The Rise in Test Automation for Cognitive Systems (AI)

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1. A quick word from our sponsor, Applitools

Meeting Platform provided by:

RedRex

2. Our special guest moderator, RedRex Co-Founder & CEO

FORRESTER®

3. Featured guest speaker, Forrester VP & Principal Analyst

4. Cyberworks Robotics, Founder & CEO

CYBERWORKS ROBOTICS

CrossWing

Trellis

5. CrossWing and Trellis, President & CEO

6. Introducing QA Consultants' xCog Test Automation Accelerator

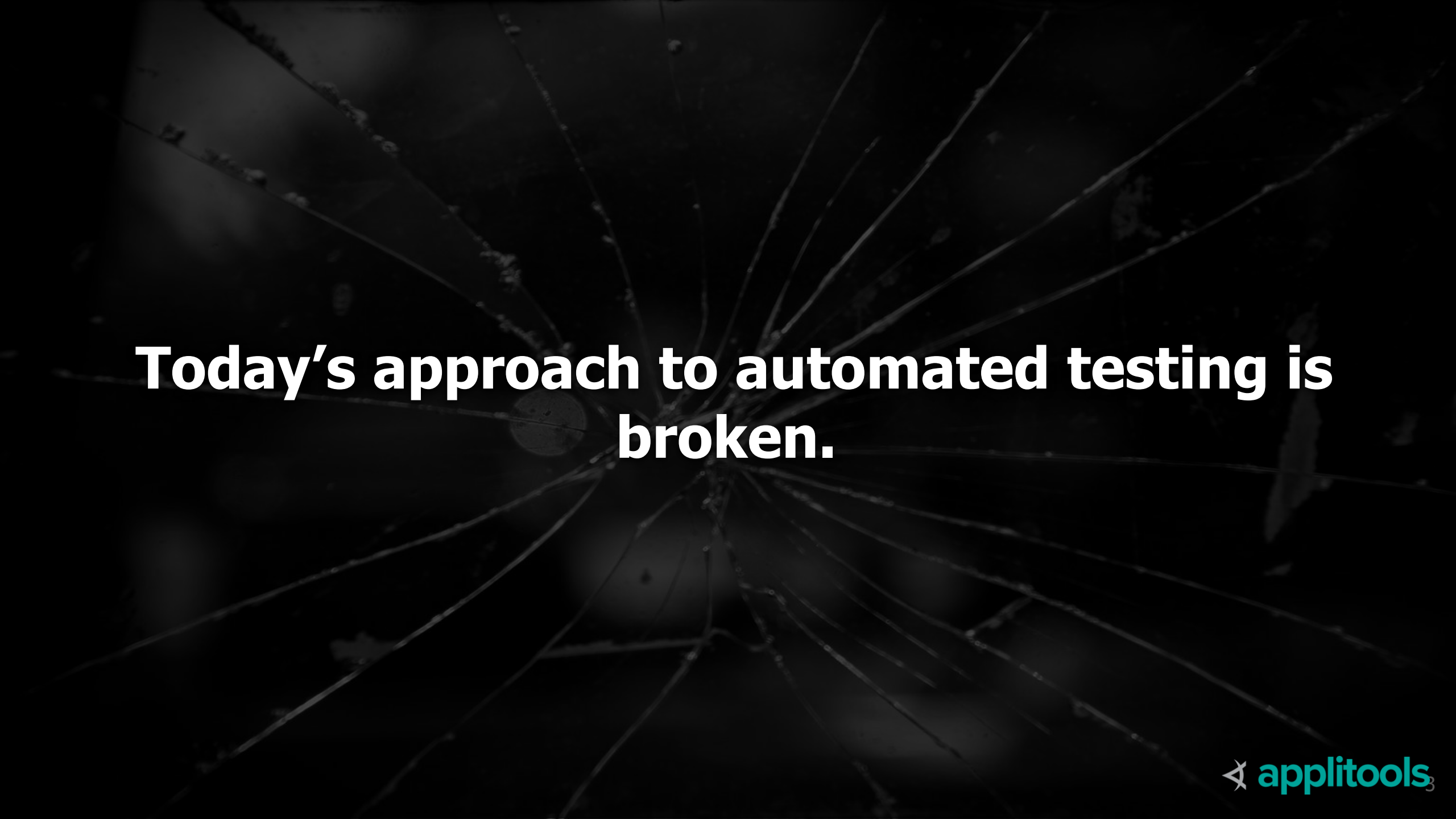
QA Consultants

Next Generation Test Automation Powered by Visual AI

Increase quality, accelerate delivery, and reduce cost with the world's most intelligent test automation platform.

Presented by:
Daniel Levy
Senior Director, Product Marketing
@dlevy

applitools


Today’s approach to automated testing is broken.

What we hear from engineering & quality leaders

Today's approach to automated testing is broken.

Test Creation is Slow

Test authoring is time consuming - this can slow down releases or lead to poor quality tests.

Automated Tests are Brittle

Locators are required for browser interaction and assertions - the more thorough the test, the more costly it is to maintain.

Growing Pains

Over time, more tests are added - which means more locators, more flakiness.

Cross Browser Fail

Brittle tests running across multiple browser and viewport combinations further reduce stability, wasting time and money.

Slow / Broken Builds

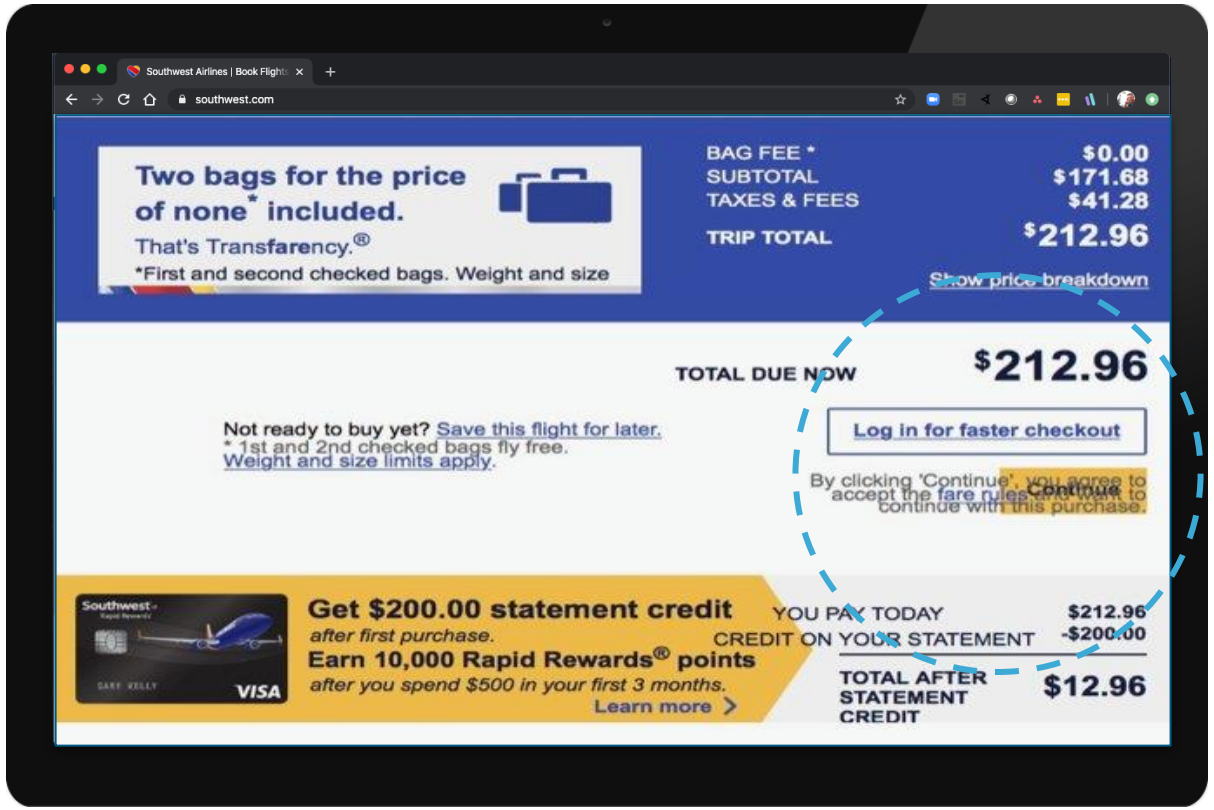
Automated testing is a necessity for successful CI/CD environments, but constant false positives and slow test runs can ruin developer productivity.

Bugs Still Escape

Traditional automated testing frameworks are not built to detect modern app defects - and as a result, major bugs slip into production.

Bugs Still Escape

Traditional automated testing frameworks are not built for modern apps.



Southwest

Bugs Still Escape

Traditional automated testing frameworks are not built for modern apps.

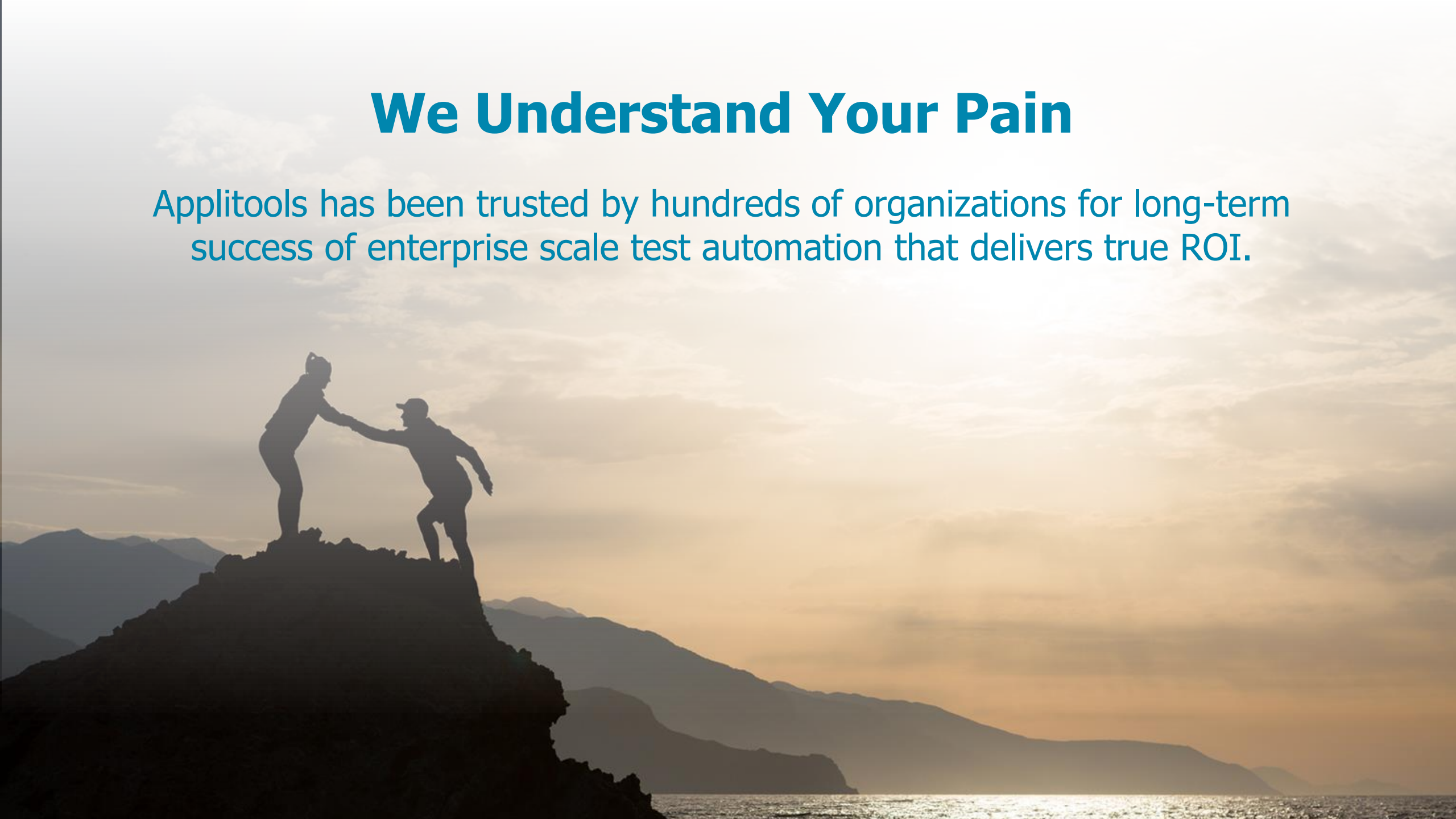
yelp

Bugs Still Escape

Traditional automated testing frameworks are not built for modern apps.

We Understand Your Pain

Applitools has been trusted by hundreds of organizations for long-term success of enterprise scale test automation that delivers true ROI.



We Have Diverse, Amazing Customers

Banking & Finance

Plus many more, including 5 of the largest 10 banks in the world.

Retail

Plus many more prominent online retailers use Applitools to deliver better experiences.

Technology

Plus many more, including 10 of the largest 10 tech companies.

Healthcare & Pharma

Plus many more, including 6 of the largest 10 global pharmaceutical companies.

