Department of Information Resources

Legacy Systems Study (LSS)

Analysis Briefing and Workshop

July 16, 2014

Department of Information Resources

DIR Welcome

Todd Kimbriel
Chief Operations Officer

Priscilla Pipho
Chief Customer Officer

Agenda

- **DIR Welcome**
  - Todd Kimbriel, Chief Operating Officer and Priscilla Pipho, Chief Customer Officer
- **Meeting Process Overview**
  - Lynda Baker, Strategic Communications Facilitator
- **Legacy Systems Study Context**
  - John Van Hoorn, Director, DIR Enterprise Solution Services
- **Briefing**
  - Ernst Rampen, Director, Gartner Consulting
  - Justin Gaspard, Director, Gartner Consulting

Break

- **Work Sessions**
- **Next Steps**

DIR thanks the Texas Association of State Systems for Computing and Communications (TASSCC) for sponsoring this program.

Ideas for:

- Remediation

- Collaboration

- Application Portfolio Management

- Any Question

Legacy System Study - Background

- HB 2738 – legislation requiring DIR to conduct a legacy study
- Inventory systems maintained by state agencies
- Identify costs, security risks and, if feasible, remediation estimates for legacy systems
- Provide a plan for assessing and prioritizing statewide modernization projects

Legacy System Study - Timeline

- September 2013 – Began inventory
- May – June 2014 – Completed inventories
- June – July 2014 – Began data analysis and application assessments
- August – September 2014 – Analysis and recommendations report creation
- October 2014 – Presentation to state leadership

Legacy System Study - Deliverable

- **Analysis data and recommendations**
  - To state agencies
  - To state leadership upon request
  - Data classified as confidential
- **Executive Summary**
  - To State Leadership
  - Summary is publicly available

Briefing Content

- **Legacy System Study Analysis Methodology**
  - Review of the process to identify business applications' technology components
  - Determining the legacy status of hardware and software
  - Developing remediation options
- **Characteristics of the Texas agency technology landscape**
  - Application types, infrastructure and tool types
  - Potential areas to leverage shared solutions
- **Industry technology trends**
  - Cloud: Software-as-a-Service and Platform-as-a-Service
  - Customer self-service
  - Mobility
  - Citizen development

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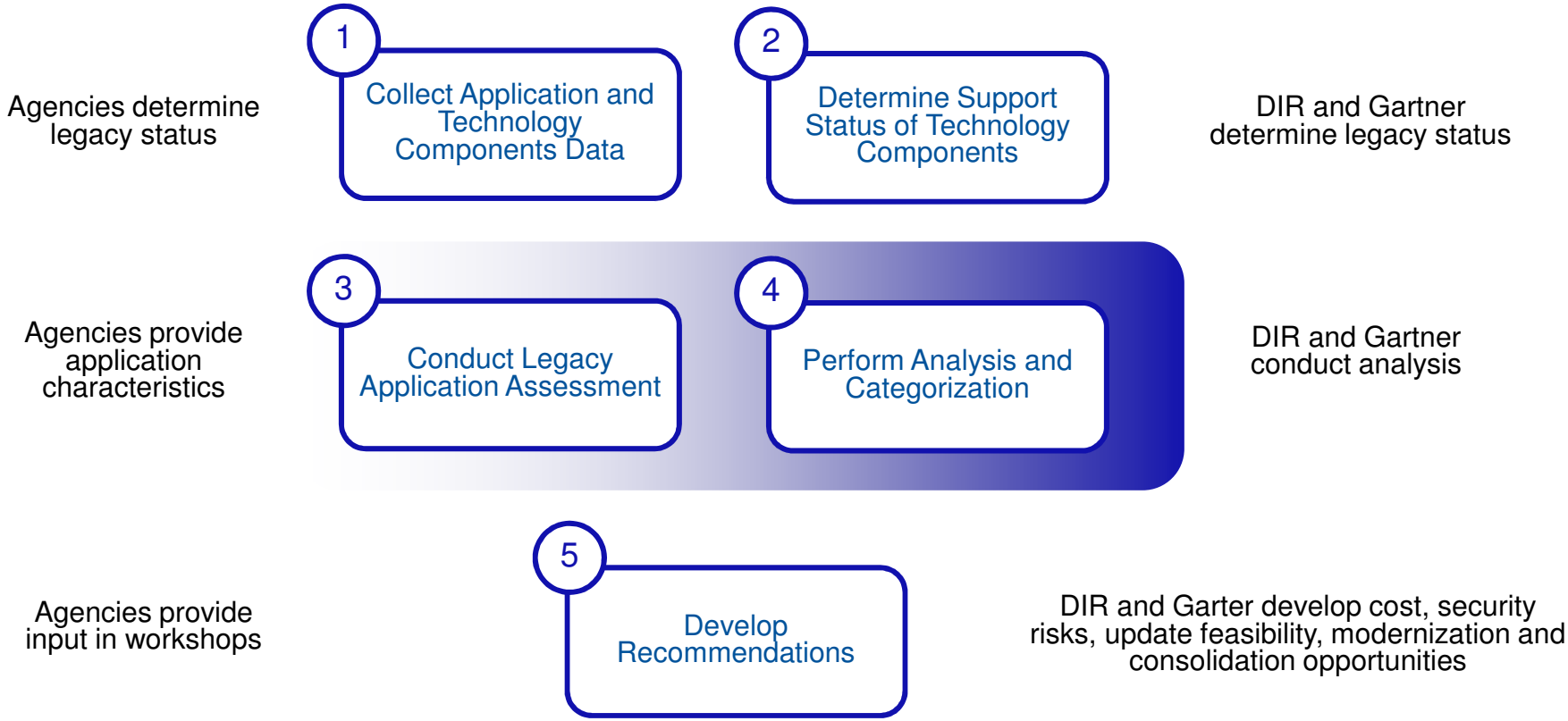
Legacy System Study Analysis Methodology

Legacy System Study Analysis Methodology
Overview: Where Are We Now?



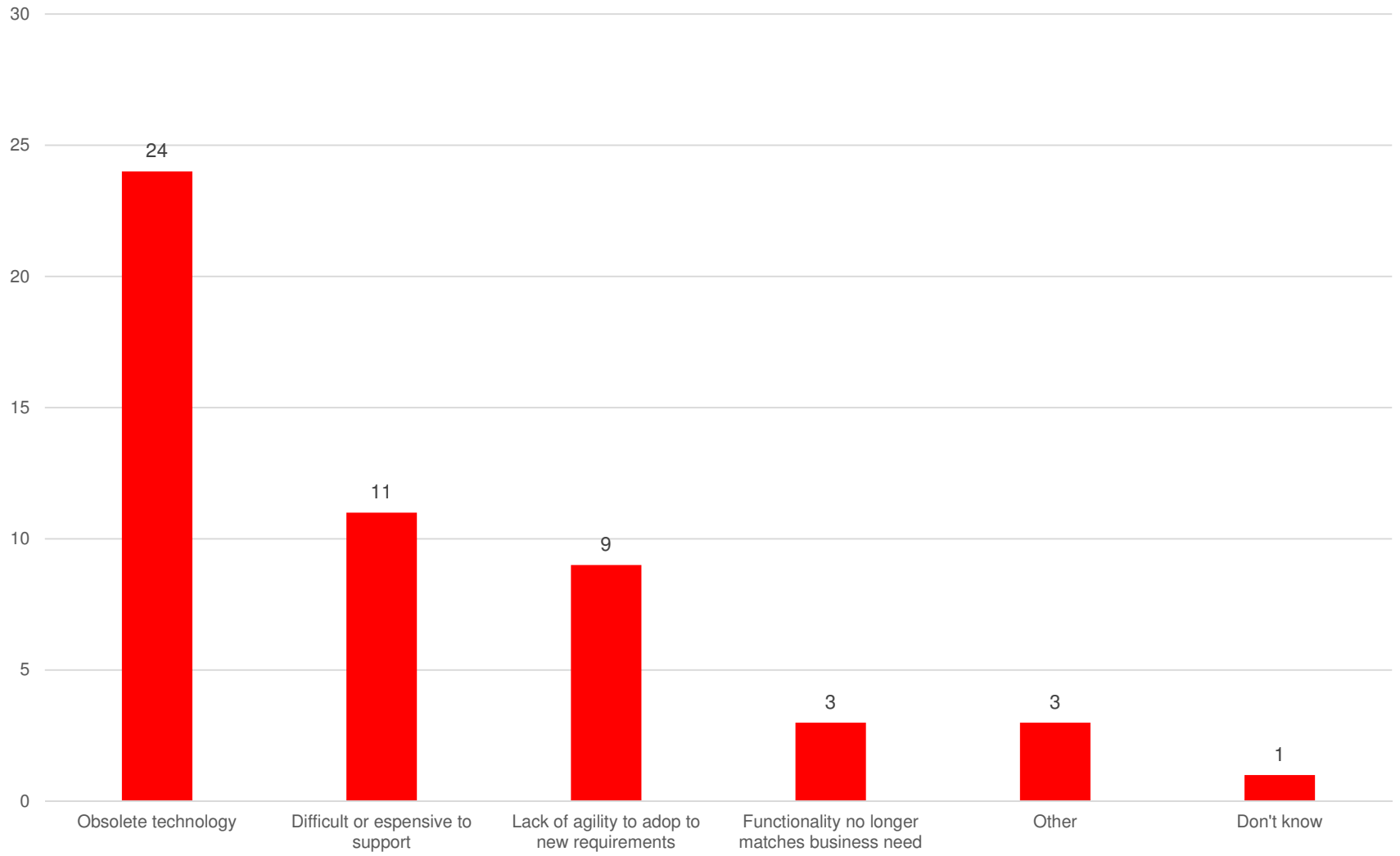
Legacy System Study Analysis Methodology
Poll Everywhere Question

Agencies were given an option to provide a legacy status of business applications, when this data was first collected.

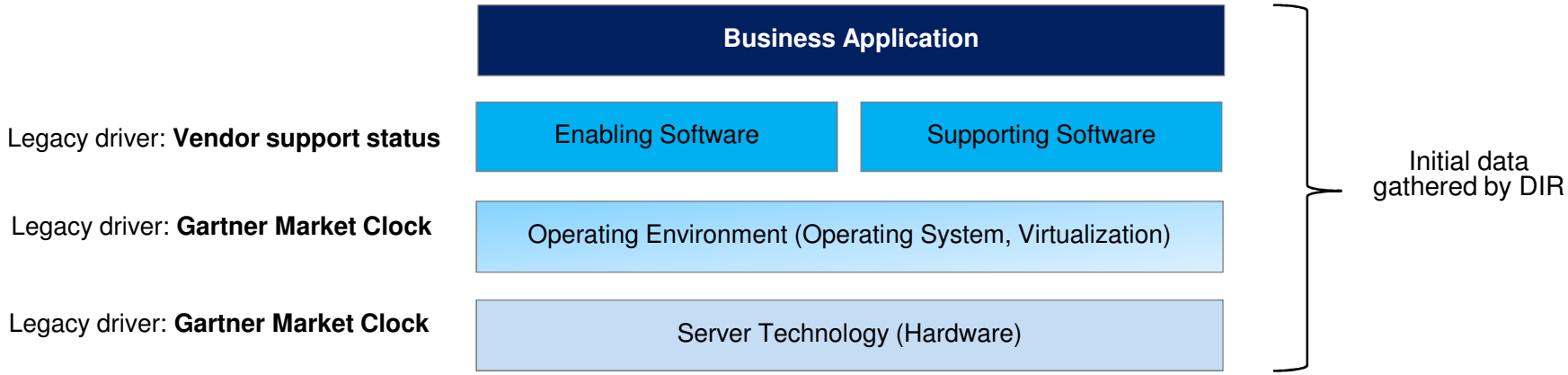
What was the predominant reason your agency qualified system components as legacy?

