Enlightened, Inc. White Paper Series for Government Agency Officials

Enlightened Inc.

White Paper Series

Topic:

Build vs. Buy Strategy

September 2017

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1.0 EXECUTIVE SUMMARY

Business ecosystems of today tend to focus on achieving efficiencies across the organizational landscape. Given this context, decisions around "build versus buy" that originated in the manufacturing arena now extend across information technology, human resources, operations and maintenance, and other fundamental business functions of an organization. It is, therefore, critical that every organization develop a framework around which to make such decisions.

This document focuses on three key areas to examine in the decision process:

1. A decision support framework that focuses on information technology acquisitions, with an extended focus on the evolution of best practices and toolsets beyond build versus buy
2. An articulation of the framework derived from research on best practices, and aggregation of content from various sources of research literature
3. A brief discussion on evolving and changing contexts that come into play, given the volatile world of modern day enterprise computing

2.0 BACKGROUND

Most organizations follow loosely spun policies that govern technology procurement. Enterprise ecosystems experience loss of functional agility due to a concentration of hardware and software entities that accumulate across business silos over time. It also results in a maintenance nightmare that has given rise to enormous "technical debt." Technology procurement needs a disciplined, consistent, methodology-driven approach. An organization-wide, one size fits all build versus buy policy is not a viable solution at the enterprise level, especially when several putative solutions are available under the evolving category of "nuanced" options. Purchases made based on unsound reasons, inconsistent decision-making patterns, and a propensity for custom software development produce negative outcomes and must be tightly controlled. Therefore, a set of guidelines serves as a key support asset, focusing on the "what-to-do," which is then leveraged by decision makers to determine the "how-to" within their specific organizational context.

3.0 BUILD VERSUS BUY AND BEYOND

Traditional questions to systems or application acquisition boiled down to the dual option form factors of build versus buy. Refinements and progressions in technology have ensured the evolution of other tools and options available to today's decision makers. The emergence of XaaS, specifically, Software as a Service (SaaS), adds the "rent" option, forever changing the evaluation criteria traditionally centered around the budget, risk, and capacity. Further, robust computing architectures have fueled an ever-increasing focus on End User enablement and feature expectations such as embedded enterprise content across every line of business application. This has given rise to an extensible third option – platform architecture driven rapid application development (RAD).

4.0 FRAMEWORKS AND FUNDAMENTALS AND REQUIREMENTS ASSESSMENT

Per best practice leaders such as Gartner, the six fundamental concepts in Figure 1 and accompanying questions below greatly influence outcomes from software form factor decisions.