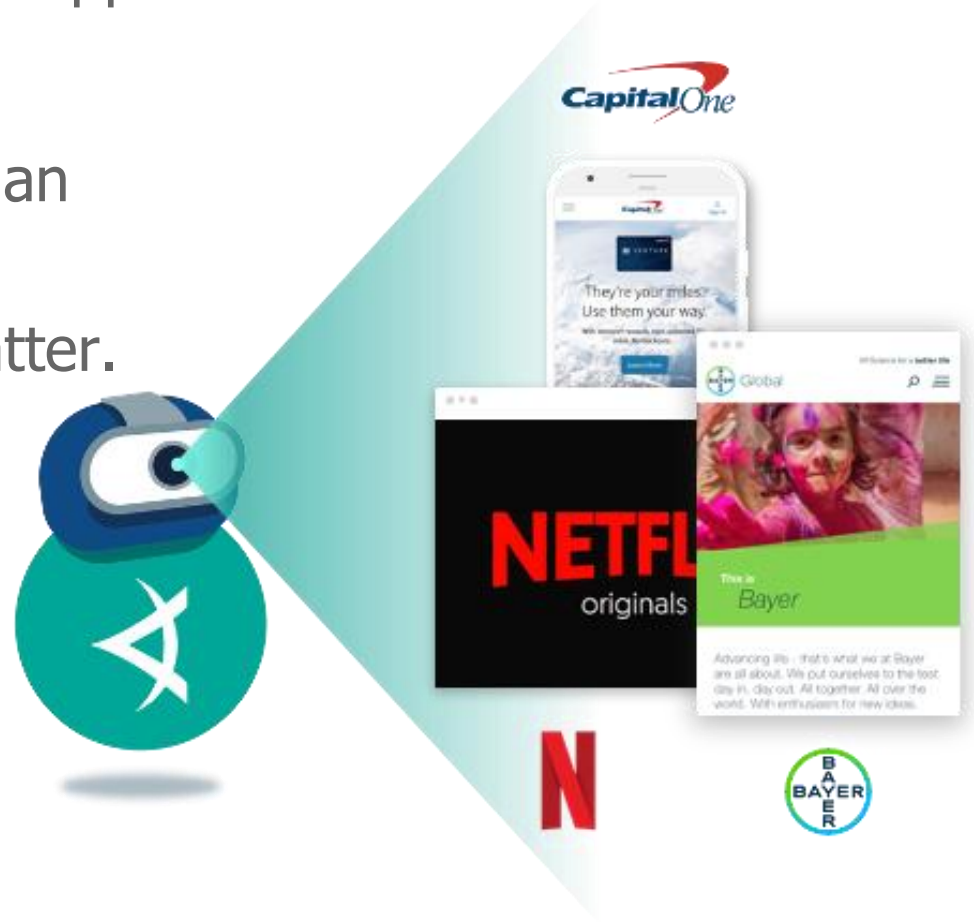
Other

Hundred of companies from Media, to Transportation, to Insurance use Applitools.

Next Generation Test Automation Through Visual AI

Our Mission is to help your team release perfect apps much faster at a reduced cost.

We invented Visual AI that replicates the human eye and brain, looks at every screen and page in seconds, and spots app regressions that truly matter.



We help teams with:

- ➔ Functional Testing
- ➔ Visual Testing
- ➔ Web, Mobile, and UI/UX Testing
- ➔ Cross Browser & Device Testing
- ➔ Compliance Testing
- ➔ Localization, Accessibility, PDF, & More

One Intelligent Platform

Adding Applitools Visual AI to your existing test automation framework allows quality teams to release perfect apps faster and as a reduced cost.

Visual AI

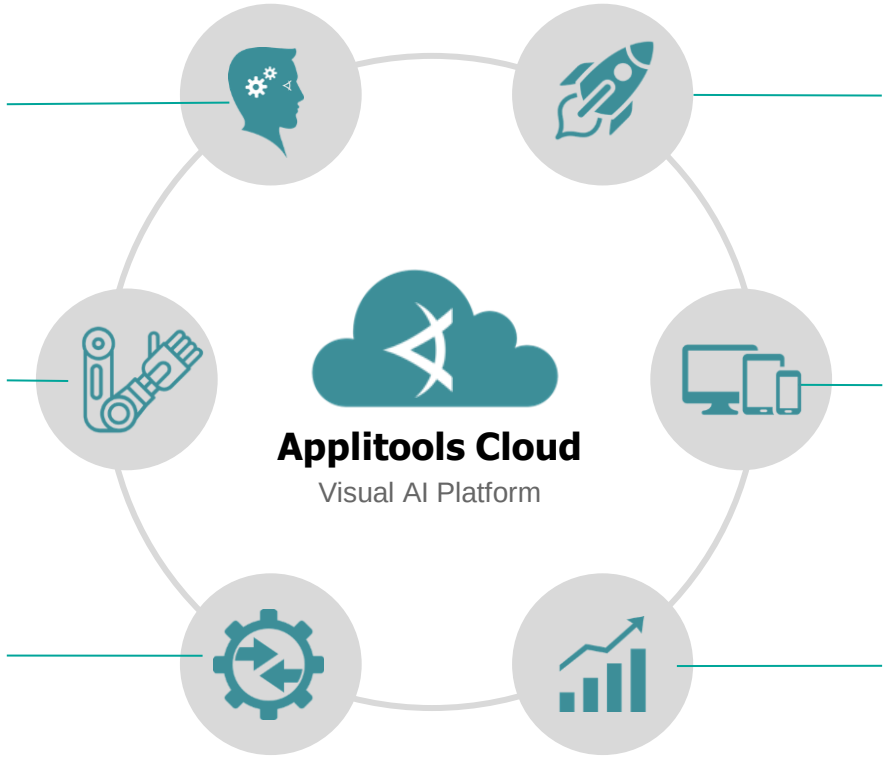
Industry's only AI powered computer vision replicates the human eye & brain.

Ultimate Efficiency

Create tests faster & with fewer brittle locators and labels.

SDKs & Integrations

SDKs to augment all modern test frameworks, and integrations with popular source control, CI, and defect tracking systems.



Speed of CI/CD

Execute tests in seconds vs minutes for faster builds and on-time delivery.

Perfection Across All Screens

Ultrafast Grid ensures visual perfection across all browsers, screens, and viewports.

Ultrafast Grid Architecture >>

Increase Test Coverage

Open-ended, AI powered assertions, reduce code, maintenance while increasing test coverage.

Visual AI: The Empirical Evidence

5.8X
FASTER

Visual AI allows tests to be authored 5.8x faster compared to the traditional code-based approach

5.9X
MORE EFFICIENT

Test code powered by Visual AI increases coverage via open-ended assertions and is thus 5.9X more efficient per line of code.

3.8X
MORE STABLE

Reducing brittle locators & labels via Visual AI means reduced maintenance overhead.

45%
MORE BUGS CAUGHT

Open-ended assertions via Visual AI are 45% more effective at catching bugs.

Source: 2020 "Impact of Visual AI on Test Automation" Study

Use Cases

> *We use Applitools very very extensively for localization...we support 53 locales which adds up to about 100 languages that we support*

Bijoya Chatterjee @ Sony PlayStation

Excerpt from Applitools Future of Testing Event 2020

slack	**Visual & Functional Regression Testing**	Compare every version against the baseline to add full UI coverage + Test functionality of rich UI
adidas	**Visual Acceptance Testing & User Experience Monitoring**	Identify all UI changes before deployment and apply continuous monitoring after deployment
BAYER	**Compliance and Documents Validation**	Validation testing as part of compliance validation process
Capital One	**RWD & Cross Browser/device Testing**	Full UI validation on all environments, including cross browser/device visual validation
Microsoft	**Localization Testing & Advanced Use Cases**	Fully automated localization testing + page comparison against graphic design

Create your free account today:

https://applitools.com/register

RedRex

Connecting the Digital and Physical

Founding Team

Jennifer Bonine

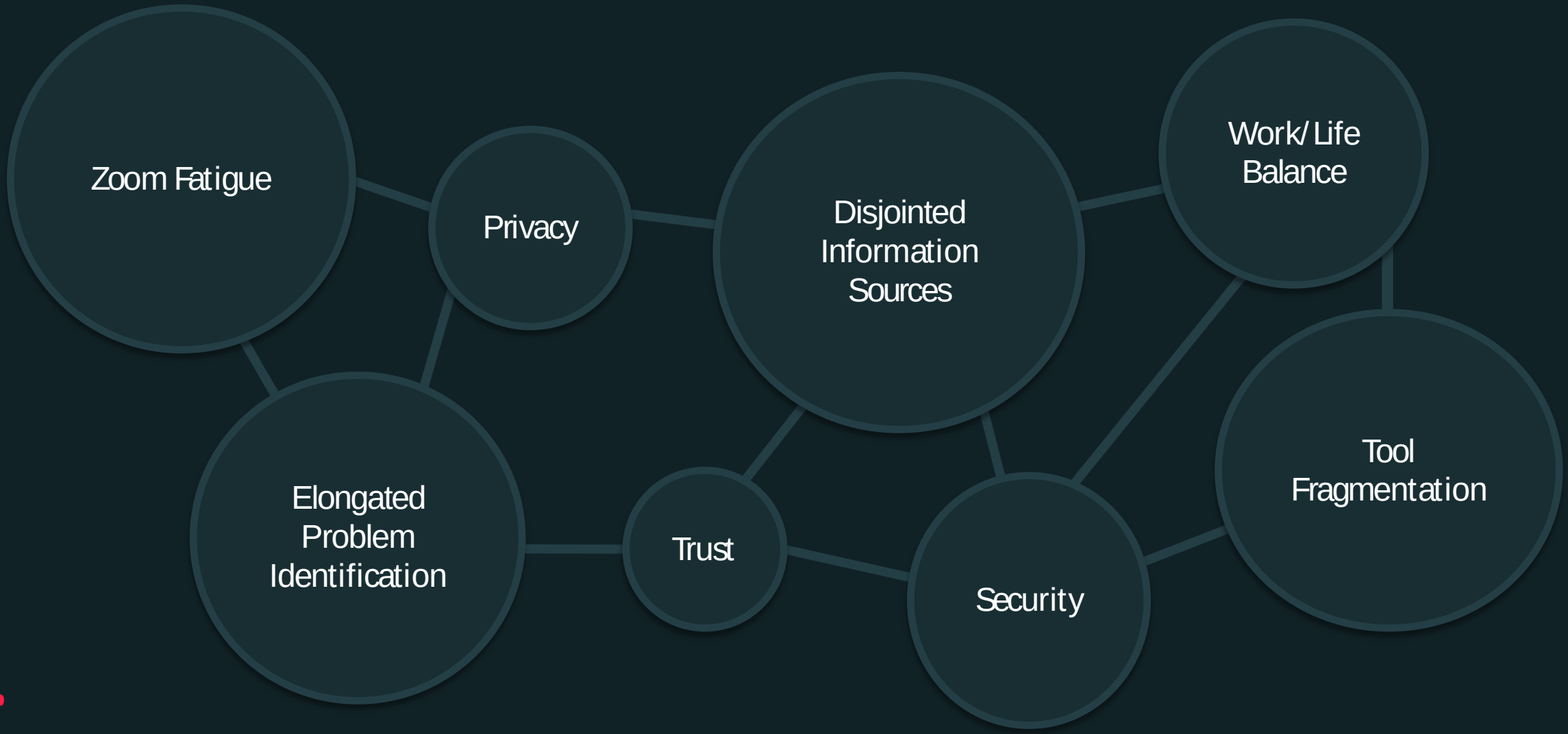
Andrew Birkholz

Rick Faulise

Disney · ORACLE · Microsoft · RIOT GAMES · TARGET · DELL · S&P Global · Google

Problem Statement

The Problem with Distance and Digital



The Need for Digital Spaces

Emphasis on remote capabilities

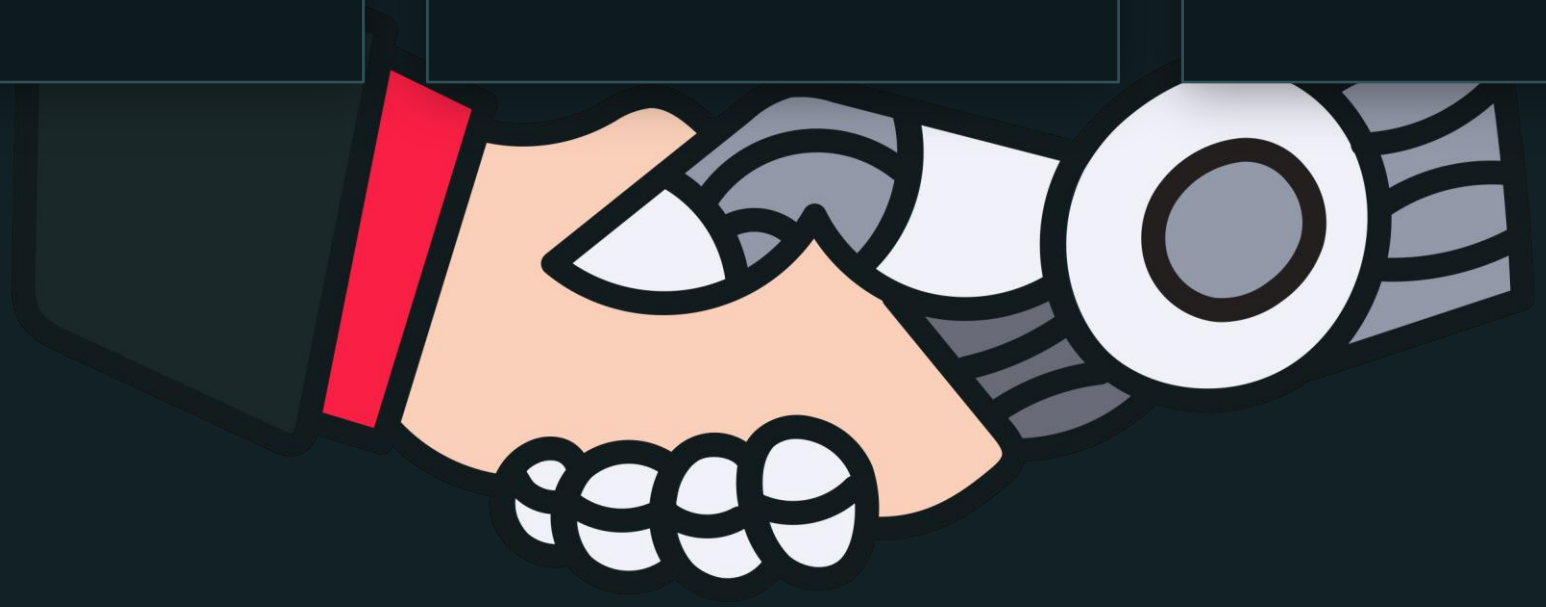
There is currently a push to accommodate remote working and minimize in person interactions.