1. Obsolete technology
2. Difficult or expensive to support
3. Lack of agility to adopt to new requirements
4. Functionality no longer matches business need
5. Other
6. Don’t know

What was the predominant reason your agency qualified system components as legacy?

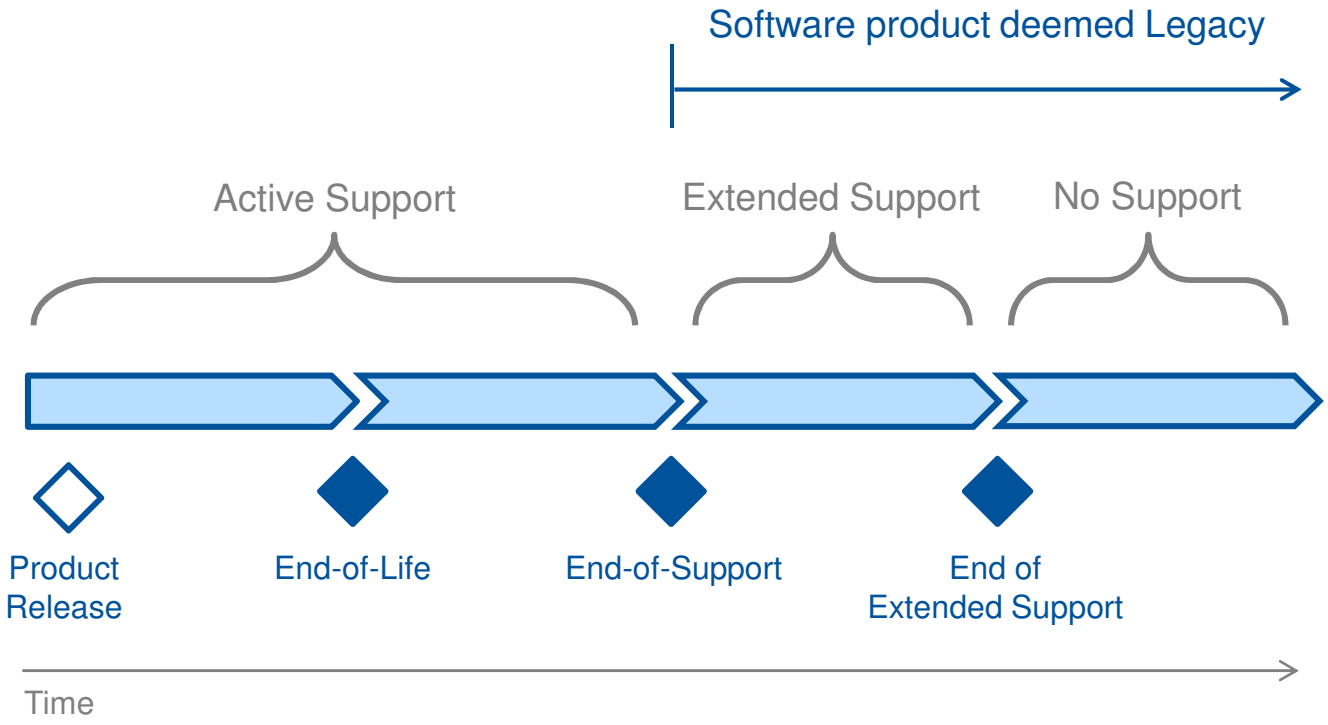


Legacy System Study Analysis Methodology
Determining Legacy Status of the "Stack"



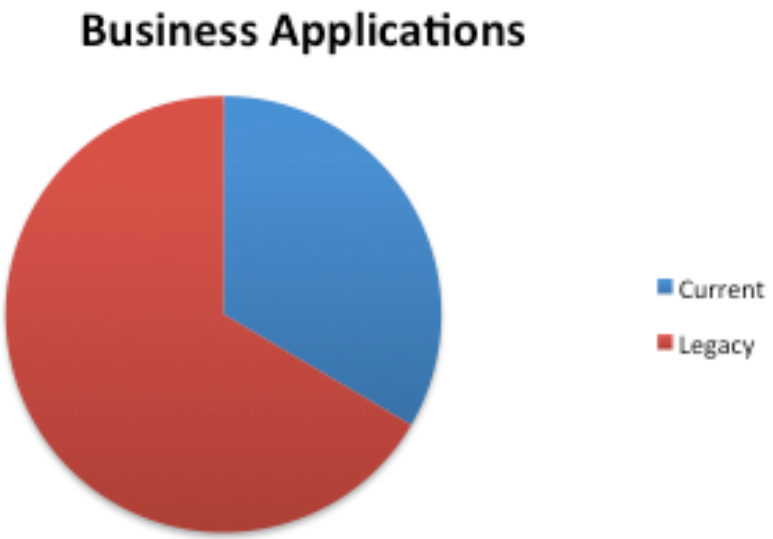
- **Business applications are dependent on a number of technology components**
  - Enabling software; application server and databases
  - Supporting software; backup/restore and monitoring
  - Operating environments; operating systems and virtualization
  - Server technology; the hardware platform
- **Each of these components may be in a different phase of its lifecycle**
  - We review these components to determine the legacy status of a business application

Legacy System Study Analysis Methodology
3rd party Software Support Lifecycle



This timeline shows the typical software support lifecycle. Not all software vendors distinguish between these milestones

Legacy System Study Analysis Methodology
Accumulated Software Components



- To date, agencies have provided data for 4,460 applications
- These applications are implemented with approx. 112K software components
- Based on the support status of the technology, approx. a third of the business applications are current, while two thirds have enabling components that are out of active support

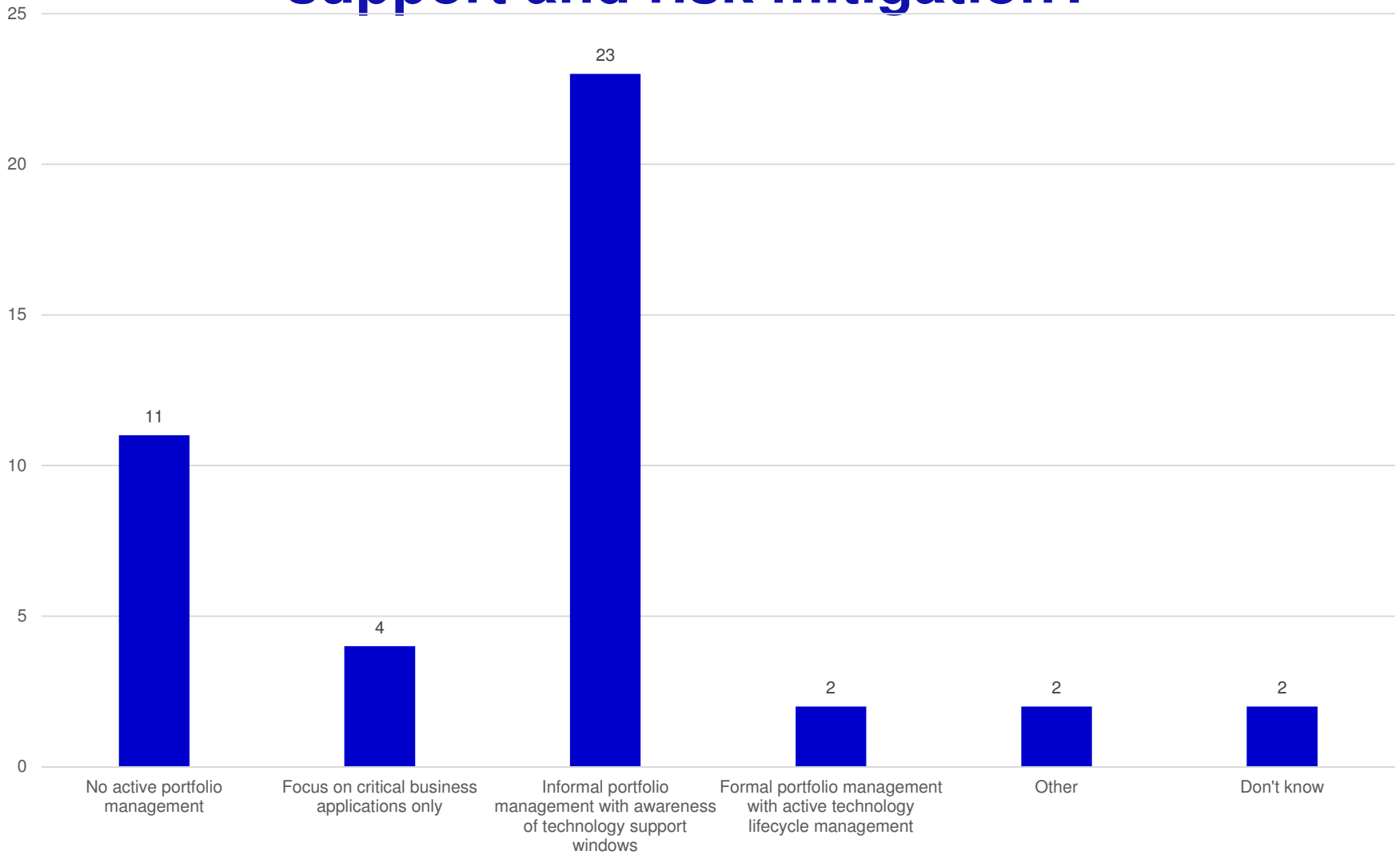
Legacy System Study Analysis Methodology
Poll Everywhere Question

For a variety of reasons, organizations retain technology beyond their standard or extended support windows. When managed well, the risks of reliance on outdated technology may be reduced.

How does your agency manage its application portfolio with respect to technology lifecycle support and risk mitigation?

1. No active portfolio management
2. Focus on critical business applications only
3. Informal portfolio management with awareness of technology support windows
4. Formal portfolio management with active technology lifecycle management
5. Other
6. Don't know

How does your agency manage its application portfolio with respect to technology lifecycle support and risk mitigation?

