

CapTech[®]

Architecture for IoT

Don't Forget The Lessons From The Past

Others Talk,
We Listen.

Copyright © 2017 CapTech Ventures, Inc. All rights reserved.

Copyright © 2017 CapTech Ventures, Inc. All Rights Reserved.

CONFIDENTIAL – CapTech considers these materials to be confidential and proprietary business information.

Agenda

Introductions

What Is IoT

Business Value of IoT

Building IoT Systems



Vinnie Schoenfelder
vschoenfelder@captechconsulting.com



Jack Cox
jcox@captechconsulting.com

Banking & Financial

RAYMOND JAMES®



Government



Virginia.gov



Ohio.gov

NEVADA



Kentucky.gov

Health Care



Retail & Consumer Goods



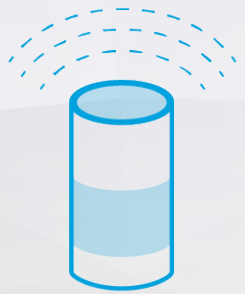
Other Industries



What Is IoT?

Technologies that control, collect and transfer information on the condition of physical assets or people.

IoT Examples



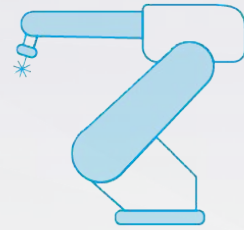
Amazon Echo



Smart Light Bulbs



Wearables



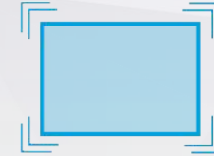
Conveyor
Controls



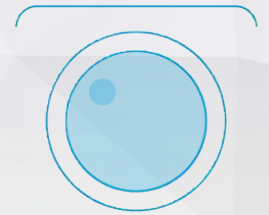
Temp
Sensors



RFID tags



Vibration
Sensors



Security
Systems

What's The Business Value

Increased data about business activities

- Every activity has data associated with it

From increased data comes increased intelligence

- Move from descriptive reporting to diagnostic reporting
- Move from diagnostic reporting to predictive analysis
- Move from predictive analysis to proscriptive actions

Business Value

Increased customer value proposition

- Realtime updates
- Realtime and historic sensor data

Increases supplier value proposition

- Realtime supply chain visibility
- Improved chain-of-custody tracking

Increased Intelligence Use Case

Fuel Distribution company tracks and records vehicle movements

Information led to more intelligent scheduling solution

Reduced long idle times by 64%

Improved customer service via real-time location updates

Increased Operational Efficiency

Utility company measures and record line voltages at residential meters

Data led to intelligent control of the electrical grid

Fine-grain control allows significantly reduced energy use to meet and exceed regulatory requirements

Innovative internal use led company to spin-off software as a stand-alone for-profit company.

