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A TECHNOLOGY INVESTMENT REQUEST (TIR) GUIDE:
Comparing IT Alternatives to Find Viable Solutions

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TIR Guide: Comparing IT Alternatives to Find Viable Solutions

Section 7 of the TIR evaluates possible IT approaches for resolving a business problem, and/or taking advantage of a technology opportunity. Generally the TIR business case addresses resolving a business problem by applying appropriate technology. However, with rapidly advancing technology, new IT opportunities can become available that allow an agency to gain efficiencies, and more effectively meet their business goals without necessarily having a critical business problem.

A variety of IT alternatives should be addressed when looking for the best possible IT solution. They include:

- ◆ Staying with the current system and modifying your business processes to fix the problem (generally called the Status Quo),
- ◆ Substantially modifying or fixing the existing method,
- ◆ Custom development of a new application (i.e. building a new application),
- ◆ Implementing a commercial off the shelf software (COTS) solution,
- ◆ Transferring a system from another state or organization,
- ◆ Outsourcing to an Application Service Provider (ASP), that provides the entire solution as a service,
- ◆ Acquiring the needed functionality as a Web service
- ◆ A Hybrid mixture of any of the above possibilities (for instance having one vendor supply the application and EITS handle the infrastructure), or
- ◆ Other unique opportunities that have been identified.

Each alternative approach to resolving the business problem or taking advantage of a technology opportunity should be evaluated for its viability. A viable solution must pass a basic evaluation or screening based on business, timeframe, cost, benefit and risk criteria. The Alternatives Evaluation Table has been provided for this purpose. The result of screening each alternative will result in a “pass” or “fail” determination. The determination that an alternative “fails” and is not a viable solution may be based on one or more critical screening factors, depending on the importance of each factor to the individual project.

Differences from the previous TIR processes:

The FY10-11 TIR analysis of alternatives was based on simple narrative. The FY12-13 version provided a methodology for screening alternatives with an Alternatives Evaluation Table. Solution alternatives determined viable would be further analyzed with a Cost Benefit Analysis methodology, also new for FY12-13.

TIR Guide: Comparing IT Alternatives to Find Viable Solutions

This new version includes the use of Web services as an alternative to be considered, and includes a discussion of the State's preferred IT architecture for systems that are not outsourced: the agency is responsible for their business application and EITS provides the infrastructure services (server hosting, virtualization, networking, storage, etc.). Exceptions to this should be justified in the TIR and approved by the State CIO.

The methodology has also been expanded to clarify possible mixed sourcing of infrastructure, application and networking services, which have been added in the Alternatives Evaluation Table.

- **Application Service** – This refers to the support of the business application. It can be provided by a vendor, or internal agency staff, EITS or MSA staff.
- **Hardware/Software Hosting** – This, along with Network make up the components of infrastructure support. It includes hardware, operating systems, storage,
- **Network**– This specifically refers to wide area networking and may include, direct connect or wireless approaches.

Definitions of terms in the Alternatives Evaluation Table:

Service Support:

The table asks for a designation of who the support provider is for the three major areas addressed above.

Provider types include:

- EITS ,
- Agency,
- Vendor,
- MSA,
- Other (this may be another federal, state, or local agency or private group and should be specified in a footnote)
- TBD (dependent upon RFP responses or other pending information).

Alternatives:

Note: this is referring to a solution / business application]:

- **Status Quo** – This is the current method of supporting business functionality. It may be any combination of manual processes and technology components.
- **Modify** – This involves fixing the current technology with any combination of enhancements, significant application changes, and new add-in software modules so that it can meet the business requirements.
- **Build** – This involves replacing the current method with a custom built system. The implementation process involves all of the phases of the software development lifecycle.

TIR Guide: **Comparing IT Alternatives to Find Viable Solutions**

- **COTS** – This involves replacing the current method with a Commercial off the Shelf Software. These are ready-built applications. There generally is some degree of customization required to fit state requirements.
- **Transfer** – This involves the acquisition of a system built with public funds by another governmental entity. Customization is generally required to modify the transfer system to meet Nevada requirements.
- **Outsource** [Application Service Provider] – This involves selecting a service provider that owns the application, provides support and hosts the solution. These Application Service Providers (ASPs) provide various user support, such as a help desk. Use of the system and its support are charged as a service under a contractual agreement.
- **Outsource** [Web services] - In a software on demand model, the provider gives customers network-based access to a single copy of an application created specifically for software as a service (SaaS) distribution.
- **Hybrid** – Hybrid solutions may combine a variety of approaches. In some cases, vendors will provide a particular set of the total required services. When several vendors are involved this is often referred to as multi-sourcing. EITS services may also be a component of a multi-source solution. Multiple vendor products may also be integrated for a solution. A web page or application that combines data or functionality from two or more external sources to create a new service is another type of hybrid, called a mash-up.
- **Other** – This includes anything not covered by the other categories, and therefore necessarily requires a description of the particular unique alternative. An example would be having the opportunity to “piggy-back” another agency’s system.

