The Fourth Industrial Revolution
Rewriting the rules of business, leadership and sovereignty

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OECD NAEC
1991

Programming \n\nProtocol Standard \n\nPolicy (25+ years!)
Microsoft to Use 'Biometric' Tools
To Bolster Security for Windows

By JATHON SAPSFORD

Staff Reporter of The Wall Street Journal

Microsoft Corp. has agreed to include in future versions of its Windows operating system a type of software that uses "biometric" devices such as fingerprint or eye scanners to boost online security.

Microsoft today will announce it signed a licensing agreement with closely held I/O Software Inc. of Riverside, Calif., which has a proven "application programming interface," or API, for biometrics technology. This essentially is a program that lets fingerprint or eye scanners communicate with operating systems.

Some see these scanners, which identify users based on unique individual characteristics, as eventually enhancing or replacing computer passwords. A crucial
Who am I?

- Investor
- Board Member
- Teacher
- Advisor
- TV Commentator
- Entrepreneur
Navigating the next industrial revolution

<table>
<thead>
<tr>
<th>Revolution</th>
<th>Year</th>
<th>What happened?</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌍</td>
<td>1754</td>
<td>Steam, water, mechanical production equipment</td>
</tr>
<tr>
<td>💡</td>
<td>1870</td>
<td>Division of labour, electricity, mass production</td>
</tr>
<tr>
<td>💻</td>
<td>1969</td>
<td>The computer, electronics and the internet</td>
</tr>
<tr>
<td>![Question Mark]</td>
<td>?</td>
<td>The barriers between man and machine dissolve</td>
</tr>
</tbody>
</table>
World is changing increasing faster...

- Market
- Mother Nature
- Moore’s Law

...at the same time!
Market
The Age of Tech
Market capitalization of the world's most valuable public companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil</td>
<td>$362.5b</td>
</tr>
<tr>
<td>General Electric</td>
<td>$348.5b</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$279.0b</td>
</tr>
<tr>
<td>Citigroup</td>
<td>$230.9b</td>
</tr>
<tr>
<td>BP</td>
<td>$225.9b</td>
</tr>
<tr>
<td>Royal Dutch Shell</td>
<td>$203.5b</td>
</tr>
</tbody>
</table>

* as of August 1, 2016
Sources: Yahoo! Finance, Forbes
Data = “New Oil”

1Q2017
Net Revenue = $25B
Moore’s Law
ICT → IoT

ICT

= Internet

Cybersecurity

Troubles

Transistor

Communication

Storage

Sensors

Microchip transistor sizes, 2000-2020

Moore's Law

www.futuretimeline.net
ICT → IoT

ICT = Information Communication Technology

Combining Transistor, Communication, Storage, Sensors into IoT Platforms
Moore’s Law - Exponential Growth

Singularity
2nd Machine Age
Innovation 3.0
Industry 4.0
Society 5.0
Connected Industries

log (n)
exp (n)
Exponential Growth

- In the last 20 years...

1,000x ↓

1,000,000x ↓

1,000,000,000x ↓
Linear vs Exponential
Being Human...
... Being Human

Network

Communication

Teamwork
Networked Businesses - World’s largest:

- Media company
- Movie company
- Taxi company
- Hotel
- Retailer
### Networked Businesses - World's Largest...

<table>
<thead>
<tr>
<th>Category</th>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>taxi firm</td>
<td>Uber</td>
<td>owns no cars</td>
</tr>
<tr>
<td>media firm</td>
<td>Facebook</td>
<td>creates no content</td>
</tr>
<tr>
<td>TV company</td>
<td>Youtube</td>
<td>creates no content</td>
</tr>
<tr>
<td>retailer</td>
<td>Alibaba</td>
<td>carries no stock</td>
</tr>
<tr>
<td>accomodation provider</td>
<td>Airbnb</td>
<td>owns no property</td>
</tr>
<tr>
<td>information provider</td>
<td>Google</td>
<td>doesn't write the applications</td>
</tr>
<tr>
<td>phone company</td>
<td>Skype/WeChat</td>
<td>isn't the investor</td>
</tr>
<tr>
<td>entertainment provider</td>
<td>Netflix</td>
<td>sells no camera</td>
</tr>
<tr>
<td>retailer*</td>
<td>Amazon</td>
<td>owns no cinema / lays no cable</td>
</tr>
<tr>
<td>car company*</td>
<td>Tesla</td>
<td></td>
</tr>
</tbody>
</table>

**$70B market cap**
Biggest data pool on supply (driver) and demand (passenger)

**$52B market cap**
1Q2017 = 25K cars (GM = 2.3M)
1.3B miles of data

**Trust**:
1 Minute = 400 hours of video uploaded
IoT?

Internet of Things

-or-

Internet of Threats

-or-

Insecurity of Things
Cybersecurity
Business = Security

1969 ARPANET
1983 TCP/IP
1992 Commercial use
1993 Mosaic/WWW
1995 Secure Socket Layer (SSL)
2000 RSA

Internet + Security = Business!

Security is the fundamental enabling technology of the Internet
ABC’s of Security

Atomic
Biological
Chemical
Digital
ABC vs. “D”

Not constrained by Physics

Speed of Light…

… From Anywhere

Simultaneously
“Cold War” → “Code War”

Non-State Actors

Attribution

Asymmetric
The Threat Actors

- National Interest
- Personal Gain
- Personal Fame
- Curiosity

Roles:
- Vandal
- Trespasser
- Thief
- Professionals / Spy
- Author

Skills:
- Runs Scripts
- Basic Programming & Networking
- System Level Programming & Networking
- Specialized Skills & Knowledge
Risk: Logical → Physical

Logical
- Damage
- Disruption

Physical (Kinetic)
- Destruction
- Death

Brain - 1st PC virus
January 1986

Idaho National Laboratory Demo
March 2007
Security is Complicated

- Authentication
- Confidentiality
- Privacy
- Integrity
- Authorization
- Accountability
- Non Repudiation
- Availability
Security is Complicated

- Authentication
- Confidentiality
- Privacy
- Integrity
- Authorization
- Accountability
- Non Repudiation
- Availability
New Paradigm = “Security by Design”

- Makes things better
- Increases efficiency
- Increases ease of use
- Reduce costs & lowers TCO
- Enhances system robustness
- Increases functionality & resilience

Cybersecurity is NOT a technical issue. It is a management and leadership issue.

Cyber Risk
People make mistakes
Machines break
Accidents happen
No 100%
Failure is normal
Resilience

re·sil·i·ence
noun /ri-ˈzil-ən(t)s/

an ability to **recover** from or **adjust** easily to misfortune or change

Y2K

12/31/99

↓

1/1/00
The Fourth Industrial Revolution – 6 D’s

- Digitized
- Deceptive growth
- Disruptive
- Dematerialized
- Demonetized
- Democratized
New Networked World

- 5,000+ sensors
- 10 GB/s per engine
- 2.04 Tbps for Boeing 737MAX
  (Formula 1 car = 12.28Gbps)