

Driving Data Center Modernization and Cloud Adoption Maturity in the Public Sector

A Precise Software Solutions Presentation:

Ben Duan, Chief Technology Officer

Ellen Crayton, Enterprise Architect

About Precise Software Solutions – Rockville, MD

ABOUT PRECISE

Precise Software Solutions, Inc. (Precise) is a nimble and fast-growing SBA 8(a) certified small business focusing on strategy and IT consulting services to public sector customers. We are proud of our strong reputation for overcoming obstacles and delivering innovative, quality work with measurable results. For detail information, please visit us at www.precise-soft.com



Precise Software Solutions – Relevant Services & Solutions

MISSION SUPPORT & STRATEGIC CONSULTING IT Transformation and Innovation Services

We developed the data center modernization strategy and roadmap for a large federal agency. Work included multi-cloud adoption and migration and on-premises data center consolidation and automation. Enabling Data Sharing Through a National Exchange. We are implementing a National Food Safety Data Exchange (NFSDX) to integrate federal, state, and local regulatory partners in forming a more holistic regulatory oversight.

SYSTEM MODERNIZATION & INTEGRATION System Modernization and Integration with 30+ Legacy Systems

We supported a large \$150M+ system integration program to modernize, streamline, and automate a federal agency's mission critical regulatory program. The program was completed on time, within budget, and with high customer satisfaction. Laboratory Information System Development. We streamlined our critical information processes. Our 40+ laboratory and technical experts help our customer to perform high quality laboratory analysis using our Agile and DevOps management and operation management methodologies with 100% on-time delivery and zero defects.

DATA MANAGEMENT & ANALYTICS Large Scale Enterprise Data Management

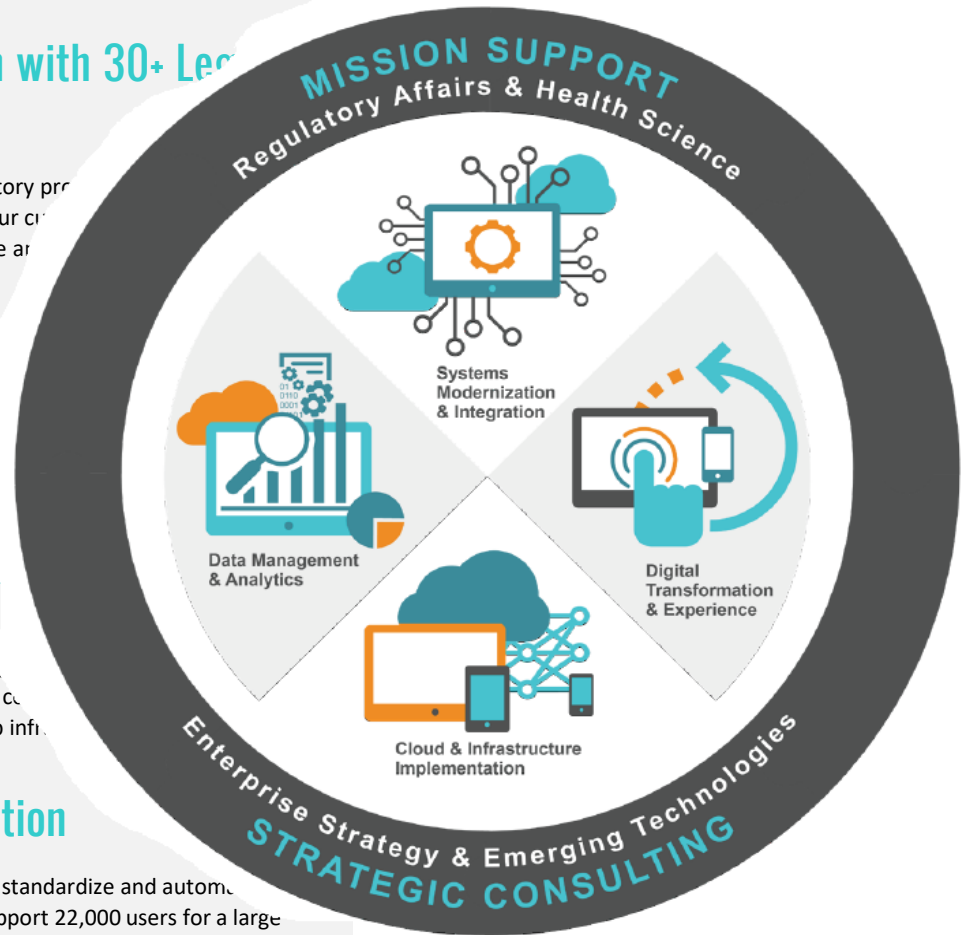
We performed all aspects of data management for a large government program including database modeling, design, database migration and optimization over 2,500 database tables with the total database size of 3.2 TB. Advanced Data Analytics Services. We supported the Financial Industry Regulatory Authority (FINRA) in searching, data analytics, data visualization, pattern recognition, and predictive analysis. Our implementation at FINRA included processing multiple stock exchanges to recognizing patterns for fraud detection.

CLOUD & INFRASTRUCTURE IMPLEMENTATION Enterprise Azure IaaS Design and Implementation

We designed an enterprise IaaS platform for a large government agency on Azure GovCloud to provide a highly secure, reliable and easy to manage extension of their on-premises data centers. Server Strategy and Implementation. We developed a server modernization strategy for a large government agency and conducted a comprehensive data center and server inventory assessment and designed a future state architecture that includes on-premises and cloud technologies such as bare metal, hyper-converged infrastructure, software-defined network and storage, server virtualization, virtual desktop infrastructure, and containerization.