1. Does the candidate technology contribute positively to the application portfolio of the organization?

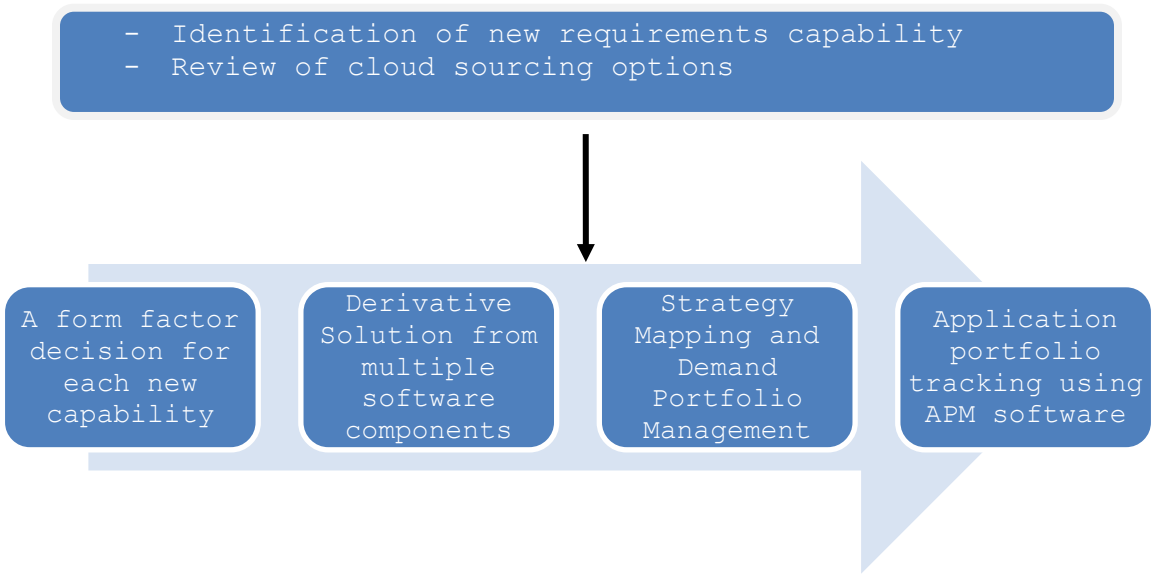

Figure 1. Contextual interactions driving decision outcomes (Gartner, 2012)

2. Assess strategic importance, business value, and quality scores, with a goal to determine if the candidate technology is a commodity or a differentiator to the enterprise ecosystem
3. What is the modernization strategy for the applicable technology?
4. Was an analysis performed to create cost and risk models using a best practice framework such as a Strategic Software Assessment Framework (SSAF)?
5. Given that cloud services are here to stay, what is the strategic outlook toward potential cloud adoption and cloud delivery?
6. Has End User Analytics been leveraged to trend out embedded content requirements across the enterprise?

5.0 CONTEXTUAL DETERMINANTS FOR BUILD VERSUS BUY FORM FACTORS

Most contemporary enterprise application portfolios have suffered from years of locally optimized, tactically expedient and inconsistent decision making. Contextual determinants of these decisions are important drivers that help in laying out the larger architectural scope involved and help relate the choices to applicable business use cases.

Figure 2 shows the main elements of these factors.

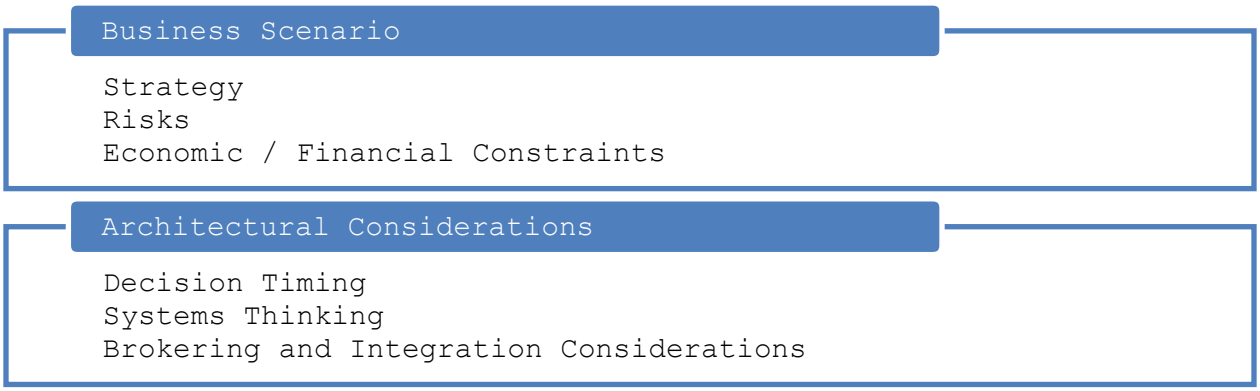

Figure 2. Factors influencing decision contexts for build versus buy

6.0 EVALUATION CRITERIA

Effective procurement mechanisms and related decision-making are reflective of evaluation criteria focused on removal of bias of any kind, be it cultural preferences or unstated policies. Gartner broadly classifies these criteria into two categories:

1. Requirements and Constraints – criteria that form the basis of specific acquisition decisions over time
2. Principles – organizational fundamentals that do not change with every acquisition decision

Figure 3 lists specific entities of these two categories discussed in following sections.

