Office Productivity Application Migration

Guidelines for Establishing Migration Strategies for Office Productivity Applications

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Acknowledgments

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Purpose

The purpose of this document is twofold. One is to address the concerns of the Texas Legislature for state information to be interoperable and readily available, now and in the future, to the public by investigating the practicality of using open standards for document formats.

The second purpose is to provide guidance to help state agencies[1] develop a migration strategy for office productivity applications. In support of the legislative goals, agencies are encouraged to consider the suitability of using applications that support open standards for document formats when developing their migration strategy.

This document provides guidance. It does not establish any specific set of requirements. Agencies may choose to tailor the guidance to meet their specific needs. The appendices offer sample tools and additional information that may be helpful to agencies as they develop their own office productivity application migration strategy and identify the application most appropriate for their needs and budget.

Note: The guide covers the migration planning process but does not include details for implementing migration activities.

AGENCY INSTALLATIONS

Results from the DIR 2009 Information Resources Deployment Review indicate that for 89% of agencies, the majority of documents stored are saved in Microsoft Office file formats.

Agencies using Microsoft Office 2007, service pack 2 or later versions, have the option of saving files opened or created by the application in the open standard document formats—.odf, .ooxml, or .pdf—as well as the proprietary format.

Enduring Access to Electronic Documents

Since the early 1990s, most government documents have been created using proprietary software and stored in electronic form. Because applications and file formats change over time there is a danger that essential documents produced in the past cannot be retrieved or accessed in the future. Concerns about the viability of government information led several states' legislatures[2] to propose adopting as public policy the use of open document formats for interoperability and ease of access to citizens.

Texas lawmakers introduced bills relating to use of an open document format for electronic state documents in 2007 and 2009.[3] At that time office productivity application publishers had standardized on one of two different open document formats and were competing for a share of the public market. Texas concluded, as did the other states, that use of a specific technology standard should not be mandated. However, the issue was assigned for further study to interim committees in both the Senate and House of Representatives. One of the interim committee recommendations[4] made to the 81st Legislature was to encourage the Department of Information Resources to develop a comprehensive guide state agencies could use when determining whether to purchase open or proprietary software during natural software upgrade cycles. This guide is the result of that recommendation.

Since the original bills were filed, the technology landscape has changed. Initially, Open Document Format (ODF)[5] was implemented in a few open source office productivity applications. Currently, ODF is

1 For the purposes of this document, the term *agency* is used to refer to both agencies and universities.

2 Massachusetts, Minnesota, Florida, Oregon, Connecticut, California, and New York

3 House Bill 1794 and Senate Bill 446 (80th Legislature) and Senate Bill 266 (81st Legislature)

4 Interim Report to the 81st Legislature from the House of Representatives' Government Reform Committee

5 ISO/IEC 26300:2006 Open Document Format for Office Applications (OpenDocument)

implemented in almost all popular proprietary applications, including Microsoft Office suites. The desire to adopt an open standard for document format no longer rests on the choice of office productivity application.

Refer to Open Standard Document Formats in the appendices for additional information.

Planning Office Productivity Application Migrations

Excluding e-mail, office productivity applications are likely to be the most widely used computer applications in state agencies. These applications are used daily to create and exchange documents, perform numerical data analyses, and develop presentations.

Office productivity application publishers update their applications with new or redesigned functionality every few years. Agencies upgrade or change applications periodically to leverage efficiency improvements from new versions and reduce support costs for outdated technology. Although it is tempting to purchase a new application as soon as it becomes available, agencies should develop an office productivity application migration strategy based on their agency business requirements.

Developing a migration strategy will provide an agency with a consistent approach for deciding which office productivity application is most appropriate for its business and technology environment and the most cost-effective time to perform the migration. Although e-mail client and calendaring, personal databases, web browsers, desktop project management, and file compression may be considered components of office productivity software, for the purposes of this guide, only word processing, spreadsheet, and presentation components will be considered. It should be noted, however, that the relationship of these three components to the other components should be considered when making migration decisions.

This guide focuses on three parts:

- identifying the business need for an office productivity application migration
- analyzing and evaluating the office productivity application, cost, organizational, technology, and user factors impacting a migration
- documenting analysis results in a business case

Complexity of Factors in Migration Decisions

As Texas taxpayers have become more comfortable using technology and downloading free software from the Internet for their own use, they began to question agency expenditures on commercial office productivity applications. The public notion that agencies could use free open source[6] office productivity applications does not take into consideration the complex mix of factors inherent in an existing installation that must be evaluated by business and information technology units to make the most cost-effective and beneficial decision for an agency.

Information Resources Managers (IRMs) should develop a strategy for migrating office productivity applications in conjunction with business units. Agency IRMs should monitor the office productivity application marketplace and be familiar with available products, taking note of when new releases will become available, when publisher support for older versions will end, what productivity benefits could be gained from new features, and whether the application has wide market acceptance. The new application capabilities should be evaluated in light of agency staff needs for supporting the business.

6 State of Texas, Department of Information Resources, *Open Standard, Open Source, Open Format: An Introduction,* Austin, Texas: June 2008. See Appendix K for additional information.

The agency must also consider effects of a migration on the operations of the agency; costs involved with licensing fees, labor, and training; user profiles and requirements; the agency technology infrastructure and compatibility of hardware, operating systems, and other applications; as well as file formats, ease of use, security vulnerabilities, and delivery options.

Depending on budget, the needs of end users, and technology replacement cycles, an agency may choose to skip a version of an office productivity application. Skipping a version may contain expenditures for the short term. However, additional expenses may be incurred in the future when upgrading to a later version becomes inevitable.

Refer to Considerations for Skipping Versions in the appendices for additional information.