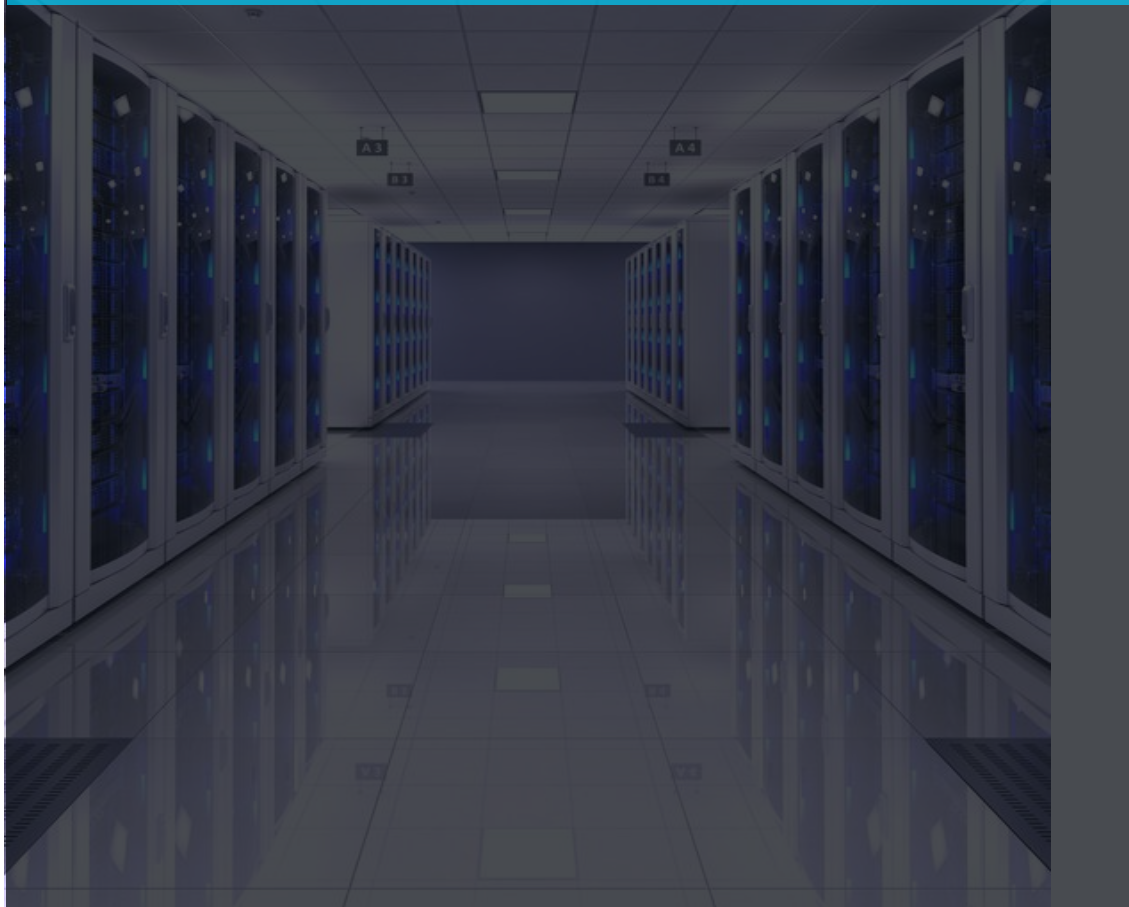
DIGITAL TRANSFORMATION AND EXPERIENCE Automated Mobile Inspection Solution

We supported 4,000 agency investigators to carry out their regulatory mission by developing a comprehensive mobile inspection platform to standardize and automate customer's field operations. Enterprise IT Service Automation with ServiceNow. We developed the IT Service Portal and Service Catalog to support 22,000 users for a large agency using ServiceNow with the goal to streamline and transform customer's manual and labor-intensive IT service processes into smart online forms and end-to-end automated workflows.



please visit www.precise-soft.com

Agenda



- 01** IT Modernization – Public Sector Mandate
- 02** Value Based EA, ITSM, & ITIL v3 & Precise EIF
- 03** Modernization & Cloud Adoption – Precise Software Case Study
- 04** Current State Observations
- 05** Cloud Maturity Model
- 06** Reference Architecture
- 07** Future State Recommendations
- 08** Cloud Center of Excellence
- 09** Technology Decision Tree
- 10** Implementation Roadmap
- 11** In Closing - Takeaways

Overview of IT Modernization Public Sector Mandate

Modernizing Federal IT will enhance mission effectiveness and reduce mission risks through a series of complementary activities that culminate in 2022

01

Enhance Mission Effectiveness

Enhance the effectiveness and efficiency of government services, leveraging data-driven, customer-focused strategies to **modernize legacy systems, consolidate common agency services, adopt new shared services models, and embrace commercial cloud solutions.**

02

Reduce Cybersecurity Risks to the Federal Mission

Mitigate the impact of risks and impact of threats to Federal agencies' data, systems, and networks **by implementing cutting edge cybersecurity capabilities.**

03

Build a Modern IT Workforce

Enable agencies to develop and empower an IT workforce with the skills to achieve modernization goals and support up-to-date technology.



Source: https://www.performance.gov/CAP/action_plans/FY2018_Q1_IT_Modernization.pdf

Value Based Enterprise Architecture: EA, ITSM & ITIL v3

Integrating the EA, ITSM and ITIL frameworks is critical for the collaborative process; valuable insight is realized that contributes to the future state recommendations on the subject of capability-based planning, IT consolidation and automation, data center management, security and risk management, regulatory compliance and most important, continuous service improvement.

Focus on measurable results, just in time, just enough

Our holistic approach helps exceed expectation and fulfill our commitments with excellence:

Public Trust, Safety and Security

Architecture Management, Risk Management, Resource Management, Investment Oversight, Transformation, New Technology Vision, Cybersecurity

Practice Duties

Alignment, Models, Learning, Strategic, Measures, Influence, Fiduciary, Governance, Best Practices, Modernization and Automation