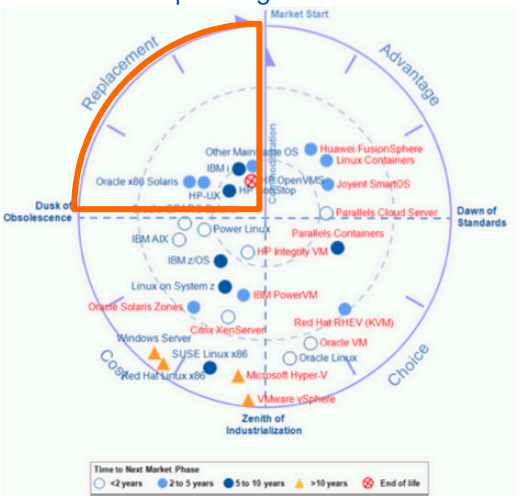


Legacy System Study Analysis Methodology
Determination of Hardware Viability

- **The software that supports agency business application runs on:**
  - Server technology, or the hardware platform
  - Operating environment, or the operating system and possibly virtualization
- **The lifecycle stage of these technologies is tracked by Gartner in IT Market Clocks***
  - Advantage (12-3 o'clock)
  - Choice: (3-6 o'clock)
  - Cost Optimized (6-9 o'clock)
  - Replacement (9-12 o'clock)
- **We consider the technology to be legacy when it is in the replacement zone**

IT Market Clock for Server Technology

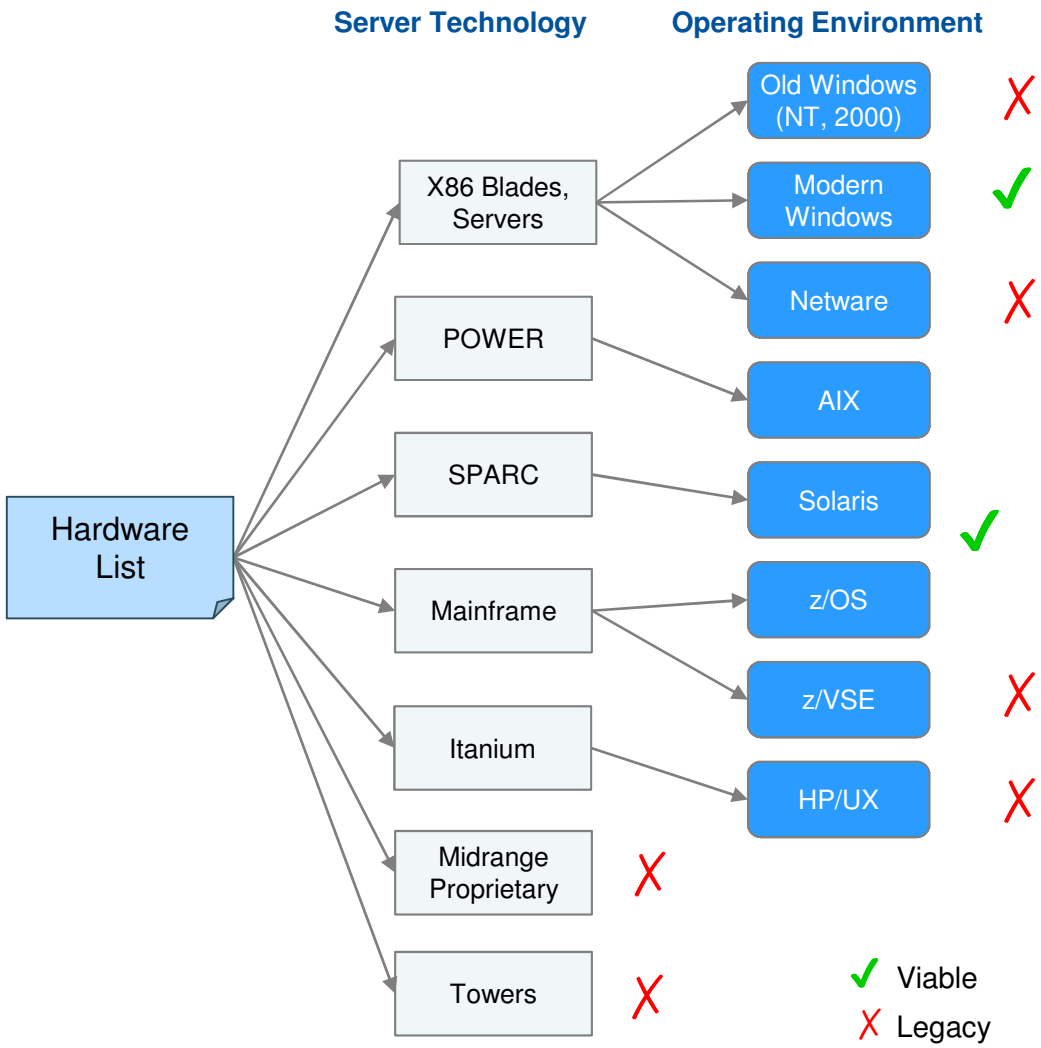
IT Market Clock for Server Virtualization And Operating Environments



 * See appendix for details

Legacy System Study Analysis Methodology
Determination of Hardware Viability – Technology Categorization

- Server technologies used by agency business systems:
  - Commodity hardware, such as rack-mounted X86 servers, or aging towers
  - Current RISC environments, such as POWER and SPARC
  - Mainframe environment
  - To be discontinued technology, such as Itanium, or already discontinued midrange proprietary architectures, such as PA-RISC and RS/6000
- Operating environments:
  - Discontinued OSs such as Windows NT/2000/2003 and Netware
  - Aging OSs that become less viable, such as HP/UX and z/VSE
  - Modern Windows OSs, such as 2008 and 2012
  - Viable UNIX variants, such as AIX and Solaris



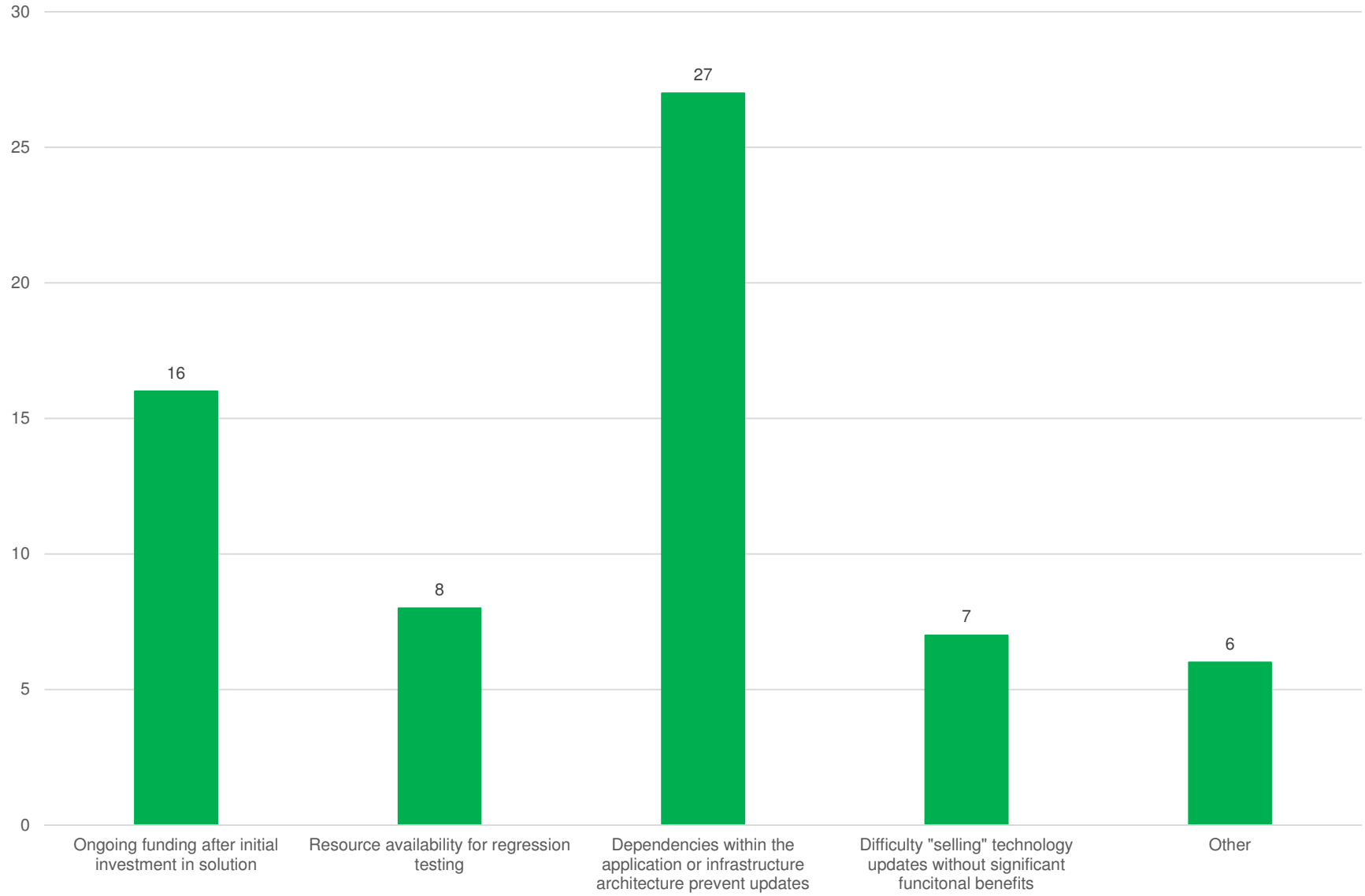
Legacy System Study Analysis Methodology
Poll Everywhere Question

Organizations face many challenges in keeping technology components current, ranging from funding to complexity of dependencies.

What is the primary inhibitor to maintaining technology current in your agency?

1. Ongoing funding after initial investment in solution
2. Resource availability for regression testing
3. Dependencies within the application or infrastructure architecture prevent updates
4. Difficulty “selling” technology updates without significant functional benefits
5. Other
6. Don’t know

What is the primary inhibitor to maintaining technology current in your agency?