Developing the Strategy

The following activities can be used to develop an office productivity migration strategy:

1. ***Identify business need*** – Conduct an analysis to identify a compelling cost, productivity, or service quality need to upgrade or replace the office productivity application.

   Why? Examining the investment value of performing the office productivity application migration aligns the migration initiative with agency business goals and objectives.

2. ***Analyze and evaluate migration alternatives*** – Analyze the current and future business and technology environments within the agency. Consider the factors that impact migration, determine requirements for a new office productivity application, and evaluate candidate applications with the identified requirements.

   Why? Office productivity application migrations should not be based solely on the release of a new software version or application. Consideration should be given to how the new version or application will improve business processes or services through use of the technology.

3. ***Document the analysis in a business case*** – Use the information gathered by performing each of the activities above to develop the migration strategy. Establish the business justification for the migration strategy by documenting the expected business benefits, the alternatives considered, an evaluation of the alternatives, and the expected costs.

   Why? Development of a business case provides a method for analysis and selection of business solutions based on alignment with agency goals and objectives.

Bottom Line

An office productivity application migration strategy should be developed by each agency to meet its own needs. The decision to migrate should be based on a business analysis and the evaluation of agency needs, the technology environment, and impact of the interrelationships with other agencies and stakeholders. Consideration should be given to the industry best practice of combining the office productivity application migration strategies with PC life cycle and operating system replacement for possible cost reduction and increased agency efficiencies.

Office Productivity Application Migration

Many state government workers depend on office productivity applications to accomplish their jobs. Agencies upgrade or replace these applications periodically to leverage efficiency improvements from features and functionality of new software and reduce support costs for outdated technology. In order to document the decision process and ensure that all pertinent factors have been considered and evaluated, an agency should develop an office productivity application migration strategy. An efficient strategy can improve services, reduce operational complexity, improve security, and coordinate purchases for consistent budgeting.

Although e-mail, personal database applications, and web browsers are often considered office productivity tools, for the purposes of this guide only word processing, spreadsheet, and presentation components will be considered.

Publishers of office productivity applications release new versions of their software every few years. However, the release of a new version does not mean that an agency should automatically start a migration process. Because migrating to a new version of an application can be an expensive, risky, and disruptive process, careful planning is crucial for success. A number of factors need to be evaluated and documented before making the decision to migrate and determining the optimal time to conduct the migration.

A set of sample tools that can be used during development of the migration strategy, including guidance, templates, questionnaires, and checklists, is provided in the appendices. Use of the tools is voluntary and intended to be customized to fit specific agency and project needs.

Factors that Affect Application Upgrades

Factors that affect application upgrades are used to compare various alternatives and to provide a basis for selecting the one that delivers the greatest value to the agency. All of these factors—Office Productivity Application factors, cost factors, organizational factors, technology factors, and user factors—should be considered as the agency develops its business case for office productivity application migration. Although the factors are listed separately, many of the elements are interrelated and should be considered holistically. No particular order of action is intended. Each agency should conduct its analysis based on its own individual requirements. The factors are described below and a detailed explanation of how to use them is included in Developing the Migration Plan.

Office Productivity Application Factors

Office productivity applications provide end users with capabilities or functionality such as word processing, spreadsheets, and presentations that enable job performance. These factors impact the installation and integration of the application, its performance and usability among agency staff, the technology infrastructure, and other applications in use.

Office Productivity Application factors include:

- Market options
- License restrictions
- Functionality and feature sets
- Accessibility requirements
- User experience
- File formats and compatibility

- Product maturity
- Delivery options

Cost Factors

Cost factors refer to direct and indirect costs associated with the migration strategy planning process. They include costs related to the assessment effort necessary for developing the business case, projected costs of conducting the migration, and impact on business functions. Hardware upgrades, software licenses, training, and labor are examples of direct costs, while productivity loss and document conversion could be considered indirect costs. Cost factors related to not upgrading are associated with obsolescence and increased risk of failure, which can result in greater cost and time. All factors discussed in this guide will have some costs related to them.

Cost factors include:

- Licenses, usage fees, and subscriptions
- Labor
- Training
- Technology upgrade
- Productivity loss
- Process/template conversion

Organizational Factors

Organizational factors are aspects of the office productivity application's deployment and use that affect the organization's ability to deliver required services.

Organizational factors include:

- Dependency on current application
- Implementation approach
- End-user readiness
- End-user transition
- Technology support
- Migration disruption
- Regulatory/policy compliance

Technology Factors

Technology factors are considerations impacting the technical performance of the office productivity application within its business and technical environments. The assessment of technology factors provides guidance in identifying the proposed/post-migration technology environment.

Technology factors include:

- Agency technology migration strategies
- Current technology environment
- Hardware and operating system requirements
- Network requirements
- Security requirements

User Factors

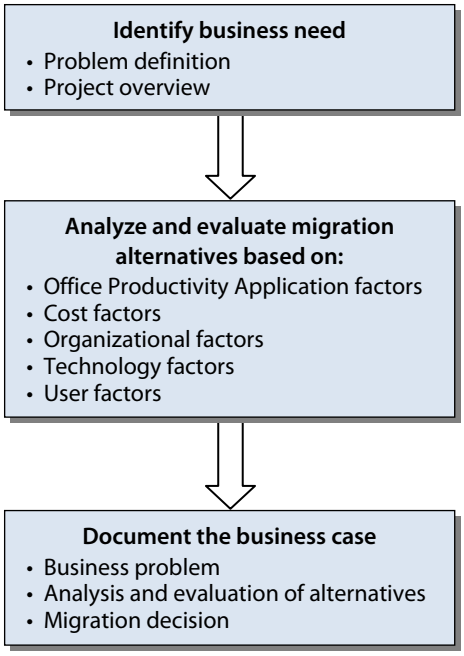
User factors are aspects that affect the ability of staff to perform their jobs using the office productivity application. Key actions for developing the migration strategy include assessing the functional needs of all users, including those with disabilities; complexity of features used; technical skill levels; users' attitudes about the application capabilities; and training needs when deploying new application versions.