Soft landing to hard problem

Individuals and companies are looking for a simple approach to allow resources to connect remotely.

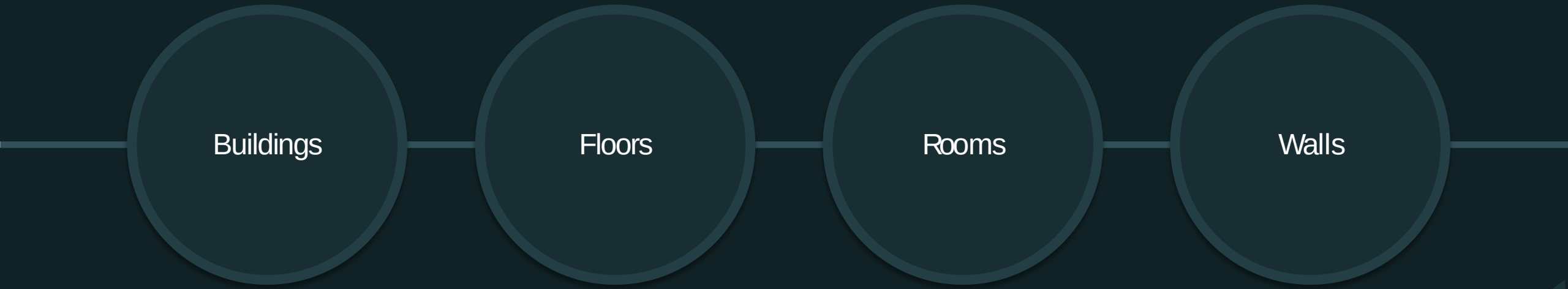
Workspaces are forever changed

Covid-19 has forever changed the way we will interact as companies from business to interpersonal interactions.



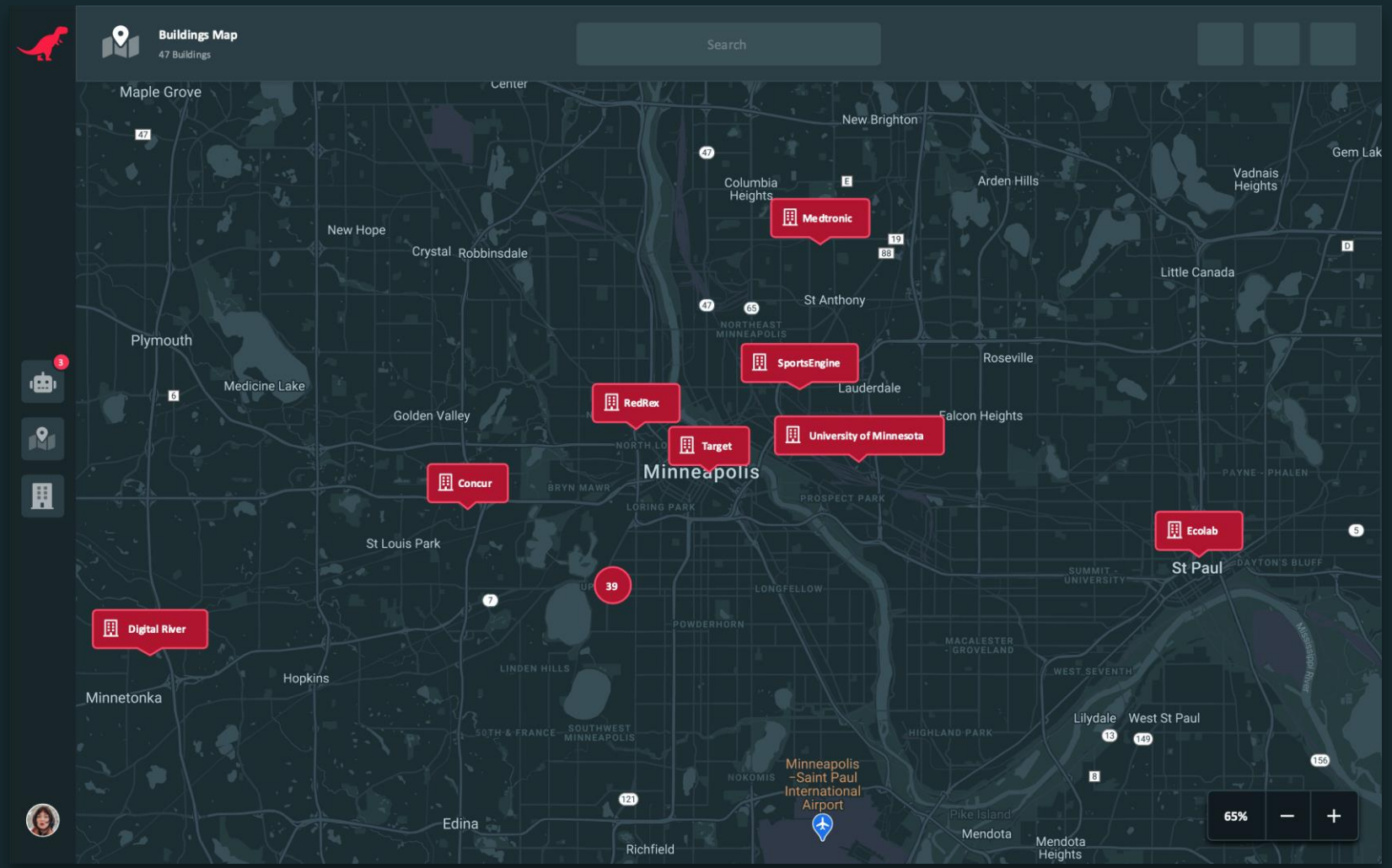
Building Blocks

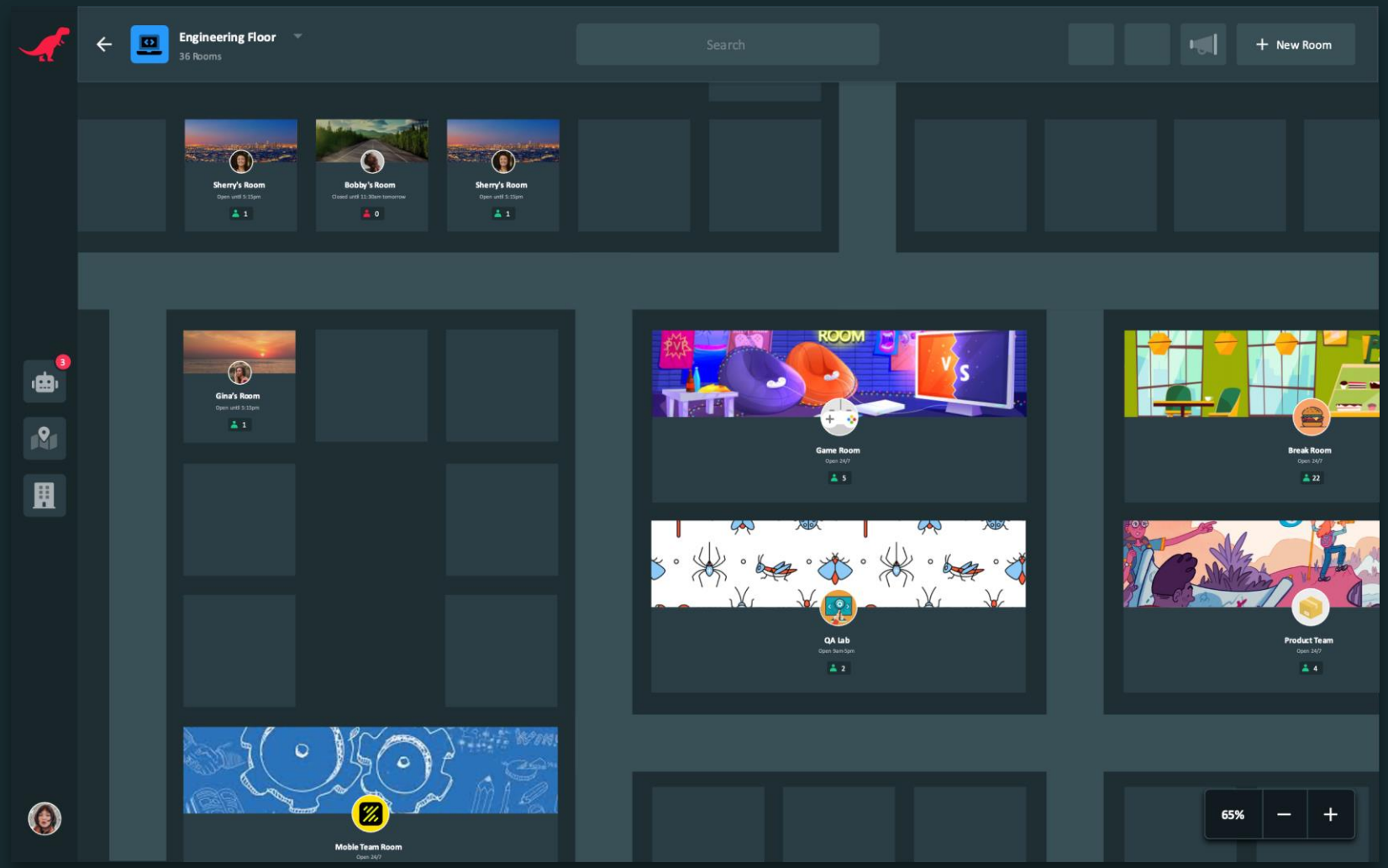
The virtual workspace is comprised of four core components



Buildings

A building has floors or levels, just like a real office building. Users can invite outsiders to visit their building just like they would in real life.





Floors & Rooms

Floors have two basic ingredients: **rooms** and **hallways**.

Users can build their floor plan and choose the room types they want on the floor.

Initial Room Types:

- Personal Offices
- Conference Rooms
- Team Rooms

Walls

Walls are the modules or functionalities within a given room.

Types:

- Desk
- Whiteboard
- Digital Assistant
- Dashboards
- Meeting Timeline & Summaries
- Wiki
- Custom Walls

Customers

Customer adoption around four areas.

