



The State of IoT Software Development

VDC | Research
Insights for the Connected World

8th August 2024

Speakers and Agenda

Agenda

- Memfault Intro
- State of IoT Software Development Report Overview
- Q & A



Chris Rommel

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Insights for the Connected World



Jesse Dukes

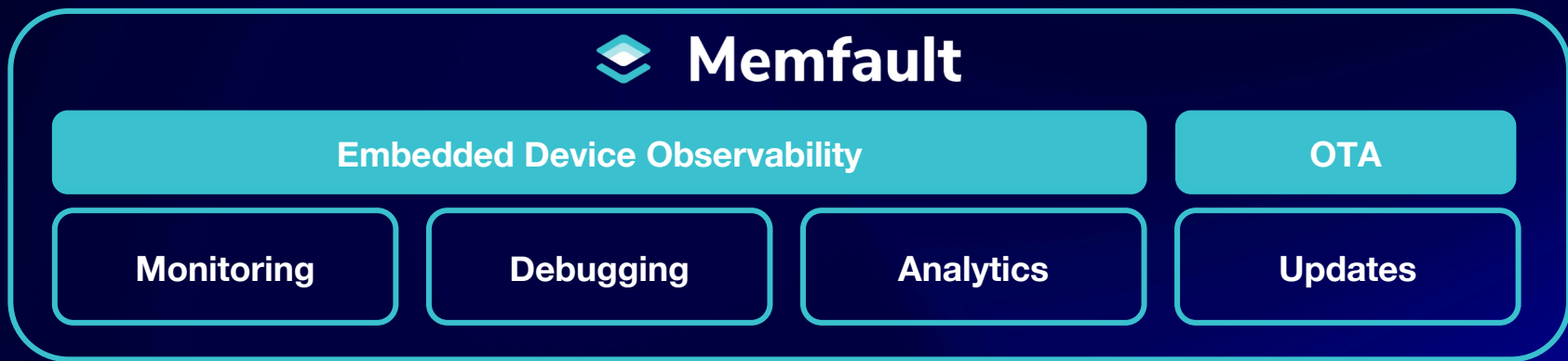
Director of Product
Marketing

 **Memfault**

Memfault helps
embedded development
teams find faults and
ship fixes, **fast.**



Bringing together your development **tools**



Find it → Fix it → Improve it → Ship it

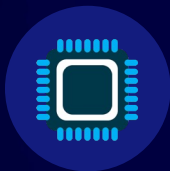


Built for **embedded** devices

With one experience across all major embedded platforms

Power

- ✔ Works on your low power device



MCU

Connectivity

- ✔ Works with any connectivity set-up



Android

Compute

- ✔ Works on highly constrained devices



Linux

The State of IoT Software Development



@chris_rommel

CHRIS ROMMEL – EXECUTIVE VP

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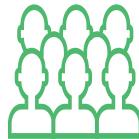
B2B tech market research & consulting



Founded in 1971 in Boston



Longstanding specialized coverage

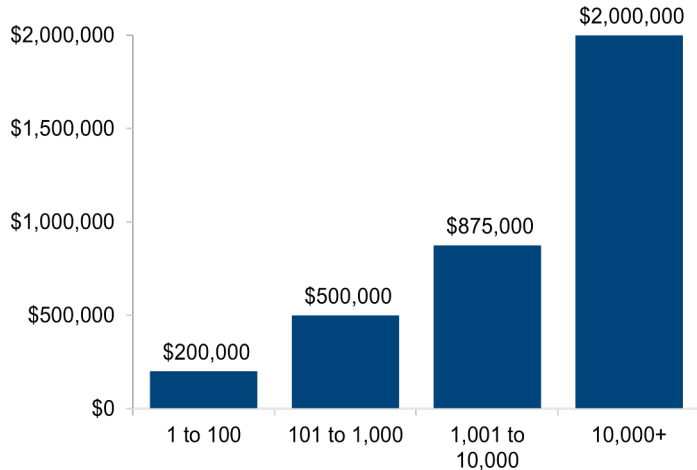


Serving tech users, vendors and investors

CHRIS ROMMEL – EXECUTIVE VP

Pressures Facing IoT Product Development Organizations

Development Cost of IoT Products, by Total Number of Employees



Beyond need to control dev costs, engineering orgs must now architect a foundation for the continuous delivery of business value