User factors include:

- End-user needs
- User profiles
- User practices
- User skill levels
- User tolerance
- End-user training
- User productivity

Strategy Overview

The following diagram outlines the actions to be executed by an agency to develop an office productivity application migration strategy. Each agency should evaluate its resources and create a migration strategy that supports its goals. A strategy will enhance an agency's ability to manage information resources in a cost-effective manner, while remaining responsive to the needs of the agency.



Activities in Developing a Migration Strategy

1. Identify the Business Need

Technology projects are initiated and implemented to aid agencies in meeting their business goals. Office productivity application migration projects should solve a business problem that relates to the agency's operations, processes, or constituent services. Technology for the sake of technology should not be the motivation for an office productivity application migration project.

In this activity, the business problem and related goals and objectives are defined in terms of enhancements to current business processes that improve the agency's ability to meet its goals.

Define the Problem

State the problem and describe how updating the office productivity application will enhance specific processes, services, and/or technology within the agency. Define the problem without presupposing a specific solution. This prevents bias and enables an objective business case analysis to identify the best possible solution.

Develop the Project Overview

Describe the project, state the goals and objectives, and identify other aspects of the project, such as assumptions and constraints. Understanding how the office productivity application migration will solve the business problem is critical to project success.

Cross-referencing the problem definition to the project overview information helps ensure that the proposed project actually solves the business problem.

2. Analyze and Evaluate Migration Alternatives

Identify, evaluate, and contrast the agency's current and future requirements for office productivity applications. This is accomplished by collecting and documenting information about a complex set of interrelated factors that influence the decision whether to upgrade the current office productivity application, replace it with a different office productivity application, or continue to use the current application as is, while developing a timeline to review migration alternatives in the future.

Cross-referencing the requirements to the problem definition and the project overview information helps the agency select the migration alternative that solves the business problem and meets the agency's business goals.

Analyze and evaluate migration alternatives based on the following factors that affect application upgrades.

Office Productivity Application Factors

The following application factors impact the availability, installation, performance, and usability of office productivity applications.

Market options
Market options refer to the number of different office productivity applications and/or versions available for sale or use at any one time. Information about requirements, capabilities, and compatibilities of available applications may be obtained from various sources including vendor marketing literature; non-biased, third-party white papers and studies; and application users.

Assess the market options:

- Determine the availability, requirements, and capabilities of the various office productivity applications on the market.
- Identify statistics about the usage and adoption of applications for indications of favorable levels of support and user satisfaction.

License restrictions
License restrictions refer to conditions that specify how and where applications can be used. Office productivity applications pre-installed on PCs may come with original equipment manufacturer (OEM) licenses that restrict use to the specific equipment purchased. Other licenses are obtained directly from the application publisher. Publishers offer a variety of license types, such as volume licensing plans, subscription-based plans, licenses that cover devices rather than users, licenses that provide application maintenance programs, and licenses that convey rights to new versions of the licensed application. Certain types of licenses may limit an agency's ability to move to another publisher's office productivity application.

Assess license restrictions:

- Assess any restrictions imposed by licenses associated with the currently used office productivity application. Determine the value of the license benefits and compare to the cost of the license.

- Investigate the possibility of changing the license type. A perpetual enterprise license for the current application may make it difficult to make any choice but to upgrade the current application.

Functionality and feature sets

Functionality is the capability of an office productivity application to perform certain operations. Feature sets are tools that allow users to carry out actions that realize the functionality of the application. Functionality and feature sets of office productivity applications may differ among publishers or between versions from the same publisher. Functionality and features may be lost or gained by an upgrade or replacement and related processes. Customized templates or macros may need to be recreated or modified.

Assess functionality and feature sets:

- Assess and contrast the functionality and features of the available office productivity applications in relation to agency requirements.
- Assess any documented bugs or problems in the available applications.

Refer to Document Fidelity in Office Productivity Applications in the Open Standard Document Formats appendix for an example of one way to develop a function/feature comparison.

Accessibility requirements

Accessibility requirements are specific features and functions mandated in the Texas Administrative Code, Chapters 206 and 213, that enable people with disabilities to use electronic and information resources such as office productivity applications, the Internet/intranet, etc.

- Consider office productivity applications from publishers that document their accessibility compliance levels in the form of a Voluntary Product Accessibility Template (VPAT).
- Assess and contrast the accessibility features and functions of the available office productivity applications to meet accessibility compliance regulations through VPAT evaluations and accessibility testing.

User experience

User experience refers to the user's familiarity with and perception of an application. User experience is subjective in nature. It includes perceptions of application utility, ease of use, and efficiency. Users with a negative perception of a new office productivity application may resist the migration, while users already familiar with a new application may be impatient for its installation in the workplace.

Assess user experience considerations:

- Assess and contrast user experience aspects of the available office productivity applications in relation to agency requirements or preferences. Considerations may include aspects of human-computer interaction, personal product ownership, and perceptions of application utility, ease of use, and efficiency.
- Consider that users may resist change in migrating to a new office productivity application because of a perception that using an unfamiliar interface may hinder the ability to perform their jobs.

File formats and compatibility

Office productivity applications from different publishers, and sometimes new versions from the same publisher, may use different file formats to encode files for storage and renderability. An application may lack the ability to open, save, or interpret a document that has been stored by a different application. In order to convert incompatible file formats to a usable form, a file format translation utility, provided within the application or available through a third party, may be required. Long-lived documents are especially vulnerable to changing file formats. Although new applications generally retain backward

compatibility so that files saved in an older version can be rendered appropriately, older applications may not be able to open or interpret files saved in newer versions.