Evaluation Criteria:

- **Business Objective** – Does the alternative meet the primary business objective?
- **Needed Functionality** – Can the solution meet the essential business requirements? Functional requirements should be indicated in the TIR Requirements Matrix. It is possible that a potential solution can meet business requirements but fails to meet technical and/or security standards (see below).
- **Target Deadline** – Can the solution be implemented within the established timeframe?
- **Within Cost Ceiling** – Can the solution be implemented within an acceptable cost ceiling?
- **Technical Standards** – Will the solution meet technical and security standards? This necessarily includes all of the Nevada State Security Policies, Standards and Procedures (http://infosec.intranet.nv.gov/Security_PSPs.htm). Security and Technical standards should be indicated in the TIR Requirements Matrix. It is possible that a potential solution can meet the identified technical and security standards but fails to meet functional standards.
- **Target Infrastructure** – Can the solution fit into the infrastructure of the agency / state?
- **Financial Benefit Targets** – Can the anticipated benefits be achieved by the solution?
- **Non-Financial Targets** – Will the anticipated intangible benefits be accomplished?
- **Acceptable Risk** – Is the risk for implementing this alternative acceptable?

TIR Guide: Comparing IT Alternatives to Find Viable Solutions

Evaluation Example:

This example portrays an agency with a serious need for a new system that can adequately meet its billing and reporting needs. The agency hopes to be able to deploy a new system within a \$200,000-500,000 estimate. The following describes the agency's evaluation of the status quo situation, and each of several competing alternatives.

Status Quo

The Health Services Agency has a failing client management and billing system that can no longer meet its billing objectives, resulting in stale claims. Federal deadlines are being missed and penalties are pending. The process has been streamlined as much as possible considering the constraints of the old system, and more and more staff have been committed to this process. To meet the projected shortfall more than \$200-500k would be needed for added staffing. This would still be a temporary fix. It was recently determined that the current system does not meet the technical standards of Sarbanes Oxley, and has some questionable security practices.

Modify

The current applications have been fixed and patched over the last seven years. It is becoming increasingly difficult to find qualified professionals who can maintain the old applications. Many of the system components are based on old technology. The architecture required for operating the system is out of date. Most of the applications cannot be fixed to run with current technology. Some of these components are no longer being supported by the vendor. In one case, the vendor is out of business. This component cannot be fixed if it breaks.

Build

The Health Services Agency contacted EITS. Discussion with the EITS Chief of the Enterprise Application Development unit indicated that this was not something that could be developed with current EITS resources. While it was also determined that a vendor custom built system could meet their requirements, a vendor-built application would take longer and be riskier to manage the more complex implementation issues than those of a COTS implementation. Scope blow outs and timeframe extensions have been the rule with vendor developed systems in Nevada. Also, it is doubtful that a new application could be built at an acceptable cost. Similar development projects in Nevada have had high cost overruns, and another state development cost \$1.2 million (much higher than the \$300,000 cap established by the agency for replacing this

TIR Guide:
Comparing IT Alternatives to Find Viable Solutions

system). Cost overruns and lack of continued funding is a risk of having portions of the system incomplete, possibly resulting in a non-functional system.

COTS

A recent trade journal provided a listing of vendors who had commercial off the shelf (COTS) health services billing solutions. Of the 20 listed vendors, 10 appeared to be possibilities. A Request for Information (RFI) was constructed and issued to vendors by the State Purchasing Division. Five vendors responded with proposals to meet the functional requirements at a cost under \$500,000. Two also had ASP solutions (see later discussion). Although most were reticent to commit to target deadlines, one vendor stated that they had completed a similar state project within the desired timeframe and gave a customer reference. Several different supporting IT architectures were indicated in the proposals, showing a range of opportunities. Vendors also addressed a range of benefits for their own particular solution.

Transfer

The agency conducted research to see what other states were doing to support their particular health and human services billing functions with technology. More specifically, it was hoped that potential transfer systems would be identified by this research. Contacts with the National Association of State CIOs and other associations failed to identify any available transfer systems.