Legacy System Study Analysis Methodology
Obtaining Business Value and Application Characteristics

Individual application legacy drivers guide *remediation options*

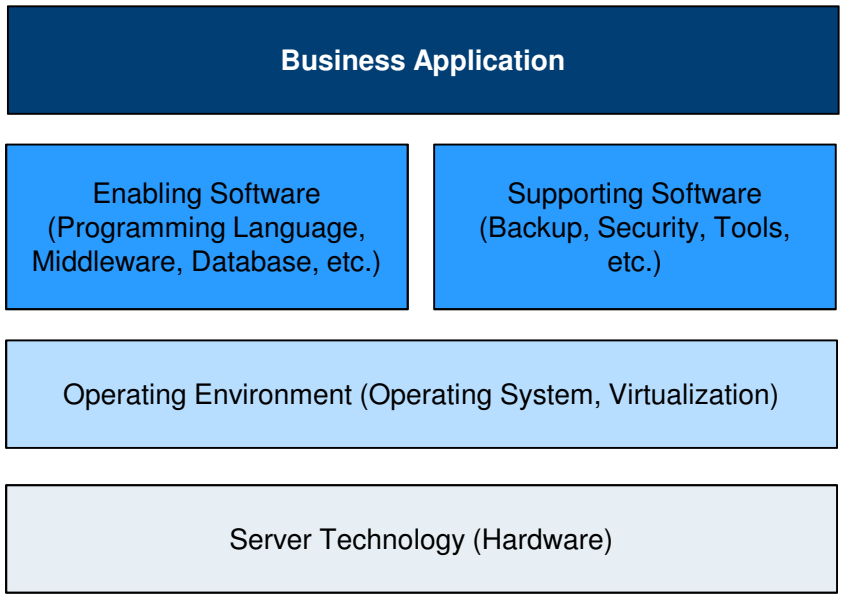
Remediation drivers: **Business Value, Cost, Risk and Application Type**

Legacy driver: **Vendor support status**

Legacy driver: **Gartner Market Clock**

Legacy driver: **Gartner Market Clock**

Business value, technical condition and cost drive *prioritization within the portfolio*

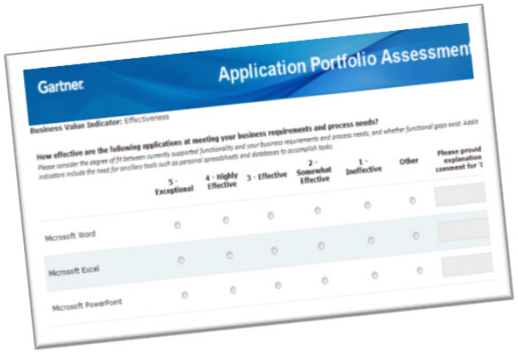


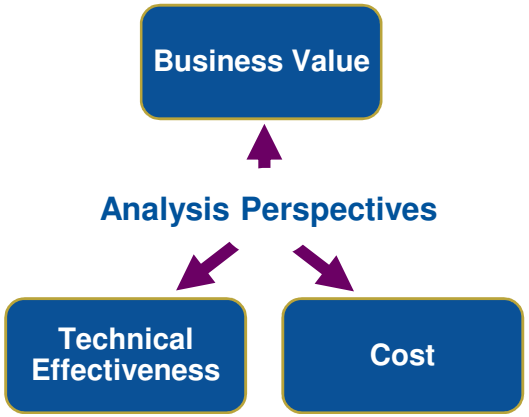
Gathered through online assessment

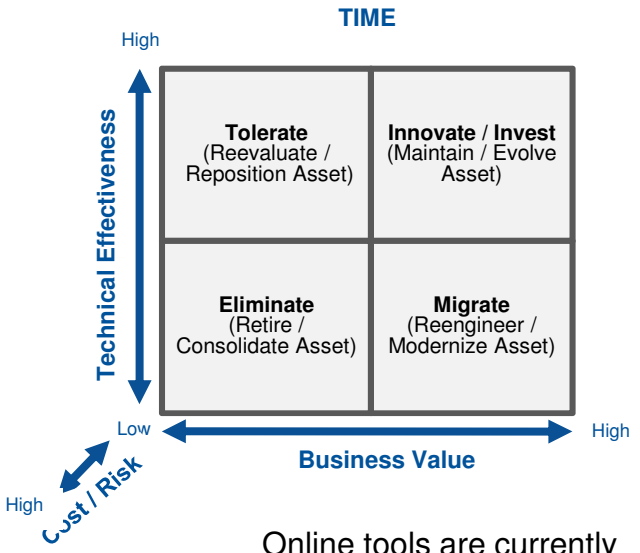
Gathered through spreadsheets
To be augmented through survey

Legacy System Study Analysis Methodology
Legacy Application Categorization and Remediation Options

- Online tools are currently collecting data from hundreds of people across hundreds of applications over the past two months
- Analysis will then contrast business, technology, cost indicators through various pace layer and overhaul filters to find signatures/fingerprints of legacy software
- The resulting comparative prioritization will help to identify application remediation activities according to tolerate, invest, migrate, and eliminate (TIME)

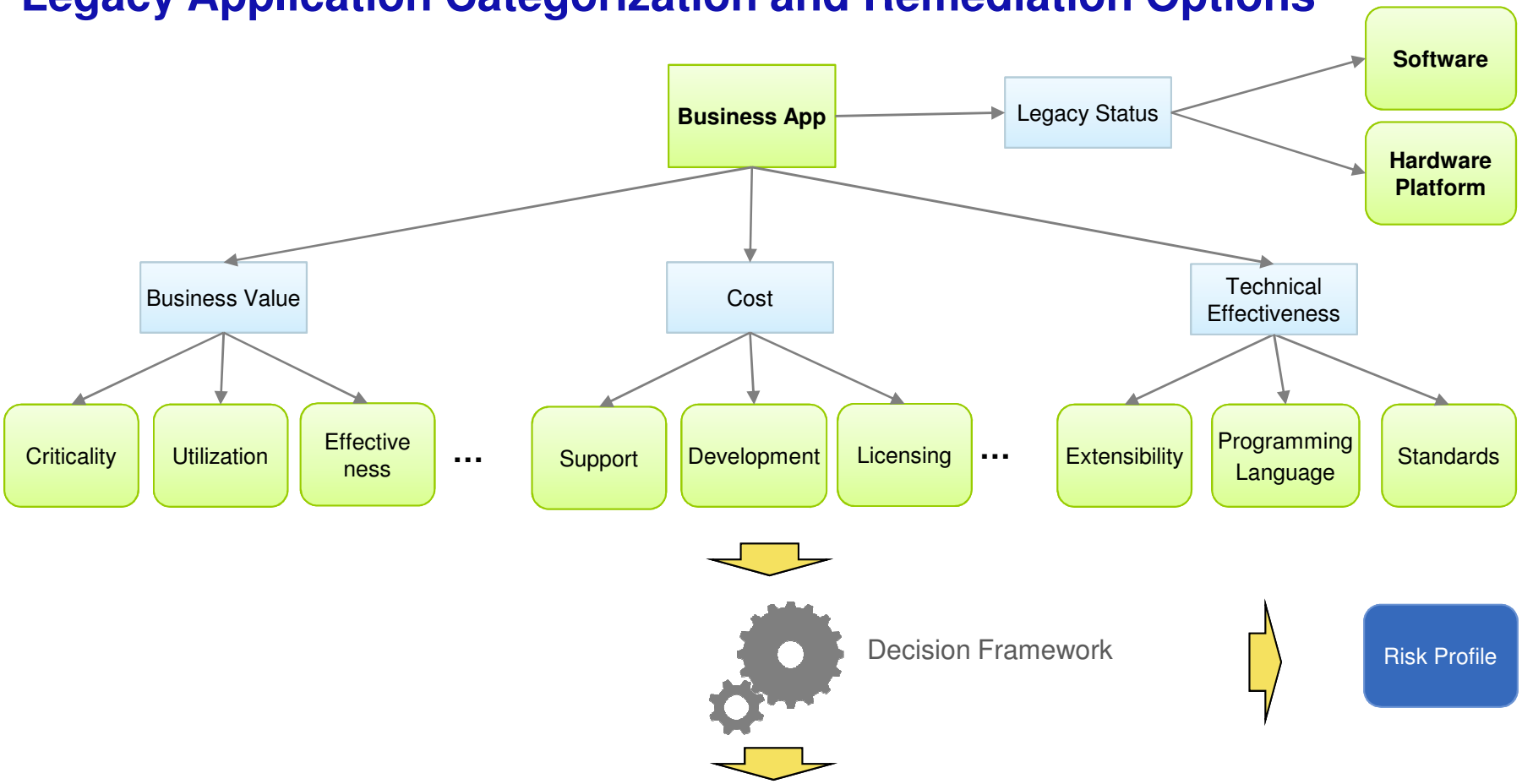






Online tools are currently collecting data from hundreds of people across hundreds of applications over the past two months

Legacy System Study Analysis Methodology
Legacy Application Categorization and Remediation Options



Legacy System Study Analysis Methodology
Remediation Options – Tolerate and Eliminate

Remediation Option	Description	Possible Fit For
Eliminate/Retire	Retire the business application, using functionality of other applications to perform the business function	• Legacy applications that are low value, providing functionality that can be supported by other applications in the current portfolio • Example: secondary financial systems that track expenditures that can be managed within the statewide financial system
Tolerate/No Change	Leave the business application as-is	• Legacy applications that are high value, low cost, have a low degree of change and are relatively low risk • Example: staff-facing asset management applications that run on older technology

Legacy System Study Analysis Methodology
Remediation Options – Invest/Innovate

Remediation Option	Description	Possible Fit For
Replatform Hardware	Move the business application to a new server technology	• Legacy applications that are high value and have a sound software technology foundation, but run on aging hardware that can be replaced without significant impact to the business application • Example: licensing systems that use modern application servers on aging servers that can be ported to modern hardware
Upgrade Software Stack	Upgrade underlying enabling software (application servers, databases, etc.) to current versions	• Legacy applications that are high value and have a sound architecture, but run on outdated software with manageable impact to the business application • Example: permitting systems that use older versions of .NET environments or SQL Server databases that is superseded by modern versions
Upgrade COTS	Upgrade the Commercial Off-the-Shelf (COTS) software, that implements the business application, to a current version	• Legacy applications that are high value and are implemented with a viable COTS solution, but runs on an old version of the COTS solution that can be upgraded with a manageable impact to the business application • Example: human resource systems that use older versions of an ERP solution that is superseded by modern versions
Transform Code	Transform the application code of a custom application from a legacy programming language/platform to a current platform, without making significant functional changes	• Legacy applications that are high value and generally meet the current and anticipated business needs, but have been built with a programming language or platform that can no longer maintained by readily available resources in the marketplace • Example: registration applications that run on COBOL and non-relational databases

Legacy System Study Analysis Methodology
Remediation Options - Migrate

Remediation Option	Description	Possible Fit For

Consolidate	Combine the functionality of a legacy application with another existing application	• Legacy applications that provide important functionality that is similar to functionality provided by another existing system, which could feasibly incorporate this functionality
		• Examples:
		  • Provider management system that tracks vocational schools, which is similar to tracking adult education providers
		  • Agency financial systems that are similar to financial systems for other agencies

Replace with COTS (Software as a Service or on-premise)	Replace a custom or aging Commercial Off-the-Shelf (COTS) system with a modern COTS solution	• Legacy applications that support important business functions, but are implemented with aging custom developed software or obsolete COTS software that cannot be readily upgraded, but is readily supported with modern COTS solutions
		• Examples:
		  • Custom developed case management system that has a good functional fit with COTS case management solutions
		  • Aging Telligent content management system that no longer has an upgrade path

Rewrite	Replace the business application with a new custom developed solution	• Legacy applications that that support business critical functionality, but can cannot be remediated with any other option • Example: business application that supports unique Texas capability