Assess file formats and compatibility:

- Inventory the files created by the current office productivity application and identify the formats in use. Investigate the formats used by the available applications and determine if they are compatible with the old formats. If not compatible, determine if compatibility packs or translator programs are available for the candidate application.
- Determine if any new document formats will impact business processes or document exchange internal or external to the agency.
- Consider the integrity of accessibility functions and features between the current application and candidate applications.
- Consider the longevity and importance of documents and determine if saving files in open document formats would be beneficial to the historical record of the agency and to the public. Review the *Electronic Records Standards and Procedures*[7] of the Texas State Library and Archives Commission for information about recommended file formats for long-term preservation.

FUTURE OF OPEN DOCUMENT STANDARDS

Over the next three to five years, ODF and OOXML will likely emerge as accepted standards inside of office productivity applications as greater interoperability is integrated into the technology infrastructure.

However, as long as Microsoft has the competitive advantage of dominant market share in office applications, the Microsoft binary formats .doc, .xls, .ppt, etc., will continue to be the de facto standards for office documents.

ODF and OOXML, as emerging standards, will be appropriate choices as office platforms evolve over the next few years. However, market-driven de facto standards that provide the widest coverage should also be considered as they may provide the most cost-effective and most useful life cycle.

Source: Darnee Phipps, The Advisory Council. Personal Advisory Report, April 9, 2010.

Product maturity

Product maturity refers to a stage in a product life cycle. Once an office productivity application is published, it progresses through a sequence of stages from introduction to growth, maturity, and retirement. Service updates may be made to a new application to correct problems uncovered through use or to add additional features. An application stabilizes as it matures and generally becomes more reliable. Eventually, the publisher will release a new version to supersede the older version's functionality. An application that has been superseded becomes legacy, and is finally retired.

Assess product maturity:

- Assess and contrast maturity of the available office productivity applications in relation to agency policies and guidelines. For example, some agencies prohibit deployment of products in early release or near retirement.
- Decide how long to wait from the time a new version is released before beginning broad, mainstream deployment. It could take 6 to 18 months for an application to stabilize through vendor support, testing, and piloting.

Delivery options

Delivery options refer to methods by which software is delivered to the consumer. There are two aspects of software delivery options, the source from which the software has been installed, and the location of the software when accessed for use.

7 State of Texas, Texas State Library and Archives Commission, Electronic Records Standards and Procedures: State Agency Bulletin Number One, November 2005. Retrieved September 10, 2010, from www.tsl.state.tx.us/slrm/recordspubs/stbull01.html.

Assess delivery options:

- Assess and contrast the software delivery options of the available office productivity applications in relation to agency requirements or preferences.
- Consider both aspects of delivery options—the source from which the software has been installed, and the location of the software when accessed for use. Common sources from which office productivity applications are installed are CD-ROMs and websites. Common locations from which office productivity applications are accessed for use are local install on the desktop, local install on a server, Software as a Service (SaaS), or a hybrid.

Cost Factors

Cost factors will most likely influence the decision to upgrade, replace, or postpone migration more than any other factors. Cost factors should include costs to the agency for developing and documenting the business case, project costs such as labor and assets associated with the migration, and business impact on the agency that would be caused by conducting the migration. The number of end users and the size of the agency will also impact cost. If the agency decides to continue using the current office productivity application, the agency should also calculate avoidance cost or cost of obsolescence that may lead to increased risk of failure and greater future costs.

When determining what cost factors to consider, balance the time spent on analysis with the degree of accuracy needed.

Refer to Cost Model for Application Migration in the appendices for an example of one way to document projected application migration costs.

Licenses, usage fees, and subscriptions

Licenses, usage fees, and subscriptions are legal instruments that govern the usage or redistribution of an application. Publishers of proprietary applications require payment for the initial acquisition of user licenses, subsequent license increases, and upgrades. Open source applications may have no fee for the initial license acquisition or for subsequent license increases, renewals, or upgrades; however, costs may be incurred for deployment, administration, enhancement, and support of the applications.

Usage fees and subscriptions are methods used by publishers or suppliers to provide access to office productivity applications that can be used through an Internet connection. Customers do not own the physical system infrastructure but pay a third-party provider to use its resources. Examples of this type of access are cloud computing and SaaS. Consumption of cloud computing services is usually billed on a utility model basis (resources consumed, like electricity) or subscription basis (time-based, like a magazine) with little or no upfront cost. Fixed licenses allow one end user per license; whereas floating licenses allow a limited number of concurrent users to share a license.

Inventory and evaluate licenses, usage fees, and subscriptions:

- Identify the type of license, usage, or subscription fees currently in place in the agency. Investigate licensing, usage, or subscription options for candidate office productivity applications.
- Determine the license contract terms, such as type, pricing provisions, use entitlements, and version release levels owned versus those deployed. Calculate the financial implications of each license option. Determine if the license is perpetual, platform-based, or component-based and when the license expires. Consider different types of licenses based on technology refresh cycles and whether the agency has leftover or unused version rights from the previous license. Create an accurate asset baseline and identify future technology requirements to make better licensing decisions and spend less on license costs. Compare product bundles with à la carte pricing. Be aware that some technical support agreements are dependent on purchase rights to new releases.

- Evaluate risks and opportunities for cost savings when reviewing license renewal. Some licenses may be paid for but not used or there could be more end users than the number of purchased licenses. Investigate the use of floating licenses for staff who only need office productivity applications occasionally.
- Determine what fees apply to open source office productivity applications. Downloads may be free or there may be a one-time fee or an annual subscription fee, depending on the publisher. Technical support, patches, security updates, and new releases may all have fees associated with them and should be included in the cost analysis.