Practice Standards

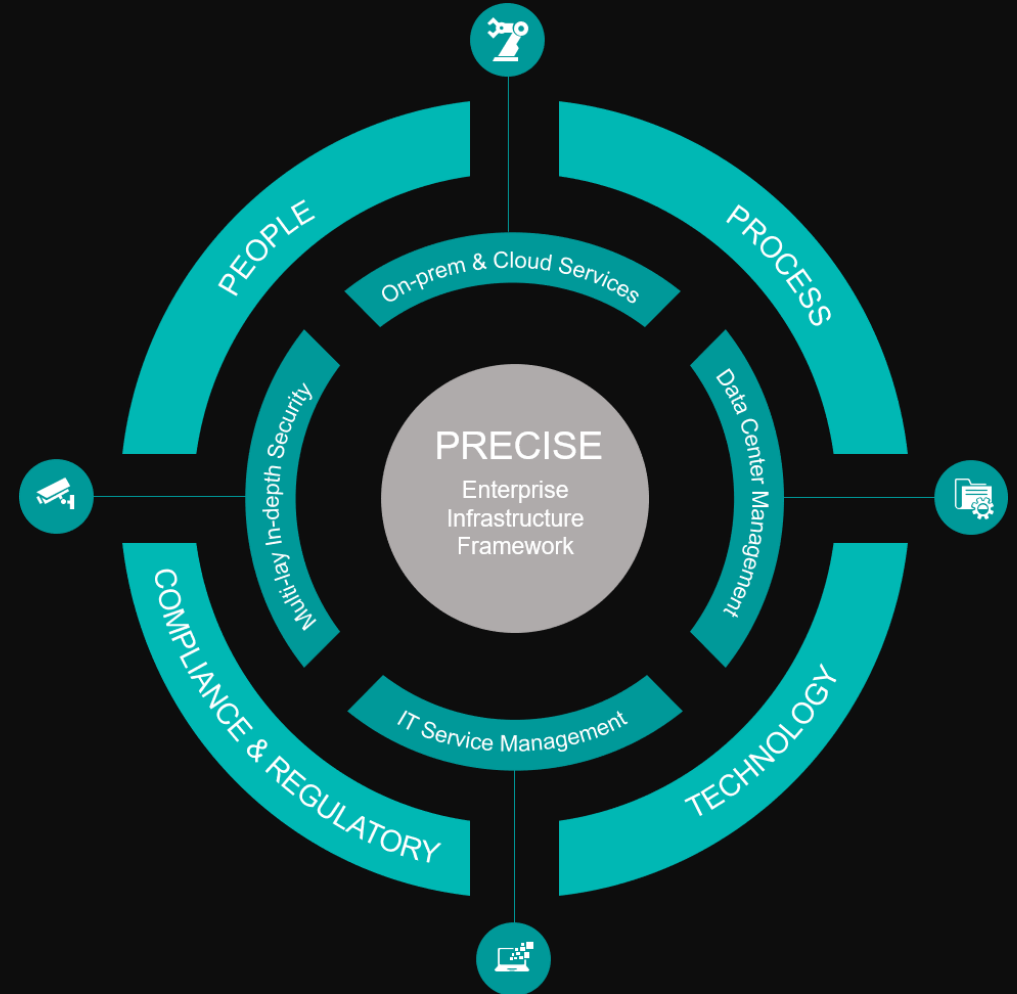
Examinations, Experience, Education, Modernize Workforce, Ethics

Standard of the Profession

Industry Body of Knowledge, IT Working Groups, Professional Education, Industry Governance, Protecting our Brand, Code of Ethics, Accreditation, Professional Development, Skill Development.

Precise Enterprise Infrastructure Framework (EIF)

Our proprietary framework, Precise EIF, built on the best practices of EA, ITSM and ITIL, helps identify challenges and pain points using a 46 points questionnaire that aligns with our customer's IT transformation strategy and mission mandate



Driving Data Center Modernization and Cloud Adoption Maturity in the Public Sector

Precise Software Case Study

— PERCISE —
***Case Study -
Summarized***



It was clear to the agency's leadership that a comprehensive, "fix the foundation and forward-looking" data center modernization strategy was imperative to its future success. By pursuing a digital transformation initiative and better leveraging IT resources, the agency would achieve greater operational efficiency, security, compliance, and innovation.



A large federal agency's data center, the foundation for its Information Technology (IT) operations was facing various challenges, including: low customer satisfaction, inconsistent service delivery quality, operations team burn-out, inadequate operational data for ongoing support and future capacity planning, a lengthy manual service provisioning process, a cumbersome cloud migration process, and many end-of-life (EOL) servers.

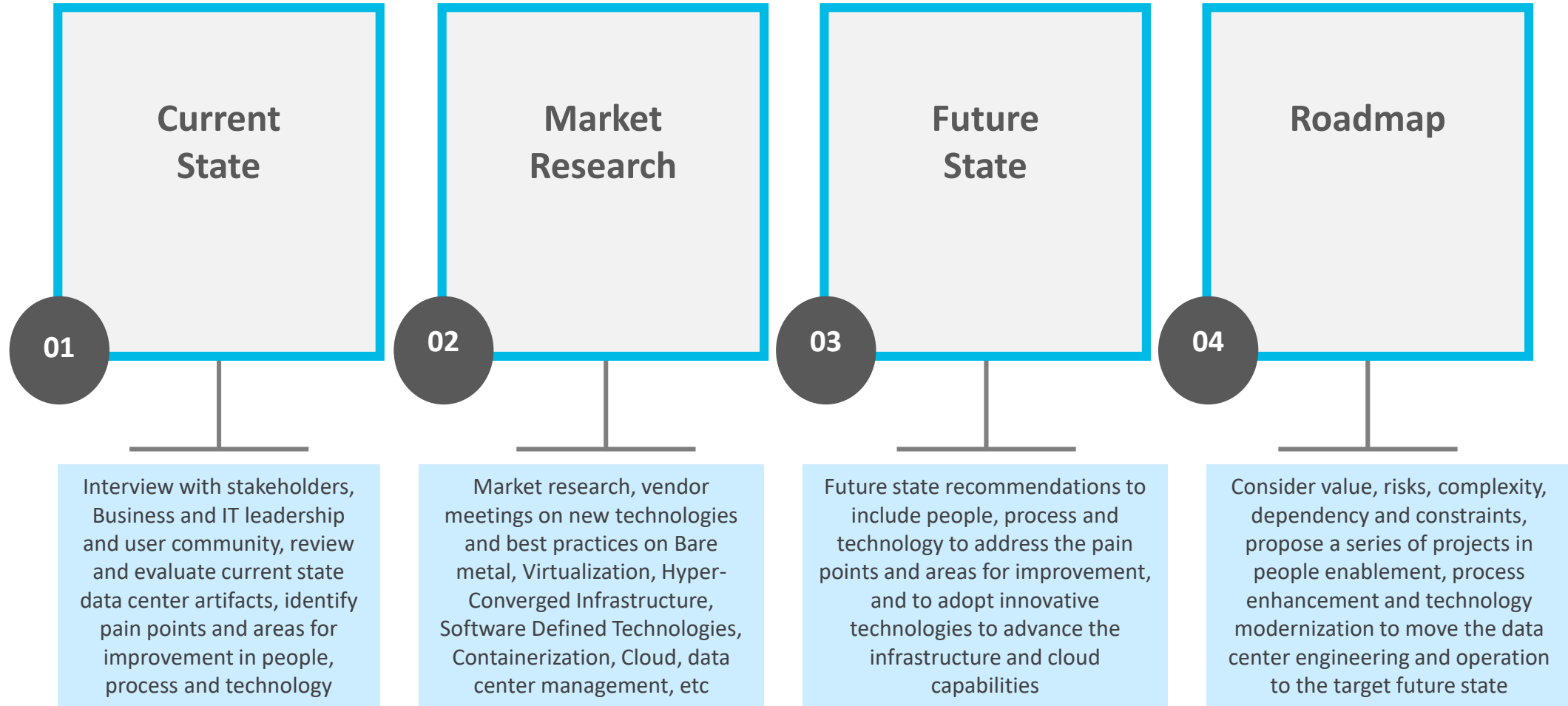
OUR TASK

To develop comprehensive hybrid data center (On-premise and Cloud) modernization strategy, focusing on people, process and technology that enable our federal customer to fulfill its mission and federal mandate