Startups

Social: ex: e-sports

Education

Enterprise

Get in touch or join us after in the session in the Tech Support/RedRex Lounge

RedRex

jennifer@redrex.com

The Rise in Test Automation for Cognitive Systems (AI)

MAY 25, 2021 12PM ET – 1PM ET

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VIVEK BURHANPURKAR
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CYBERWORKS ROBOTICS

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FORRESTER®

TONI JARDINI
Test Automation Expert
QA Consultants

STEPHEN SUTHERLAND
CEO
CrossWing

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It’s Time To Get Really Serious With Testing Your AI

Diego Lo Giudice
Vice President, Principal Analyst

May, 2021, QA Consultants Webinar

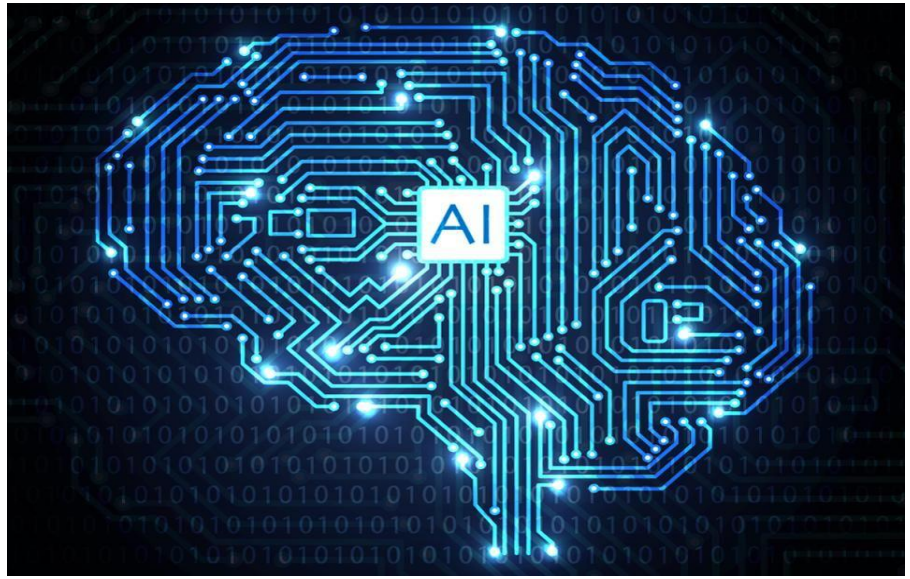
FOR APPLICATION DEVELOPMENT & DELIVERY PROFESSIONALS

No Testing Means No Trust In AI: Part 1

Ensure Testing Of Your AI-Infused Applications

November 12, 2019

Source: Forrester Research



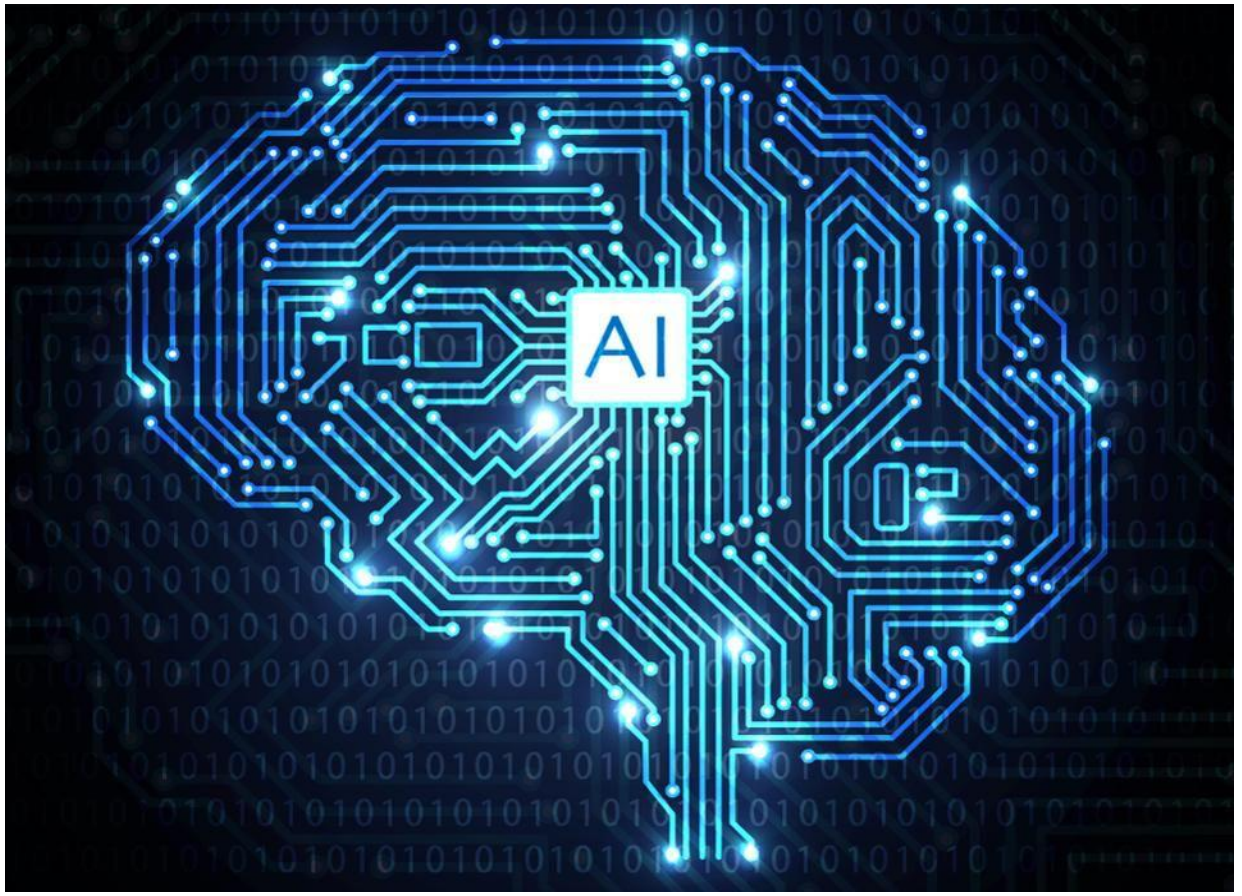
PART 2: NEW!

FOR APPLICATION DEVELOPMENT & DELIVERY PROFESSIONALS

It's Time To Get Really Serious With Testing Your AI

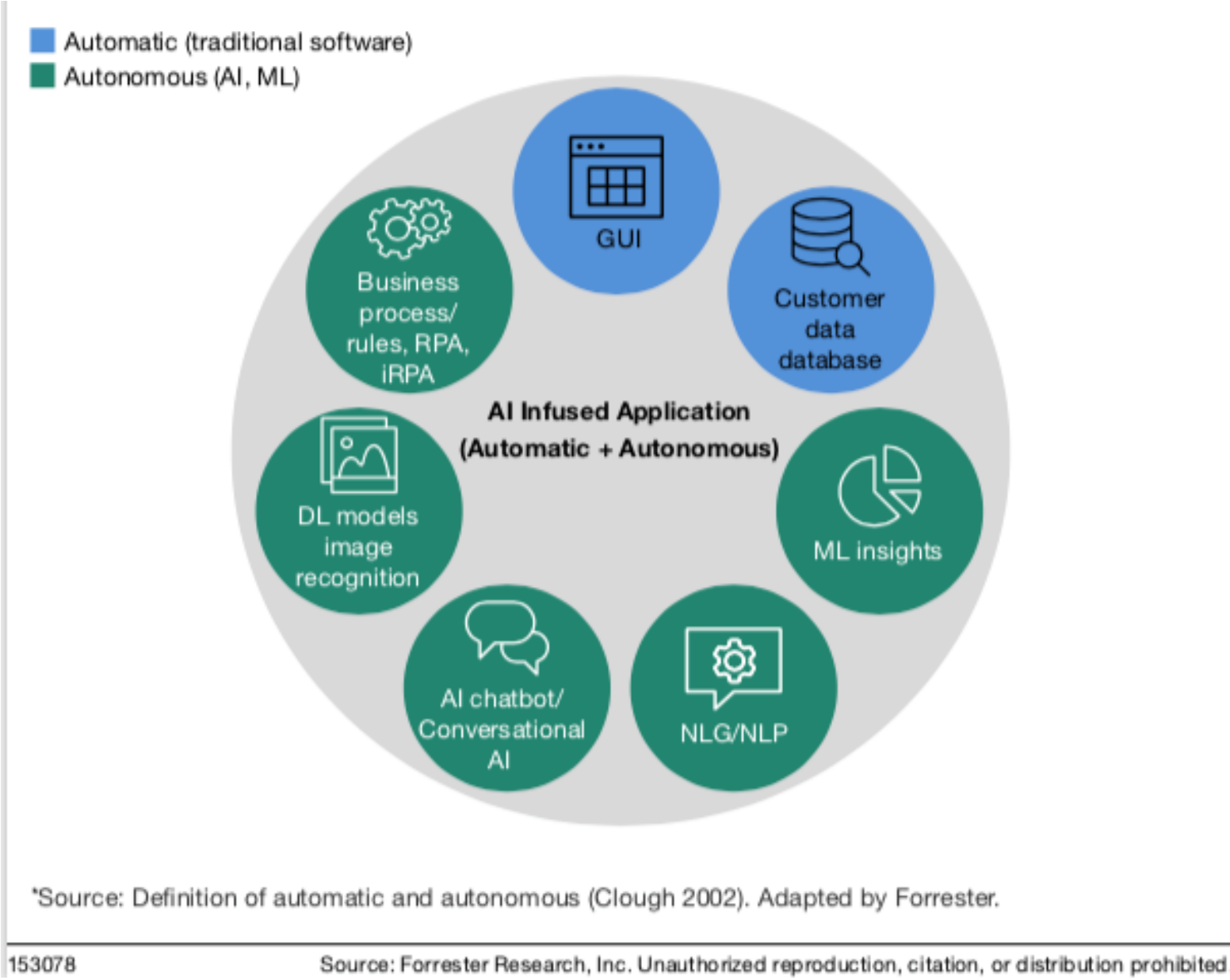
Create A Clear Strategy and Test Automation Approach

Source: Forrester Research



An AI Infused Application (AIIA) is a combination of both traditional SW code and AI code that learns!

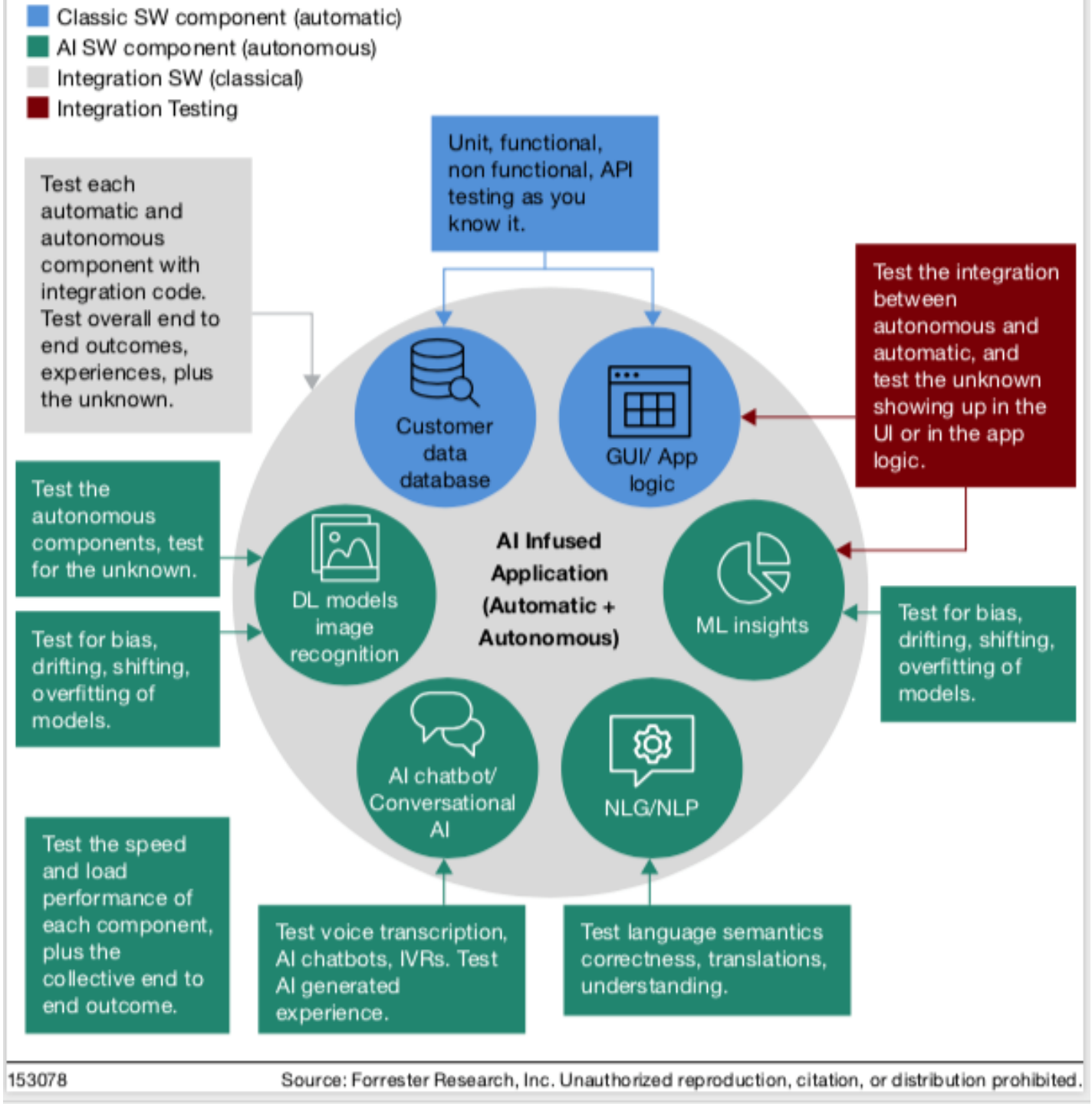
Software that speaks, listens, sees, senses, learns and decides..