Labor

Labor refers to time and personnel costs involved in developing the application migration strategy, implementing the migration, and providing post-deployment help desk support.

Identify labor costs:

- Determine labor costs by identifying typical salaries and time spent for everyone involved or affected by the office productivity application migration. Planners, technical support staff, and end users may be included.

Training

Training includes the cost of identifying and planning for the level, type, and quantity of education needed for a successful office productivity application migration. It includes preparation of migration deployment and support staff, as well as facilitation of the end-users' transition to productive use of the new office application.

Assess training costs:

- Determine the cost of training that IT technical support staff will need to conduct a successful migration. Include costs for planning end-user training.
- Investigate costs of instructors and training facilities. Compare costs for bringing trainers on-site or sending staff off-site.
- Investigate and compare costs for lecture-type training versus hands-on, laboratory-type training; train-the-trainer programs versus direct end-user training; and computer-based training versus e-learning programs.

Realize that providing no training for end users may extend productivity loss for a longer time.

Technology upgrade

Technology upgrade costs refer to the need to purchase new equipment to meet minimum or recommended system requirements for the candidate office productivity application. Pairing office productivity application migrations with operating system, network component, and hardware platform upgrades is a recommended industry best practice and can realize significant savings in the future.

Assess technology upgrade costs:

- Identify costs associated with technology upgrades required to meet minimum or recommended system requirements for the candidate office productivity application based on the results of the technology factors assessment.
- Consider pairing office productivity application migrations with technology upgrades not required to support the candidate office productivity application.

Productivity loss

Productivity loss refers to a temporary condition caused by decreased end-user productivity while learning the new application. If the new application interface and/or file formats are very different from

the current application, end users may experience a greater loss of productivity than if the new interface and file formats are similar to the current application. For end users already familiar with the new application through home or personal use, the costs of temporary productivity loss may be averted. Additionally, high-quality training and support during the migration deployment cycle can minimize productivity loss.

Assess productivity loss:

- Determine the cost of lost productivity for end users by calculating unproductive time, such as downtime and time away from the job in classes or learning the new system, and time required to modify documents and formats.
- Determine the impact on stakeholders or loss of business due to downtime, if applicable.

Process/template conversion

Process/template conversion refers to the cost of identifying and developing alternative methods for completing business processes that are tightly coupled with the current office productivity application. Highly formatted documents, customized templates, stationery, macros, complex formulas, and file formats used on an ongoing basis may need to be redesigned or converted to be compatible with the new office productivity application.

Assess process/template conversion costs:

- Identify any business processes that are tightly coupled with the current office productivity application and will need to be modified or reworked and determine the cost to convert.
- Determine how many macros, templates, and documents will need to be converted to make them compatible with a new office productivity application and the time it will take to convert them. Focus on macros, templates, and documents that are used on an ongoing basis.

Organizational Factors

Organizational factors are aspects of the office productivity application's deployment and use that affect the agency's ability to continue delivering services. Determine how the office productivity application migration will affect the agency as a whole. During the migration strategy planning process, consider requirements for delivery of services such as availability and usability of the application, the organizational structure, and agility of technology support. Mitigate risks that may impact the delivery of services in order to minimize social, political, economic, and legal consequences.

Dependency on current application

Dependency on the current application refers to the degree to which the agency utilizes capabilities embedded with functionality provided by the current office productivity application or other business software. These capabilities include macros, customized templates, complex formulas, stationery, and forms. The current application may also be built into workflows within the agency or between agencies and stakeholders. Macros may be used to automate critical business processes. New software may mean rewriting or converting a significant number of processes. At least a temporary loss of productivity will be felt as these changes are implemented.

Assess dependency on current software:

- Determine the agency's dependency on the current office productivity software and its relation to other business software required to deliver services. Other products in use may be tightly integrated with the current office productivity application. This could have the immediate effect of limiting the choice of candidate software.
- Evaluate the capabilities that are embedded with the current office productivity application and other software such as macros, customized templates, complex formulas, stationery, accessibility,

and forms. Determine if the migration will require transforming, rationalizing, or recreating these capabilities.

Implementation approach

The implementation approach is the method used to deploy the migration and decommission the current office productivity application. A phased deployment approach consists of multiple phases where the migration is deployed to a manageable segment of the agency. The "big bang" deployment approach is a method where the migration is deployed to the entire agency all at once.

Assess implementation approaches:

- Determine the most productive methods for deploying the migration and decommissioning the current office productivity application.
- Identify risks with the migration approach that will impact the delivery of services. Mitigate disruption vulnerabilities by considering agency schedules and business cycles such as accounting schedules, trends in demand for services, and legislative sessions. Consider that migration downtime may be minimized and costs better controlled by conducting migration activities during times of non-peak use, after hours, or concurrently with training on the office productivity application.

End-user readiness

End-user readiness is the preparedness of the end users to use the new office productivity application after deployment.

Assess end-user readiness:

- Identify methods for assessing end-user migration preparedness. For end users to be prepared and willing to interact with a new office productivity application they must have confidence and a relatively positive attitude toward engaging with the application. User readiness will determine initial training requirements, ongoing end-user support needs, and methods for overcoming end-user resistance.
- Use the end-user assessment and business needs to determine if the migration should occur. If the migration will occur, use the end-user assessment to prioritize the order in which users/groups are migrated to the new office productivity application.

End-user transition

End-user transition is the period of time and effort that end users spend adjusting to changes in the office productivity environment due to the migration.