Software as a part of hardware systems is still relatively new

Clear need to focus on things other than device manageability

- 43% of projects currently include AI/ML
- 48% said they expect to include such capabilities in 3 years

Many orgs must navigate million-dollar dev problems and tech debt

3rd party software platforms will become an increasingly important tool for both revenue maximization and cost control strategies

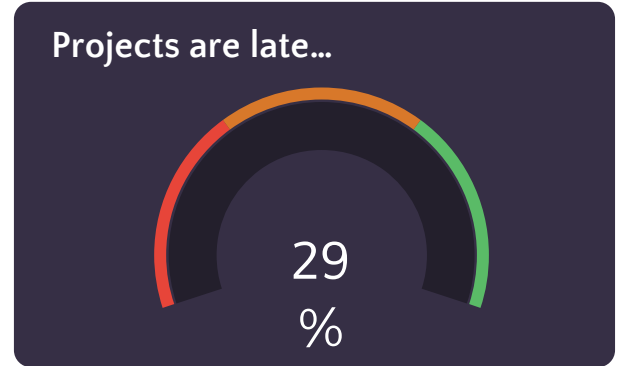
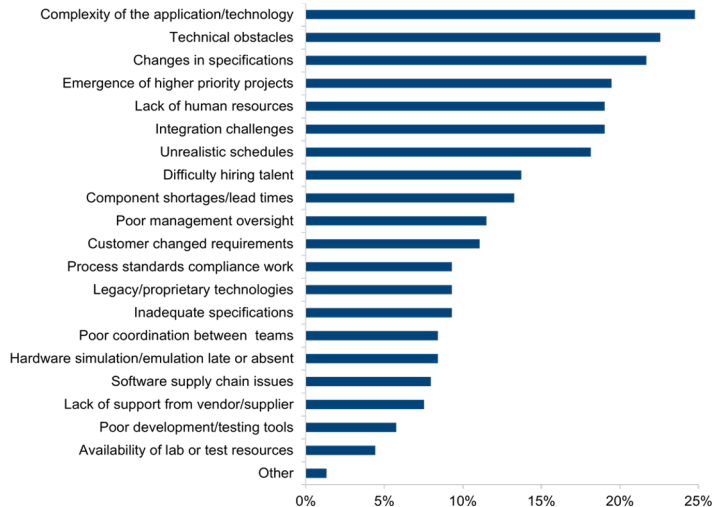
Uneven Progress Toward IoT Potential

The pursuit of IoT opportunity does not guarantee success

New opportunities bring them into uncharted territory, and they need help

Many are already unable to meet schedules for existing projects

Reasons for Project to be Behind Schedule



Challenges to success abound

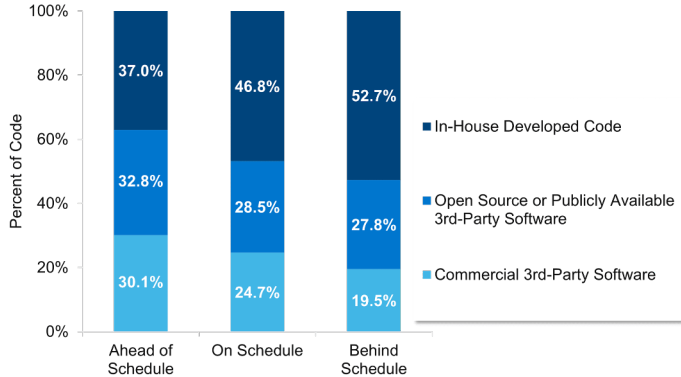
IoT opportunity does not come without challenges and risks

Lack of engineering expertise in connectivity and new challenges / risks (e.g. OTA security; IT/OT integration)

Many traditional technologies and methodologies cannot satisfy needs for today's designs, let alone scale for new ones

