

The new essentials

Big data, biometrics and everything in between

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Together we'll go far



Hold on to your seats

The pace and promise of change
has never been greater.

faster, cheaper, better

bigger, brighter, sharper

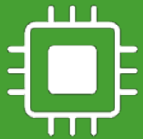
newer, safer, smarter

Connectivity puts information to work

A few emerging technologies
to consider...



Big Data



Artificial Intelligence



Internet of Things



Biometrics



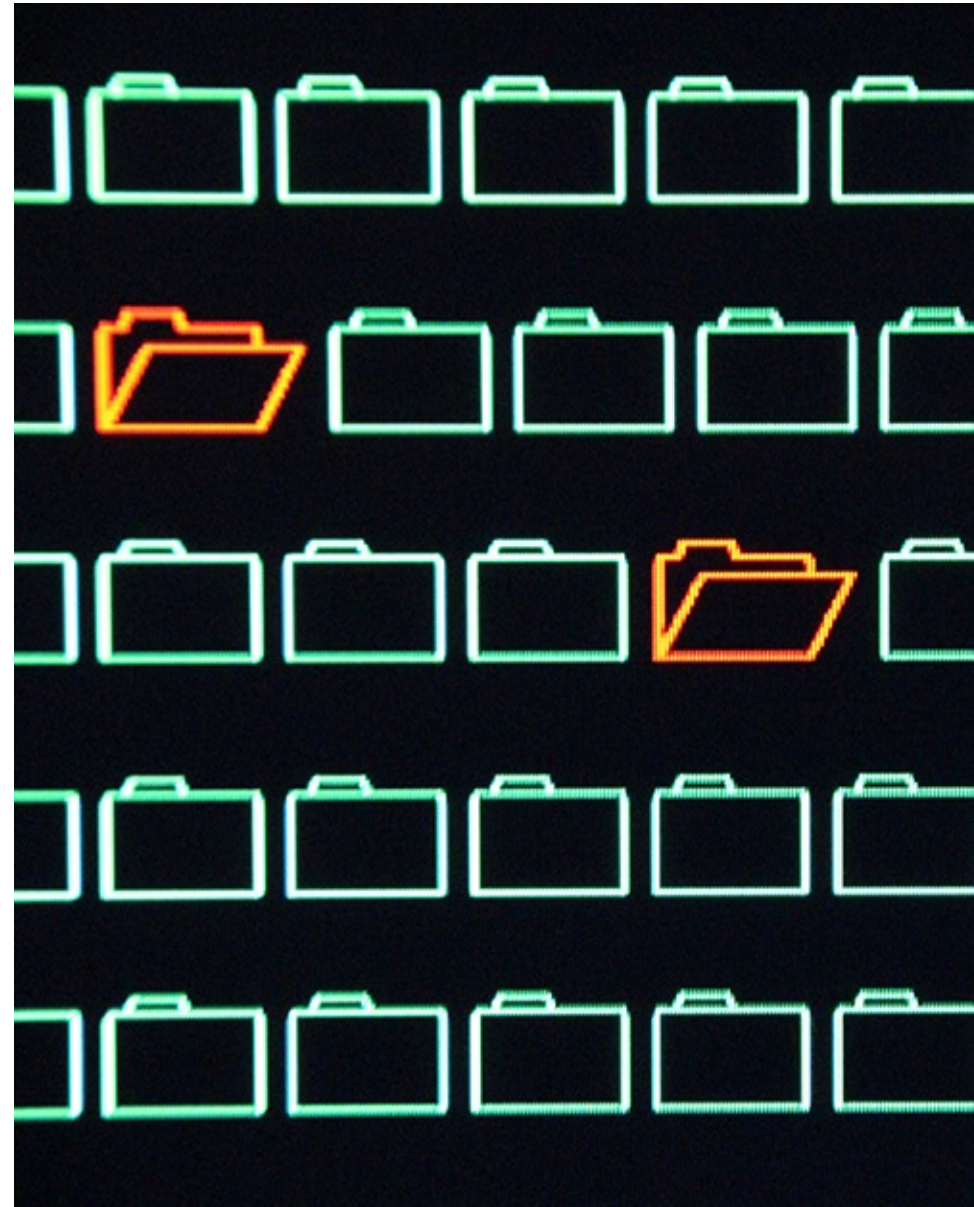
APIs

Technology, imagination and opportunities

The patterns are out there ...



- Information technology generates huge volumes of data, cheap to store and tough to analyze.
- Data created for narrow processing functions is an untapped source of broader market insights.
- Classify, learn, reason, and predict possible outcomes.
- Powerful computational processes can find patterns, trends, environmental factors.
- Finding generalizations or digital canaries in the data coal mine?



