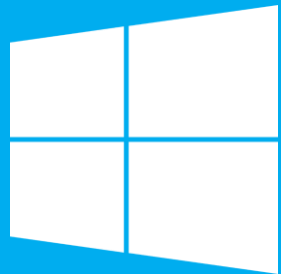




How Technology is Shaping the Future of Assessment

Where we are today, where we will be tomorrow, and where the future is taking us...



State of the Art Today



Technology has changed how we think about...



Design

Technology-enhanced items (TEIs)

Simulations/emulations

Game-based elements



Development

Authoring & Banking systems

Automatic item generation

Smart items



Administration

Alternative test delivery models

Remote proctoring

Record & Review

Identity verification

Design: Creating more engaging, more life-like content



Technology Enhanced Items

Video

Animation/avatars

Constructed response

Drag-drop, hot spot



Simulations

Simulating the work experience



GBA elements

Scorecards

Participant choice

Frequent feedback

Game-Based Assessments



Our recommended all-in-one solution combines aptitude and assessment with a smart, futuristic look.

[Find Out More](#)



The latest addition to the Artic Shores family measures 30 different aspects of behaviour and cognition.

[Find Out More](#)



Six space themed levels measuring 13 different job-relevant behaviours and aspects of cognition.

[Find Out More](#)



Our gamified take on a traditional aptitude test measures numerical, verbal and abstract reasoning.

[Find Out More](#)

Development: Creating Better, Stronger Items



Authoring

Automated item
generation during
development



Banking

Workflow
Security



Delivery

Dynamic forms assembly

LOFT

CAT

Mobile and tablet delivery



Proctoring

Remote (Online)

Record & Review



Identity Verification

Biometrics

Fingerprints

Administration: Ensuring Rigor & Security

What are the
emerging
technologies that will
change the future of
testing?



The background of the slide features a series of concentric, curved lines in a light gray color, creating a sense of motion and depth. These lines are more prominent on the left side and fade towards the right.

Emerging Technologies

- Machine Learning
- Artificial Intelligence
- Analytics
- Game-based elements
- Animation
- Virtual Reality, Mixed Reality, Augmented Reality
- Automated exam monitoring
- Cognitive Services: Speech, Gesture, Gaze, Facial Recognition, Voice Recognition
- Robots
- Blockchain
- Universal Design

AI, Cognitive Services, Machine Learning



Artificial intelligence:
Understands what's happening in environment and acts accordingly



Machine learning:
Algorithms “trained” using large amounts of data so that it can learn how to perform the task



Cognitive Services
(Emotion and sentiment detection; Image and speech recognition; language understanding; semantic engines)

Design: Creating Exam Experiences People Want



Cortana, Siri, Bots

Interactive conversations (interviews)
with AI agent
Scoring verbal responses
Scoring written replies



Assessment Your Way

Create your own adventure
Customized solutions based on personal
needs



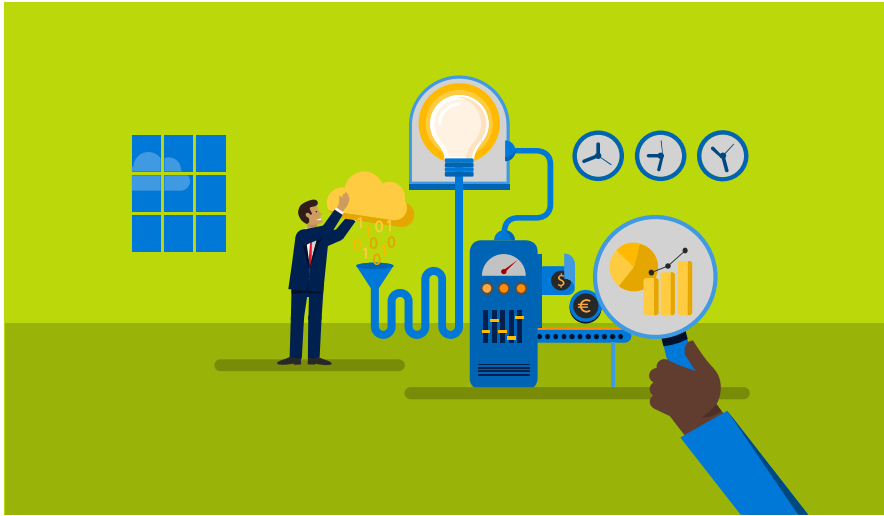
Next Generation of Item Types

Virtual reality
Augmented reality
Mixed reality



Evaluating a Whole New Set of Skills

Teamwork
Communication
Writing



Using Bots for Skill Assessment and Practice @ Microsoft and Beyond



Chatbot Tasks in Microsoft MOOCs on edX



IT Support Capstone Project



Assignment, Solution Validation,
Scoring, Script, etc.



