Horizon Scanning
Envisioning Post-2015
IT WAS the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity...we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way...

Charles Dickens
Strategic Foresight Is Itself A Growing Trend for Many Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Brazil</td>
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<tr>
<td>India</td>
<td>Mexico</td>
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<tr>
<td>Japan</td>
<td>Chile</td>
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<tr>
<td>South Korea</td>
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<td>Kenya</td>
<td>United Kingdom</td>
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<td>Nigeria</td>
<td>Germany</td>
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<tr>
<td>Botswana</td>
<td>France</td>
</tr>
<tr>
<td>South Africa</td>
<td>The European Union</td>
</tr>
<tr>
<td>Canada</td>
<td>Sweden</td>
</tr>
<tr>
<td>Russia</td>
<td>Denmark</td>
</tr>
<tr>
<td></td>
<td>The Netherlands</td>
</tr>
<tr>
<td></td>
<td>Canada</td>
</tr>
</tbody>
</table>
Unprecedented Number of Tectonic Shifts

• Growth of the Global Middle Class
• Wider Access to Lethal and Disruptive Technologies
• Definitive Shift of Economic Power to the East and South
• Unprecedented and Widespread Aging
• Urbanization
• Food and Water Pressures
• Youth Bulges
Biggest Shift: Individual Empowerment

- Root of the other big changes—expanding global economy, rapid growth of developing countries and widespread exploitation of new enabling technologies.
- Explosion of Educated Middle Class in Developing World and Drop in Poverty Rate.
- Demand for Opportunities as Individuals move into the middle class.
- Sense of Insecurity Will Persist—Particularly in the West Now, But Developing World Too
Growth of the Global Middle Class

The Middle Class Is Growing...

Global Population by Income

1965
3,267,422,420 People
Top 5,558,825 | Middle 736,853,742 | Bottom 2,525,009,853

2012
6,820,730,223 People
Top 357,936,395 | Middle 4,871,161,044 | Bottom 2,782,424,086

2030
8,011,521,525 People
Top 357,936,395 | Middle 4,871,161,044 | Bottom 2,782,424,086

Mathew J. Burrows
Director, Strategic Foresight Initiative
...and Moving Eastward

![Chart showing the shares of global middle class consumption, 2000-2050. The chart illustrates the increasing share of consumption by regions, with a notable rise in China and other Asian countries.]
Rapid growth in computing innovation leads to subsequent new revolutions.

Moore’s Law is now applicable to more than computing, which means several technologies are evolving exponentially at the same time.
Disruptive convergence of breakthroughs will revolutionize individuals’ abilities to create societal change.
Information Technology: Big Data

The Exponential Growth of Data...

5 EXABYTES = 5 BILLION-GIGABYTES

From the start of time ~ 2003
In 2010... ~2 days
In 2013... ~10 minutes

72 Hours of video content is added to YouTube every minute
A commercial airliner generates One Terabyte of data per day.

Source: Eric Schmidt, Abu Dhabi Media Summit, 2010
Scope for Improvement

Exhibit 23
Emerging economies’ share of Internet population is large, but their share of data and communication flows remains low
Population and Internet activity, 2012

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Internet population(^1)</th>
<th>Cross-border online traffic</th>
<th>Cross-border eBay sales</th>
<th>Cross-border Twitter followers</th>
<th>Internet content indexed by Google(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging</td>
<td>86</td>
<td>68</td>
<td>24</td>
<td>21</td>
<td>17</td>
<td>10</td>
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<tr>
<td>Developed</td>
<td>14</td>
<td>32</td>
<td>76</td>
<td>79</td>
<td>83</td>
<td>90</td>
</tr>
</tbody>
</table>

1 We define Internet population as total country population multiplied by the broadband penetration rate of the country.
2 Total amount of user-generated content indexed by Google in 2009. The United States, Europe, and Japan created 90% of total content.

SOURCE: World Development Indicators, World Bank; International Telecommunication Union; Telegeography; eBay; Twtrland; Geographies of the world’s knowledge, Oxford Internet Institute, 2012; McKinsey Global Institute analysis
Huge Stakes in Urbanization

- How Urbanization is Managed will determine whether global war for sustainability is won or lost
- Biggest Risk is that We Don’t Identify, Adapt and Scale the Most Promising Technologies

13 May 2014
Mathew J. Burrows
Director, Strategic Foresight Initiative
Third Industrial Revolution

• Convergence of Several Broad Technologies—Nano, Bio, IT, Advanced Manufacturing, Artificial Intelligence, New Materials and Robotics
• Transforming the Way Goods Are Made
• Creating But Also Destroying Jobs
• Need for STEM education and new skills training for modern workforce
Advanced Manufacturing (3DP/4DP)

- Democratization of production

- May enable adversaries to leapfrog to niche competitor

- Enables complex designed objects to be produced

Mathew J. Burrows
Director, Strategic Foresight Initiative

13 May 2014
Biotechnology

• Disease management → prolonged lifespan
• Greater resources (e.g., food, water, energy)
• Human augmentation
Mastering the Global Challenges

Education
Technology
Innovation