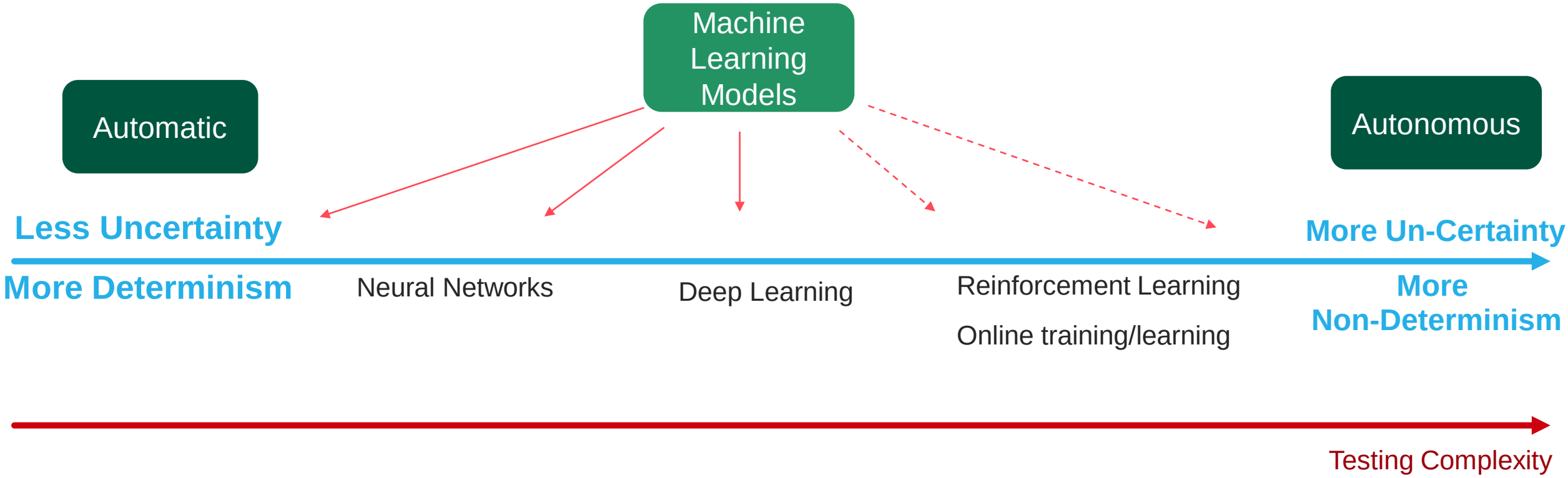
*Source: Definition of automatic and autonomous (Clough 2002). Adapted by Forrester.

153078 Source: Forrester Research, Inc. Unauthorized reproduction, citation, or distribution prohibited

Testing an AIIA Is much more than testing the sum of all parts plus their Interaction / Integration, and un-expected uncertain outcomes!



And the more autonomous machine learning algorithms and AI are the more they disrupt testing



Why is there more or better testing needed ?

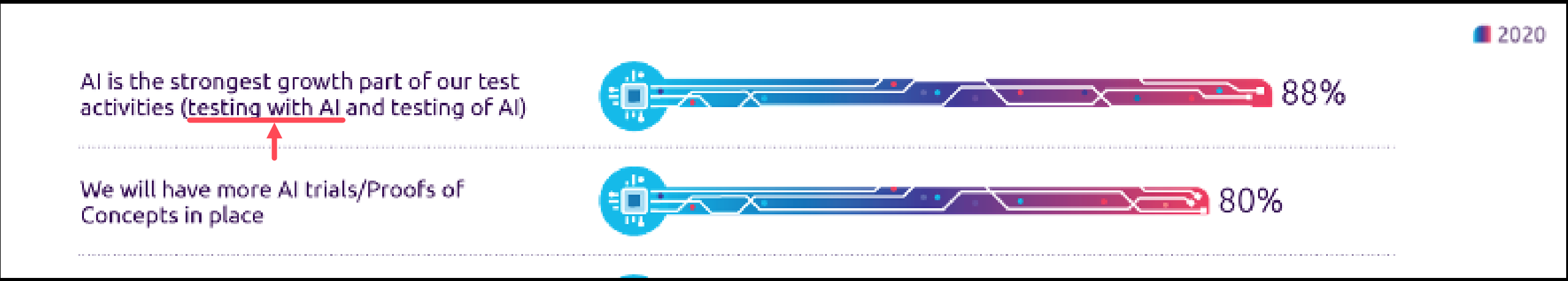
AIIAs Are involved in strategic decision making

Are often responsible for people's lives (i.e., self-driving cars and autopilots).

Are becoming increasingly riskier as humans get out of the loop with more automation

So, are organizations testing AIIA’s well and enough ?

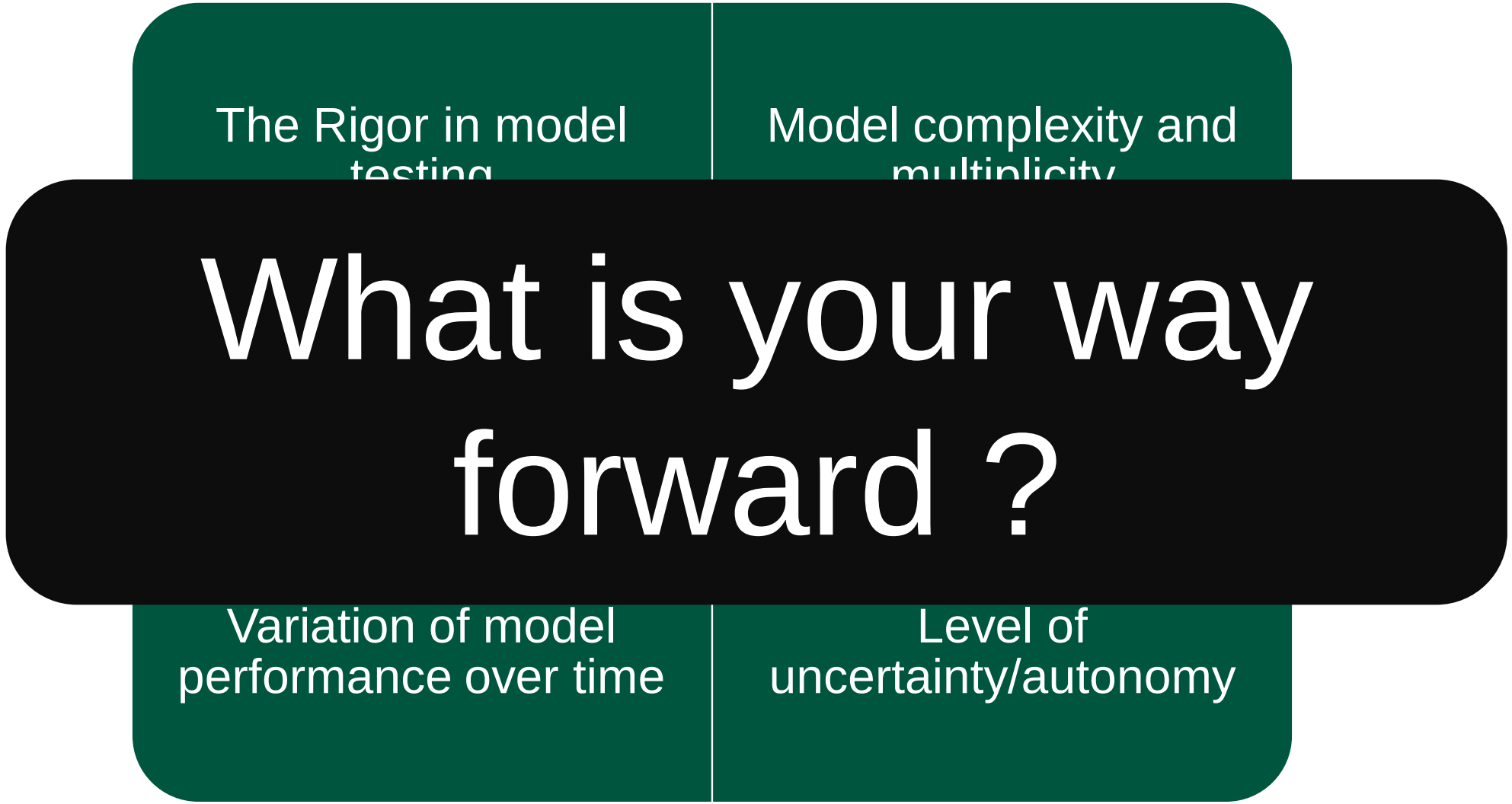
More testing with and for AI are in the plans in coming years…because of growing AI Infused Applications !



Source: World Quality Report 2020

The good news: most of the types of sw testing can be applied in testing of AIIAs….

The bad news: there are challenging factors that influence testing of AIIA, here's four of them…

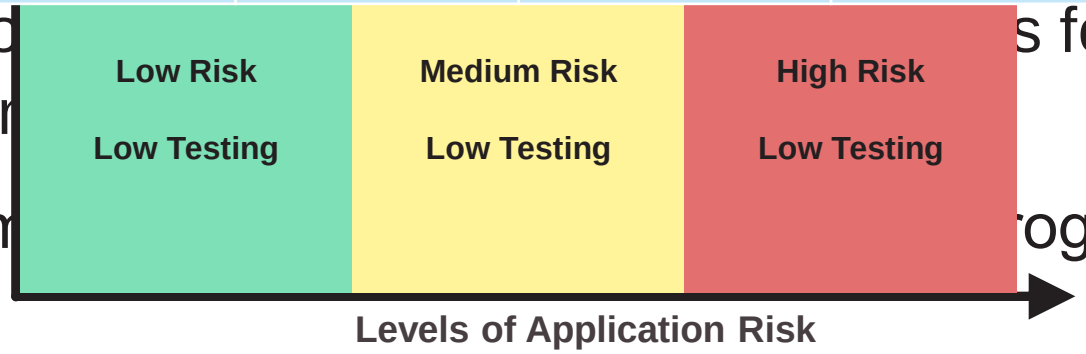


Start now with a proper AIIA test strategy

	Automatic SW Unit Testing	Functional Testing	Load/Speed Performance	End to End integration testing	Production Testing (Monitoring)	Data Quality For Training and Testing	Model Validation, Accuracy	Model and AIIA Bias testing
Data Engineer				x		X		
Data Scientist			X		X		XXX	XX
Testing SME		XXX	XXX	XXX	XX	XX	X	XXX
Developers	x	x	x	x	XX			
Business Stakeholders		X	X	X				X

7. Pressure vendors fo s for more test automation in data-r

8. Not all of it is "autom rogress to get there




The future of testing AIIA is evolving
and there is no set journey yet…
But you must start your journey now !

Related AI research

- No Testing Means No Trust In AI: Part 1 Forrester report
- "It's Time To Get Really Serious With Testing Your AI" Forrester report
- Diego Lo Giudice (host), "Avoiding AI Gone Wrong: The Challenges Of Testing AI Applications," What It Means, Forrester, January 23, 2020
- Testing AI-Infused Applications: The Good, The Bad, And The Ugly Forrester webinar
- Diego Lo Giudice, "No Testing, No Artificial Intelligence!", Forrester Blogs, November 18, 2019
- The Path To Autonomous Testing: Augment Human Testers First Forrester report
- Diego Lo Giudice, "Autonomous Testing Is Like Autonomous Driving: The AI Needs Human Assistance," Forrester Blogs, January 9, 2019
- Trend: AI Learns To Code Enterprise Applications, Forrester
- Diego Lo Giudice, Mike Gualtieri, and Jeffrey Hammond, "Prepare For AI That Learns To Code Your Enterprise Applications (Part 1)," Forrester Blogs, March 18, 2021

Thank You.

Diego Lo Giudice
Vice President, Principal Analyst

dlogiudice@forrester.com

CYBERWORKS ROBOTICS

Vehicle Agnostic
AI Self-Driving Platform

vivek@cyberworksrobotics.com

One Platform, “Unlimited Applications”

Tow-Tractors / AGV

World’s First Autonomous
Greenhouse Tug

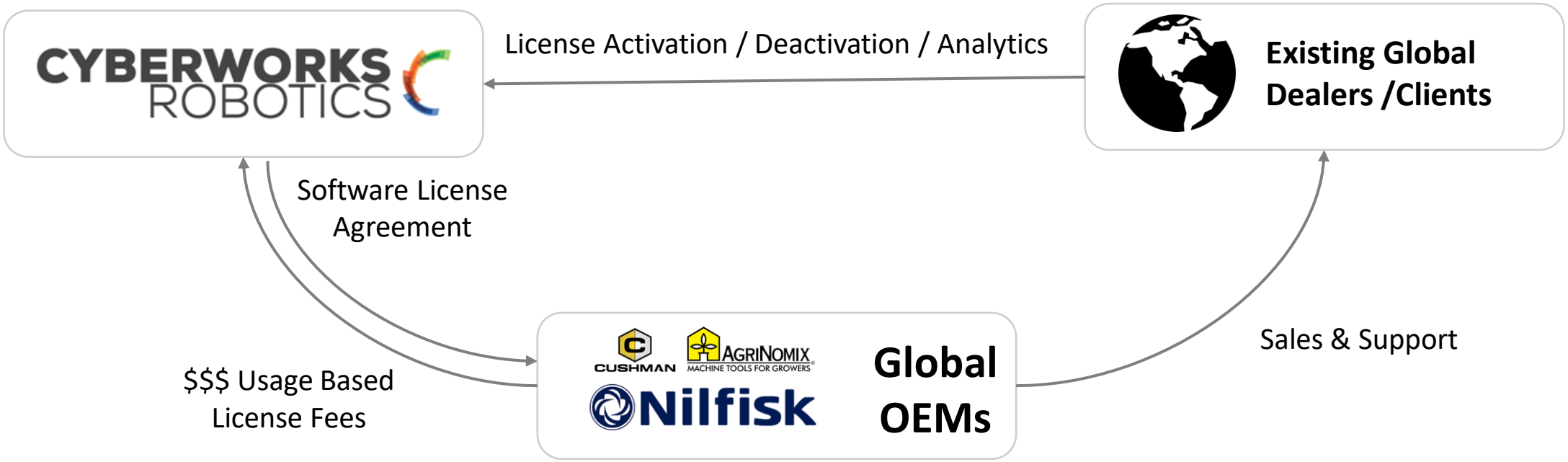
Floor / UV Cleaners

World’s First Autonomous
Industrial Vacuum

Wheelchairs

World’s First Autonomous
Hospital Wheelchair

Business Model - Global OEM Licensing



- RAPID PRODUCT DEV CYCLE: **6 WEEKS**
- DE-RISK OEM PRODUCT ROLLOUT
- PIONEERING EXPERTISE SINCE 1980's

More *"Cyberworks Inside"* Product Examples

Nilfisk

- **World's First** Autonomous UV + Floor Scrub

CUSHMAN

- **World's First** Greenhouse Tractor-Tug

CYBERWORKS ROBOTICS

Kubota

KLAXON

- **World's First** Autonomous Wheelchair in Medical Clinical Trials

BERG HORTIMOTIVE

- Most Popular Greenhouse Tractor in the EU

Partner Network

CYBERWORKS ROBOTICS

Research Partners

- University of Toronto
- University of Waterloo
- Harvard University
- OntarioTech
- Seneca
- University of Washington

