

OSIsoft®

# USERS<sup>2011</sup> CONFERENCE



Turning **insight** into **action**.



# **The Future: A New World of Interconnected Devices and Cloud Services**

Presented by **Dr. Daniel A. Reed**  
**Corporate Vice President**  
**Microsoft**

# The Questions Don't Change, But the Answers Do...



# TOMORROW LOOKS LIKE TODAY...

**...BUT THE DAY AFTER TOMORROW  
LOOKS NOTHING LIKE THE PAST**

- This is the power of computing exponentials ...
  - Computing, storage, networking
- The insurmountable, intractable and horrendously expensive...
  - ... can become solvable, simple and inexpensive
- We have an opportunity for a better society, afforded by technology
  - ... mediated by nimble policies and cultural change



# Computing Eras: Exponential Change

Mainframe Era



Pre-PC Era  
(1980)



PC Era  
(1995)



Internet Era  
(2000)



Consumer Era  
(Today+)



## 21<sup>st</sup> century implicit and natural computing

- Increasingly natural interfaces
- Embedded intelligence in everyday objects
- Ubiquitous network access and cloud services



# Disruptive Technologies and Trends

Client + Cloud  
New software models

Computing Consumerization  
Many device world

The Internet of Things (IoT)  
Computing everywhere

System on a Chip Designs  
Powerful devices

Ubiquitous Sensors and Media  
Explosive data growth

Natural User Interfaces  