IT Support Formative Assessment
Tasks



Documentation, Fundamentals,
Communication, Service Call,
Troubleshooting, Support Agent
Quiz

Learner View

Learners interact with one or more bots in typical IT customer service call situations:

- Bots are programmed to simulate customers and/or supervisors
- Bots initiate conversations with learners and respond adaptively based on pre-defined rules
- Bots responses take from of text, audio, video, images or PDFs
- Feedback and scores on single or multiple skills provided in real-time

The screenshot shows a chat interface with a light blue background. On the left, a learner named Tim is represented by a circular profile picture. He sends a message to a bot, which is represented by a blue circular icon with a person silhouette. The bot's response is in a purple bubble. Tim then replies with 'Yes'. The bot responds again in a purple bubble. At the bottom, a supervisor named Kristin, represented by a circular profile picture, provides feedback in a green bubble. The chat interface includes an 'OK' button and a blue circular icon with a person silhouette at the bottom right.

Bot,

I have 5 users who are receiving non-delivery receipt notifications on email responses that are not being delivered... can you help me rectify this for these five users?

Sure, I can help you Tim with this problem. Let me just see if I have this correct. You have 5 users that are not having their email responses delivered; new emails are being delivered, but email responses are not. Is that correct?

Bot,

Yes

OK good. But just so you know, I can only work on one issue per service request ticket, and in this case each user's NDR issue represents a separate issue. So please let me know which user you would like me to start troubleshooting.

Kristin,

You're right! The service agent should begin by paraphrasing the problem. And in a situation such as this that involves multiple users experiencing the same problem, a service request should only be for one user at a time, which the SA explained to Tim.

OK



Which of the following communication techniques builds customer loyalty by confirming the agent's understanding of the customer's problem?

Restate and verify, express empathy again and demonstrate ownership.



Kristin, Teaching Assistant



Customer: I just bought a new Microsoft keyboard, but it's not working! What can you do? My son needs to use the computer for school and we need the keyboard!

Kristin, Teaching Assistant



How should the Support Agent respond?

I guess you'll have to return it to the store you bought it from. I hope you still have your receipt.

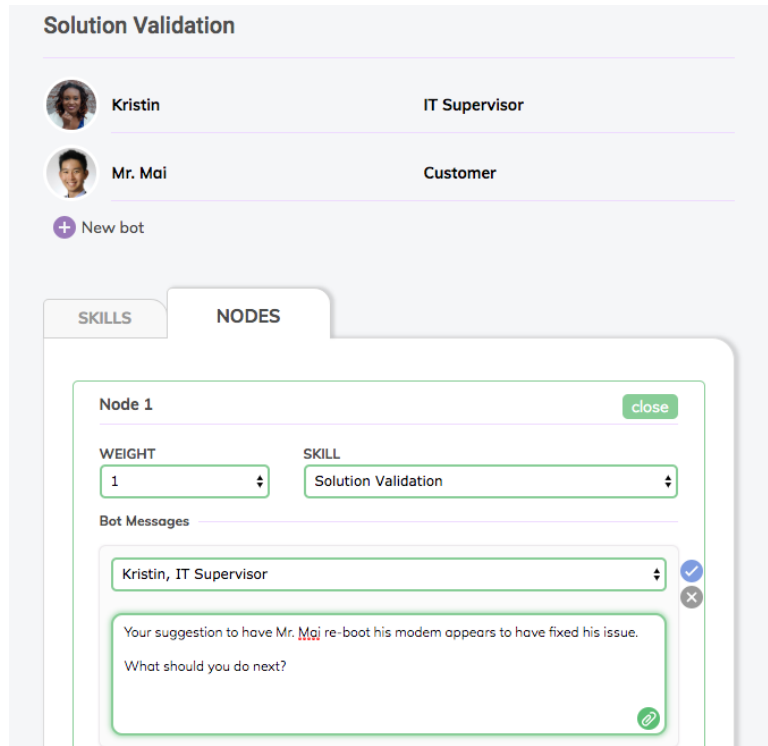


Let me make sure I understand the issue. When you press a key on your keyboard, the computer does not respond to your input. Is this correct?

Oh, that's unfortunate. Did your son do something to it, such as spill water or some other drink on it? If he did, that would void the warranty.

Oh, I'm sorry to hear that. Well, do you have it plugged in properly? Oh, it's a wireless keyboard. You should have stated that up front. I only handle wired keyboards. However, I can put you in the queue for wireless accessories and let me see if an agent can call you back. We're pretty busy, so it may take awhile.

Authoring Tool



The screenshot shows a web-based interface for creating chatbot tasks. At the top, under the heading "Solution Validation", there are two user profiles: Kristin, IT Supervisor, and Mr. Mai, Customer. Below them is a "+ New bot" button. The interface has two tabs: "SKILLS" and "NODES". The "NODES" tab is active, showing "Node 1" with a "close" button. Under "Node 1", there are two dropdown menus: "WEIGHT" set to "1" and "SKILL" set to "Solution Validation". Below these is a "Bot Messages" section. It contains a dropdown menu with "Kristin, IT Supervisor" selected, a blue checkmark icon, and a close icon. Below the dropdown is a text box containing the message: "Your suggestion to have Mr. Mai re-boot his modem appears to have fixed his issue. What should you do next?". There is a green edit icon at the bottom right of the text box.