Increased Customer Value

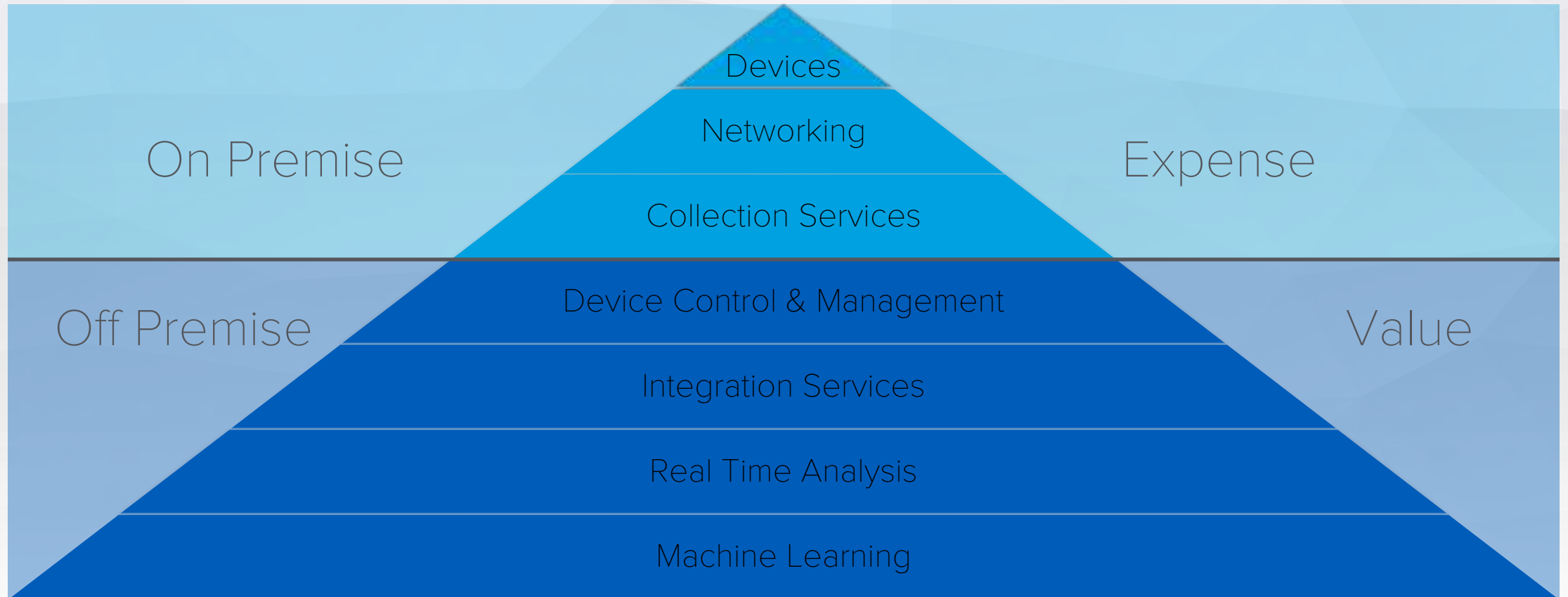
Major hotel chain replaced room locks with intelligent locks

On-site check-in process is eliminated since customers mobile phones become their door keys

Customer satisfaction, especially amongst younger customers, increases dramatically

Poor customer experience of erased room keys is eliminated

IoT Ecosystem



Wringing Value Out of the Ecosystem

Increase Intelligence



Increase Flexibility

(e.g. opportunity)



Increase Integration



Control Risks



Control Costs

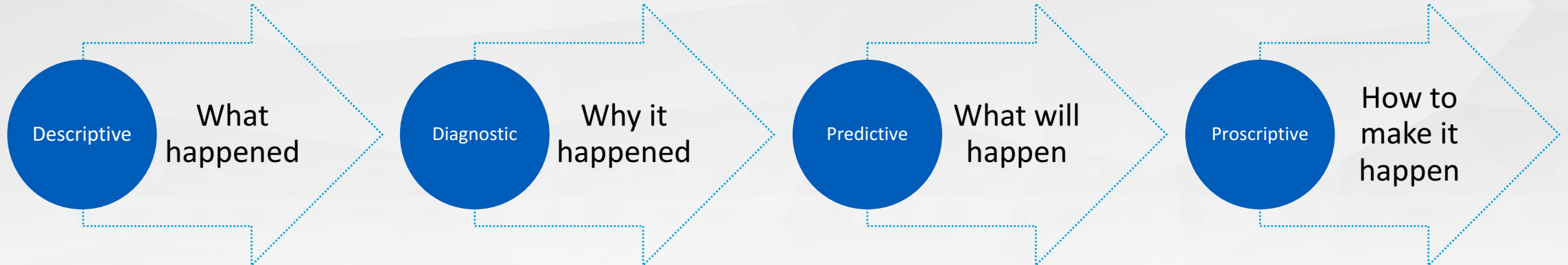
Increasing Intelligence

Reporting

Auditing

Analytics

Machine
Learning



Increase Flexibility

Loosely Coupled

Scalability

Availability



Secure
cloud
Docker
Cloud
API REST
Reusable
HTTP
Microservices
TLS

Loosely Coupled

Devices can interact with multiple backends

All backend functions are accessible via services

All backend data available for export

Provides Flexibility in

- Migrating to new platforms
- Supporting diverse devices
- Avoids vendor lock-in