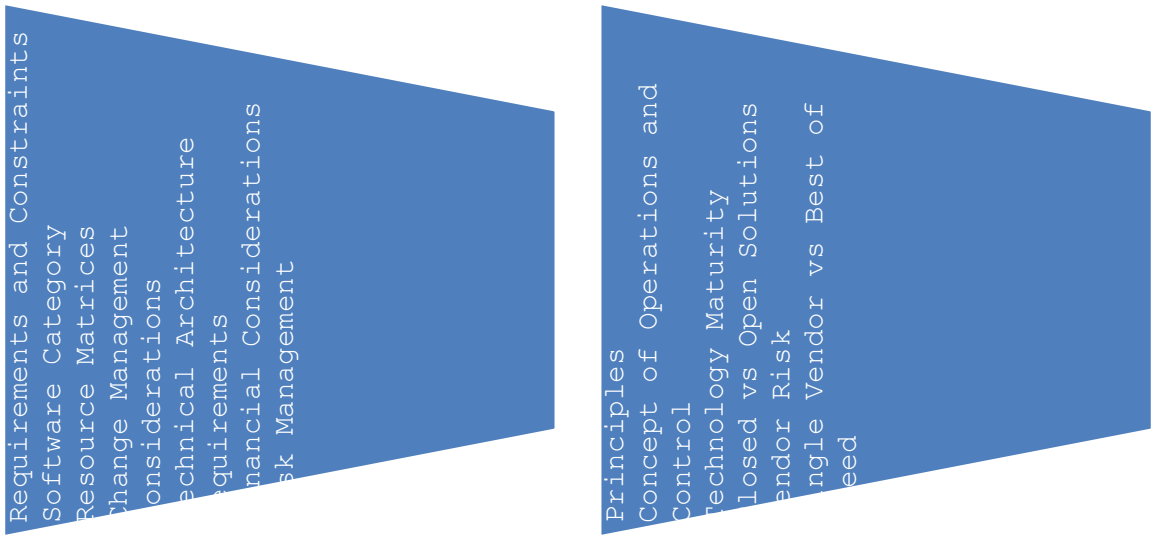

Figure 3. Evaluation criteria at a glance

7.0 ANALYSES OF ALTERNATIVES- SCORING AND DECISION ANALYSES METHODOLOGY

A decision analyses table is a recommended mechanism for performing a comparative view of the options based on the core selection criteria determined by the previously discussed considerations.

7.2.1 Decision Analyses Table

Table 2 represents a real-world example of a prototypic evaluation. The steps to populating the table and calculating final scores are:

1. Decompose each requirement or criterion to the level of granularity required for an accurate analysis. It is highly recommended that decomposition is limited to one level, as shown in Figure 8.

15%	**Assessments**		15%				15%	
	Form builder with drag'n'drop UI	9	4%	0.36		1	4%	0.04
	On the fly form template generation	9	4%	0.36		9	4%	0.36
	Offline access on mobile devices	9	2%	0.18		9	2%	0.18
	Capability to apply branching logic	9	4%	0.36		9	4%	0.36

Figure 8 – Requirement decomposition for analyses

2. Assign a weight (W) to each criterion, ensuring the total of the weights add up to 100%.
3. Points / Raw Scores (P) range from 1-10 with the following gradation guidance:
    - 10 – Fully meets requirements
    - 7 – Meets most requirements
    - 3 – Partially meets requirements
    - 0 – Unusable solution
4. Calculate the final scores in two steps:
    - Compute weighted scores, P*W
    - Final Score = Sum of the weighted scores

The application with the higher final score is the preferred product.

7.2.2 Evaluator Variance and Reconciliation

Reconciliation of variance in scoring between evaluators is imperative to the decision analyses process. If there is a variance of >10%, evaluators must discuss the rationale behind the scores and the process repeated by reframing the evaluation perspective. This process repeats until resolution of the issue. Table 2 shows an example of a decision analysis spreadsheet.