Chatbot authoring allows content specialists to create assessment and practice tasks at scale with no coding experience needed

- Select one or multiple bots to participate in the task
- Measure one or multiple skills throughout the task by selecting a skill for each node/item
- Provide differential weight if needed
- Define adaptive rules to create different proficiency paths (optimal, proficient, struggling)
- Provide scaffolding and feedback

Other Uses



AdelaideX: Chatbot tasks for learners interacting with virtual instructors in medical/biology MOOCs.



DelftX: Multi-stakeholder chatbot tasks in engineering design MOOCs.



Harvard: Chatbot tasks on learning sciences for Graduate School of Education and Medical School students.



ACT: Teamwork chatbot tasks for middle school students.

What is the difference between VR, AR, and MR?



Virtual Reality (VR)

- A computer-generated virtual world that completely replaces the real world
- Head-mounted display
- Content is entirely virtual
- Feeling of being transported to somewhere else with no sense of the real world



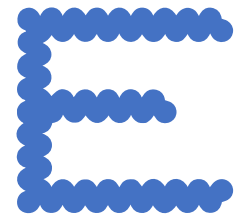
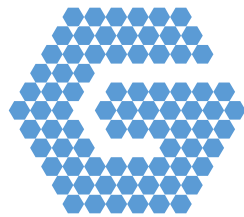
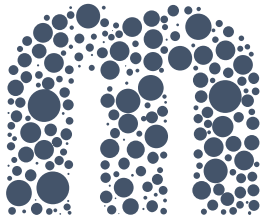
Augmented Reality (AR)

- Computer-generated elements are overlaid on the real world
- Virtual and real-life objects are seamlessly blended
- Feeling of still being in the real world but with new elements superimposed



Mixed Reality (MR)

- Merge of the real and virtual world where physical and virtual objects co-exist
- Mixed reality combines the best of both virtual reality and augmented reality
- Feeling of still being in the real world, but with new elements superimposed that co-exist with and react to the real world