Ideas and opportunities



- Use sales and revenue data to demystify consumer behavior.
- Manage liquidity forecasting based on otherwise hidden risk factors.
- Optimize property expense drivers, operational processes or distribution channels.
- Identify high-performing talent with a broader data set of company metrics and environmental factors.

Pro Tips:

- **Structure:** Clean data architecture is critical for clear insights – a large bank may have 25 unique data tags for “account number.”
- **Show it:** Data visualization is what really tells the stories of data mining.



The next frontier

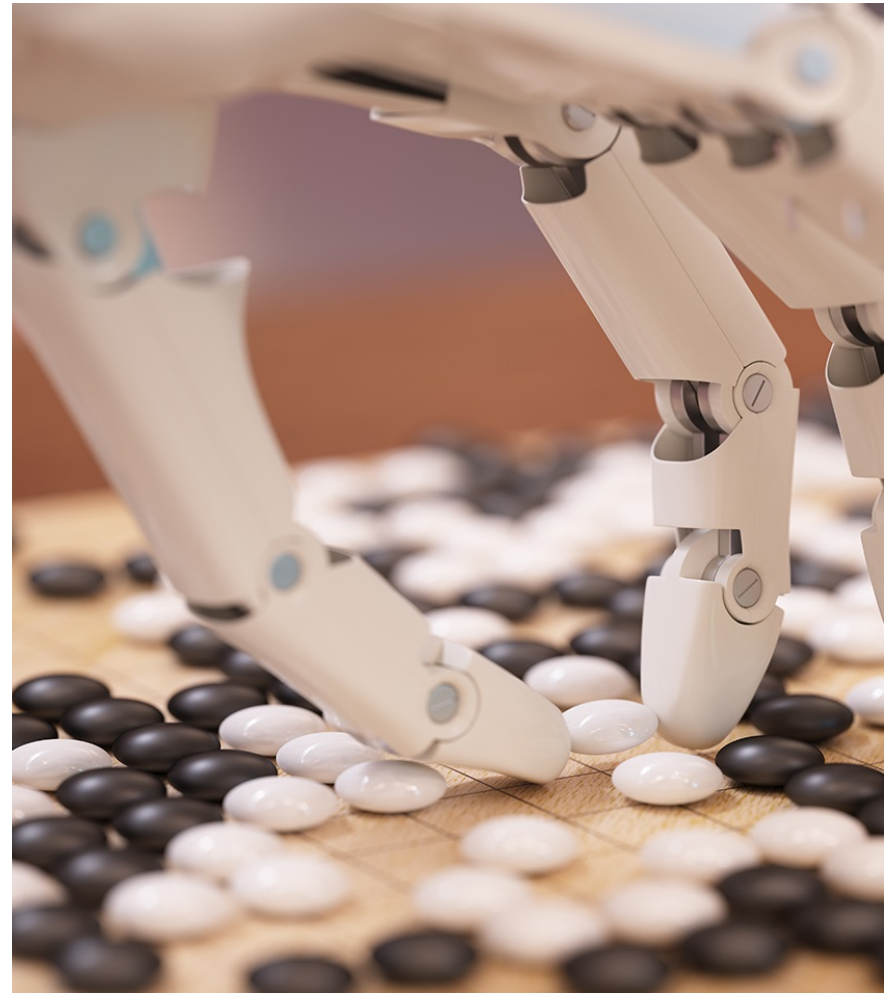


“It may be a hundred years before a computer beats humans at Go —maybe even longer.”

— *New York Times*, 1997

“Master of Go Board Game Is Walloped by Google Computer Program.”

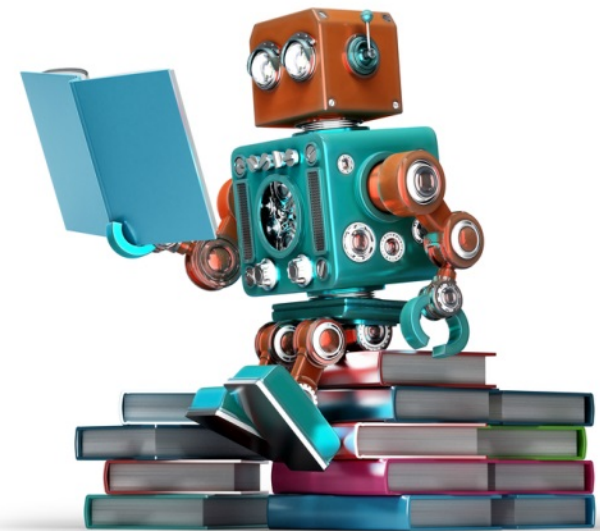
— *New York Times*, 2016



Learning on the job



- Artificial intelligence computer programs adapt and evolve when exposed to new data.
- Self-learning machines are more scalable for tackling highly complex problems.
- Medical diagnoses, personalized marketing, and financial fraud detection will all benefit from software that learns from past outcomes.
- Range and nuance of emotional intelligence is still too vast – AI is unlikely to explain your teenage kid's behavior.