Non-Dilutive Stakeholders

- NSERC CRSNG
- Ontario Centres of Excellence
- MaRS
- ventureLAB Mentoring | Partnering | Connecting
- IMPACT CENTRE

Commercial Collaborations

- intel
- aws
- AgriNomix Machine Tools for Growers
- Cushman

Pilots

- UHN Toronto General Toronto Western Princess Margaret Toronto Rehab Michener Institute
- Fernlea Flowers
- YVR Vancouver International Airport Beyond, Every Day.
- Nilfisk

CYBERWORKS ROBOTICS

QA SIMULATION

>150,000 HOURS SIM TESTING

48 GPU CORES 24/7

aws

QA

SCIP

SMART COMPUTING FOR INNOVATION

CENGN

Vehicle Agnostic AI Self-Driving Platforms

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A “Cleaner” way to Quality

Rapid Control System Defect Identification

Challenge:

1. Simulate real world challenges that would be too costly in a physical lab environment

Approach:

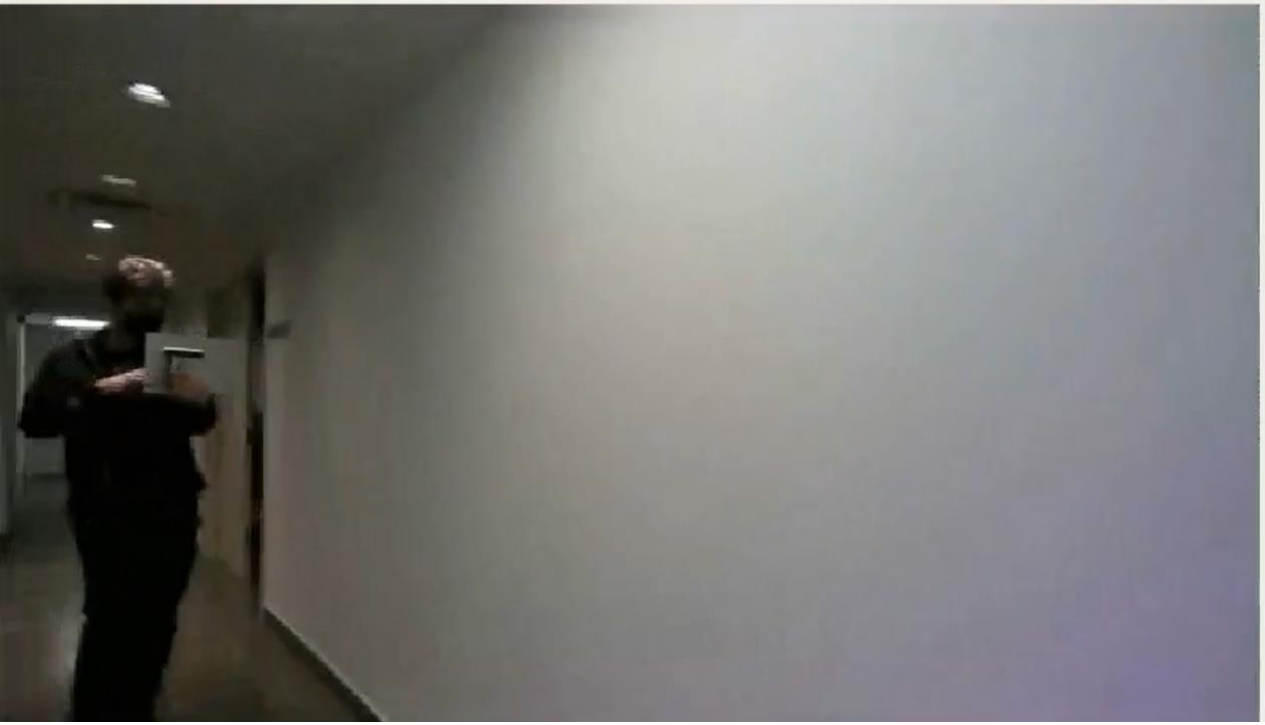
1. Implement a model-based solution that with the ability to inject obstacles
2. Execute automated tests across millions of simulated events
3. Repeat the process over several iterations determining highest risk defects

Results:

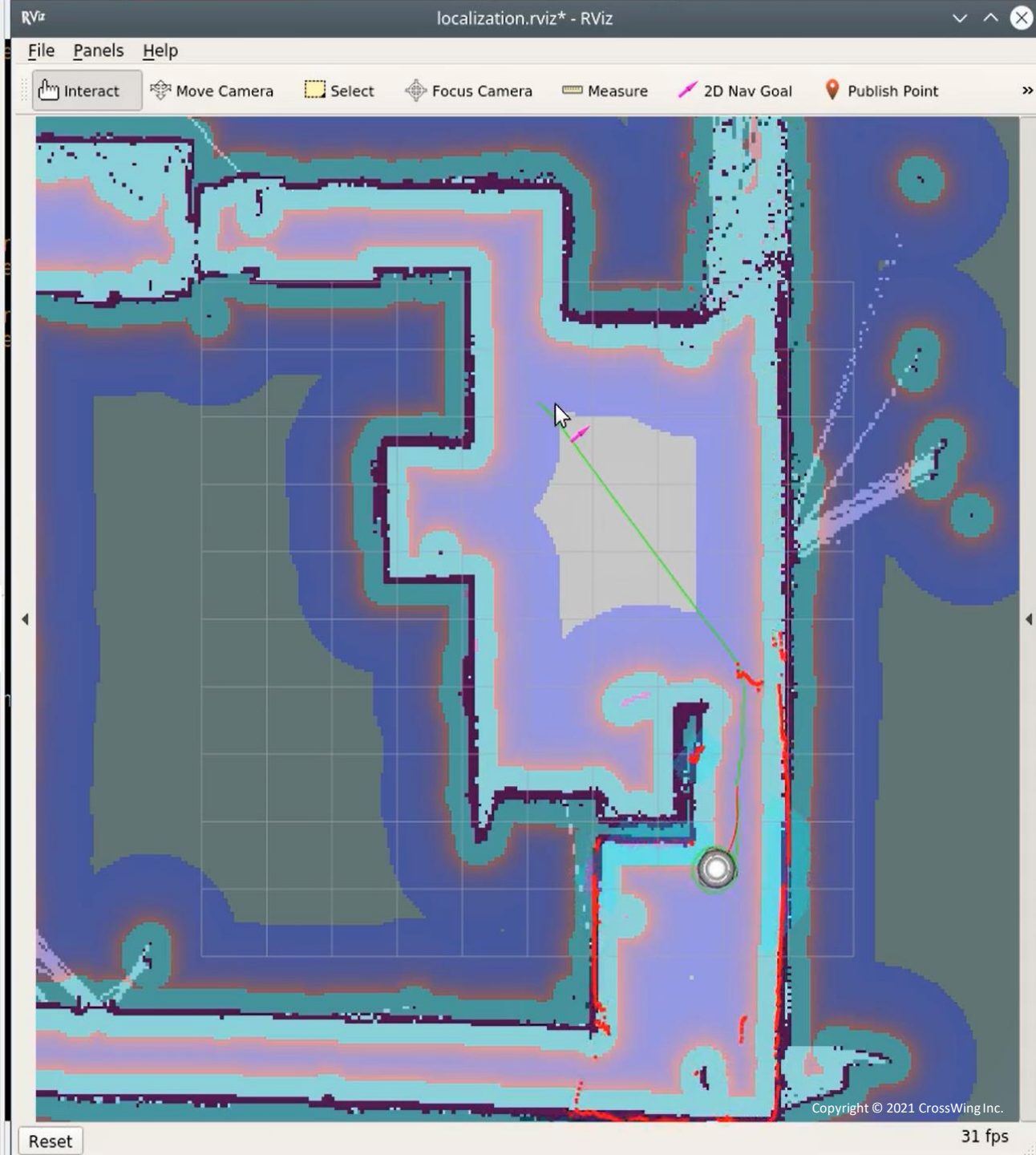
1. Design issues in AI processing identified rapidly
2. Continuous quality process implemented

QA Consultants

CrossWing



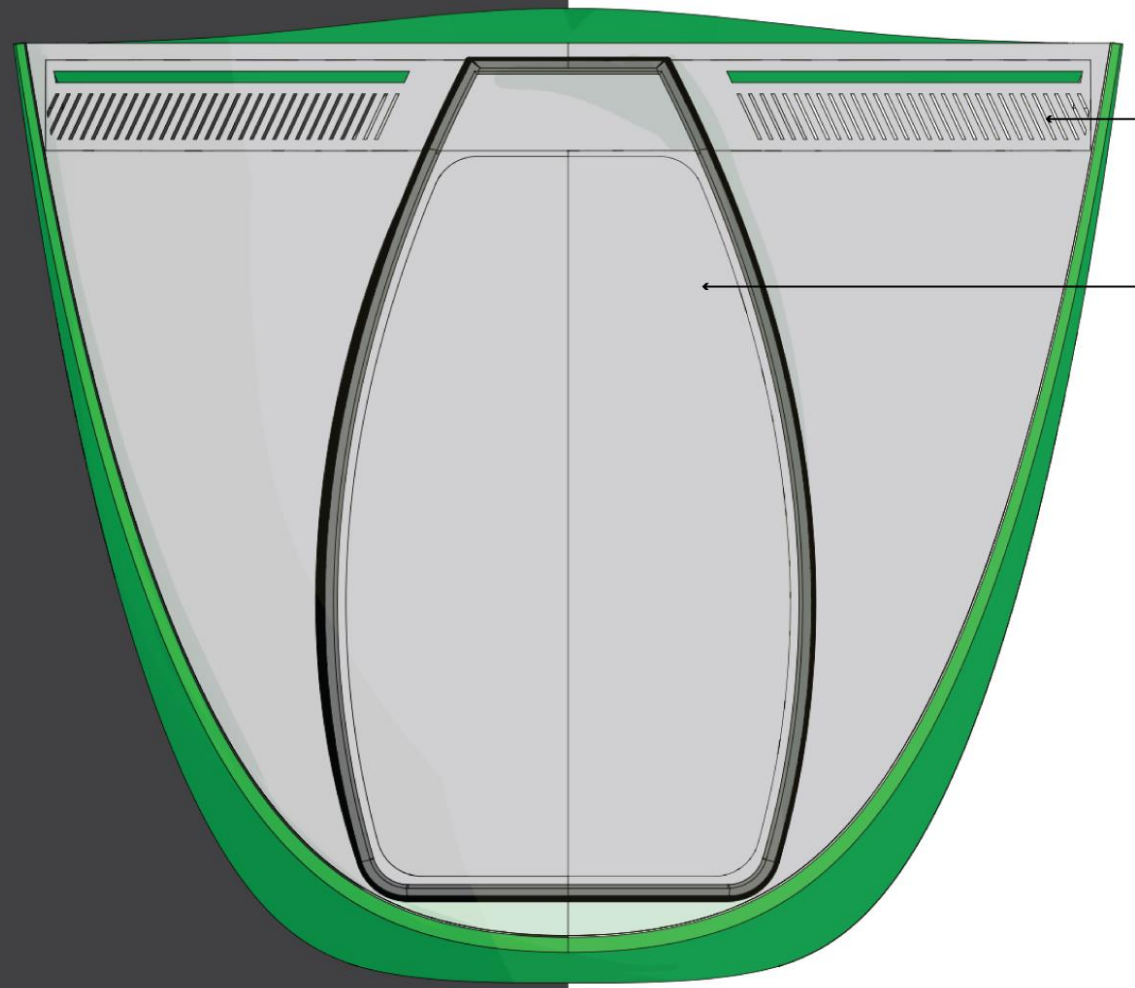
Traditional Autonomous Testing Rigs:
– Always the same locations + Time Consuming + Costly



Introducing Trellis Transit™

What is Trellis?