Assess methods for end-user transition:

- Determine methods to facilitate the transition to using the new office productivity application that will minimize temporary loss of productivity for end users. Transition may involve becoming proficient in use of the new application, converting or migrating files, or recreating customized shortcuts, macros, and templates.
- Consider activities and tools to aid end users during the transition, such as providing quick reference materials, deploying transitional technology support programs, and holding sessions where end users share tips, tricks, and lessons learned.

Technology support

Technology support is the ability to conduct the migration and to support end users during and after deployment.

Assess technology support:

- Assess the technical knowledge and ability of agency technology support staff to conduct the migration and to support the new office productivity application after deployment.
- Determine whether support staff should be trained or if technical support should be outsourced to a third party if the technical knowledge and ability to conduct the migration or provide support after the deployment do not currently exist.
- Consider deploying temporary transitional support programs such as rapid response or tasking end-user subject matter experts with providing assistance to less knowledgeable coworkers during the transition period.

Migration disruption

Migration disruption is productivity loss due to the inability of a user to perform job functions in the usual manner. Migration disruption may result from deployment of the migration or end-user transition, but can also be caused by technical problems, downtime during migration, and slower technology support response time due to increasing call volume.

Assess migration disruption:

- Determine the impact of potential disruptions to all business functions within the agency. Consider alternate methods for deployment of and transition to use of the new office productivity application that minimize disruptions.
- Evaluate agency schedules and business cycles to determine alternate methods such as scheduling deployment to avoid periods of peak use; arming end users with tips, tricks, and tools for use during transition; and enhancing training and support programs.

Regulatory/policy compliance

Regulatory/policy compliance is the state of being in accordance with relevant laws and regulations set by governing bodies. The Texas Legislature establishes laws that are published in the state statutes, while state agencies adopt rules that are published in the Texas Administrative Code. Agencies are obligated to comply with established law and ensure conformance by implementing policies, standards, guidelines, and procedures within their organizations.

Assess regulatory/policy compliance:

- Assess agency compliance requirements and dependencies that may impact the office productivity application migration, such as accessibility, security, and privacy, to ensure that migration decisions are made in accordance with established legislation, policies, standards, guidelines, and procedures.
- Determine if regulations imposed on the agency will impact the selection and deployment of office productivity application candidates.

Technology Factors

Information technology (IT) is changing rapidly. Rapid change increases the complexity and dependencies of managing IT environments. Operating systems, hardware, and software applications require the ability to execute and communicate within the agency's technology environment. Network components enable communications channels that facilitate communication among users and allow users to share resources within the agency's technology infrastructure. A technology factors assessment will aid in determining the proposed/post-migration technology environment by providing an understanding of the complexity and dependencies involved and by confirming compatibility among the proposed technology environment, the office productivity application candidate(s), and the agency technology migration strategies.

Refer to Technology Factors Decision Tree in the appendices for information that may aid in conducting the assessment of technology factors.

After completing assessment of the technology factors, specify the proposed/post-migration technology environment. Refer to Determining Proposed/Post-Migration Technology Environment in the appendices.

Agency technology migration strategies

Agency technology migration strategies provide guidance and considerations used to govern technology migration planning within the agency.

Assess agency technology migration strategies for infrastructure components such as hardware, operating systems, software, and network components.

- Determine if agency technology migration strategies for hardware, operating system, software, and network components exist and if they are aligned with industry standards, best practices, and recent industry developments. Note that it may be necessary to update existing strategies or develop strategies, if none exist.
- Use the guidance within the agency technology migration strategies to determine if and when an office productivity application migration should be considered. Assess compatibility and optimization among the proposed technology environment, the office productivity application candidate(s), and the agency technology migration strategies.

Refer to Agency Technology Migration Strategies in the appendices for examples of information that may be included.

Current technology environment

An agency's current technology environment consists of the hardware, operating system, software, and network components currently deployed within the agency's infrastructure along with the policies and procedures used to govern the environment. Assessment of the current technology environment provides an in-depth understanding of which systems and equipment are deployed, where components reside, how they are used, and how they affect core business tasks and activities. Armed with this information, an agency can improve infrastructure efficiency and performance, minimize related overhead expenses, and make informed migration decisions.

Understand the current technology environment:

- Assess the current technology environment for visibility into the hardware, operating system, software, and network components currently deployed in the agency's infrastructure.
- Determine if a current agency IT inventory exists. If not, conduct an IT inventory assessment to gain an understanding of the current, as-is technology environment that will be affected by the migration. Within the IT inventory, identify and describe the current technology environment. Include the current office productivity applications and related/required hardware, operating systems, other software applications, network components, processors, memory capacity, and storage, along with embedded customized templates, stationery, macros, complex formulas, and file formats.
- Assess which components are required by understanding the relationships to the business and technical environments. In addition, determine which components are required for optimization of the environments and which components are reaching obsolescence or end of life.

Refer to IT Asset Inventory in the appendices for examples of information that may be included in the inventory.

Hardware and operating system requirements

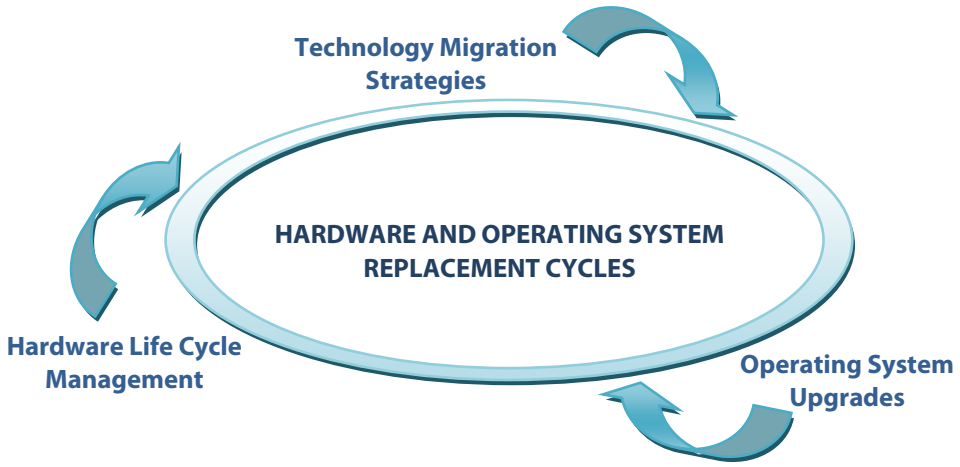
Hardware is a comprehensive term for all of the physical parts of a computer, as distinguished from the data it contains or operates on and the software that provides instructions for the hardware to accomplish tasks.