Navigate in your own words

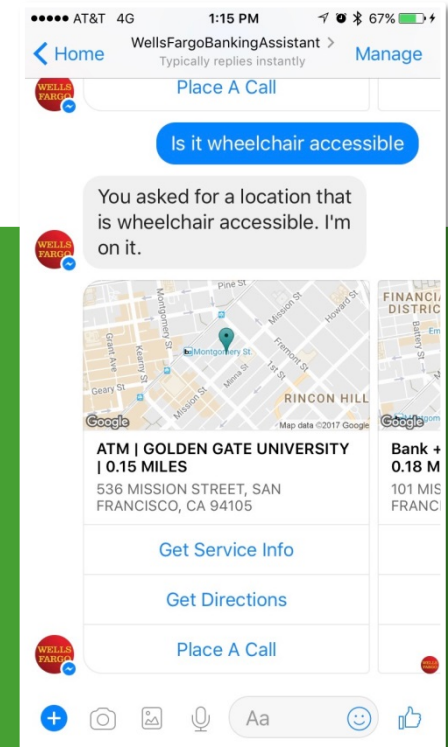


- AI powers bots that can handle natural language processing
- Conversational interfaces allow more intuitive interactions with computers
- Will Siri, Alexa and Cortana compete on personality?



Ideas and opportunities

- Digital channel interaction with consumers can be reimagined to provide a customized experience.
- Employees' "tribal knowledge" about the business can be captured in a machine-learning knowledge base.
- Routine cash positioning tasks can be automated, with self-improving decision logic based on daily events.



Pro Tips:

- **Context matters:** Unsophisticated AI will result in clueless bots – or skew risk monitoring with false positives.
- **Tone matters:** Screenwriters and novelists may have the best computer programming instincts in the future.

Driving into the future



Internet of Things

What if cars could share and react to road condition data instantly?

The expanding value chain



- Collect and process data signals via system actions or activity sensors.
- Modern cars have over 100 sensors that create 25 gigabytes of data per hour.
- Gartner predicts 20 billion things will be connected globally by 2020.
- This will drive convenience but commercial value is tough to predict – McKinsey guessed an economic impact of \$4 trillion to \$11 trillion by 2025.



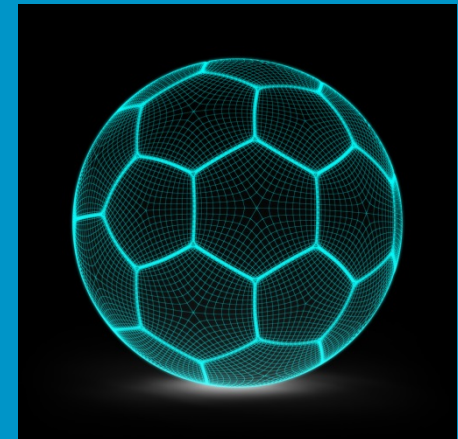
Ideas and opportunities



- Any action or event in your supply chain can predict inventory impacts, or trigger supplier performance payments.
- Give yourself and your customers insights about how they can optimize the use of your services.
- Generating information from data can add whole new product layer – Adidas sells a soccer ball that tracks kick power and trajectory to help coaching and training.

Pro Tips:

- **Monetize:** Data streams need thoughtful pricing strategies to reflect how much data is sent and/or used.
- **Security:** Connected devices need the same security protection as any other access point that could be hacked.
- **Privacy:** Let customers opt-out.