OUR DELIVERABLE

Data Center Modernization Strategy:
Future State Recommendations,
Implementation Road map

Our Approach



Current State Analysis Questionnaire - Sample



DATA CENTER CURRENT STATE ANALYSIS QUESTIONNAIRE

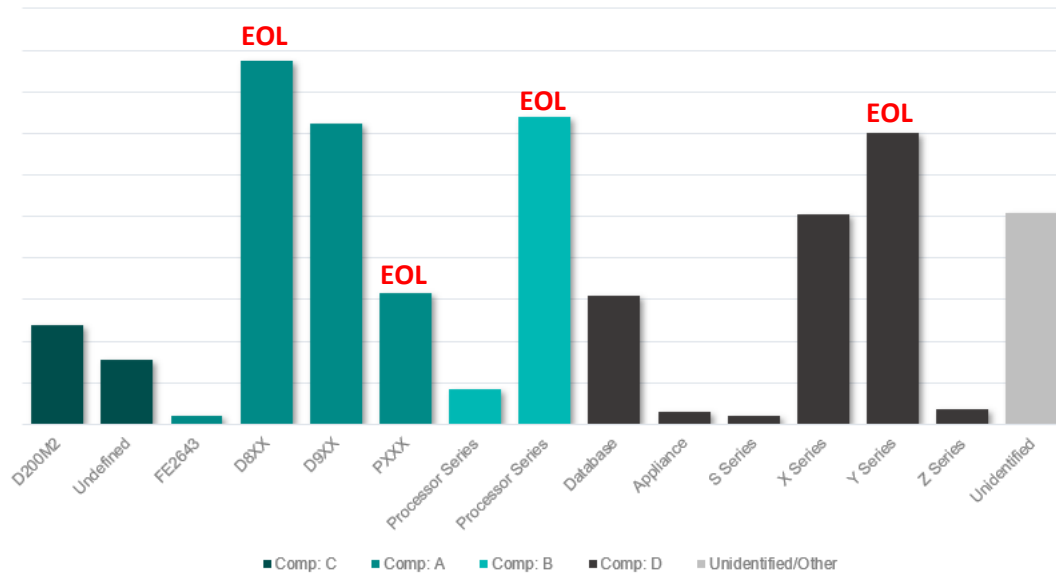
General Comments:

Delivering Service Excellence			Recommendation				
	Ref	Question/Topic	Feedback/Response	People	Process	Technology	Comment
DC1:	Do you have adequate resources (staff, finances, etc.) to bring the business up to normal operating levels? At peak time.						
DC2:	Is staff sufficiently trained on existing technologies and is there depth in staff knowledge within the team. How is new technology training addressed?.						
DC3:	Do you have a succession plan established to support the data center staff resources in the event of staff retirement? In support of the IT modernization strategy?						
DC4:	Are the processes for deploying a physical machine fully documented? There were some automation in Puppet, correct? How many steps in the build process?						
DC5:	What decision points determine your need for new compute resources?						
DC6:	How are licenses managed for data center assets? i.e HW, Core, Processor?						
DC7:	Are data center audit requirements defined and implemented?						
DC8:	How are changes managed? How is the team tracking and documenting work?						