Outsource via ASP

As mentioned above, two of the COTS vendors also offered ASP solutions. These appear to be very cost effective for the initial implementation. However, the Total Cost of Ownership (TCO) appears more expensive when compared to a state hosted version. Compliance with State, agency and industry standards (including security standards) is in question with the ASP architecture, though several other states use this ASP vendor. Also, there is no control over the vendor's hosted infrastructure, and any changes and direction. If this alternative is determined to be viable, these concerning issues would require further evaluation and necessary stipulations made in the vendor contract.

Outsource via Web Services

Using Service Oriented Architecture and Web services was appealing. However, this approach has yet to be deployed in a similar State billing function, and Nevada's process is complex. First a feasibility study would be required, and if feasible, a plan and architectural design developed. These solutions involve multiple entities, and contracting could be complex. This solution was determined to be too risky at this point in time.

TIR Guide:
Comparing IT Alternatives to Find Viable Solutions

Multi-source or Hybrid

There is a possibility of hosting the primary software component at the State's computer facility, to better integrate billing processes with the State's financial system while outsourcing all Federal billing reporting requirements to one of the ASP vendors that currently does similar reporting for eight other states. This seems feasible, but would require the additional requirements of system integration and data transfer not required for a single system. This additional complexity elevates the risk and may possibly extend the timeframe if not carefully managed. This is not an acceptable risk.

Other

No other potentially viable alternatives were discerned.

Alternatives Evaluation Table Example

The following table was completed by the Health Services Agency to evaluate the alternatives for their billing system.

**TIR Guide:
Comparing IT Alternatives to Find Viable Solutions**

EXAMPLE: Health Services Agency: Billing System

ALTERNATIVES EVALUATION TABLE		Status Quo	Modify Existing	Build	COTS	Transfer	Outsource (ASP)	Outsource Web Service	Hybrid*	EITS	*1
Service & Support Characteristics	Application Service	Agency	MSA	Vendor	Vendor	NA	Vendor	Vendor	TBD	NA	
	HW/SW Host	Agency	Agency	EITS	EITS	NA	Vendor	Vendor	TBD	EITS	
	Network	EITS	EITS	EITS	EITS	NA	TBD	TBD	EITS	EITS	
Business Case Criteria	Business Objective	N	N	Y	Y	NA	Y	?	Y	NA	
	Needed Functionality	N	N	Y	Y	NA	Y	?	Y	NA	
Schedule & Cost Criteria	Target Deadline	N	N	N	Y	NA	Y	?	?	NA	
	Within Cost Ceiling	N	N	N	Y	NA	Y	?	Y	NA	
Technical Criteria	Technical Standards	N	N	N	Y	NA	?	?	?	NA	
	Target Infrastructure	N	N	?	Y	NA	?	?	?	NA	
Benefits Criteria	Financial Targets	N	N	Y	Y	NA	Y	?	Y	NA	
	Non-Financial	N	N	Y	Y	NA	Y	?	Y	NA	
Administration	Complexity & Risk	N	N	N	Y	NA	?	N	N	NA	
Key for Alternatives Evaluation Table Above: Use “Y”= YES; “N” = NO; “?” = Possibly or Somewhat; “NA” = Not Available											
VIABILITY		Fail	Fail	Fail	Pass	NA	Pass?	Fail	Fail	NA	
Indicate “Pass”, “Fail”, or “NA” to show viability based on the Alternatives Evaluation Table above											

*Hybrid solution description: This involves hosting the primary software component at the State’s computer facility to better integrate billing processes with the State’s financial system. Federal reporting is to be handled by the ASP vendor.

TIR Guide: Comparing IT Alternatives to Find Viable Solutions

Viability Alternatives Evaluation:

Several COTs vendors provided RFI responses showing that they could meet the evaluation criteria within cost and time constraints. Two of the respondents also have ASP solutions that meet all requirements, though complete details on their internal infrastructure are not known.

Non-Viability Alternatives Discussion:

The Status Quo is problem ridden and its continued failure will result in costly penalties and risk of failure to meet the agency mission (see TIR business case). Fixing the system and its applications is not possible as they require old unsupportable technology to operate. Building the system would require too much time to build the specifications and manage the development lifecycle. State resources are not available. The National Association of State CIOs was contacted regarding similar systems in other states. No state transfer system possibilities were indicated. A SOA/Web Services solution would require a feasibility analysis, architecting a solution and probably have contractual complexities. This would require additional time and have risks that would be difficult to manage with existing state resources. A hybrid solution (see above) appeared to be a viable contender but has too many implementation risks for the timeline. While EITS can provide hosting and network services there is no EITS software application available (NA).