Operating system refers to the set of software programs in a computer that organizes and controls the way hardware, application software, and users work together to accomplish a task. Operating systems provide a platform on top of which application software can run.

Hardware and operating system configurations must meet minimum system requirements for an application to run properly. Optimal execution and usability is provided by using recommended system configurations.

Determine hardware and operating system requirements:

- Assess and contrast the office productivity application system requirements, the agency migration strategy, and the current technology environment to plan for acquiring new hardware and operating systems, if necessary.
- Consider the hardware and operating system upgrades required to meet minimum or recommended system requirements for the candidate office productivity application.
- Consider the industry best practice of pairing office productivity application migrations with hardware and operating system platform upgrades not required to support the candidate office productivity application.



Network requirements

A computer network (network) is a collection of computers and devices interconnected by communications channels that facilitate communication among users and allow sharing of resources. Network hardware and software technology is used to connect the individual devices in the network.

Determine network requirements:

- Assess and contrast the office productivity application requirements and delivery options, the agency migration strategies, and the current technology environment to plan for acquiring or optimizing network hardware and software technology, if necessary.
- Consider that the availability of a cloud-based or SaaS office productivity application is dependent upon network technology.

Security requirements

Security requirements are the collective processes and mechanisms by which sensitive and valuable information and services are protected from publication, tampering, or loss by unauthorized activities or untrustworthy individuals and unplanned events.

Determine security requirements:

- Identify security requirements for protecting sensitive and valuable information and services from unauthorized publication, tampering, and loss.
- Assess security requirements for the proposed technology environment, the office productivity application candidates, and the agency migration strategy.

User Factors

User factors play a large part in determining the need for and timing of an office productivity application upgrade or replacement. An end-user assessment will identify staff who use office productivity software, how they use it, and if current features meet their needs. User profiles will be built based on the information gathered. Understanding the expectations and needs of end users may be the largest single factor in a successful migration.

End-user needs

End-user needs refer to application functions, skill levels, adaptability, and training necessary for users to complete their jobs.

Assess end-user needs:

- Conduct a staff inventory to establish user profiles and identify user practices, skill levels, accessibility requirements, tolerance levels for candidate applications, and training needs. Count the number of users in each profile to determine the number of licenses, usage fees, or subscriptions that will be needed to migrate to the candidate application.
- Identify users who could use an alternative application.

Refer to Assessment of End-User Needs in the appendices for more information and sample charts.

User profiles

User profiles are established by identifying functional types of end users based on job activities, frequency of use, and complexity of features used. Generally, three or four categories of users should be sufficient to identify the majority of user types and provide appropriate and cost-effective product functionality.

Develop user profiles:

- Create and define user categories based on job activities and office productivity application requirements and skills. Sample categories are listed below.
    - Basic Single-task Worker – A worker whose job typically requires low-level, unskilled, or specialized tasks, such as data entry, and who never or seldom uses office productivity applications.
    - Basic Multitask-oriented Worker – A worker whose job typically involves a well-defined limited set of tasks but is likely to use basic functions of office productivity applications regularly.
    - Knowledge Worker – A worker whose job typically involves the creation, analysis, and manipulation of information in a decision support process and regularly uses advanced functions of office productivity applications.
    - Specialized Worker – A worker whose job typically involves the creation and integration of knowledge to enhance products, services, or processes using specialized graphic- or media-intensive software in addition to regular use of office productivity application advanced functions.

User practices

User practices refer to the type of applications used, complexity of functions and features used, structure and type of documents created and used, and integration with or dependence on other business information systems. For example, a user may create simple unformatted lists, or use complex stationery, customized templates, or forms; write or use macros; or use complex formulas for analyzing financial data.

Identify user practices:

- Identify the ways that workers use application functions and features, integration with or dependency on other business applications, extent of document exchange with others inside and outside the agency, document format fidelity, and connectivity needs. Sample uses are listed below:
    - Use word processing/spreadsheet/presentation functions extensively
    - Use collaboration software associated with the office productivity application
    - Use databases associated with the office productivity application
    - Use e-mail associated with the office productivity application
    - Use business processes with embedded office productivity application functionality
    - Create/use spreadsheet formulas/macros
    - Create/use complex stationery/forms
    - Exchange documents internally/externally
    - Work from single/multiple locations
    - Need consistent, reliable connectivity
    - Use mobile applications

User skill levels

User skill levels refer to the user's knowledge of the application and ability to use advanced or complex features in the performance of job activities. Some staff might use only basic functions, while others might use advanced functions extensively.

Assess user skill levels:

- Identify the technology skill levels of each user. Skilled users are more likely to adapt to the new features because they are already familiar with fundamental terminology and concepts. If the user interface is quite different from the old software, however, it may take skilled users more time to learn how to handle features they previously used routinely.
- Users may be classified as:
    - Novice Users – users with occasional requirements for basic content creation but primarily view and edit content
    - Proficient Users – users comfortable with basic formatting commands, using a spell checker, bullets, creating tables
    - Expert Users – heavy users of macros, scripts, and advanced features of the application suite and who require a high degree of product integration and compatibility.