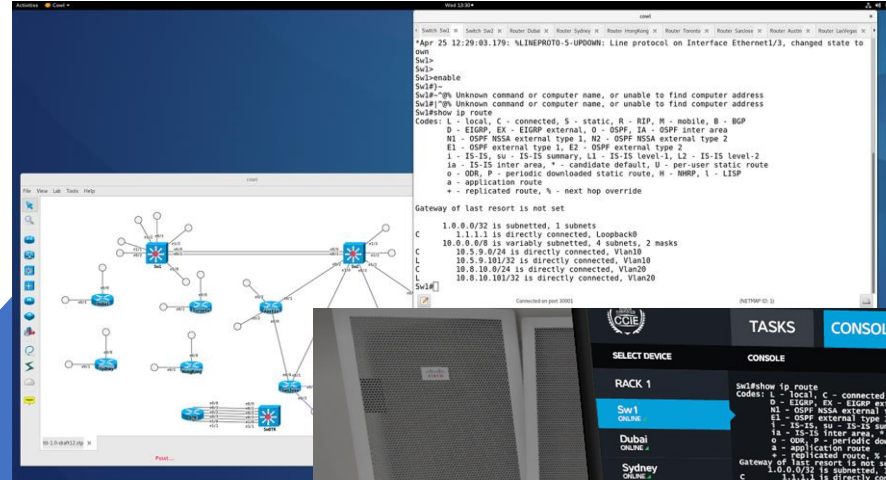


INTUITIVE

Presented with permission from Cisco

#CLUS

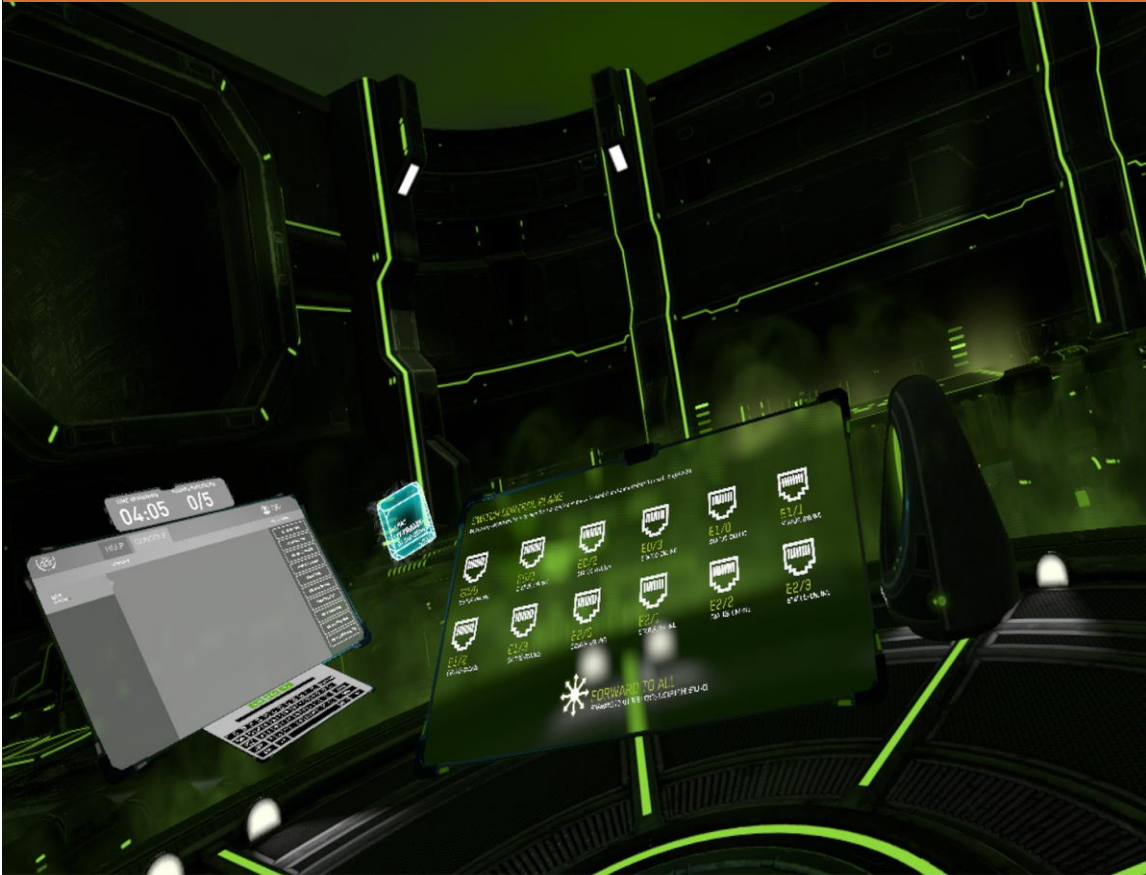
Virtual Reality 3D Experience



BeTheRouter (BTR)



BeTheSwitch (BTS)



BuildTheLab (BTL)



TroubleshootTheLab (TTL)



Cybersecurity



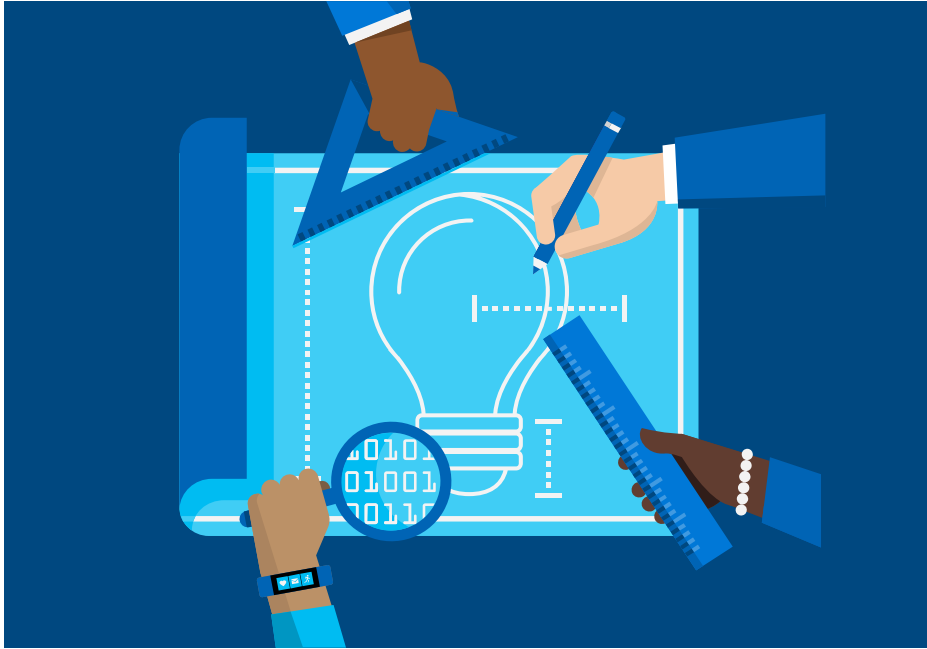
To view the Virtual Reality video click [here](#).