46 Questions covered ITIL process areas and data center technologies

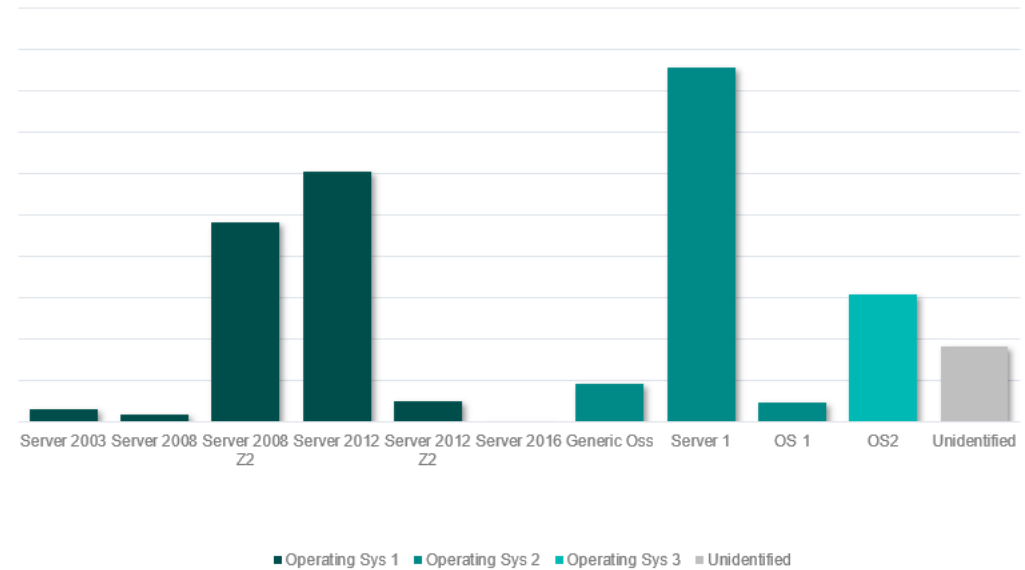
Data Center Inventory Analysis - Sample

Server Models



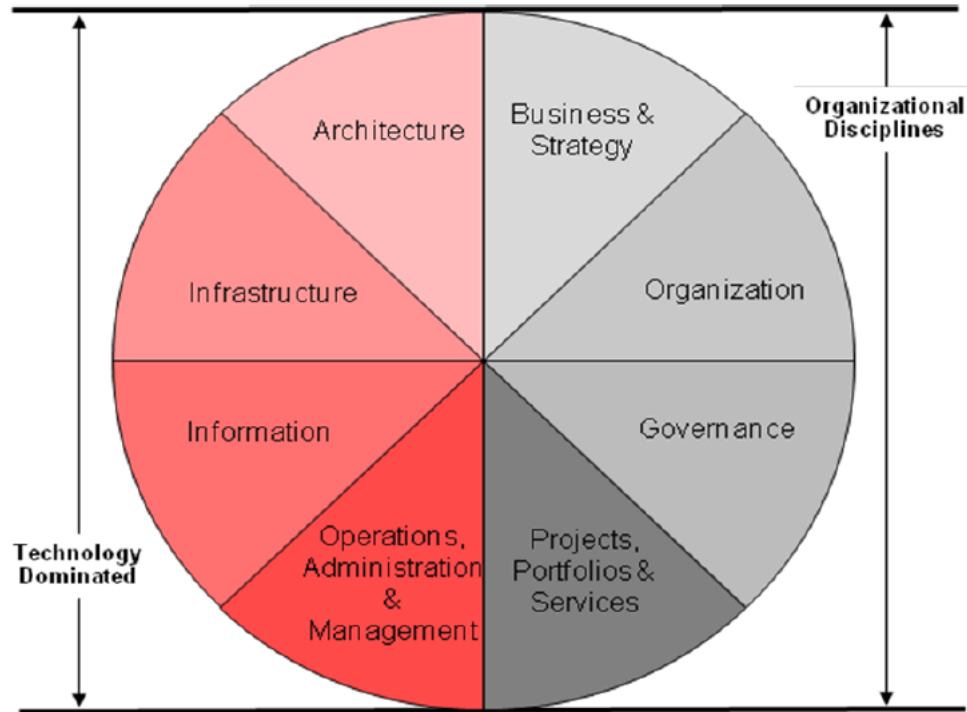
- Servers from many vendors
- Many servers are End Of Life (EOL)
- ~10% servers are not accounted for

Operating Systems



- Many OSs, variety of versions in each OS
- ~10% OS are not accounted for
- Low server utilization ratio (10%)

Cloud Computing Maturity Model – Oracle

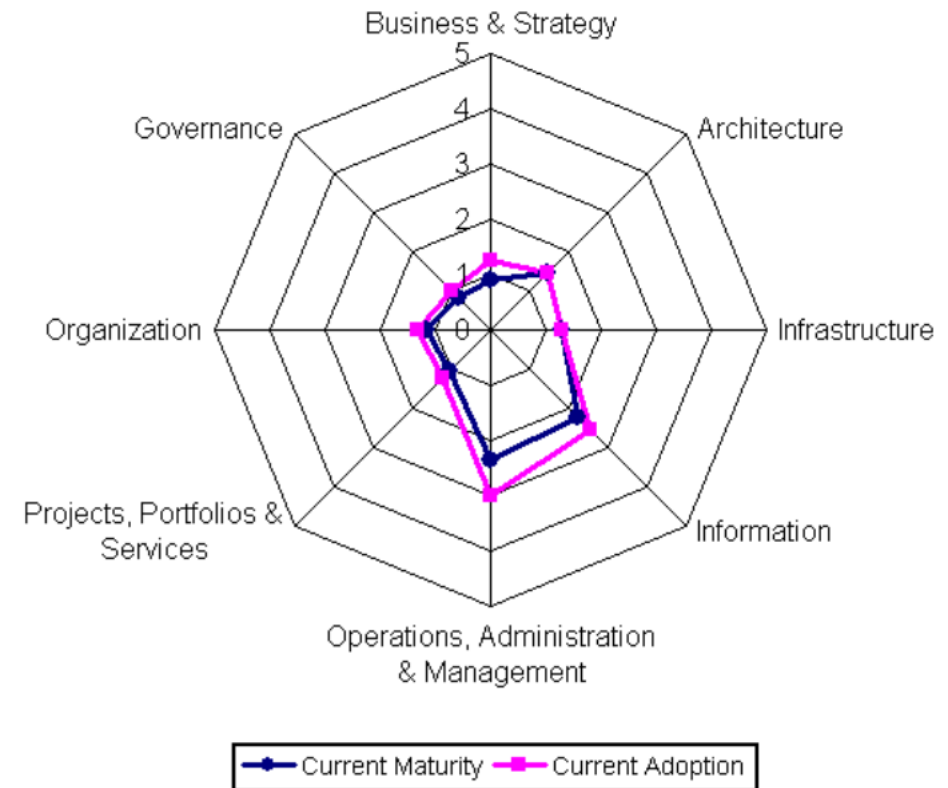


Maturity

1. Adhoc
2. Opportunistic
3. Systemic
4. Managed
5. Optimized

Adoption

1. No Implementation
2. Discrete Resource
3. Across Collections
4. Across Pools
5. Across Units
6. Across Clouds



Highlights of Current State Observations - Sample

PEOPLE



- **Knowledge Management:** document, knowledge articles are scattered in many place, no central knowledge management system....
- **Communication:** No dedicated business and IT liaison...
- **Work load:** Operation team is constantly operate at peak capacity, always busy...