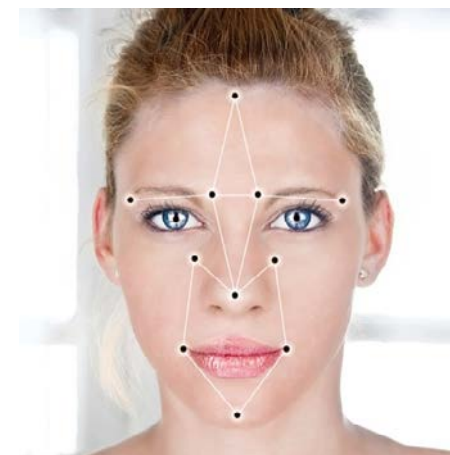
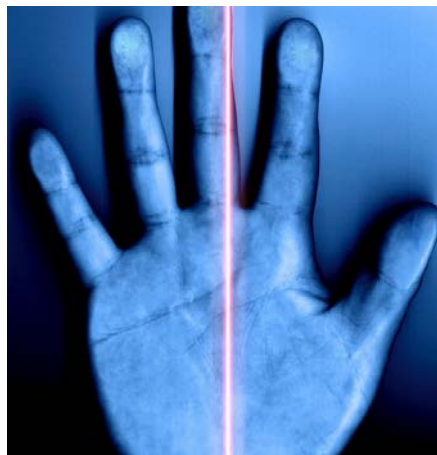


Security gets personal



- Authentication controls become increasingly critical.
- Uniqueness and custody strengthen access credentials.
- Converting image scans to data enables controls.

I am my password



Authentication factors

Hackers drive security innovations



Biometrics



What you have

Physical token
Virtual token
Device recognition



Where you are

Location identification
Geo-fencing

What you know

User ID, password
Secret questions
PIN codes

User Name	<input type="text" value="jonesmith"/>
Password	<input type="password" value="*****"/>

What you are

Fingerprint
Eyepoint
Facial recognition



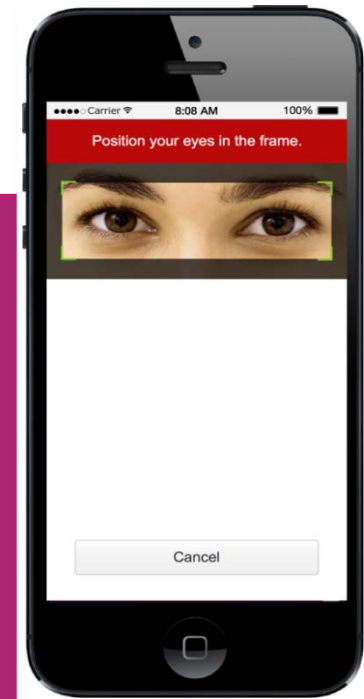
Ideas and opportunities



- Look at mobile access needs of employees or customers to assess the best uses for biometric security tools.
- High-risk payment transactions or sensitive account information need two-factor authentication.
- Customers expect the right balance of security and ease of use.

Pro Tips:

- **Offer Choice:** Introduce new biometric controls as optional, and retain alternate authentication methods for user choice.
- **Security:** Technology is no substitute for strong policy, process and human monitoring to ensure controls are working.