Cisco AR Mobile App

- iOS and Android Mobile application
- Superimposes computer-generated images on the top of a person's view of the real world
- On mobile phones, it allows a user to integrate and interact with synthetic 3D objects inside the real-time view captured by their camera
- On-demand knowledge assessments



Development: More High Quality Content for Less Money



Authoring

Automated item
generation at delivery

Smart items

Shorter exam
development cycles

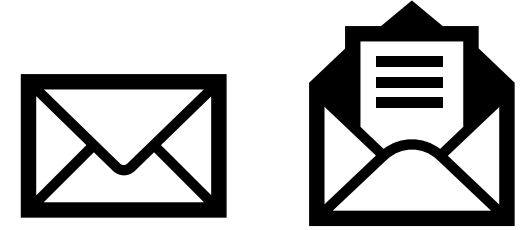


Localization

Machine translations at
parity with human
translations

Automatic translation into
any language at the push
of a button and instantly

Caveon's SmartItems



Change within a specific set of parameters each time it's shown to a test taker

Divide and Multiply 2-Digit Numbers

Only a small "slice" of the skill

Traditional Test Item: $17 \times 47 = ?$

<https://sei.caveon.com/launchpad/common-core-self-actualized-items-version-1>

SmartItem: Var1 (multiply or divide) Var2 = ?

Divide and Multiply 2-Digit Numbers

ONE SmartItem covers the entire skill!!!

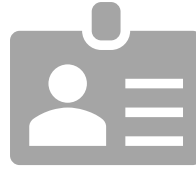
Shared with permission from David Foster



Delivery

Estimate the likelihood of that a candidate will complete a task or answer a question correctly

Present the “right” task or question to determine competence more quickly



Proctoring

Machines as proctors: More efficient, more effective, and continue to learn what behaviors are appropriate and which are not

Less cheating, collusion, proxy testing



Security

Cognitive services

Keyboarding, text analysis, facial recognition used for identity verification throughout the exam

Will we even need proctors in the way we think about them today?

Administration: Ensuring Rigor & Security
at Reduced Costs and Time Commitment

Thinking More
Broadly about
Assessment... What's
Already Being Done...




Crystal helps you understand yourself, your coworkers, and your customers. When you understand personality differences, you can communicate more effectively and build stronger relationships.



pymetrics applies
the way companies

edge AI to reinvent



1 PLAY A SET OF NEUROSCIENCE-BASED GAMES

A series of behavior based games collect millions of data points, objectively measuring cognitive and personality traits. There is no right or wrong way to play the games because every trait makes you a great fit for a certain job.

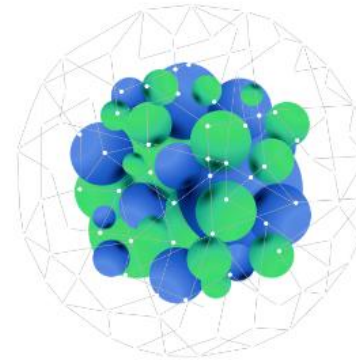


pymetrics



2 DISCOVER INHERENT COGNITIVE, EMOTIONAL TRAITS

Every candidate receives a personalized report on their cognitive and emotional traits, objectively measured through the millions of data points collected during our games



Neuroscience games

Collect objective behavioral data using neuroscience exercises that are the gold-standard of neuroscience research



3 MATCH TO WELL-FIT JOBS THROUGH A COMMON APPLICATION.

90% of people don't end up in the role they applied for. pymetrics turns a rejection email into an opportunity to find your best fit career path and perfect job.

Common application

Rejected candidates can automatically match to other opportunities across other clients using pymetrics, improving candidate experience

MAP Health Watch



[Technology](#) ▾ [Services](#) ▾ [About Us](#) [Blog](#)



Measure

By measuring a total of 6 vital signs around the clock with medical-grade sensors, the MAP Health Watch provides richer patient data than doctors have ever had access to before. And can help you and your loved ones stay healthy.

Analyze

MAP Health Watcher's proprietary analytical algorithms filter out noise from the measured signal and continuously compare the real-time data against known patterns and your own unique health profile. In this way, the system can instantly flag up anything unusual that may indicate the first sign of trouble.