PROCESS



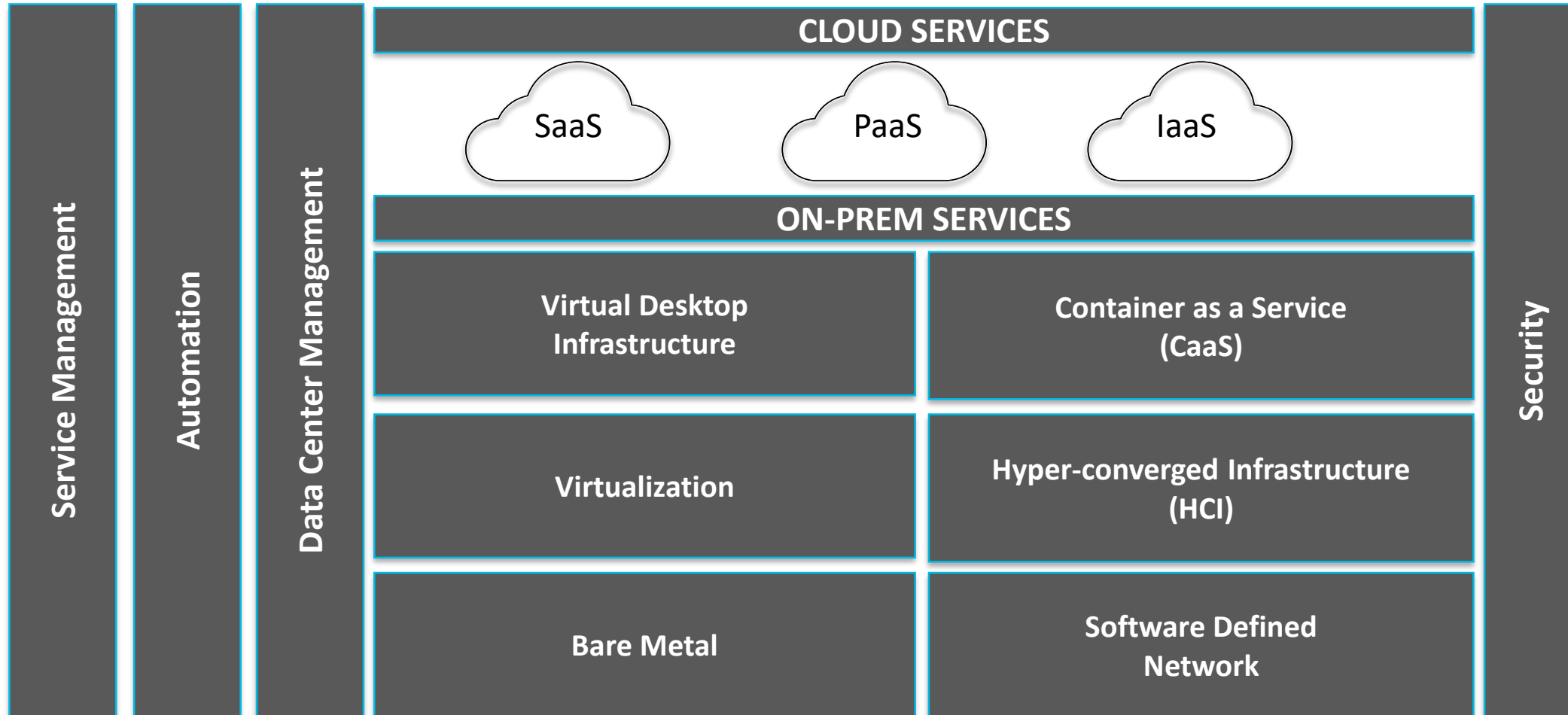
Service Strategy	Service Design	Service Transition	Service Operation	Continual Service Improvement
<ul style="list-style-type: none"> • No forecast on service demand, compute resource demand from business to IT • On-premises chargeback model not fully transparent to business • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Multiple vendors environment • Service catalog partially available • SLA and OLA are not fully documented and implemented • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Server assets are not fully captured in inventory • Document scattered, lack centralized knowledge management portal • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Lacks implementation of single pane of glass for data center monitoring and control both on premise and cloud • 80% of executive time dealing with vendor issues • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Need to automated service reporting and analytics • ... • ... • ... • ...

TECHNOLOGY



Servers, OSs	Virtualization	Cloud	Data Center Monitoring and Management	Service Management
<ul style="list-style-type: none"> • Multiple vendors environments • Many EOL servers • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Obsolete vSphere version ... • Low VM utilization ratio • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Lacks detail guidance and reference implementation for Business on how to deploy to cloud • ... • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Lacks single-pane of glass Data Center monitoring and service management tool • ... • ... • ... • ... • ... 	<ul style="list-style-type: none"> • Manual, lengthy service provision request and approval process • ... • ... • ... • ... • ...

Reference Architecture



Future State Recommendations - Sample

PEOPLE



- **Workforce Development:** Cross product and service training to meet peak service demand and future resource constraints...
- **Knowledge Management:** Construct a single-source-of-truth, comprehensive knowledge management portal...
- **Role and Responsibility:** Deploy IT Service Advisors to each business, who act as liaison to relay business strategy, app development roadmap, service demand, issue escalation to IT team...
- **Cloud Center of Excellence (CCOE):** Establish CCOE to drive cloud adoption maturity level...

PROCESS



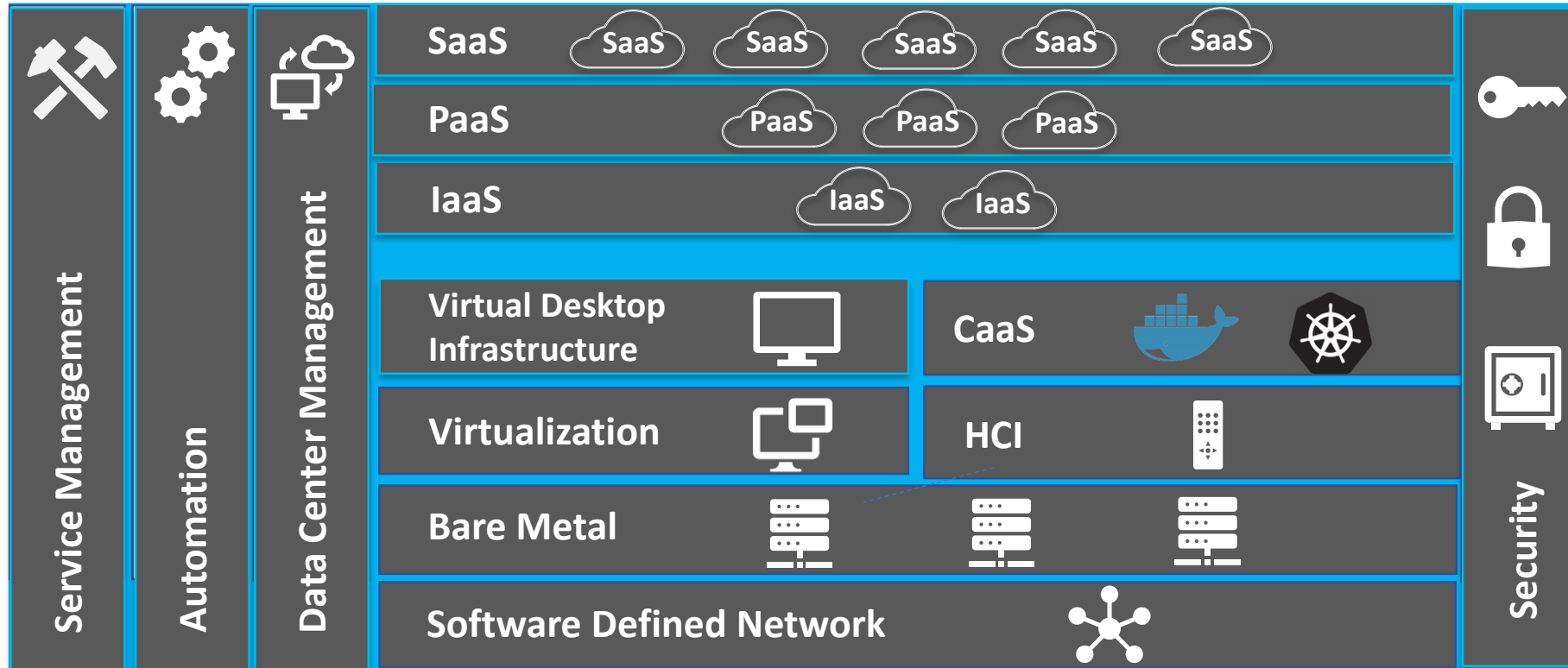
Service Strategy	Service Design	Service Transition	Service Operation	Continual Service Improvement
<p>Process Improvement</p> <ul style="list-style-type: none"> • IT liaison to bridge business and IT • ... • ... <p>Tools</p> <ul style="list-style-type: none"> • ... • ... • ... 	<p>Process Improvement</p> <ul style="list-style-type: none"> • Focus on key vendors, consolidate servers and OSs • ... • ... <p>Tools</p> <ul style="list-style-type: none"> • ... • ... • ... 	<p>Process Improvement</p> <ul style="list-style-type: none"> • Control inventory, manage assets lifecycle, compliance via tools • ... • ... <p>Tools</p> <ul style="list-style-type: none"> • ... • ... • ... 	<p>Process Improvement</p> <ul style="list-style-type: none"> • Consolidate data center and cloud management tools • ... • ... <p>Tools</p> <ul style="list-style-type: none"> • ... • ... • ... 	<p>Process Improvement</p> <ul style="list-style-type: none"> • Implement single-pane of glass data center management and reporting for both on-prem and cloud • ... • ... <p>Tools</p> <ul style="list-style-type: none"> • ... • ... • ...