Moving beyond GUIs





# Clients Create The Experiences



Fixed



Portable



Specialty/Embedded



Mobile



Fixed

Portable

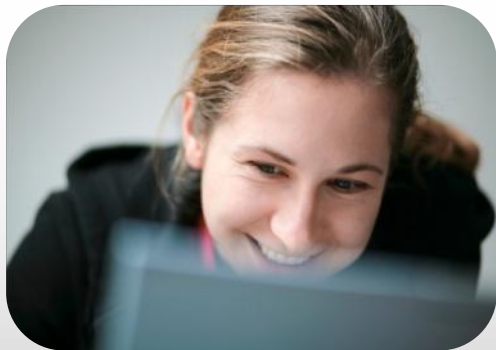
Specialty/Embedded

Mobile

*\*Source: IDC, as reported in The Economist, Feb 25, 2010*



$1.2 \times 10^{21}$   
New Bytes of Information in 2010\*



Consumer



Enterprise

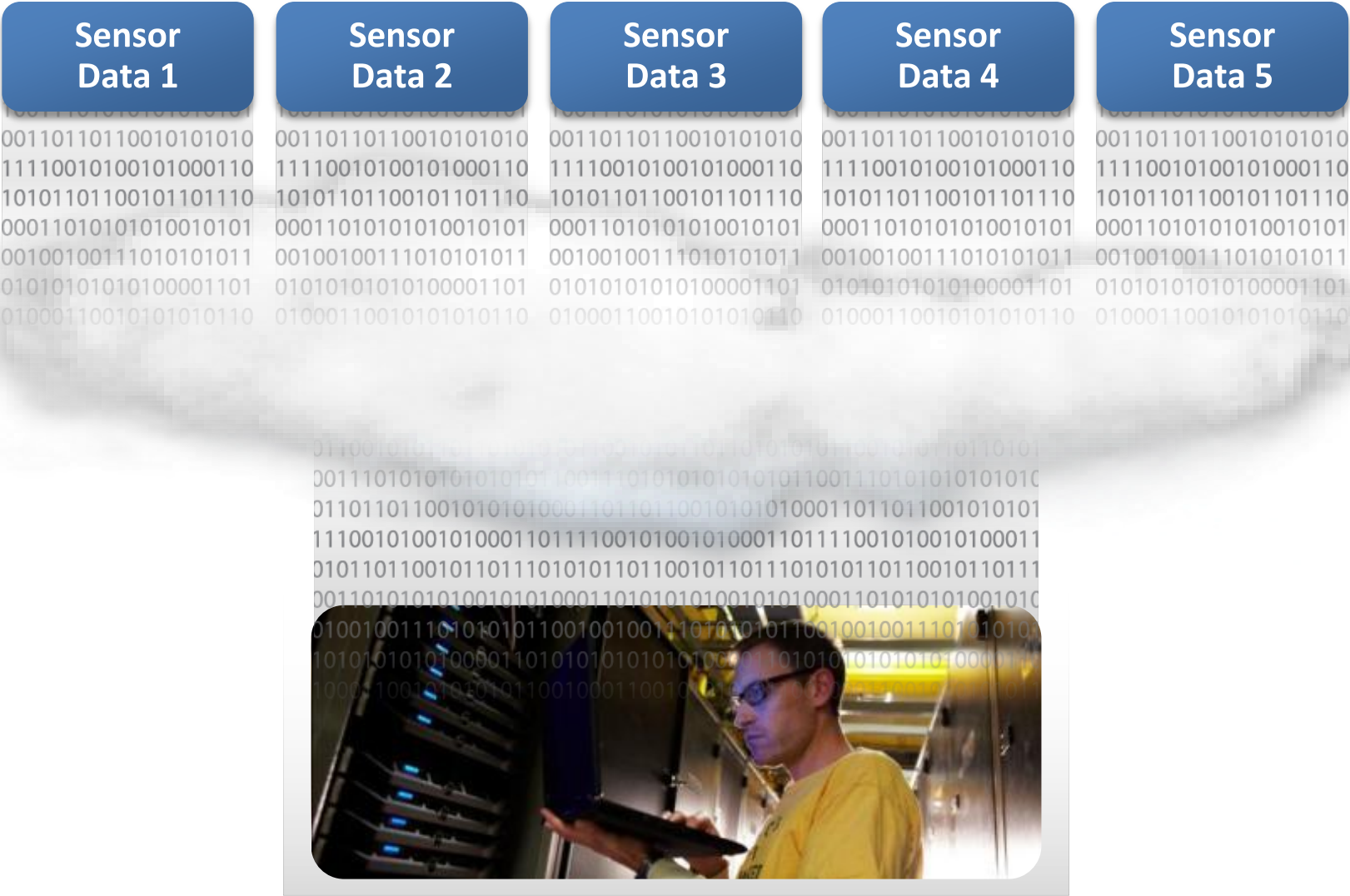


Government

*\*Source: IDC, as reported in The Economist, Feb 25, 2010*



# The Future: The Evolution Of Sensors, The Cloud And “Big Data”



# A Transition: Computing Power + Data



As individuals, we have more computing power than the fastest supercomputers once provided to a select few.

We have enough computing and enough data that when combined with the power of the cloud, new kinds of experiences can emerge, enabled by sensors, actuators and interfaces.





## Working At Your Command



## Working On Your Behalf



# Not Everyone Can Have An Assistant... Or Can They?



I'll book your favorite hotel and set up a team lunch.

There is only one connection that will work, but it requires you to stay an extra day.

I'll adjust your schedule, so that meetings don't conflict.

I need to be in Shanghai next week for a conference. Can you arrange travel?

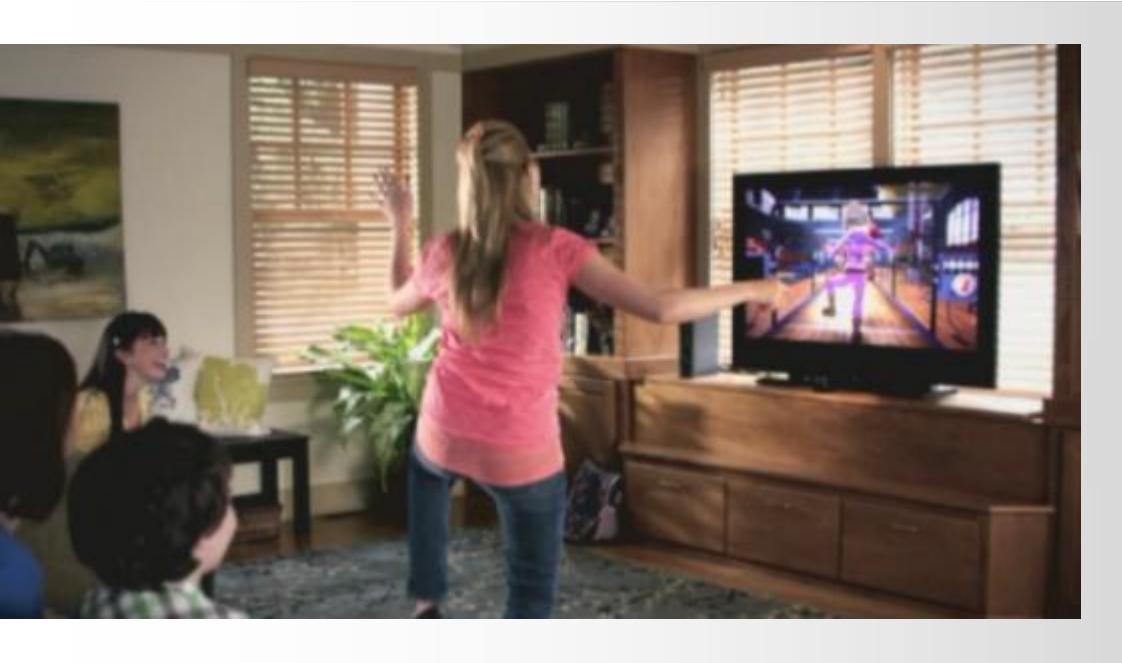
The team will also need me in London by Thursday.