Scalable

Service can grow to support any number of devices

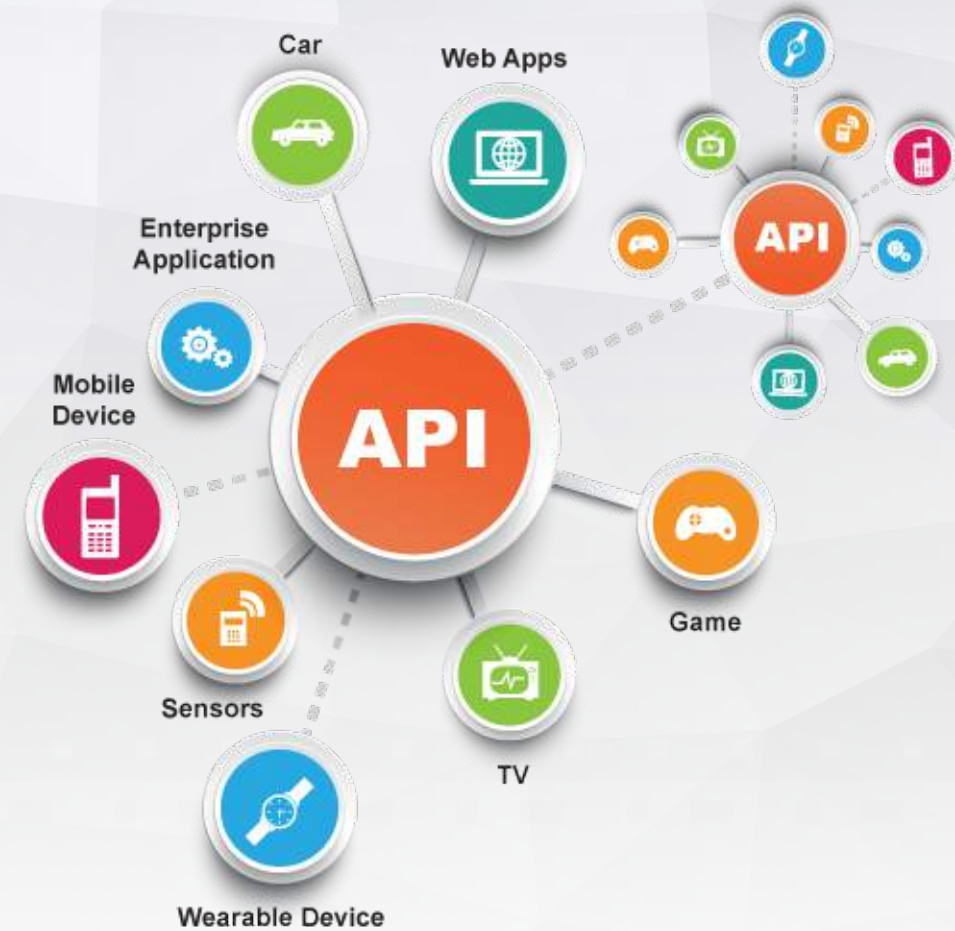
Devices not impacted by size of network

Provides Flexibility in

- Growing device farm without having to replatform
- Changing system behavior without encountering performance roadblocks

Increase Integration

Extensibility
Externalizable Service
Oriented Architecture
Bezos Famous 2002 Memo



Bezos Memo

1. All teams must expose data and functionality via services
2. Teams must communicate through services
3. No other inter-process communication allowed
4. Technology agnostic
5. Services must be externalizable
6. If you don't do it you're fired
7. Have a nice day



Bezos Memo Impact

Completely non-vertically integrated organization

Product offerings well beyond traditional retail

\$14B cloud services offering

Seemingly Unstoppable Commercial Behemoth

Mitigate Risks

Security | Migratability

The 'S' in IoT stands for Security



Security

Data

Protection at rest
Data protection in transit

Device

Protection
Validation

Migratability

Ability to migrate from one platform to another

- Without redeploying devices
- Without loosing data

Control Costs

Maintainability

Supportability

Maintainability

Updating and improving the software

- Without physically touching devices
- Without inordinate downtime

Supportability

Fixing or restoring software

- Without physically touching devices
- Without inordinate downtime
- Without data loss



Vinnie Schoenfelder
vschoenfelder@captechconsulting.com



Jack Cox
jcox@captechconsulting.com