	A	B	C	D	E	F	G	H	I
1									
2		**Analyses of Alternatives - Decision Analyses**							
3									
4				**Application #1**				**Application #2**	
5	***Distribution of Criteria Scores***	***Requirements Definitions***	***Points***	***Weighting***	***Weighted Scores***		***Points***	***Weighting***	***Weighted Scores***
6	60%	**Functional criteria**		60%				60%	
7	15%	**Scheduling and Operations support**		15%				15%	
12	15%	**Data Management**		15%				15%	
16	15%	**Business Intelligence and Analytics**		15%				15%	
21	15%	**Assessments**		15%				15%	
22		Form builder with drag'n'drop UI	9	4%	0.36		1	4%	0.04
23		On the fly form template generation	9	4%	0.36		9	4%	0.36
24		Offline access on mobile devices	9	2%	0.18		9	2%	0.18
25		Capability to apply branching logic	9	4%	0.36		9	4%	0.36
26	20%	**Implementation**		20%				20%	
31	12%	**Budget and Costs**		12%				12%	
37	8%	**Security and Compliance**		8%				8%	
40	**100%**	**TOTAL**		**100%**	**8.75**			**100%**	**6.5**
41									
42									
43		***Scoring Criteria and interpretation***							
44		*Fully meets requirements*	10						
45		*Met most requirements*	*7*						
46		*Partially met requirements*	*3*						
47		*Unusable Solution*	*0*						
48									

Table 2. A prototypic decision analyses spreadsheet

8.0 ABOUT ENLIGHTENED

Enlightened, Inc. is a leading provider of Information Technology (IT) consulting services founded in 1999 and headquartered in Washington, DC. We are certified as a small, HUBZone business; and one of the few to achieve Capability Maturity Model Integration (CMMI) Development Level 3 and CMMI Service Level 2 appraisals.

Enlightened develops and delivers strategic IT and management solutions to complex business problems of global, national and local significance. Enlightened provides expertise in the following capabilities:

- Management Consulting
- System Integration
- Information Assurance
- Business Process Outsourcing

Enlightened serves Federal (Defense and Civilian), state and local government agencies and private sector entities that face daunting challenges in achieving their mission.

Each year the federal government purchases from private firms billions of dollars in goods and services that range from paperclips to complex space vehicles. It is the policy of the United States, as stated in the Small Business Act, that all small businesses have the maximum practicable opportunity to participate in providing goods and services to the government.

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APPENDIX

A. Evaluation Criteria – Analytical detail

A.1 Requirements and Constraints

Best-fit decisions result from prioritizing requirements and constraints in the decision-making process. Evaluation of the relative importance of the determined requirements and constraints is important at every decision point in application acquisition. In this context, the following criteria strongly influence such decisions:

- Software Category
- Resource Matrices
- Change Management Considerations
- Technical Architecture Requirements
- Financial Considerations
- Risk Management

A.1.1 Software Category

There are six broad categories of software under which candidate software exists. The software is categorized based on its function and the breadth of its user base, as shown in Table 1. Typically, applications that have a wider audience, such as infrastructure applications, have a core feature set. The level of feature customization typically increases in applications that have a niche user base.

Software Category	Examples	Audience
Business Applications	CRM Applications	Specific
Productivity Suites	Email	Generic
Business Infrastructure	Data Analytics	Specific
Developer Tools	Integrated Development Environments	Specific
System Infrastructure	Operating Systems	Generic
Application infrastructure	Web Servers	Generic

Table 1. Candidate software categories and user spectra

A.1.2 Resource Matrices

Acquisitions have downstream resource dependencies that must manage the implementation, integration, operations, support, and maintenance of the application. Build-Buy-Rent decisions hinge on the will of the organization to commit to composite resources required for the effort.

A.1.3 Change Management Considerations

Any enterprise scale acquisition entails changes or tweaks in organization business processes. It is important to measure the willingness of an organization to change to match the post-implementation business process requirements as defined by the application. These measurements are used to determine the candidate application's level of uniqueness.