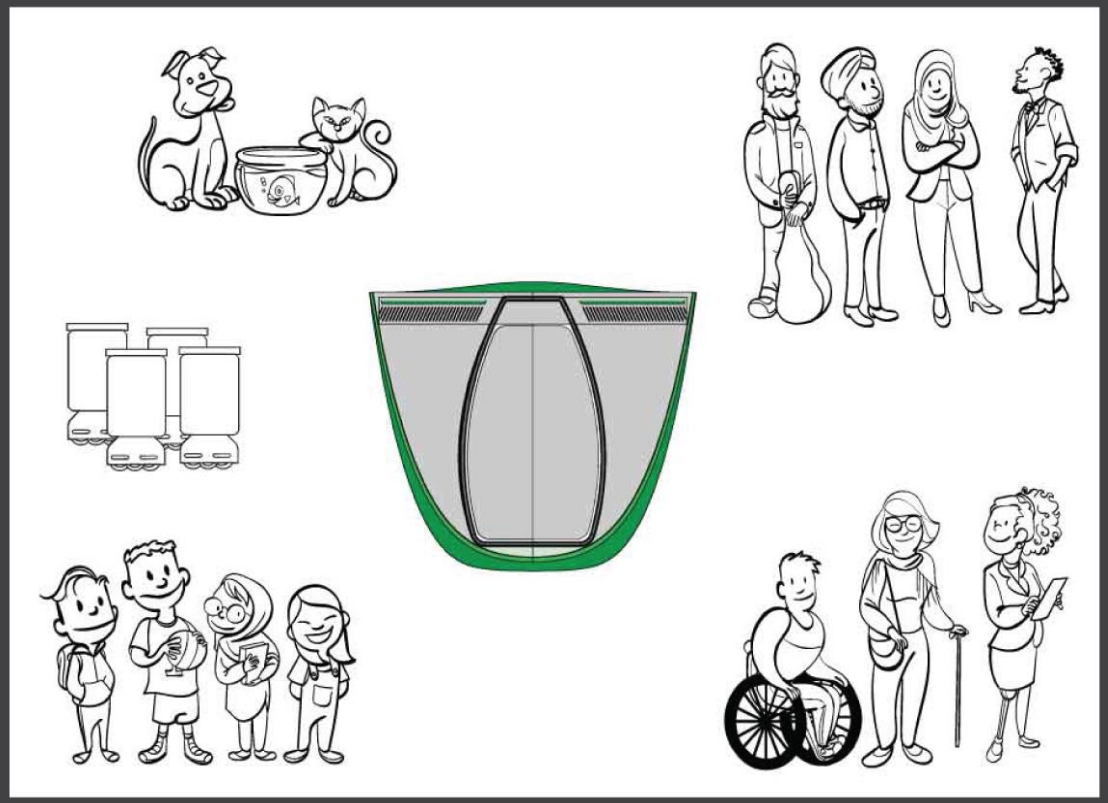
Faster – Cleaner – Cheaper – Sustainable
Safe & Secure – Inclusive 7x24 Operation

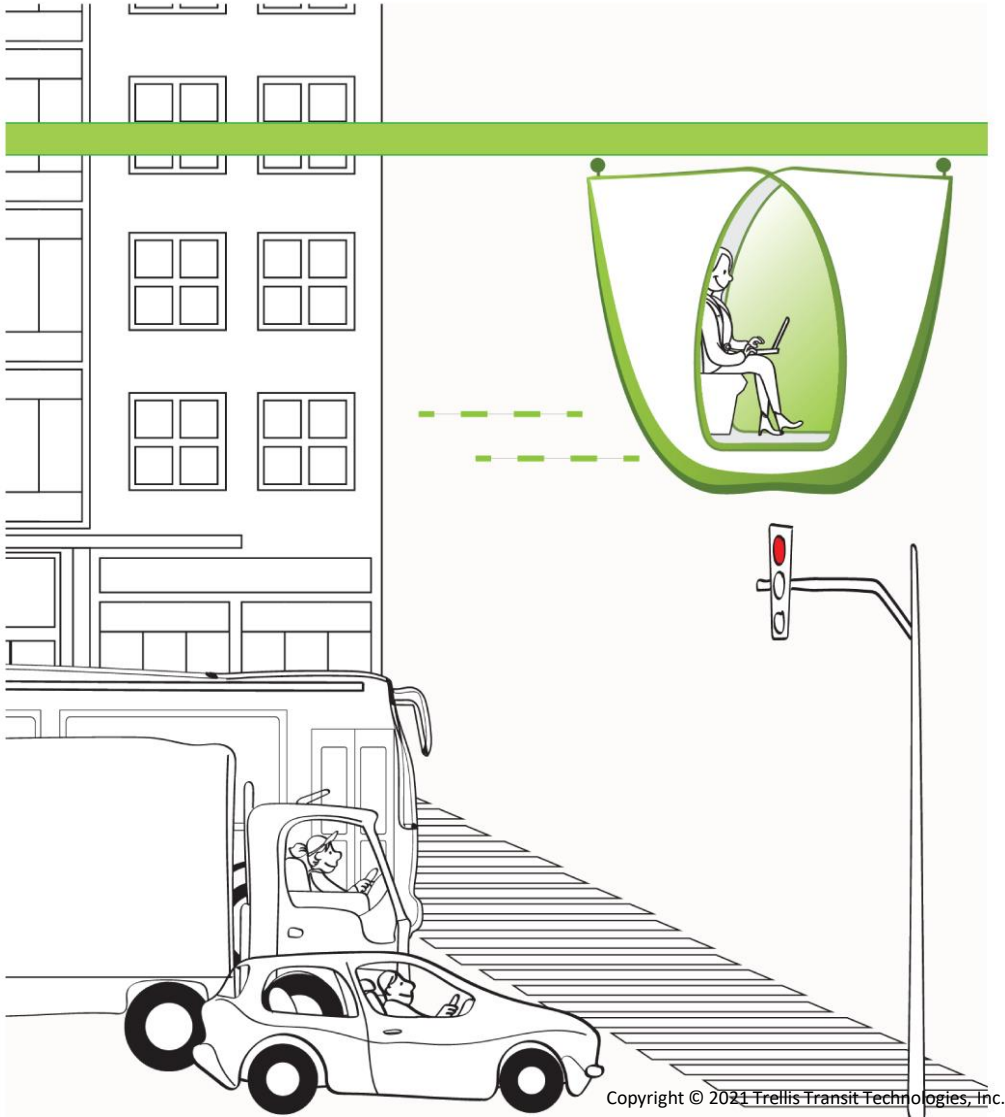


- Elevated
- Lightweight
- 4 seats
- Pet friendly
- Bicicle
- Wheelchair accessible
- Mobility scooters accessible
- Goods
- Services
- Deliveries

How can Trellis be used?

"Micro-Rail Transit" sustainably moves volumes of people, goods, services, and waste within cities and beyond – above the congestion.





Take the High Road

Trellis: A sustainable transit solution that meets the Climate Crisis – No longer must trees and foliage be sacrificed to build concrete and asphalt grids.

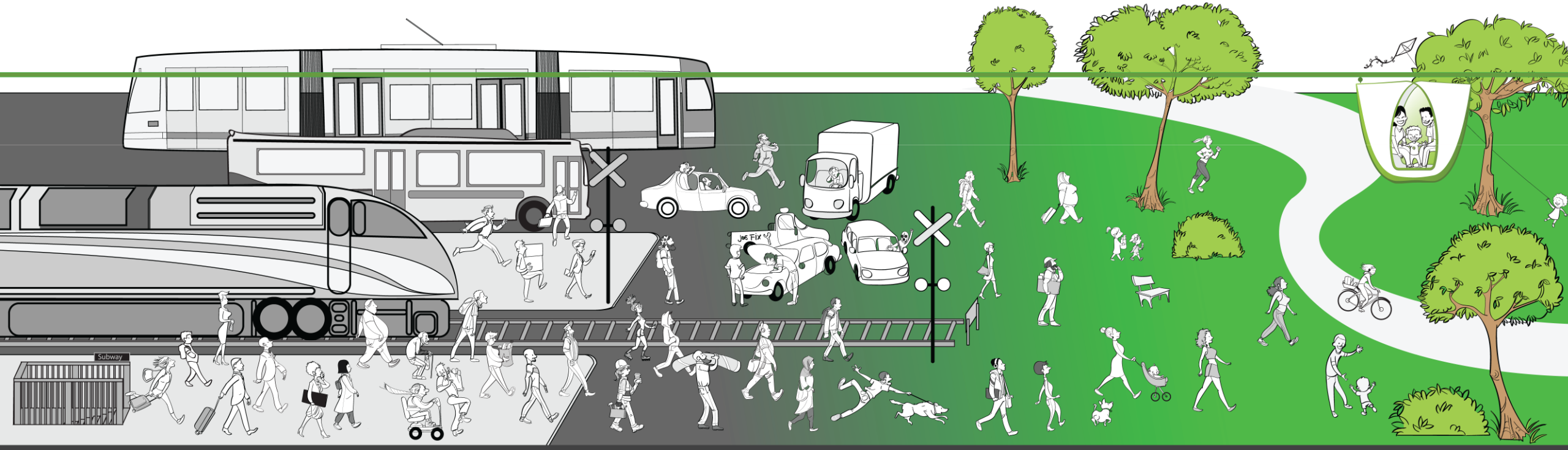
THINK GREEN!

Trellis is electric, lightweight, and made from durable composite materials. It means its environmental footprint is not only low initially but stays low over its long service life.

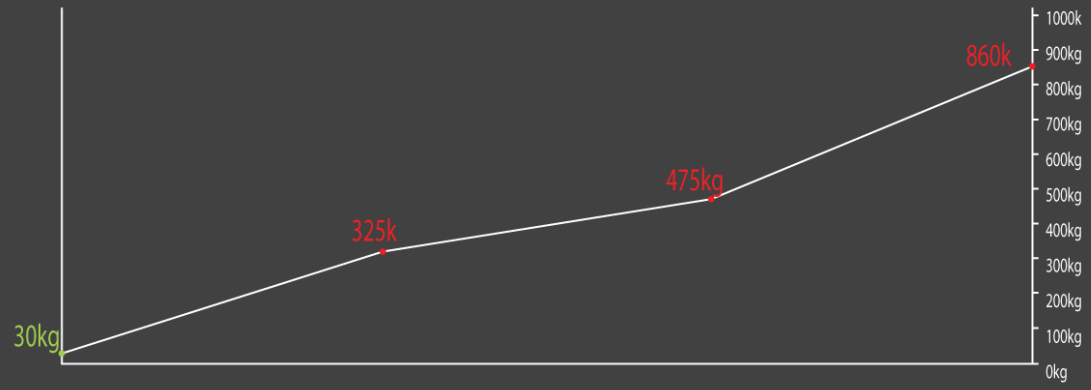
QA Consultants

Upcoming Challenge:
Simulate 200,000+ 4-passenger Pods and 50,000+ cargo and service Pods, all operating autonomously on the Trellis micro-rail grid during peak periods.

Quiet & Fresh Air Abound –
Lowest Mass & Carbon Footprint



FACT: Legacy Transit operations consume 10x to over 400x more energy per passenger than hyper-efficient, convenient Trellis Autonomous Systems.



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QA Consultants

**Quality Assurance for
AI, Robotics, & Autonomy**

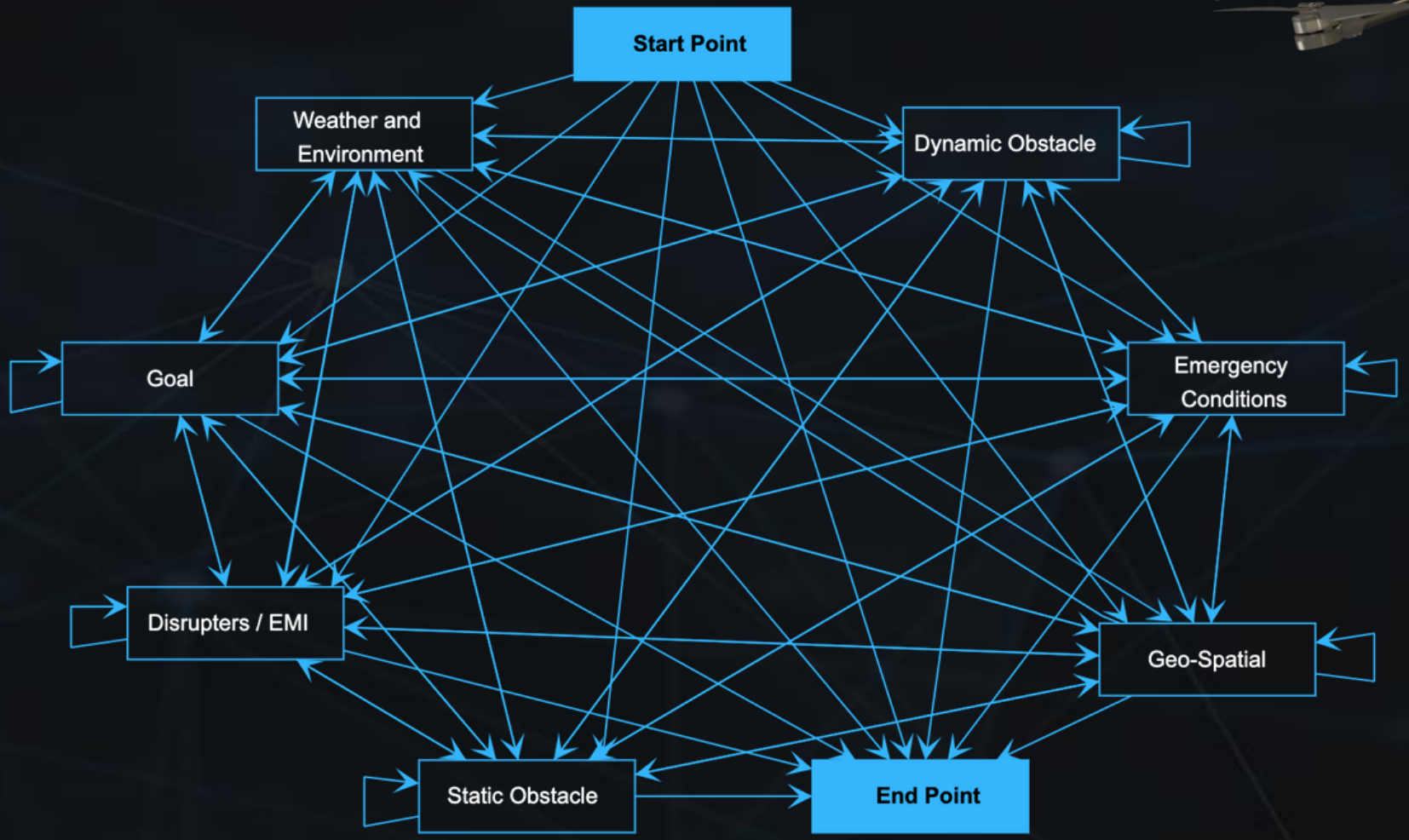
xCog

**Accelerating the Automated
Testing of Cognitive Systems**

SPENCER REUBEN
SENIOR MANAGER EMTECH
TORONTO, CANADA

OUR SOLUTION

Accelerating the automated testing for cognitive systems



MODEL-BASED TESTING

Generation and prioritization of test cases are automatically done, using a model-based approach