Legacy System Study Analysis Methodology
Poll Everywhere Question

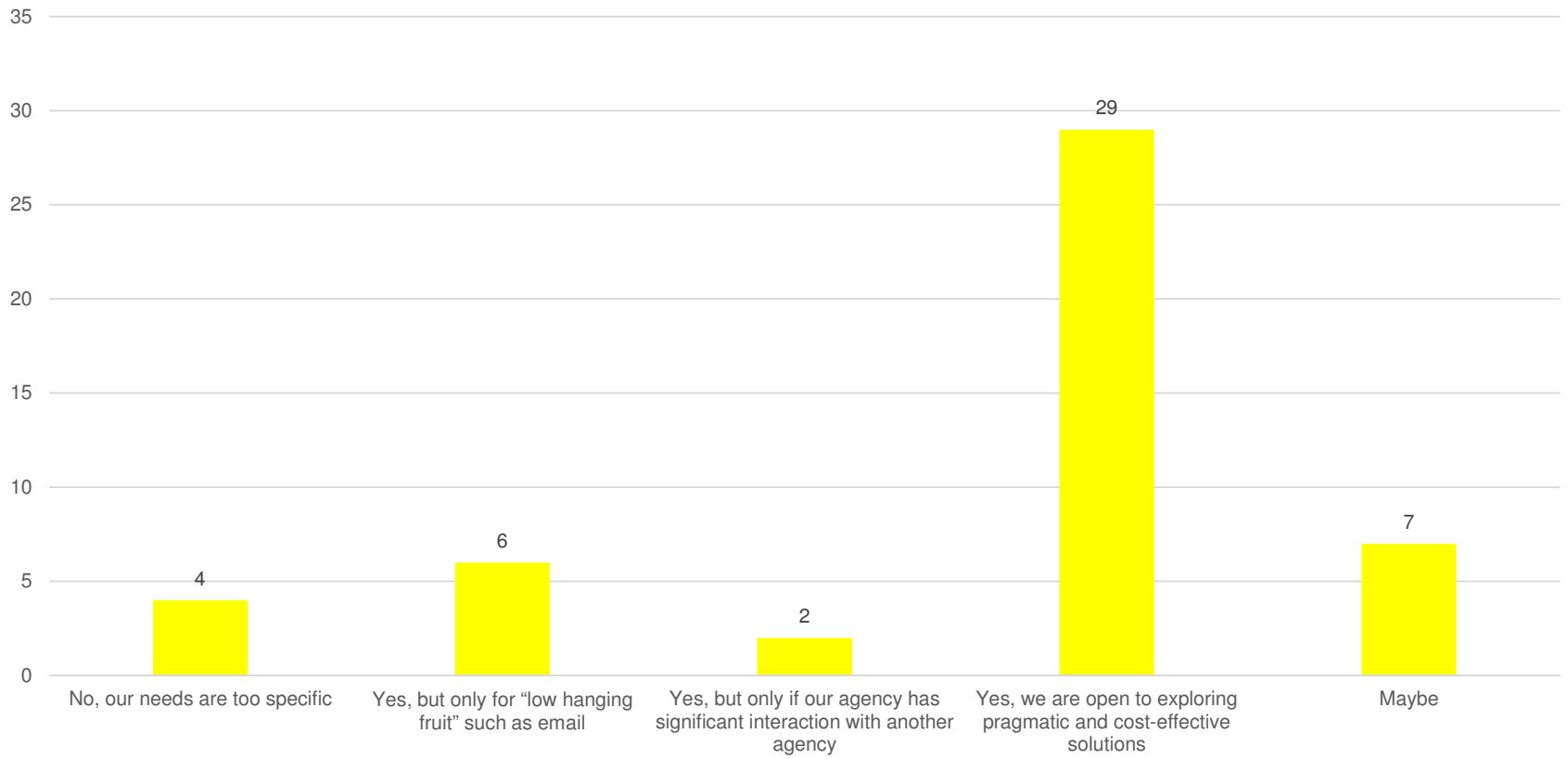
When considering remediation, an option is to collaborate between agencies to cover business needs of multiple agencies with a single solution. Common needs between agencies range from communication/productivity (email, calendaring, etc.) to business functionality (case management, customer self-service, etc.)

We will seek further input in the work session.

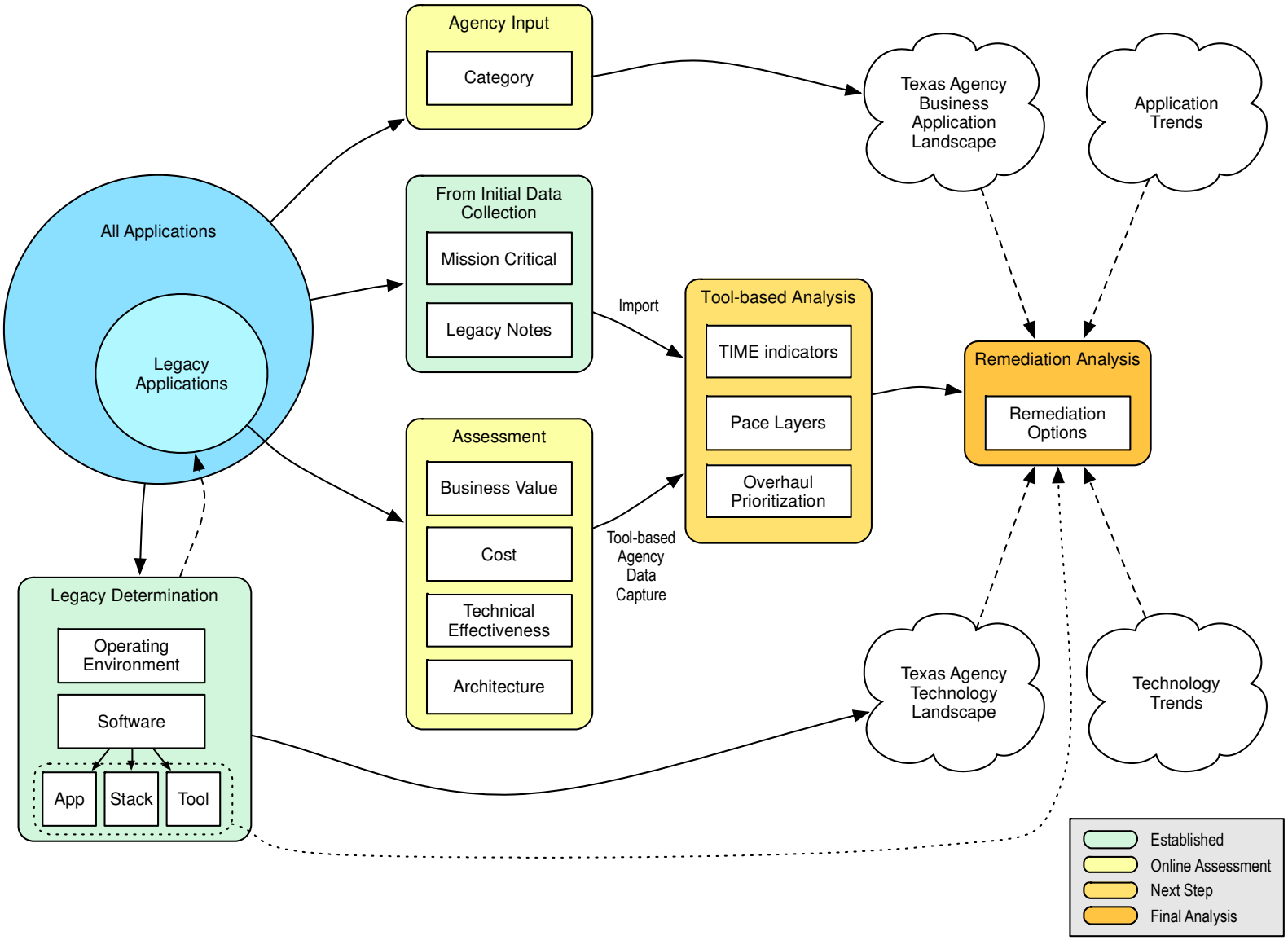
Would your agency consider such an approach?

1. No, our needs are too specific
2. Yes, but only for “low hanging fruit” such as email
3. Yes, but only if our agency has significant interaction with another agency
4. Yes, we are open to exploring pragmatic and cost-effective solutions
5. Maybe

Would your agency consider such an approach?



Legacy System Study Analysis Methodology
Next Steps



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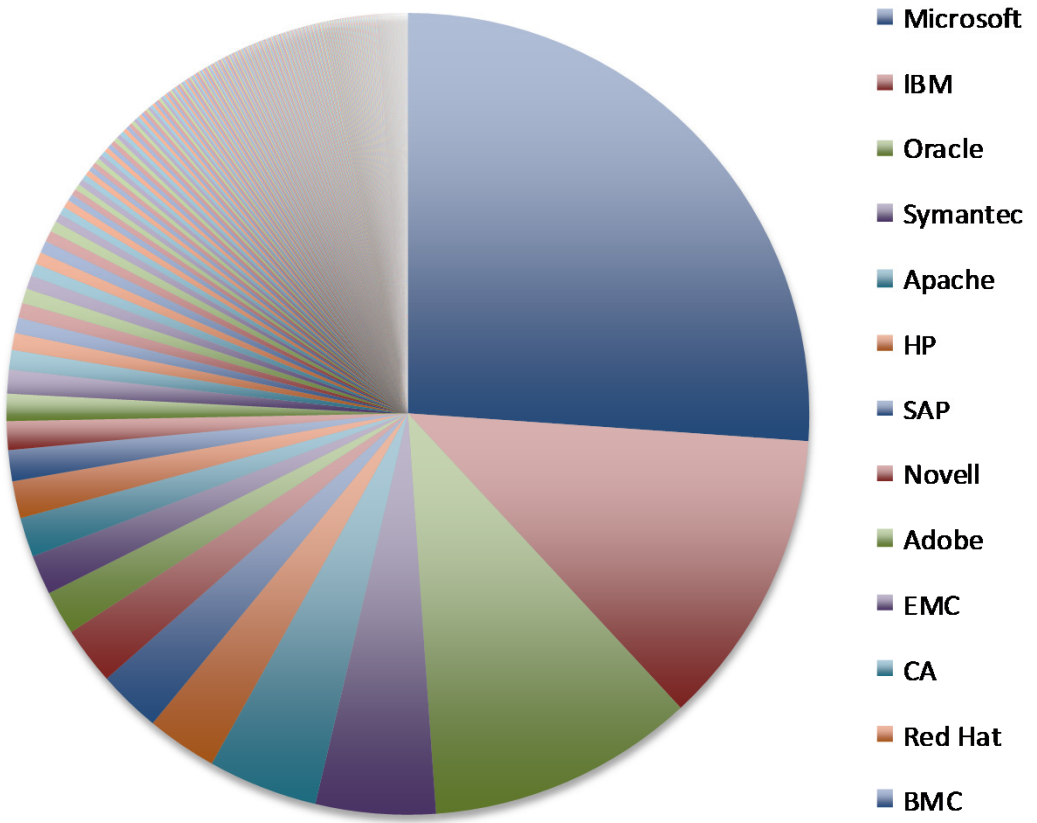
Characteristics of the Texas agency technology landscape