Considerations for this determination include:

1. Application Function – primary determinants that help in deciding if the combination of the software capability and the business process it supports is unique
2. Upgrade Cadence – requirements that relate to release cadence of upgrades and speed to deployment
3. Pre-engineered Business Processes – processes that help attain straightforward efficiencies post implementation since they are incorporated into the application from the start
4. Value Proposition Timeline – a barometer of how soon the application will support the targeted business needs
5. Time to Obsolescence – usability lifespan defined by changes in business requirements due to controllable and uncontrollable factors, such as regulatory, security, and compliance stipulations
6. User Adoption – a measure of user adaptability in terms of business-IT relationships and their effects on user adoption

A.1.4 Technical Architecture Requirements

Technical architecture requirements awareness measures the "degree of fit" of the application to the enterprise architecture posture of the organization.

Important considerations for this determination include:

1. Non-functional Requirements – Quality of Service and SLA parameters
2. Technical Standards Compliance – explicit specifications of interoperability parameters between the new application and the organizational application portfolio with superior technical architecture that gives the organization the level of control they desire over the new application ecosystem
3. Integration – measures the ease of integration and interoperability with the organization's data and application infrastructure
4. Conformance to Service Oriented Architecture Design – loosely coupled and modular systems, and software written with clearly separated concerns, allows for flexibility of changes within the larger platform architecture with minimal or no impacts to the frontal service
5. Reuse Opportunities – measurement of reuse openings at various levels, such as source code, service, and business processes

A.1.5 Financial Considerations

Gartner's Strategic Software Assessment Framework (SSAF) presents a detailed cost model that incorporates strategic cost and initial costs of an acquisition, as shown in Figure 4.

The types of costs are matrixed to usage, financial, and exit strategies at the organizational level, resulting in the following considerations:

1. Usage-driven Cost Optimization – achieving a flexible cost model that balances low user seats/transaction costs, high user seats/transaction costs and computation-intensive applications

2. Initial Cost versus Total Cost of Ownership (TCO) – organizations often omit this relationship, yet it is an important consideration. Per Gartner, initial costs account for only 8% of TCO for applications that have a median lifespan of 15 years.
3. To Capitalize or Not to Capitalize – Traditional thought processes tied this to the size of the organization. However, with the mainstream emergence of stable cloud-based technologies with subscription options, and with businesses of all sizes looking at these models, the time value of money and cost of capital are important considerations.

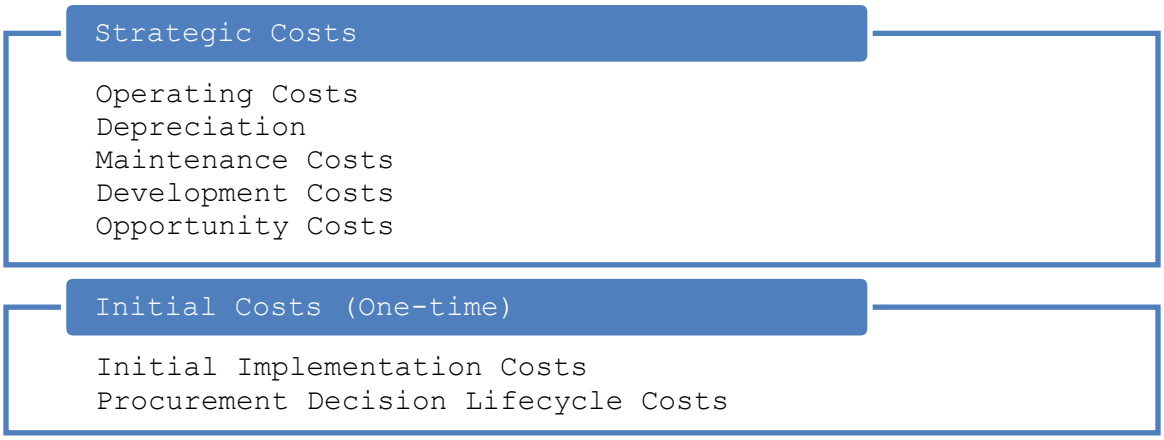


Figure 4. Cost factors in a prototypic acquisition

4. Retirement Costs – disposal costs during application decommission, including, but not limited to user migration, business process reengineering, and horizontal scalability issues arising from data migration from one provider to another.

