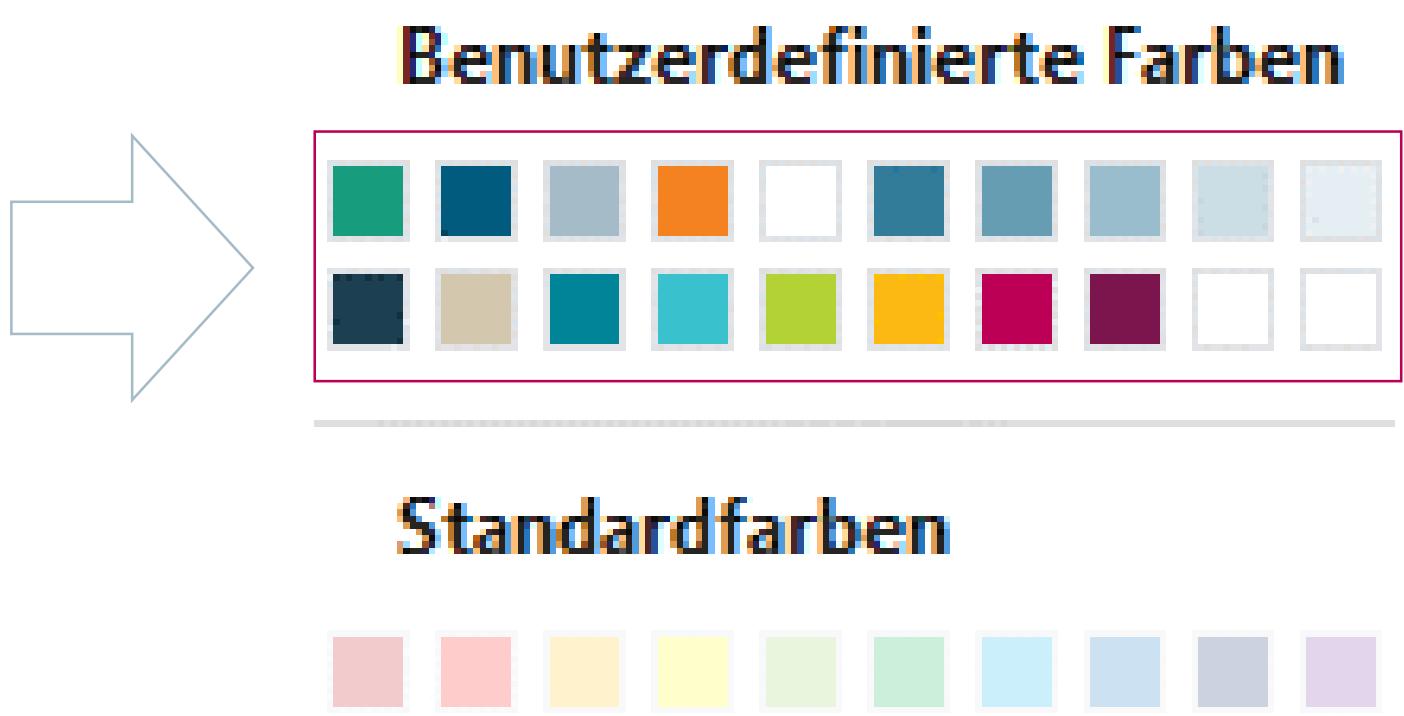
### Second level

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Fourth level  
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    – Sixth level  
1. Seventh level  
    – Eighth level  
*Ninth level*

## Design colors



## Custom colors



In Cooperation with:



Optional area for co-branding

# Headline size, Frutiger LT Com Light, 90 pt, ZAB 108

## Maximum 3 lines

Names, Frutiger LT Com Light bold, 32 pt, ZAB 45, A. Surname1, N. Name1, B. Surname1, N. Name1, C. Name1, N. Surname1, D. Name1, N. Surname1

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<sup>1</sup> References 18 pt, ZAB x 1,4. Trafic te perum faccae volorem oluptam harum a sinventur, volo officat opta  
<sup>2</sup> Sitiorepudae ommos volorum si corem doluptat aut laborerum dit, nihite sectinis rerum rem voluptu restem ipsus mo quo eum  
<sup>3</sup> Lorem ipsum dolor sit quo eum nim vene rero cum natur volorum si corem doluptat  
<sup>4</sup> References 18 pt, ZAB x 1,4. Trafic te perum faccaeitiorepudae ommos volorum si corem doluptat aut laborerum dit, nihite sectinis rerum rem

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Edit master text format	Edit master text format	Edit master text format	Edit master text format
Second level	Second level	Second level	Second level
Third level	Third level	Third level	Third level
Fourth level	Fourth level	Fourth level	Fourth level
■ Fifth level	■ Fifth level	■ Fifth level	■ Fifth level
– Sixth level	– Sixth level	– Sixth level	– Sixth level
1. Seventh level	1. Seventh level	1. Seventh level	1. Seventh level
– Eighth level	– Eighth level	– Eighth level	– Eighth level
Ninth level	Ninth level	Ninth level	Ninth level

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