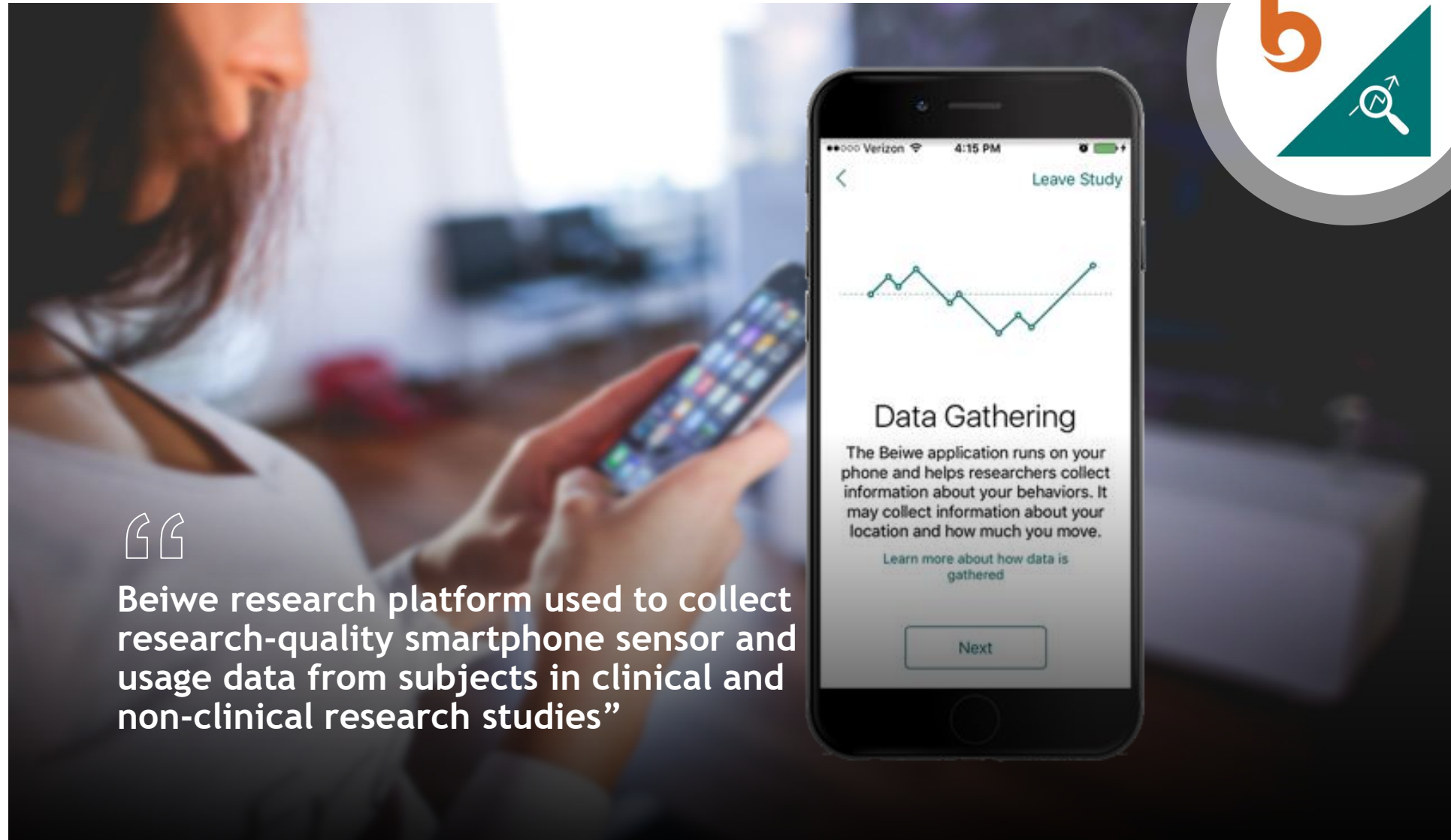


Predict

Developed by a team of highly specialized doctors and data scientists, MAP Health Watcher is capable of examining thousands of people simultaneously without ever taking a break. Thanks to the latest Artificial Intelligence technologies, this makes it possible for us to continuously learn how to predict potential health issues in the future. And to put that insight to work for our users.