Software Growth Fueling Ecosystem Change

**Percentage of Software Code,
by Project Schedule Performance**

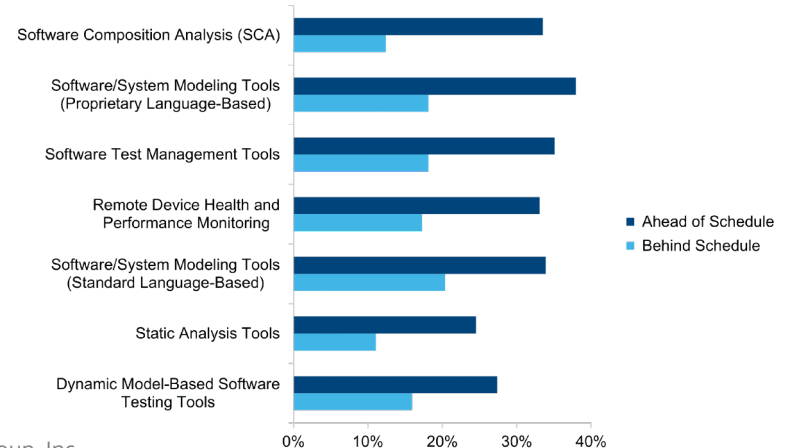


Code growth issues extend beyond scaling resources and efficiency

Already clear connection between code base size and schedule challenges

The status quo no longer suffices

**Software Development Tools Most Used in Projects
Ahead of Schedule vs. Behind Schedule**

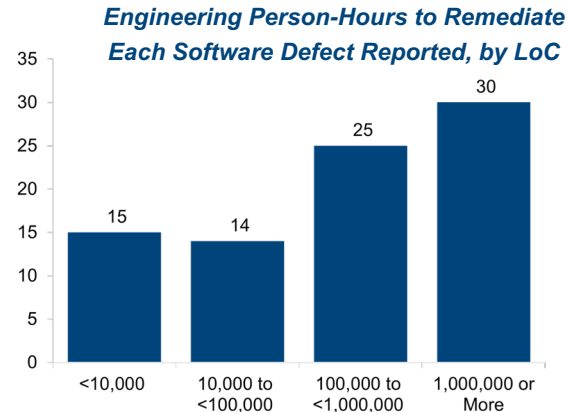
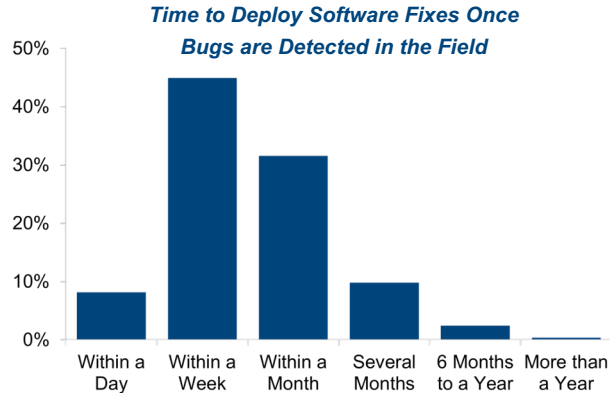


Beyond LoC size, code sources adding additional complexity

Managing SW assets is critical for efficiency and ensuring quality across product lines, requires new tools and best practices

SW content post-product deployment updates brings even greater challenges and need for change

Current Software Update Practices Fall Flat



Software will always need improvements, fixes, and patches

Evolving functionality and new security concerns require reevaluation of code management practices

Software is now a critical point for both value delivery and degradation

- 33% say their org does not adequately test the cybersecurity of products
- That portion rose to 50% among those behind schedule

The quantity of SW errors increases as complexity of the code increases

- As the LoC went up, so did the number of bugs reported
- Fixing defects requires anywhere from 75 hrs - 3 months for the most complex

Critical to limit SW refactoring time to

1. Fuel direct cost savings
2. Maximize revenue generation
3. Focus in-house development assets on new content creation

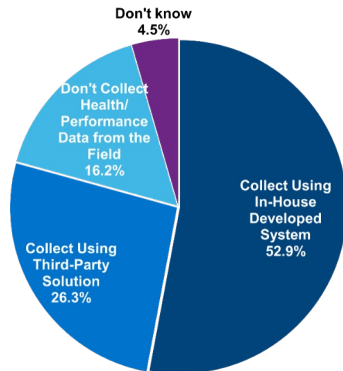
Device Health Data Discoveries

Explosion of content and business value delivered through SW has made process improvements a point of corporate focus