FULL AUTOMATION

Automated tests are automatically generated by the framework

VELOCITY AND PERMUTATION

Safety through velocity and permutation: A solution that has automated the creation of automated tests

OUR SOLUTION

Accelerating the automated testing for cognitive systems

HIGH SCALABLE

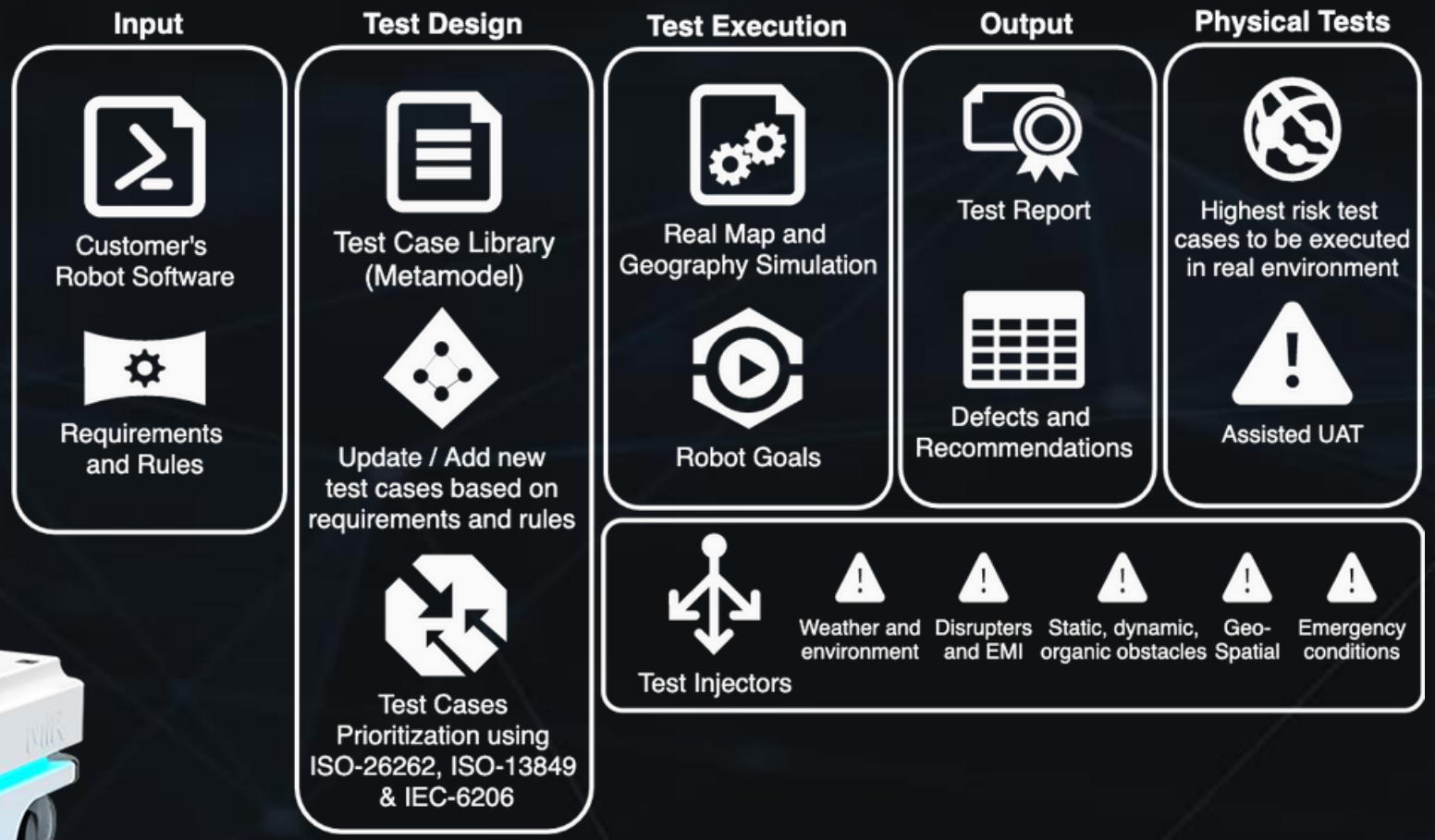
Test is performed in a simulated environment in the cloud

SAFER TEST EXECUTION

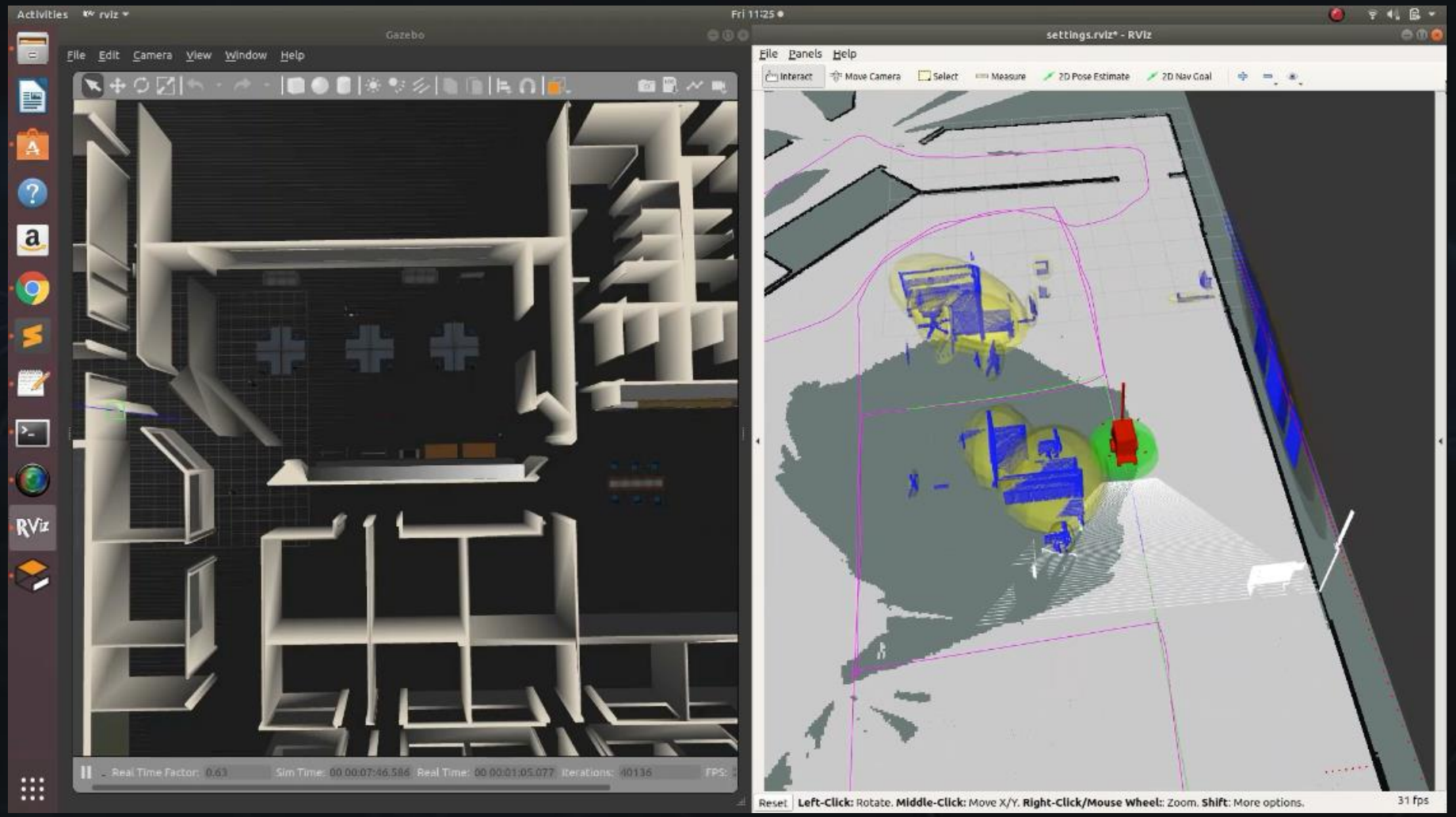
No risk to human life or equipment to validate thousands of scenarios that are needed

FASTER AND ECONOMICAL

The setup of testing is faster and more economical, once it doesn't require physical equipment and environment



xCog DEMO


Activities
rviz
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File Edit Camera View Window Help
Real Time Factor: 0.63 Sim Time: 00 00:07:46.586 Real Time: 00 00:01:05.077 Iterations: 40136 FPS:
settings.rviz* - RViz
File Panels Help
Interact
Move Camera
Select
Measure
2D Pose Estimate
2D Nav Goal
Reset
Left-Click: Rotate. Middle-Click: Move X/Y. Right-Click/Mouse Wheel:: Zoom. Shift: More options.
31 fps

BENEFITS AND ADVANTAGES OF THE xCog SOLUTION

1 LOWER COST DUE TO SIMULATION

2 FAST TIME TO MARKET

3 QUALITY & SAFETY ASSURANCE

4 STRATEGY FOR A REAL-WORLD UAT

5 LOWER RISK FOR THE ROBOT BUYER

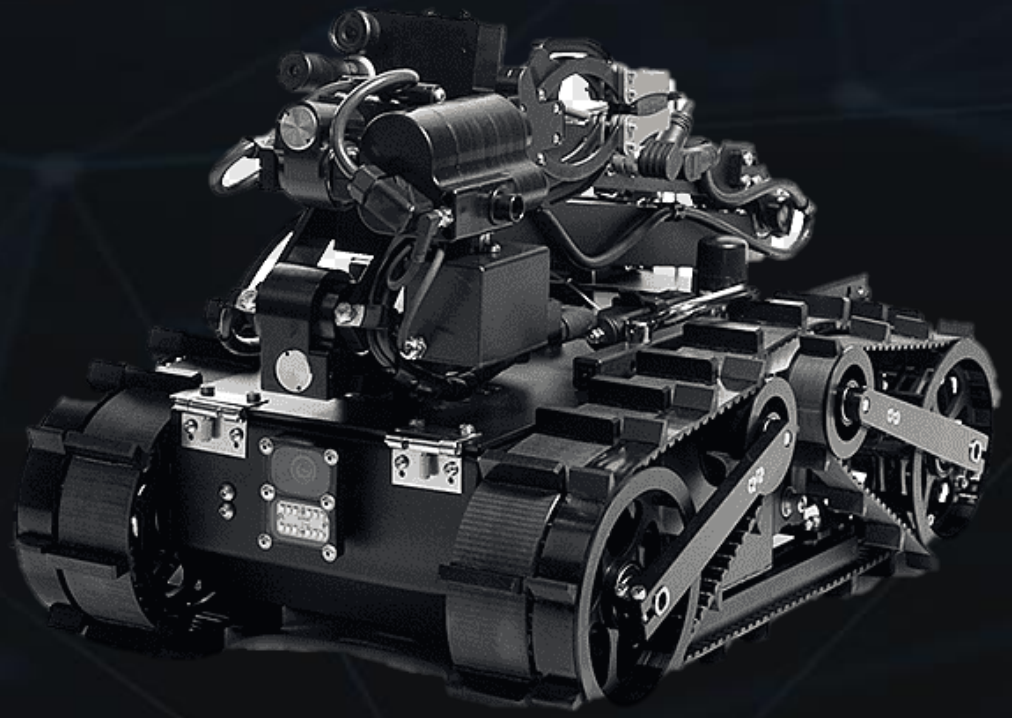
6 EARLY VALIDATION IN SDLC

7 HIGH TESTING COVERAGE

MARKET USES

End-to-end Quality

- GOVERNMENT & REGULATORS
- FUNDERS & INVESTORS
- ROBOT MANUFACTURES
- AI DEVELOPERS
- ROBOTIC SYSTEMS OWNERS



THANK YOU

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Accelerating the Automated
Testing of Cognitive Systems

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Join us in the Webinar “After Party” Room