A.1.6 Risk Management

A risk management plan for every major procurement initiative is highly important. The risk mitigation plan addresses any entity connected to the procurement lifecycle that poses an enterprise risk. These risks could include:

1. Implementation Risks
2. Intellectual Property Risks
3. Vendor Market Share and Viability Risks
4. Technical Risks related to bugs in application architecture

A.2 Principles

Principles represent an organization's strategic outlook on the utilization trajectory of its technology resources, within the spectrum of which every related procurement decision falls under. It is pertinent, however, to ensure that these principles allow for necessary flexibility and room for decision making driven by the demands and speed of evolution in the technology vertical. Core principles include the following:

- Concept of Operations and Control
- Technology Maturity
- Closed vs. Open Solutions
- Vendor Risk

- Single Vendor vs. Best of Breed

A.2.1 Concept of Operations and Control

The concept of operations and control is determined at the highest executive level of an enterprise and encompasses strategic outlook toward financial and risk management. The organization must determine the level of operational control it requires in its application infrastructure, which includes all related security and regulatory postures. This, in turn, drives operational outlook in terms of whether outsourcing of operations is a possible downstream option.

A.2.2 Technology Maturity

Maturity levels of the application and its underlying architecture differs across the software category. Further, the typical maturity of a leading edge XaaS offering is not usually in sync with traditional expectations. The outlook for a formulated wait period before adopting such architectures are considerations worth exploring.

A.2.3 Closed versus Open Solutions

Explicit policy-driven guidelines serve to ensure clarity of technical decision making during the operational lifetime of the application.

A.2.4 Vendor Risk

Each enterprise should have a policy of procurement from an approved vendor. Given the volatility and (r)evolutionary pace of change within the industry, it is valid to consider analyses that weigh the extra customization potential and flexibility offered by the smaller niche vendors, even if they fall outside of that approved vendor.

A.2.5 Single-Vendor versus Best of Breed

This decision relates to the organization's fundamental outlook on whether it places value on integrating a heterogeneous array of products to form a solution and reduce vendor lock-in risks. A single vendor policy might promote a propensity to gravitate toward solutions from the incumbent vendor, which may result in requirements trade-offs without an impartial assessment of the strengths and weaknesses of the incumbent solution.

B. ANALYSES OF ALTERNATIVES- COMPARATIVE VIEW OF BUILD/ BUY/ RENT PLATFORMS

B.1 Custom Developed Software – the "Build" Model

Custom Developed Software (CDS) consists of applications built internally within an organization for specified use. CDS typically suits scenarios where no comparable solutions exist in the market, or when there is a significant competitive advantage in implementing its unique processes through an internal build out. Figure 5 spells out the major merits and demerits of this option.

Merits

Tailored to the business
Organization retains total control of Intellectual property
non-functional requirements
future state evolution
security and regulatory posture

Demerits

Inaccurate maintenance LOE
Changing business processes creates re-engineering costs
High initial cost
Project overrun risks
Technology obsolescence risks
Directly linked to capability of the organization for application maintenance
Technical / user support responsibilities

Figure 5. Merits and demerits of CDS

7.2 Commercial Off-the-Shelf (COTS) Software – the "Buy" Model

COTS software is readily available applications/application suites licensed to organizations by commercial vendors. In terms of historical practices, poor deployment and management plague these implementations, resulting in significant reduction in projected Return on Investment.

The primary determining factor in choosing COTS software is to assess whether the candidate application is a commodity that leaves room for standardization or a differentiator that gives a competitive advantage to the business. Other principal determinants include vendor viability and relationship management, which can pave the way for influencing the future state of the product, and a steady state business process that is close enough to the pre-engineered and codified processes in the application. Figure 5 explores the merits and demerits of this model.