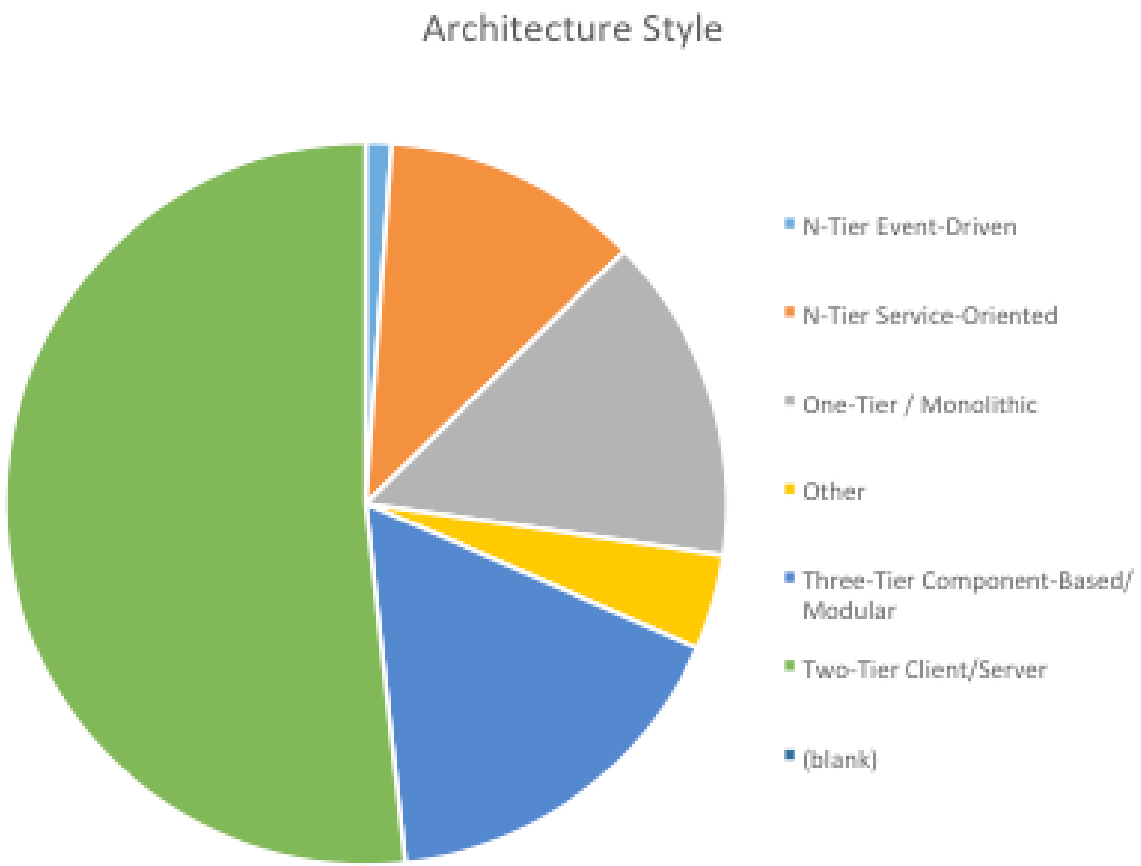
Characteristics of the Texas Agency Technology Landscape
Vendor Landscape

- Much of the technology landscape is split between:
  - Microsoft-centric technology
    - Servers
    - Application/database software and tools
  - IBM-centric technology
    - Mainframe
    - Distributed systems
    - Application/database software and tools
  - Oracle-centric technology
    - Application/database software
- A diverse landscape of vendors and products
  - ~500 vendors overall
  - ~50% have only 1 or 2 products in use by TX agencies



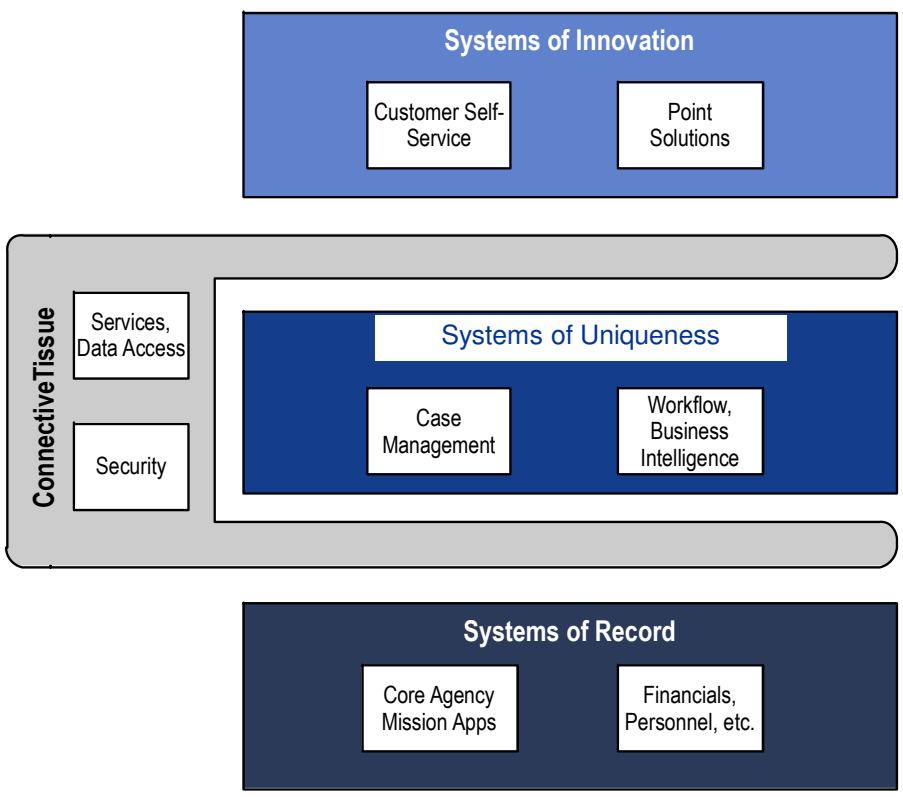
Characteristics of the Texas Agency Technology Landscape
Technology Architecture Style

- Based on a preliminary subset of agency business application assessment data, the predominant architecture style is traditional client/server
  - This includes both custom developed and package-based applications
  - These are typically not web-based applications



Characteristics of the Texas Agency Technology Landscape
Application Pace Layers

- Based on a preliminary subset of agency business application assessment data, ~95% of applications fall in the Systems of Record and Systems of Uniqueness layer
  - Many applications have long lifecycles and a slow rate of change
  - About half of the business applications maintain master data



Systems of Innovation

- Emerging business requirements
- Built on an ad hoc basis
- Short life cycle (6 months - 3 years)
- Potentially consumer-grade technologies

Systems of Uniqueness

- Unique organization processes
- Specific capabilities
- Medium life cycle (3-8 years)
- Frequent reconfiguration

Systems of Record

- Established applications
- Core transactional processing
- Master data
- Common industry processes
- Long life cycle (10-20 years)
- Rate of change is low

Characteristics of the Texas Agency Technology Landscape
Poll Everywhere Question

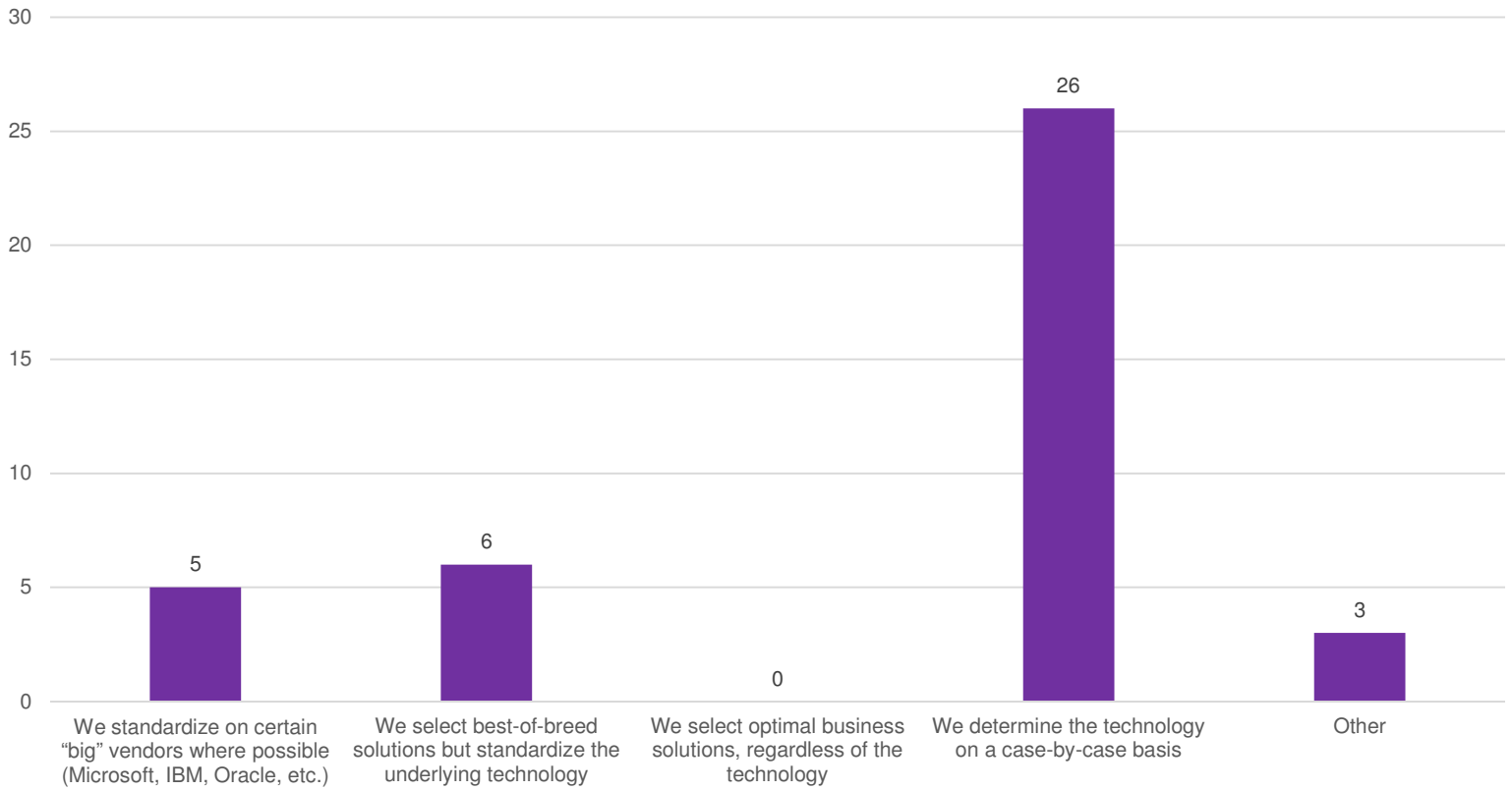
Some of the preliminary data indicates a significant amount of traditional client/server applications, a high degree of unsupported software components, a fragmented technology landscape and supporting System of Record type business applications.

Many business applications likely were developed as point solutions, and became a part of the core application portfolio. There is likely an opportunity to, at a minimum, standardize and streamline the technologies.

What is your agency's technology direction for applications that will likely become a system of record?