TECHNOLOGY



Bare Metal	Virtualization	HCI	VDI, CaaS	Cloud	Data Center Management	Automation
<ul style="list-style-type: none"> • Consolidate Linux brands • ... • ... 	<ul style="list-style-type: none"> • Improve virtualization ratio from ... • ... • ... 	<p>General Purpose HCI (GPHCI)</p> <ul style="list-style-type: none"> • ... <p>Special Purpose HCI</p> <ul style="list-style-type: none"> • ... 	<ul style="list-style-type: none"> • Promote VDI to enterprise wide adoption <p>Service Management</p> <ul style="list-style-type: none"> • Integrate ServiceNow with Data Center and Cloud management tools 	<ul style="list-style-type: none"> • Build cloud reference architecture and implementation.. • ... • ... 	<ul style="list-style-type: none"> • Deploy xxxx for VM monitoring, management, capacity planning • ... • ... 	<ul style="list-style-type: none"> • Promote Infrastructure as Code, DevOps • ... • ...

Future State Architecture – Technology Consolidation



- Single-pane-of-glass data center management tool for on-premises and cloud
- Standardize automation tools for both on-prem and cloud
- IT service management tool integrates with automation tool for end-to-end service automation

- Consolidate network, server, storage models, reduce hardware vendors
- Improve virtualization ratio
- Implement HCI for ROBO
- Promote the adoption of Container as a Service, VDI
- Consolidate security tools

- Promote SaaS over PaaS over IaaS
- Implement unified multi-cloud management

Cloud Center of Excellence



Cloud Center of Excellence Key Focus Areas

Ensuring cloud workload is well-architected to enhance mission effectiveness and reduce mission risks



AUTOMATION

- CI/CD pipelines for end-to-end cloud infrastructure provisioning and application deployment



REFERENCE ARCHITECTURE & IMPLEMENTATION

- Reference architectures and implementations for typical solutions
- Standard Cloud service catalogs
- Templates for design, test, infrastructure provisioning, O&M



ACTIVE USER ENGAGEMENT

- Advocate Cloud value proposition
- Assist in the entire lifecycle of Cloud projects



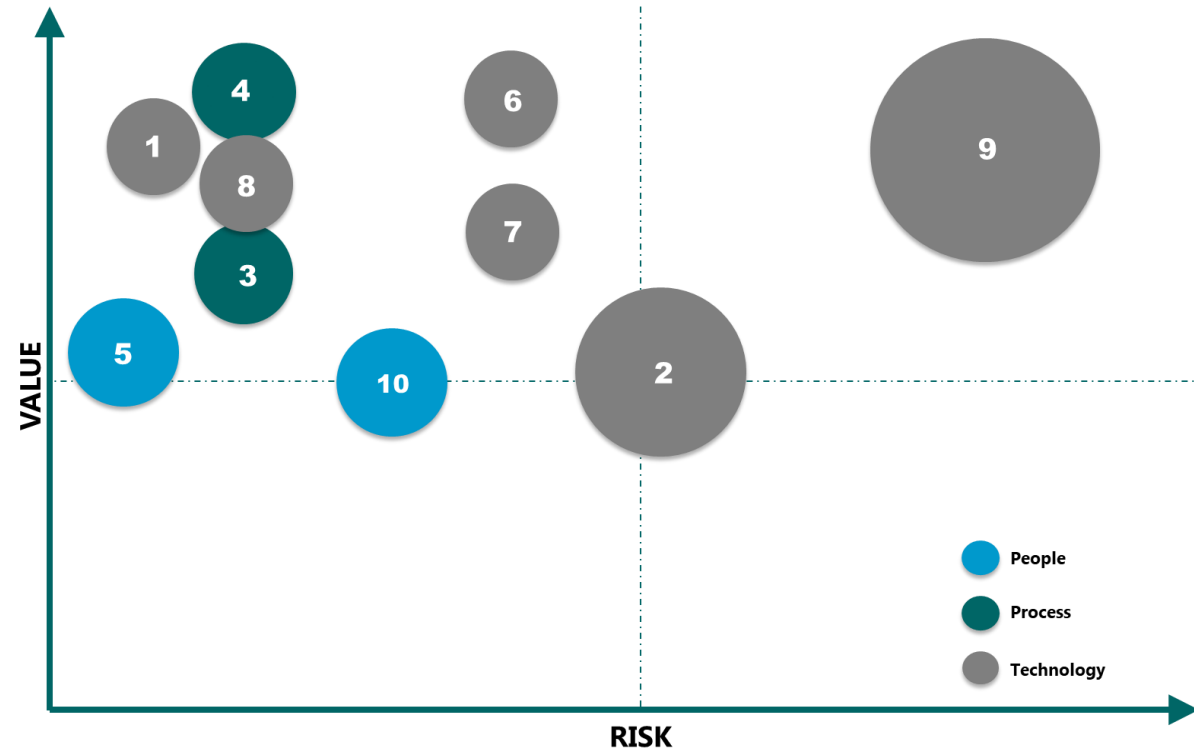
Implementation Roadmap - Sample

Consolidated – Near and Future Term Delivery



This represents all the projects identified for near and future term implementation