Merits

- Development teams more focused on integration and customization
- Pre-engineered industry best practice business processes incorporated in application
- Reference implementations can be leveraged to refine deployment process
- Shared burden of user/technical support
- Superior product documentation
- Partial mitigation of obsolescence risks

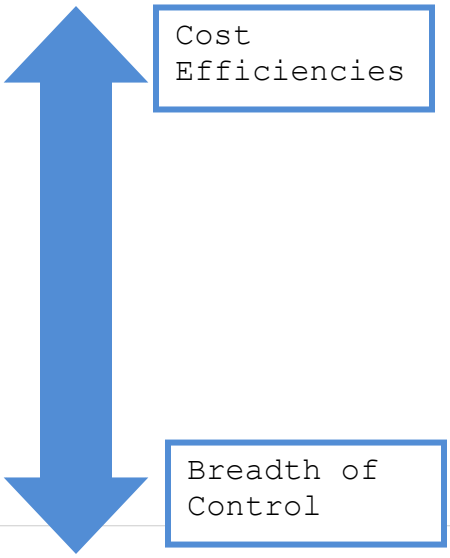
Demerits

- No COTS package will satisfy ALL requirements
- No flexibility to accomodate customer requirements over application architecture
- Prolonged evaluation process- Questionable cost model, since savings from avoiding development might be consumed in the acquisition lifecycle and post implementation tasks
- Lack of timely bug fixes can cripple required features
- Skilled resource turnover can cause O&M issues
- Silos within organization can give rise to integration issues

Figure 5. Merits and demerits of COTS software

B.3 Software as a Service (SaaS) – the "Rent/Borrow" Model

SaaS is a delivery model in which customers access a fully developed web application, hosted and managed externally by the vendor, through the Internet. The solution is a finished product with tiered user support and involves a pay-for-use or subscription cost model. Figure 6 shows the cloud "pyramid" of major "as-a-service" offerings in today's market and their relationship to cost-efficiencies and breadth of control considerations for procurement and architectural decisions. A strategic outlook with an emphasis on time to value and commoditization of business processes is an appropriate ecosystem for a SaaS implementation. Figure 7 lists the merits and demerits of the SaaS model.



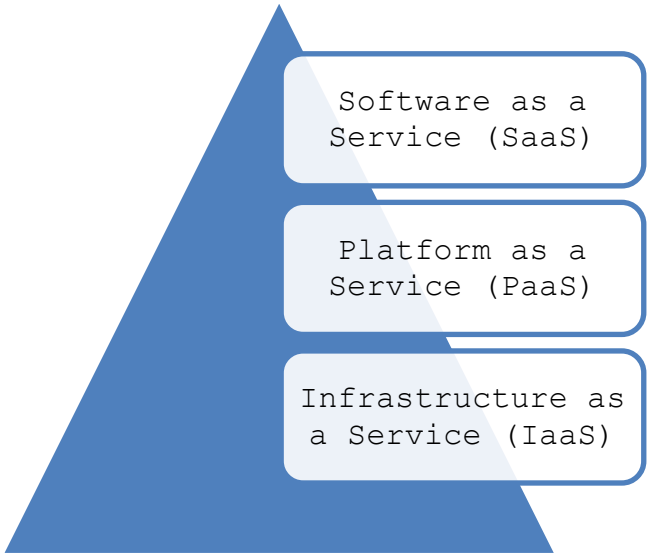


Figure 6. Cloud "pyramid" depicting XaaS elements

Merits

- Virtually no operations or application development teams required
- Pre-engineered industry standard business processes
- Try before you buy model
- Usage driven cost models
- Financially backed SLA in most cases
- Device independent, internet centric accessibility
- No infrastructure costs
- Helps move organisation to a service centric IT baseline

Demerits

- Highly dependent on vendor viability
- IP, security, regulatory and data privacy issues remain
- Horizontal scalability is a life time risk
- Possibility of policy, process and data model incompatibilities
- Integration incapability with existing applications
- Branding limitations
- In-house resources may be unfamiliar with SLA formulations for SaaS

Figure 7. Merits and demerits of SaaS