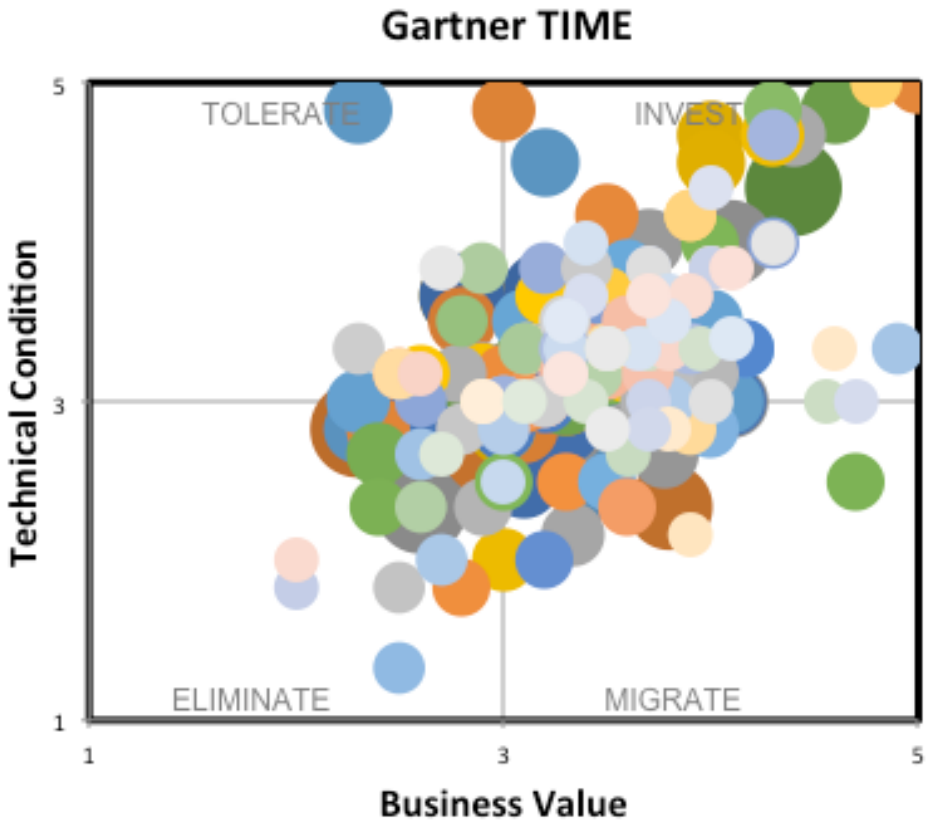
1. We standardize on certain "big" vendors where possible (Microsoft, IBM, Oracle, etc.)
2. We select best-of-breed solutions but standardize the underlying technology
3. We select optimal business solutions, regardless of the technology
4. We determine the technology on a case-by-case basis
5. Other
6. Don't know

What is your agency's technology direction for applications that will likely become a system of record?



Characteristics of the Texas Agency Technology Landscape
Application Characteristics in TIME Framework

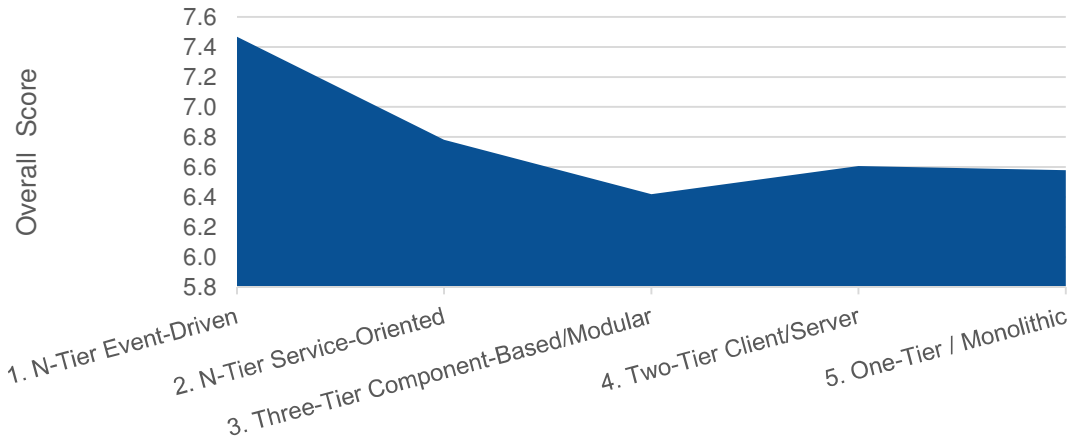
- Based on a preliminary subset of agency business application assessment data, many applications may be candidates for continued use by investing in:
  - Replatforming onto modern hardware
  - Upgrading software components that support the application
  - Updating the version of the package-based solution
  - Transform code to a modern and sustainable environment



Characteristics of the Texas Agency Technology Landscape
Preliminary Insights

- **10% of applications are identified as duplicate**
- **25% of applications have one or more identified security risk; some applications have 3+ risks**
- **50% of applications have no planned maintenance investment (no remediation costs)**
- **80% of applications require specialized skills**
- **80% of applications are departmental only**

- **There is a strong correlation between new applications and overall perceived value.**



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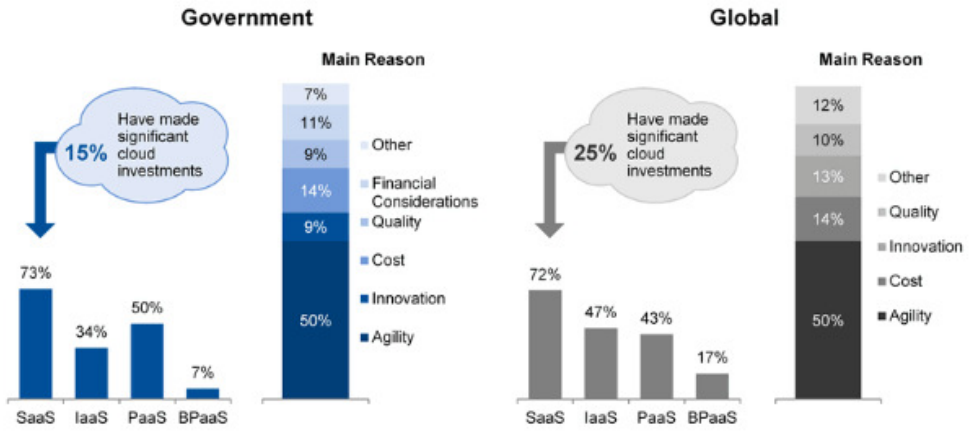
Industry technology trends

Industry technology trends
Cloud: Leveraging Software, Platform and Infrastructure Services

- Compared to overall trends in government priorities, Texas is placing an even higher emphasis on cloud adoption
- Adoption of public cloud by most government agencies is running 10% and three years behind that of the global view
  - Heightened concerns among government agencies about security, privacy and requirements to keep data within a jurisdiction serve as a drag to public cloud adoption
- A large portfolio of legacy applications impedes cloud adoption
  - Applications on aging infrastructure cannot leverage Infrastructure-as-a-Service (IaaS)
  - Applications using aging software components cannot leverage Platform-as-a-Service (PaaS)
  - Packaged applications using aging products cannot leverage shared/hosted versions of those products through Software-as-a-Service (SaaS)

Texas Priorities	Overall Government Prio.
Security and Privacy	Infrastructure and Data Center
Cloud	BI/Analysis
Legacy Modernization	Mobile
Virtualization	Cloud
Business Continuity	ERP
Enterprise Planning / Collaboration	Security
IT Workforce	Networking, Voice and Data
Data Management	Legacy Modernization
Mobility	Digitization
Network	Industry-Specific Apps

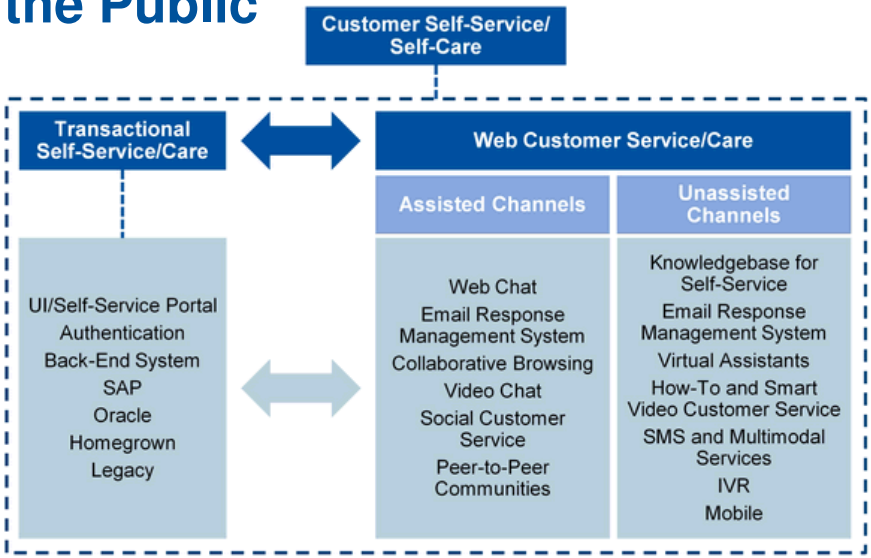
Technology Focus: Texas (DIR, 2014) and Government (Gartner, Match 2014)



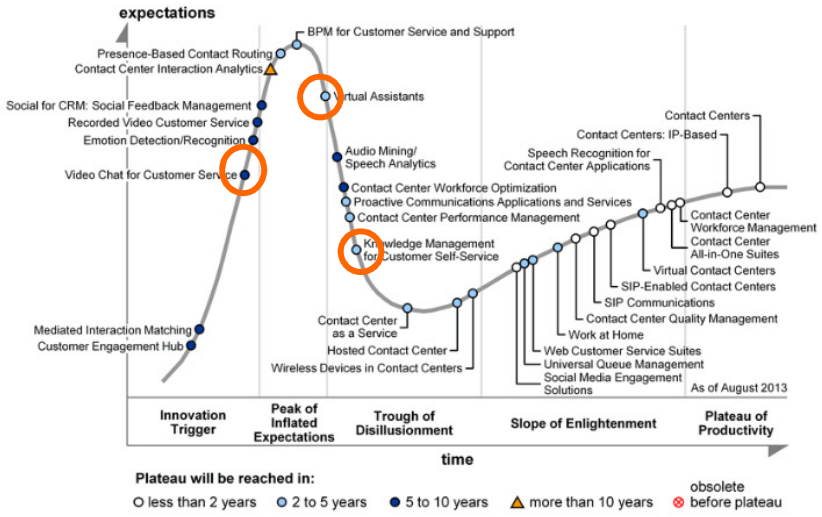
Attitudes Toward Public Cloud: Government vs. Global (Gartner, Match 2014)

Industry technology trends
Online, Customer Self-Service to the Public

- State and local government agencies continue to invest in web-based customer self-service
  - Shifting low-value services from case workers to leverage skills on more critical tasks
  - Providing 24/7 access to frequently used services
  - Adapting to expectations of the public, influenced by continuous consumerization and the digital enterprise
- Online, self-service capabilities are rapidly becoming available through vendors of different backgrounds
  - Contact centers, portals, collaboration
- A large portfolio of legacy applications impedes customer self-service programs
  - Poor interfacing options for real-time data exchange
  - Application and data "silos" are common
  - Lack of agility prevents timely adaption to needs
  - Maintenance windows prevent 24/7 access



Transactional Self-Service Versus Web Customer Service Gartner, 2013)



Hype Cycle for Contact Center Infrastructure (Gartner, August 2013)