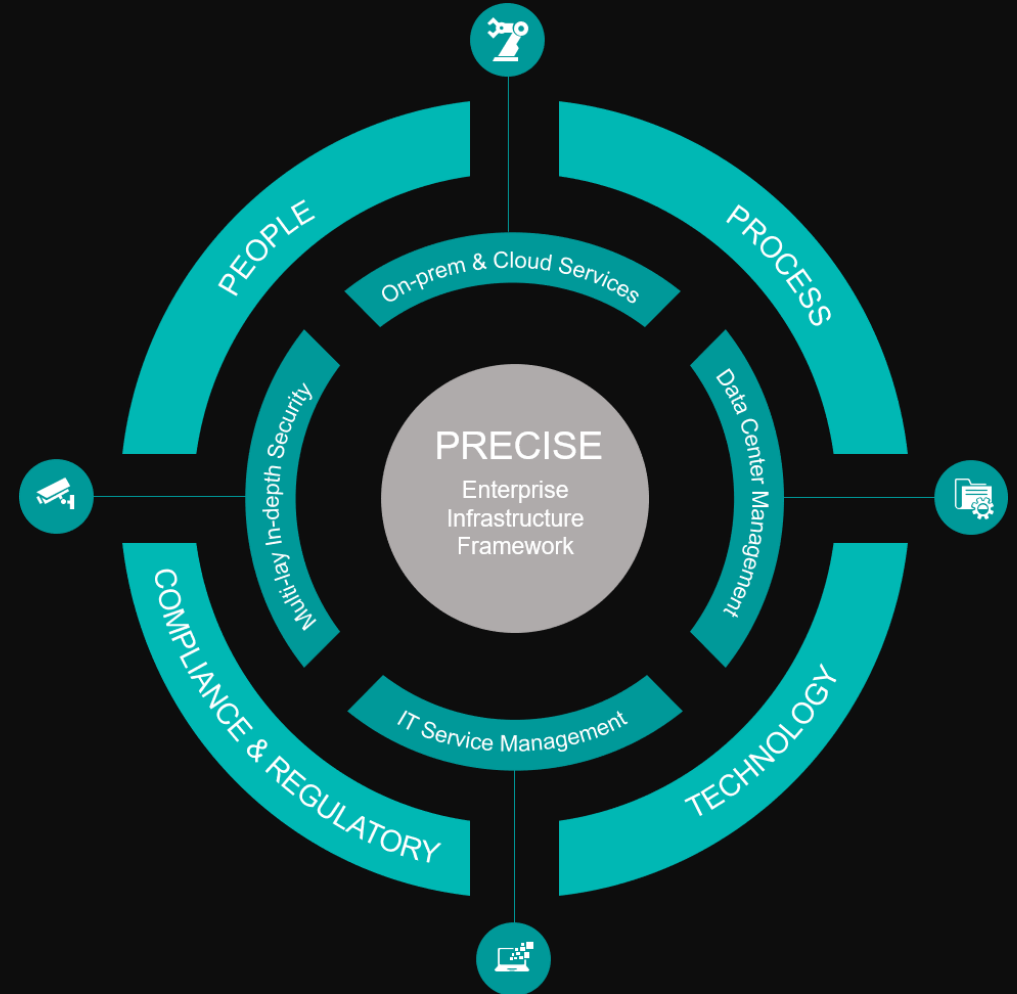
Prioritized for Near Term Delivery



This represents the high value with low-to-moderate risk projects proposed for quick wins in the near term

Key Takeaway

Integrating the EA, ITSM and ITIL frameworks is critical in the collaborative process; valuable insight is realized that contributes to decisions on capacity planning, new technologies, retiring and sunsetting unused equipment, risk management, regulatory compliance and continuous improvement and most important, to an **actionable** future state recommendations



The Presenter

BEN DUAN is the Chief Technology Officer at Precise Software Solutions, Inc. In this capacity, he is responsible for driving Precise's technology strategy and roadmap, building new capabilities, leading innovations, and advising IT Strategy, enterprise architecture and technology implementation for Precise customers. Ben has over seventeen years of experience in technology, strategy, program and operations management.

Prior to Precise, Ben held leadership roles in Oracle, CSRA and Nielsen. Ben has a PhD degree in Aerospace Engineering and an MBA.

Ben is an TOGAF certified Enterprise Architect. He is currently an Adjunct Professor at George Mason University teaching graduate level classes on Big Data and Advanced Data Analytics.



BEN DUAN, MBA, PHD
CERTIFIED: TOGAF

The Presenter

ELLEN CRAYTON is a strategic leader and subject matter expert on IT Modernization, Cloud and Innovation with over 25 years of enterprise-level consulting experience in the life and health sciences, financial, and retail sectors. She has led enterprise level IT strategic initiatives for the public and private sectors covering health care, finance and ecommerce for clients at the Gauteng Shared Service Centre (GSSC) in Johannesburg, South Africa; Dow Jones Markets, New York; Ernst & Young, New York; NYNEX Meridian Systems, New York; and, the City of New York Office of the Mayor, New York City, New York. She is currently a key member of the Precise Software strategic team that provides C-Level IT advisory for a federal agency in the Mid- Atlantic area.

Prior to consulting, she held senior positions in both the private and public sectors, including positions with Ernst and Young, LLC; Dow Jones Markets, Inc.; Nortel (Meridian); the International Trade Center in Geneva, Switzerland; and Gauteng Shared Services Centre in Johannesburg, South Africa.

She is at the forefront of research in value-based enterprise technologies, cloud infrastructure, service automation and innovation. Having lived abroad and traveled extensively, Ellen has a strong understanding of IT and management strategies in various markets throughout North America, Europe, and Africa.

Ms. Crayton earned her Master of Business Administration (MBA) degree from Case Western Reserve University's Weatherhead School of Management in Cleveland, OH, and a Bachelor of Science (BS) degree in Management Science from Saint Francis College in New York, NY.



ELLEN CRAYTON, MBA
CERTIFIED: ITIL V3, TOGAF

Contact Details



ben.duan@precise-soft.com



1445 Research Blvd, Suite #500
Rockville, MD 20850



<https://www.linkedin.com/in/bduan001>

The background of the slide is a photograph of a server room, showing rows of server racks on both sides of a central aisle. The image is heavily tinted with a blue color and has a slight blur, creating a sense of depth and a modern, technological atmosphere.

Thank You!

Please visit us at www.precise-soft.com