A Good Assistant:

- Leverages "Memory"
- Anticipates
- Holistically Completes Tasks
- Senses Emotion
- Recognizes Patterns



# Microsoft Kinect: A First Step Toward A New Interface Model



## Enabled by Microsoft Research

Leveraging a decade of basic research  
Multiple laboratories, worldwide

## HCI, AI, imaging, audio ...

Kinematics, machine learning  
Gesture recognition



# Entertainment Is Just The Start ...



Microsoft Partners See Kinect Going Beyond Games

Microsoft's Kinect patent application goes public, reveals gobs of fine print



**UW researchers using Kinect for remote surgery systems**

Perhaps the most useful "hack" of Kinect is being developed by researchers from the University of Washington, who have rigged Microsoft's motion sensor for Xbox 360 to give a surgeon haptic feedback during remote operations.



Microsoft Kinect-powered robot to aid earthquake rescue



InterKnowlogy, a Microsoft partner in Carlsbad, Calif., is exploring Kinect's potential in healthcare scenarios, working with customers to design use cases for integrating it into their existing rehabilitative care systems.



February 21, 2011 3:38 PM PST

**Microsoft announces plans for Kinect SDK**

# Intelligent, Adaptive Routing: Smart Grids and Traffic



Concept Only



# The Connected Home

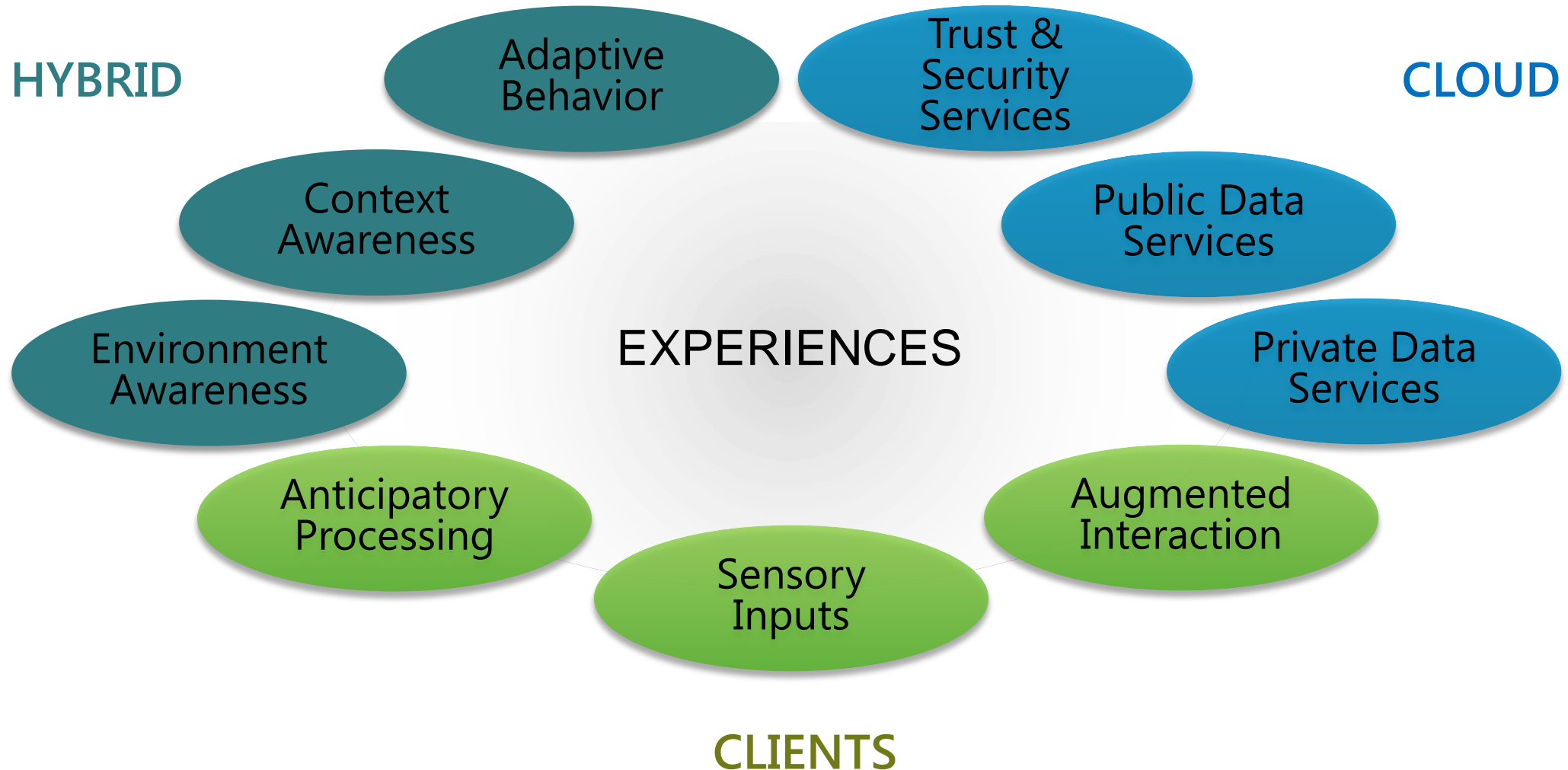


# Vision of The Future Energy Ecosystem

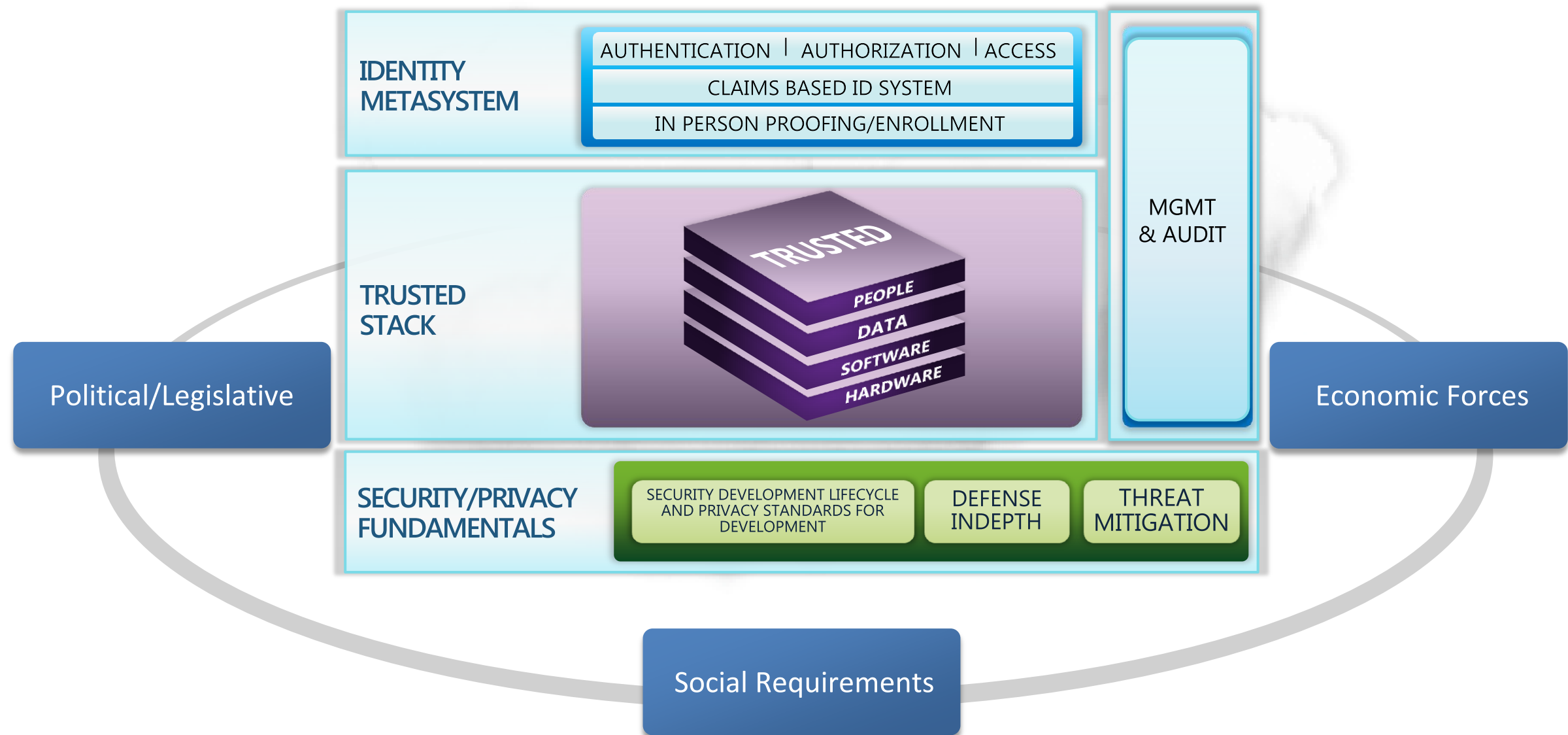




# The Future of Contextually Sensitive Experiences



# End-to-End Trust



# End-to-End Perspective



NEW EXPERIENCES

