About the Speakers

**Doug Levin**

**Business Leader, Technologist and Serial Entrepreneur**
- Sole founder and first CEO of Black Duck Software
- Expert in enterprise software, security, IoT, and AI

**Today**
- Advisor and Investor of Prescient Devices, Inc.
- Executive-in-Residence (XIR) at Harvard Business School
- IoT / EC, cybersecurity and ML startup advisor / board member

**Andy Wang, Ph.D.**

**Founder & CEO, Prescient Devices, Inc.**
- Low-code IoT/AI design software

**Founder & CTO, GTI IoT Technology**
- Wireless IoT monitoring solutions
- Over 500,000 IoT devices in deployment

**Technologist for 20+ years**
Agenda

Part I
IoT and Edge Computing

- Data of today, and the future
- Today’s infrastructure
- Industry case studies
- IoT deployment challenges
- Q&A

Part II
Low-code IoT development

- The rise of low-code
- Why low-code
- Best use cases for low-code
- Prescient Designer
- Upcoming Webinars
- Q&A
By 2025

75%

of data will be processed outside the traditional data center or cloud

Gartner
Managed closer to where it is being created

Utilized closer to where it provides value
Taken together, these new locations, data and devices are called the **edge**.

That's the part of the network near the end users, where data is created by sensors, cameras, people with mobile devices, and the entire Internet of Things (IoT).
Today’s Infrastructure
Cloud-Fog-Edge

Thousands of devices

Millions of devices

Billions of devices

Data Center – Cloud
Public / Private / Hybrid

“Fog” Nodes

“Edge” Devices
Example
Content delivery network

Goal
High **availability** and **performance** by distributing the service spatially relative to end users.

- Support for a geographically distributed network
- Uses the cloud, proxy servers & data center(s)
Example

Smart Manufacturing

Connect devices capabilities

• Sensing
• Identification
• Processing
• Communication
• Actuation
• Networking

Network control and management of

• Manufacturing equipment
• Asset and situation management
• Manufacturing process control
IoT Deployment Challenges

- Complexity
- Recruitment & Coordination
- Project Roadmap
- Cloud combinations
- “Last-mile” End-User Requirements
- Difficulties sourcing parts
- Support for CI/CD
- Difficulties processing voluminous quantities of data

Solve with Low-Code and Automated Design
Whitepaper

Accelerating IoT Edge Computing: Time to Value with Prescient Designer

tinyurl.com/pdi-lowcode
Rise of Low-Code Application Development

- **41%**
  
  CAGR for Low-code platforms 2017–2022

- **65%**
  
  Application development in low-code by 2024

- **75%**
  
  Large enterprises adopting 4 or more low-code software by 2024

[Source: Gartner]
What is Low-Code?

Application development with minimal coding

Most popular form: functional block programming

Model-driven: separation of application from underlying platform

[Sources: Mendix]
Low-Code is everywhere

**Industrial Automation**
Rockwell Automation®
RsLogix™

**Integrated Circuits**
Cadence® DE

**Product Test**
NI™ LabVIEW™

**System Design**
MathWorks® Simulink®
## Low-Code Benefits

### Simplicity
- Reduced expertise
- Reduced training
- Increased efficiency
- Consistent quality

### Modularity
- Easy to understand
- Easy to reuse and share
- Improved collaboration
- Improved scalability
Low-Code Users

Enterprise IT/OT teams
Internal solution development

Citizen Developers
Crowd-sourcing projects

System Integrators
Quick-turn applications
Why Should Enterprise Care?

Low-code speeds up organizational learning

11%
Successful IoT & AI adoption in enterprises

73%
Successful adoption with organizational learning

MIT Sloan, BCG
## The Full Landscape

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adopt to</th>
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<tbody>
<tr>
<td>Turnkey</td>
<td>Solve a peripheral need</td>
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<td>Fixed solution</td>
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<td>No-code</td>
<td>Optimize a sequential task</td>
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<tr>
<td>Programmable, constrained to a narrow space</td>
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<tr>
<td>Low-code</td>
<td>Optimize an application</td>
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<tr>
<td>Programmable, widely applicable, constrained to a technology framework</td>
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<tr>
<td>Full-code</td>
<td>Optimize technology performance</td>
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<tr>
<td>Complete freedom</td>
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## Choose the Right Framework

<table>
<thead>
<tr>
<th>Adopt to</th>
<th>Example</th>
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<tbody>
<tr>
<td>Turnkey</td>
<td>Construction company adopts work safety monitoring solution</td>
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<td>Provide quick fix</td>
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<tr>
<td>No-code</td>
<td>Manufacturing company builds operator workflow</td>
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<tr>
<td>Customize sequential task</td>
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<tr>
<td>Low-code</td>
<td>Equipment manufacturer integrates IoT into product</td>
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<tr>
<td>Enhance core competency and competitive advantage</td>
<td></td>
</tr>
<tr>
<td>Full-code</td>
<td>Technology company builds IoT product</td>
</tr>
<tr>
<td>Optimize technology performance</td>
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Example IoT Application

**Dashboard**

- Visualization: charts & alerts
- Interactive: forms & buttons

**Cloud**

- Receive data from 1000 edge devices
- Data analytics & storage

**Edge**

- Camera & edge computer
- Machine vision & machine learning
Full-code Development
Requires strong technology team

**Dashboard**
- Visualization
  - HTML
  - CSS
  - JavaScript

**Cloud**
- App
  - Node.JS / Django

**Edge**
- App
  - Python
  - C

**DevOp**
- Containers, CI/CD
- Microservices
- NGINX, Cookies

**Orchestration**
- Containers, CI/CD
- Comm, I/O, Security,
- System management
Low-Code Development
In Prescient Designer

1 Single app for the complete solution

Dashboard Element

Edge App

Cloud App

Database

Access

Action

Noop

View image

Upload image

Edge device

Display results

Dashboard headers

*Note* text box

Set state

*OK/Cancel* dialog

*Alerts enable/disable* dropdown menu

Set state

Database access
Multiple Development Modes

**NO-CODE**

**LOW-CODE**

**FULL-CODE**
Open Ecosystem

Builds on Node-RED and Node.js

Node-RED
- Low-code programming
- Powerful flexibility
- Strong community support

Node.js
- 98% of Fortune 500
- 200,000 code packages
- Support everything from web functions to ML

Pre-installed on devices from
- Siemens, Samsung, Intel, GE, Schneider, Fujitsu, Advantech, Harting, Hilscher, Opto22, etc.

PDI improves on Node-RED
- Distributed programming & synchronization
- Crash recovery & rollback
- Sensor and hardware support
- Edge-to-cloud security
Use Cases

Best used for

- Applications requiring frequent changes
- Agile integration with core competencies

Transform from hardware provider to service provider

Improve efficiency of manufacturing processes

Integrate with existing processes to build competitive advantages
Turnkey Solution Templates

Fast deployment with programmability

- Remote monitoring
- Predictive maintenance
- Industrial automation
- Training and support
- Software modules library
- Machine vision
- Dashboard
- Day-1 deployment
- Hardware library
- and more
Outlook

**IoT will be embedded in every product and process**

- Edge computing will accelerate
- Low-code will continue to grow
- Learning and iteration are necessary
- IoT is transformative

94% of businesses will use IoT by end of 2021

MICROSOFT
Upcoming Webinars

MAR 24

Prescient Designer for Node-RED users

https://tinyurl.com/pdi-events
Q&A

Whitepaper

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