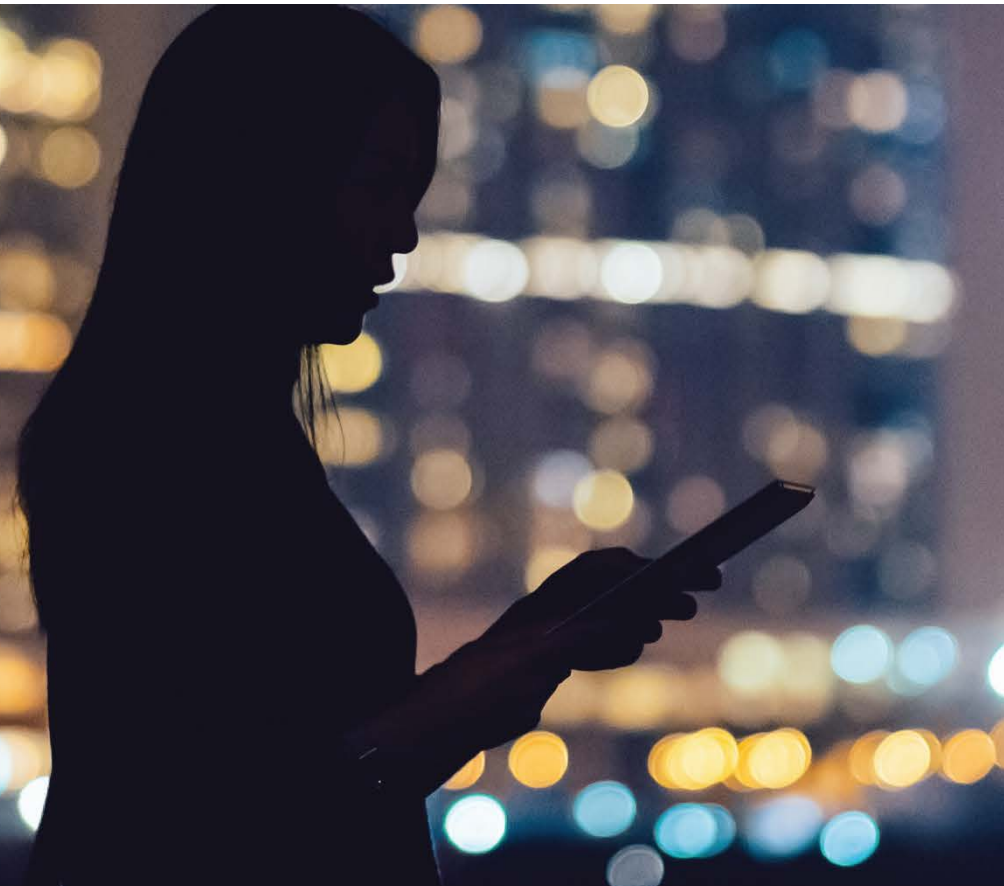
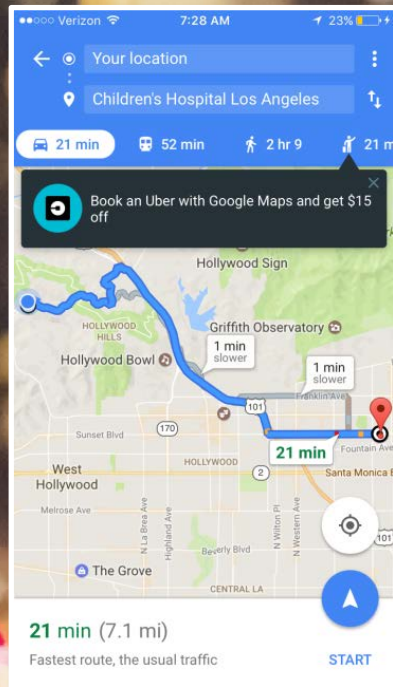


Go to where your customers are



APIs

- APIs embed services inside the digital interfaces where and when those services can be most relevant.
- Digital mash-ups create joint value propositions for business partners' common customers.



A catalyst for innovation



APIs

- Simple API integration lowers barriers to entry, accelerates development cycles, and cuts time to market.
- Ease of sharing data between platforms drives open technology strategies, composite products across providers, and coopetition.
- Check weather, buy an umbrella and have it same-day delivered to your hotel – all from an airline app before you leave home.

Businesses that
were once on
every corner

And then on
any screen...

Are now inside
every app, and
anywhere else



Ideas and opportunities

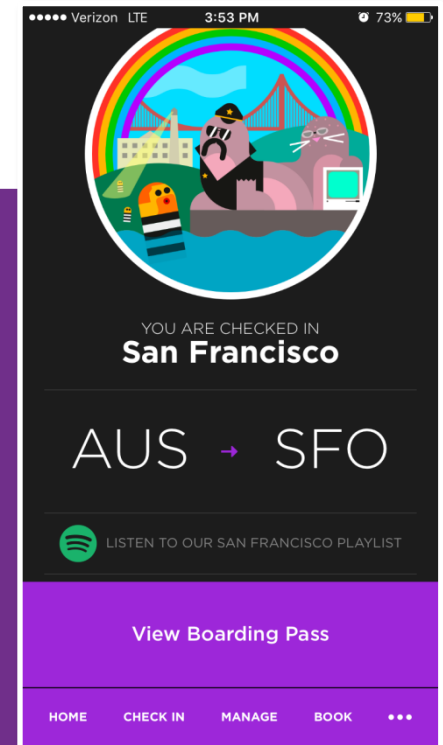


APIs

- Extend your sales channels, product offers, or customer account data into partners' digital environments.
- Plug your service providers into your operating systems.
- Bring requests for FX rates, payment status, or check images into your workstation interface, and get a real-time response, without logging in to a bank website.

Pro Tips:

- **Keep it simple:** APIs for very granular functions are better building blocks for composite solutions.
- **Think creatively:** Bring your partners, into your business model, or put yourself into theirs. Spotify's free playlist inside a boarding pass can attract new members.



Pivoting to the future

Hype is fast, but success takes time

- Experimenting doesn't fail if it drives learning that pay off later
- Start with goals or challenges your company already has
- Don't assume everyone else has it all figured out
- Look for opportunities to partner to pool resources and expertise



You know more than you think you do

Technology doesn't change your core business
but helps you change how you run it.

