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.

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

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

Our gamified take on a traditional aptitude test measures numerical, verbal and abstract reasoning.
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
What are the emerging technologies that will change the future of testing?
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

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

Machine learning: Algorithms “trained” using large amounts of data so that it can learn how to perform the task
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
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
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.
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
Virtual Reality 3D Experience
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

Traditional Test Item: 17 x 47 = ?

SmartItem: Var1 (multiply or divide) Var2 = ?


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 proven neuroscience games and cutting edge AI to reinvent the way companies attract, select, and retain talent.

**Neuroscience games**

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

**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.

**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.

**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.
Simply wearing the MAP Health Watch allows us to collect and process medical data in real time and respond immediately in the event of any issue of concern. If our algorithm recognizes any known pattern of a developing disease, we notify you and our medical team provides instant and tailored advice.

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.

MAP Health Watch'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.

Developed by a team of highly specialized doctors and data scientists, MAP Health Watch 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

Electronic Record Of Personal Activities
"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?
IMAGINE
It always seems impossible until it's done.