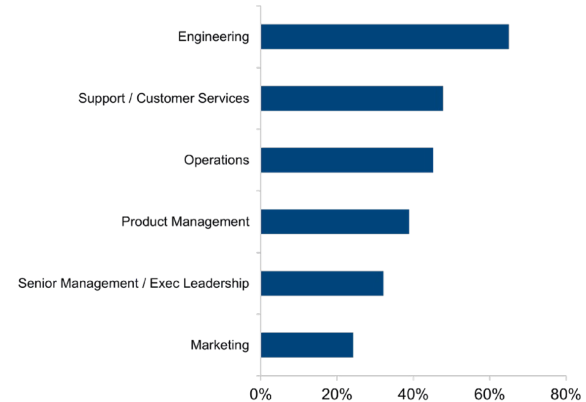
The responsibilities of product development organizations now extend far beyond device shipment

Businesses must be able to develop, deploy, and manage devices to meet customer expectations – and boost profit margins

Collection of Device Performance and Health Data from Products in the Field



Teams in Organization That Use Device Performance and Health Data Collected from the Field



Real-world usage data helps product makers find SW defects faster

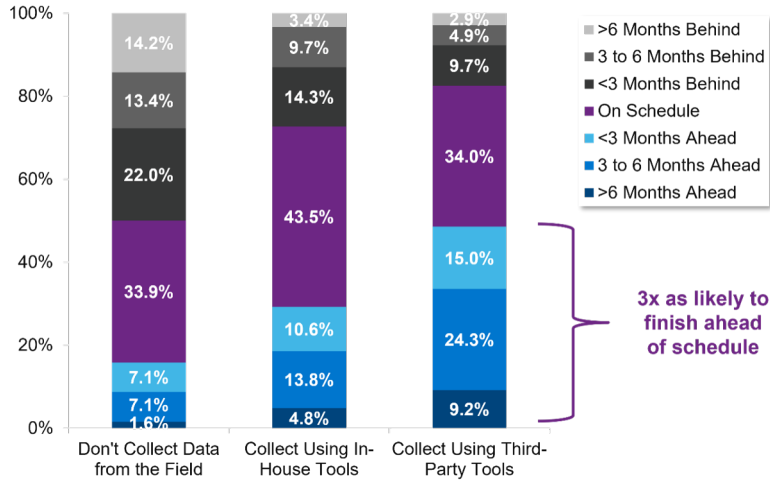
- Fewer customer bug reports and complaints
- The utility of this information extends across roles
- This functionality, and the business models that pair with it, are cornerstone of IoT

>75% collect device performance and health data from deployed products, but the majority still using in-house developed methods

Unfortunately, not all solutions are created equal

Tools for Time-to-Market Savings

*Project Schedule Performance,
by Collection of Device Performance and Health Data*



Device performance and health monitoring solutions help reduce project uncertainty and cost

Organizations using remote device health and performance monitoring solutions were:

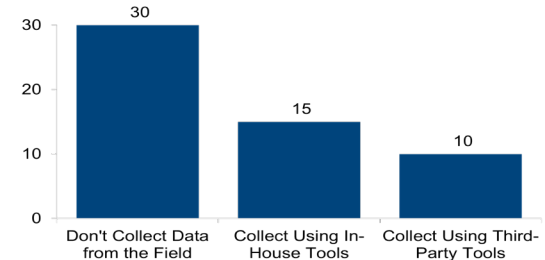
- 3x as likely to finish ahead of schedule vs those collecting no data
- 1.7x as likely to finish ahead of schedule vs those using in-house tool

Using tools to monitor deployed devices saves ½ the time fixing SW

- Allows more time to focus on new, not old features

3rd party tool use saves 57% in overall project development costs

Engineering Person-Hours to Remediate Each SW Defect



Summary & Key Takeaways

01

IoT Challenges Status Quo

OEMs, vendors, and Enterprises are trying to adapt their product and biz model strategies to stay ahead of the pack

New market dynamics, however, have magnified some traditional challenges around complexity, TTM, and quality

02

Focus on Differentiation

New features, use cases, and value delivery streams

But do not underestimate combined operational and development challenges

03

Third-party Solutions Accelerate Time-to-market

New challenge with orgs focused on developed products with deployed software tied to revenue generation

Third-party tools to monitor device performance and health save time and cost

Q&A

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