NOVEL INFRASTRUCTURE

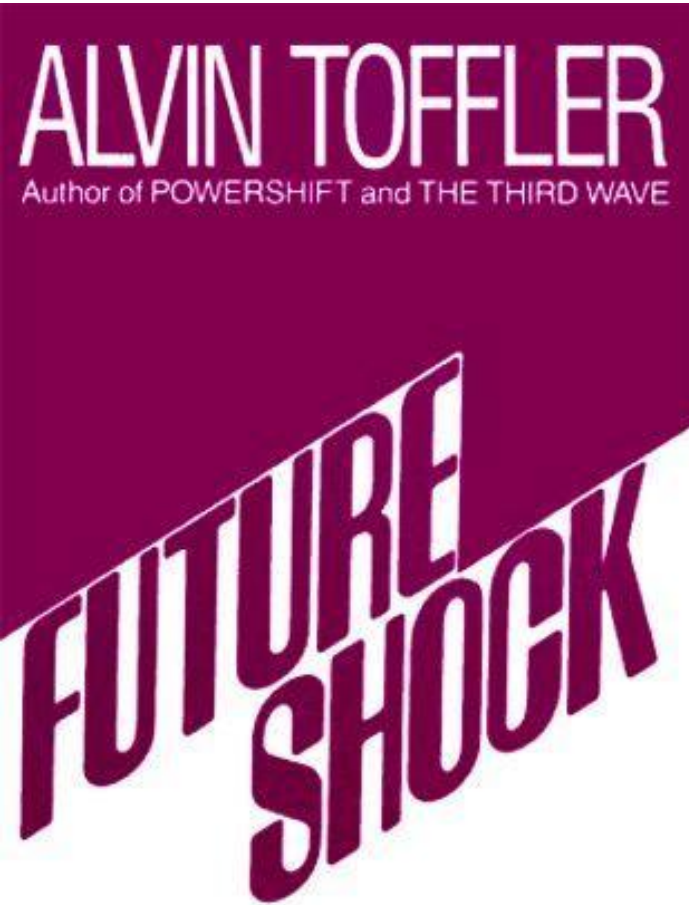
FLEXIBLE TOOLS

INTELLIGENT MANAGEMENT

END-TO-END TRUST



# Future Shock: Technology, Policy and Culture



- Exponential technical change creates **future shock**
- Technology change outstrips social processes
- The {virtuous, sinful} cycle
  - Technological capabilities enable and constrain people, businesses and government
  - People, business and government enable and constrain technology adoption and usage
- But we can work to facilitate the future; to stimulate innovation and new capabilities
  - Public and private partnerships
  - More nimble policy frameworks to accommodate the new and unexpected
  - Citizen awareness and engagement





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