Using Mobile Devices to Gather Data



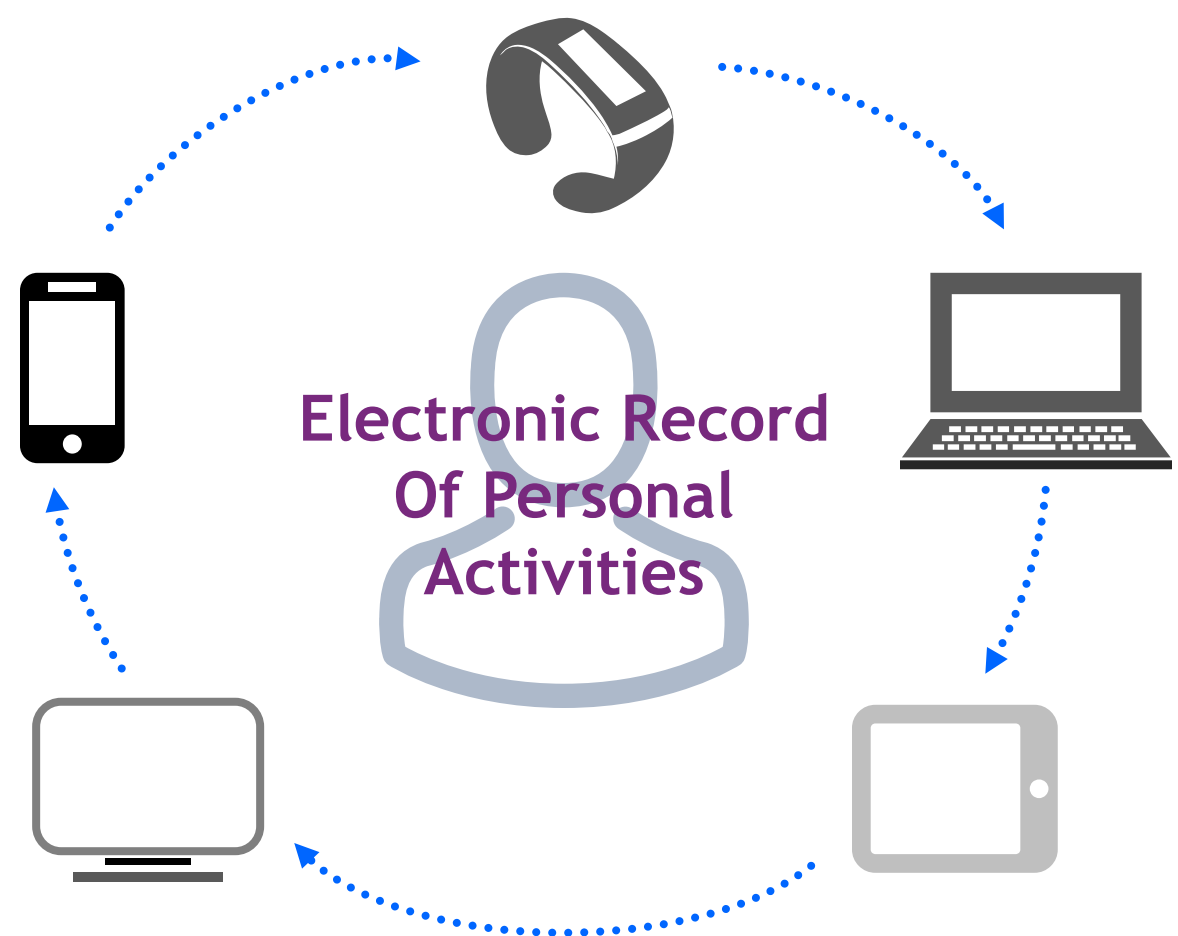
“

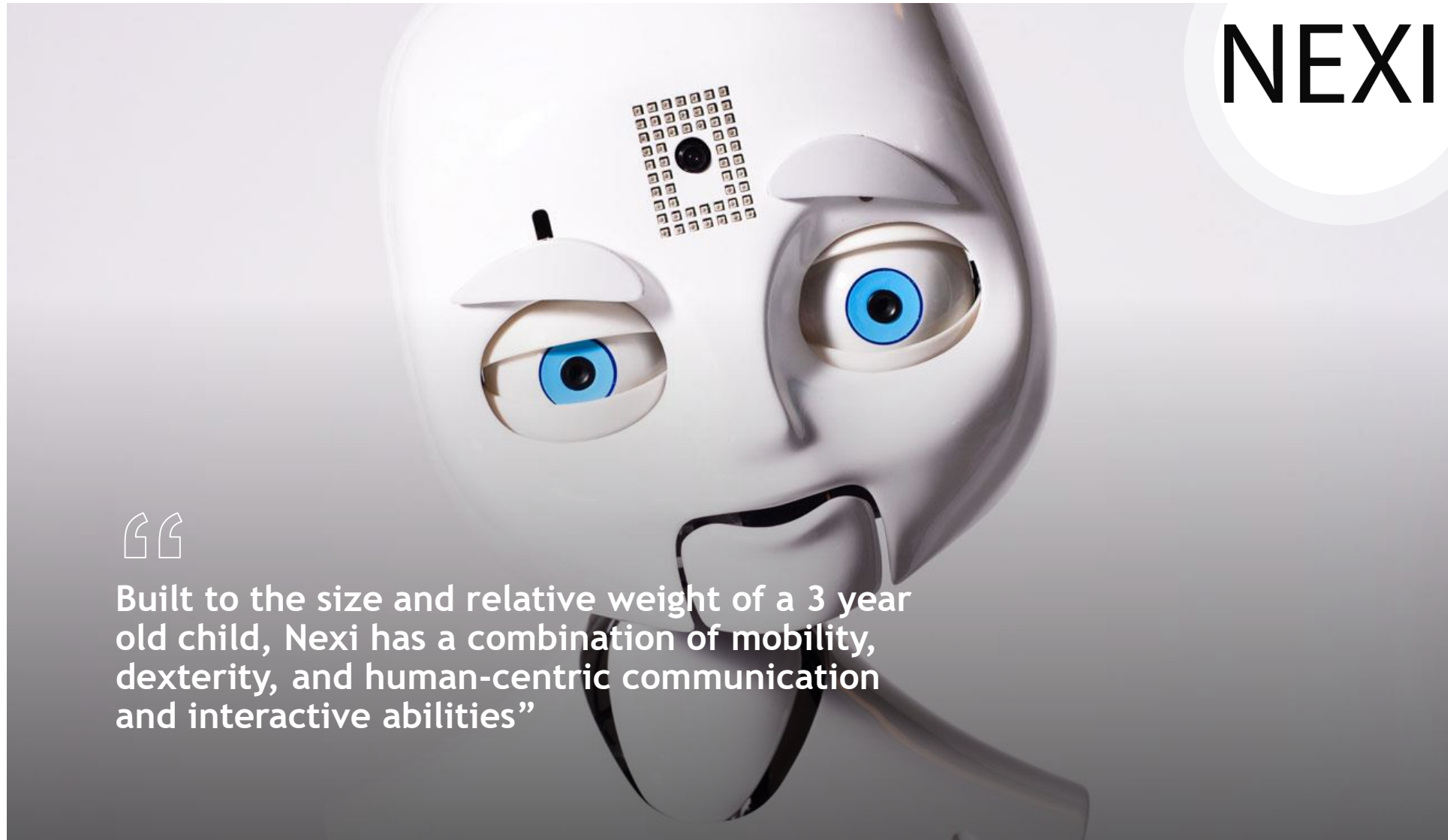
Beiwe research platform used to collect research-quality smartphone sensor and usage data from subjects in clinical and non-clinical research studies”