See appendix for larger graphic

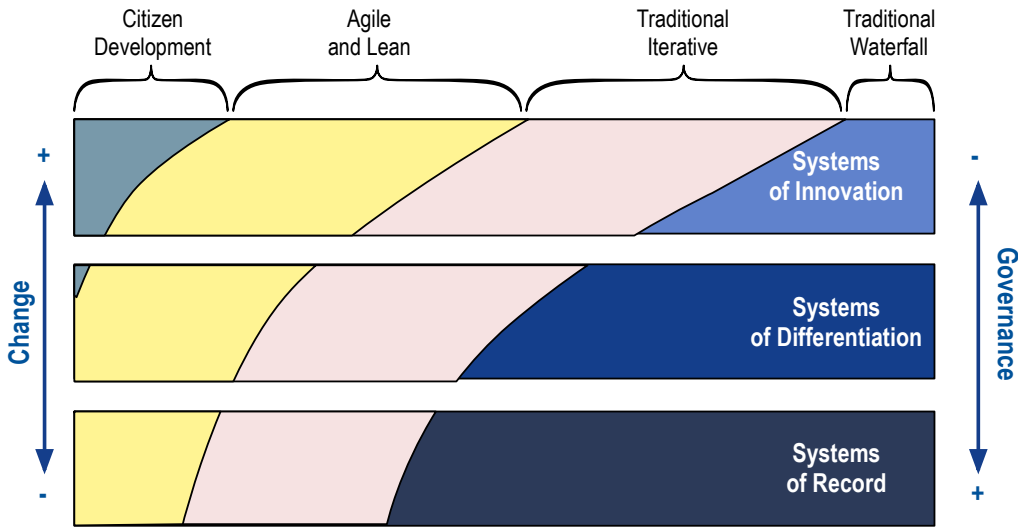
Industry technology trends
Mobility

- **As smartphones and media tablets continue to gain market share relative to PCs, location-aware mobile devices are now pervasive throughout government agencies**
  - The challenges currently posed by mobile devices in government make them unlikely replacements for PCs. Thus, they will remain additive devices in the short run
  - Many package-based solutions include mobile companion-applications with pre-configured integration
- **A large portfolio of legacy applications impedes taking advantage of mobile capabilities**
  - Poor interfacing options for real-time data exchange
  - Mismatch between security implementations
  - Lack of agility prevents timely adaption to needs on the “back end”

Top 10 Strategic Technology Trends for Smart Government (Gartner, Match 2013)

Industry technology trends
Citizen Development

- There is always more demand for solutions than IT resources can provide
- In many cases, business users develop their own applications using unsupported tools
  - The technology is typically not managed
  - The solutions often result in duplicate data entry, data inconsistency and exposure to data loss
- A Citizen Development program and technology allows business user application development with IT's blessing and support
  - IT provisions rapid development tools (either brokered as a cloud solution or on-premises); these tools are easy to use
  - IT provides data integration to system of record data in a secure and controlled fashion
  - IT administrators provide basic security, back up, reliability, performance, etc. for the applications
- A well planned Citizen Development implementation can be a remediation for legacy point solutions



Development Style vs. Pace Layers (Gartner, 2013)

Hype Cycle for Smart Government(Gartner, July 2013)

See appendix for larger graphic

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Break

Be back in 10 minutes

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Work Sessions

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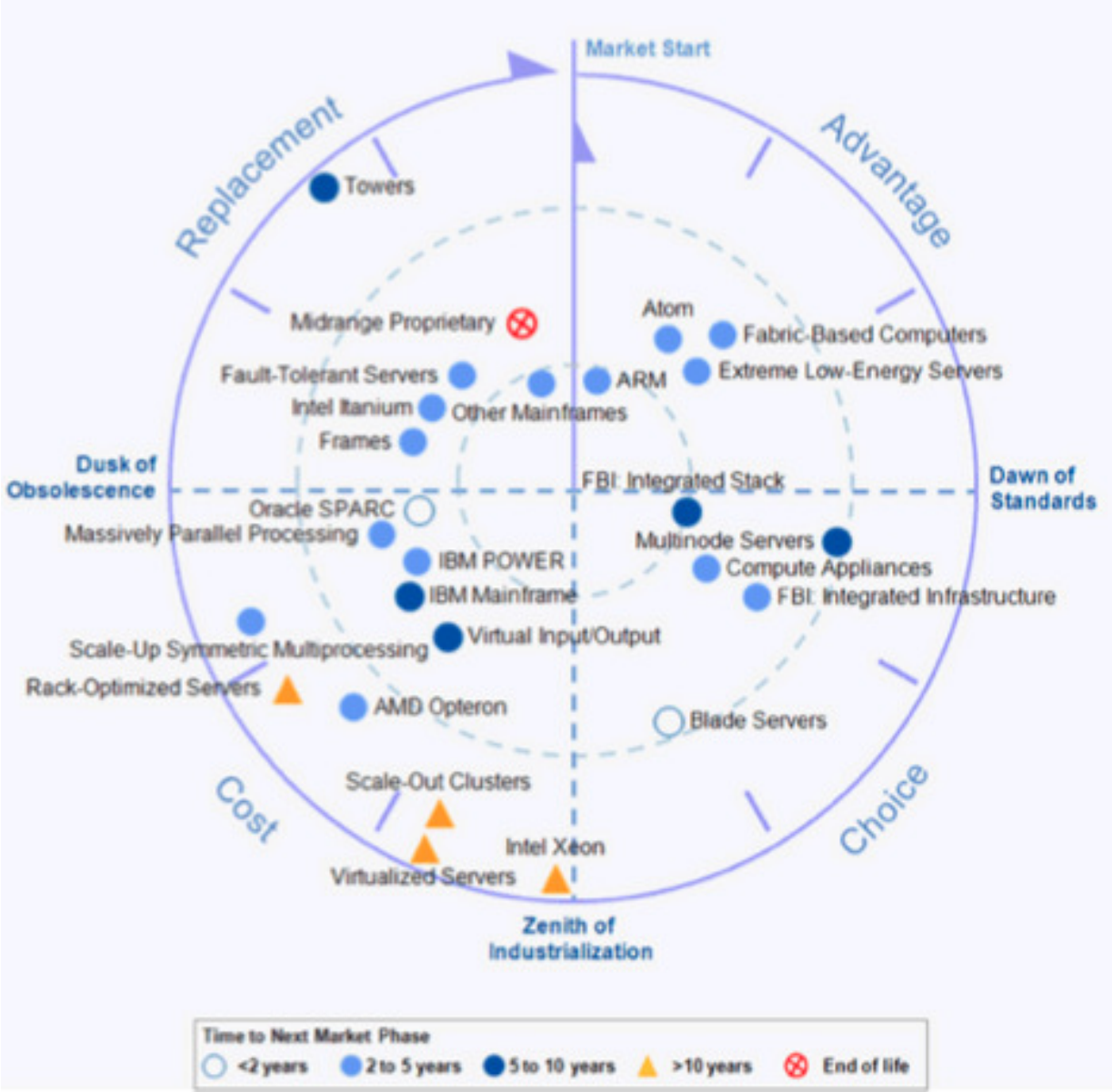
Appendix

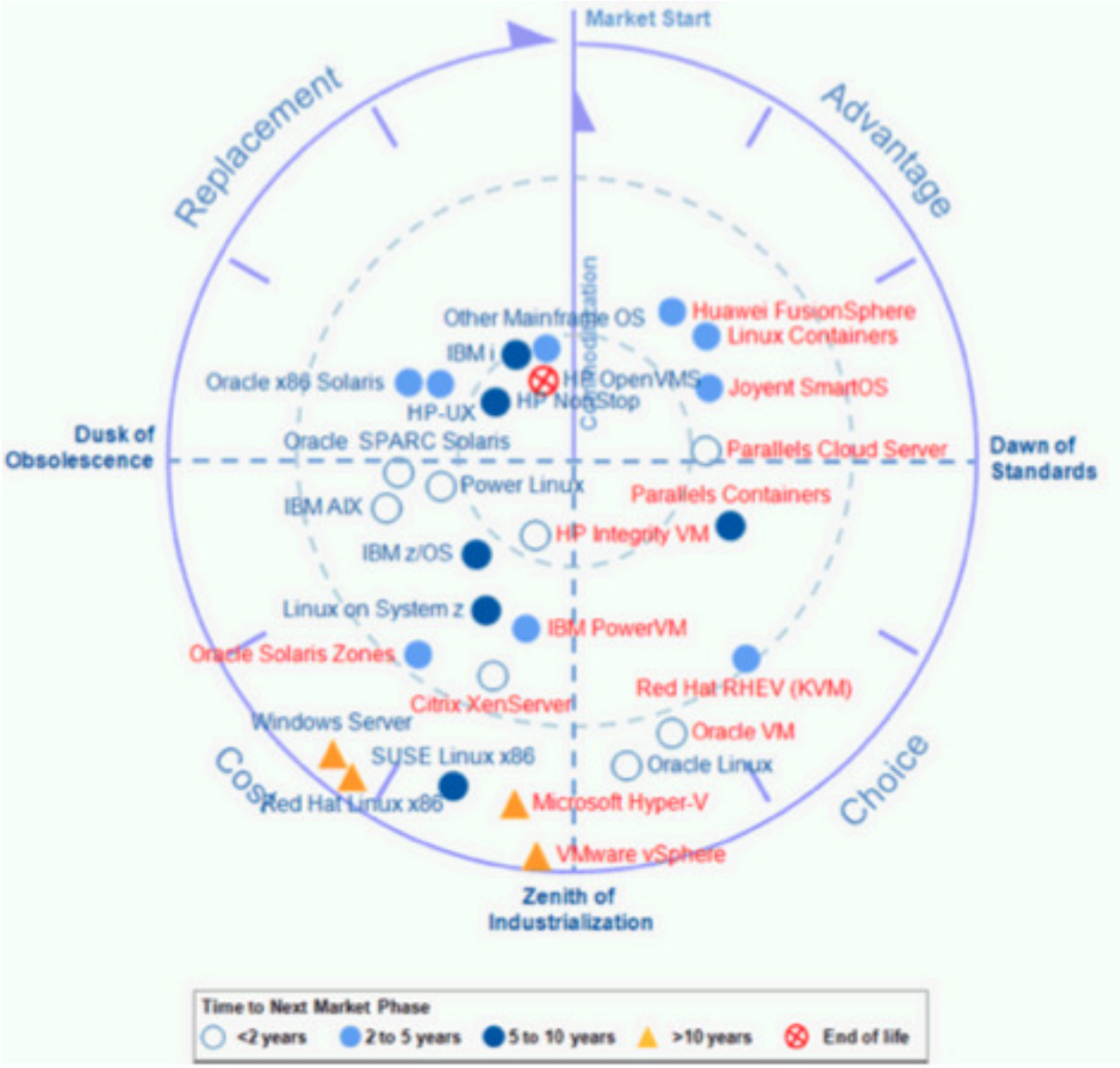
Appendix

IT Market Clock for Server Technology, 2013



Appendix

IT Market Clock for Server Virtualization and Operating Environments, 2013



Appendix

Hype Cycle for Contact Center Infrastructure (Gartner, August 2013)

Appendix

Hype Cycle for Smart Government (Gartner, July 2013)

Department of Information Resources

Wrap-up

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