What the Future Looks Like



Internet Of Things





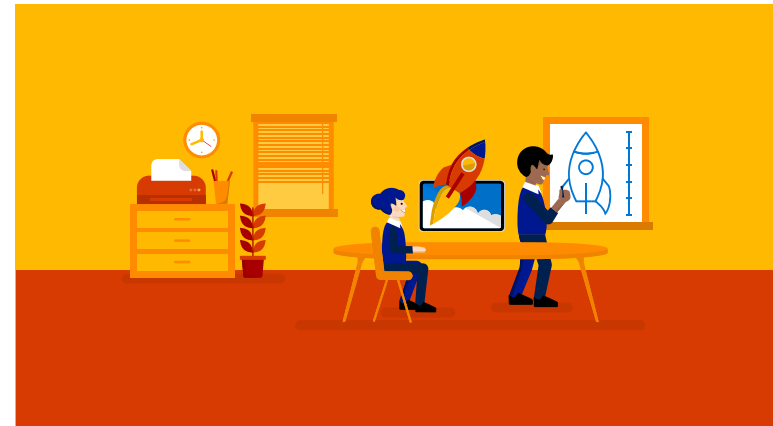
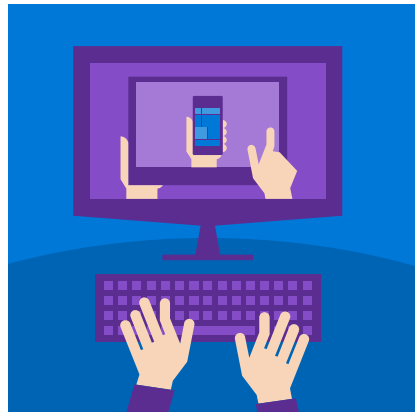
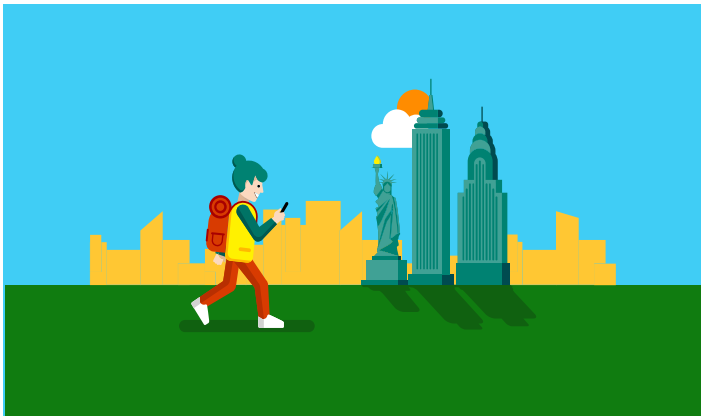
“

Built to the size and relative weight of a 3 year old child, Nexi has a combination of mobility, dexterity, and human-centric communication and interactive abilities”

Certification Without “Exams”

xAPIs (Experience APIs) exist TODAY that track what you do so that machines can learn and create a more personalized experience

- Leverage that technology to track actions as people go about their daily activities
- We're literally months away from this...not years if someone is willing to invest in this
- But, technology is around the corner that will make xAPIs old school... how can we leverage bots, AI, cognitive services to change the world?



Imagine a world where you don't
have to go to a test center to take
an exam...

Imagine a world where you don't have to go to a test center to take an exam...where you don't have to have a "testing" experience to get certified...

Imagine a world where you don't have to go to a test center to take an exam...where you don't have to have a "testing" experience to get certified... where you are certified as your doing your job...

Imagine a World Where We Truly
Customize the Assessment
Experience

Imagine a World where You
Receive a Job Offer without
Applying

It's Coming...

It's Coming... Are You Ready?



It always seems
Impossible
Until it's
DONE