User tolerance

User tolerance refers to attitudes about how well the current application meets the user's needs, belief that the new application will improve productivity, and willingness to spend time learning the new application.

Assess user tolerance:

- Identify the attitudes of users toward the current office productivity application and possible replacements. Ask staff to describe problems they have with the current application and to identify functions or features they need in the new application.
- Ask staff for their opinions about using the candidate applications to do their jobs. How comfortable users feel about using a new application will influence its use and acceptance. Resistance to using the new technology will impact productivity and may increase training needs.

End-user training

End-user training includes analyzing user skill levels and job requirements, the degree of difference between current and candidate application functions, and available training methods. Training methods range from individual to classroom instruction, hands-on training to group demonstration, and book-based learning to online instruction. A variety of training methods may need to be offered to effectively prepare different types of users.

Evaluate end-user training needs:

- Identify training needs based on user profile, skill level, user practices, and tolerance for using both current and candidate applications. End-user training is a significant determinant in the successful integration of the new software into the business environment.
- Consider various training options because all users do not learn in the same way. Some training options to consider are:
  - Individual hands-on instruction – An instructor individually walks each end user through the process of performing common tasks and answers questions.
  - Hands-on, classroom-style, instructor-led training – An instructor demonstrates to end users how the software works and how to perform common tasks, with the ability for end users to perform the tasks in a classroom setting.
  - Seminar-style group demonstration – An instructor demonstrates use of the software while performing common tasks.
  - Computer-Based Training (CBT) – CD-based or online, interactive self-paced training leads end users through the processes of performing common tasks, testing their performance and understanding.
  - Book-based, self-paced training – End users complete workbook lessons in performing common tasks.
- Decide whether training should be mandatory or optional based on the needs and roles of the users within the agency. Determine whether training should be offered before or shortly after deployment of the new software. Consider providing additional opportunities for both basic and advanced training for some time after the initial deployment.

User productivity

User productivity refers to the relationship between the input required to produce a product or service and the value of the output produced. A user's ability to complete tasks in a timely manner may be temporarily impacted by the migration to a new office productivity application, especially if the user must learn how to use the application or has to spend time reformatting documents or rewriting macros or customized templates.

Assess user productivity:

- Determine the impact of migrating to a candidate application on end-user productivity.
- Match skill levels and user practices to determine if different user profiles and skill levels will need additional time to become proficient and return to full or enhanced productivity.

3. Document the Business Case

A business case documents the justification for the migration, the expected business benefits, the alternatives considered, an evaluation of the alternatives, and the expected costs. Development of a business case provides a method for analysis and selection of business solutions based on alignment with agency goals and objectives. The evaluation process determines the extent to which the proposed project will solve the business problem by providing qualitative and quantitative information associated with evaluation factors.

During project evaluation, a minimum of three alternatives should be examined to ultimately select the best solution that delivers the greatest value to the state, agency, and constituents. Examples of alternatives for an office productivity application migration project may include:

- Upgrade to new version of current office productivity application
- Migrate to a different office productivity application
- Defer migration

A Business Case tool is provided within the Texas Project Delivery Framework. Currently, the Framework is intended for use during delivery of major information resources projects as defined in Texas Government Code, Chapter 2054, Information Resources, and for certain major contracts. Agencies may choose to use the Framework or Framework tools for non-major information resources projects.

Next Steps

If the decision is made to migrate, select the office productivity application that best meets the agency's needs and set the deployment timeline.

Architect the Solution

Plan how to conduct the office productivity application migration and determine what other actions or purchases will be required. Consider options for a full deployment or for an incremental approach to provision employees over a period of time, perhaps in conjunction with new hardware purchases. Work with vendors to determine the appropriate level of service.

Plan Deployment

Plan to spend 6 to 18 months, depending on agency size, preparing the agency for the office productivity application migration. Test the new application with other applications and run pilots with various user groups, including people with disabilities using assistive technologies, to identify any problems.

Refer to Migration Readiness Assessment Checklist in the appendices for information that may be useful in developing the migration plan.

Appendix A:
Open Standard Document Formats

From the early 1990s, most government documents have been created using computers and stored in digital form. Many of the documents were created using proprietary software, which stores files in formats dependent on the software that produced it or translator programs to interpret the content. Because software programs and file formats change over time, there is increasing danger that essential documents produced in the past cannot be retrieved, accessed, and read by current or future software. One option considered for ensuring access to documents over time has been to save document files in an open standard document format rather than or in addition to formats supplied by proprietary software.

Competing International Standards

OpenDocument Format (ODF), developed by the Organization for the Advancement of Structured Information Standards (OASIS), was adopted by the International Organization for Standardization (ISO) in May 2006.[8] Two years later, Office Open XML (OOXML), developed by Microsoft Corporation, was also adopted as an ISO standard.[9] The ODF standard has been incorporated into open source as well as commercial applications. Microsoft's OOXML has been built into the Office 2007 suite of office productivity applications and is more proprietary in character. Proponents of the competing ISO standards engaged in a struggle for market advantage and public perception and attempted to influence public policy makers to enact legislation that would require use by government organizations.

Texas, along with other state and local governments, began evaluating the practicality of adopting use of open standard document formats for all documents created by the government.

Proposed Legislation

During the 80th Legislative Session in 2007, House Bill 1794 and Senate Bill 446 were introduced to statutorily mandate the use of an open document format for state-created documents. The bills were left pending in committee, but the House Committee on Government Reform and the Senate Committee on State Affairs were given an interim charge to investigate the matter further.

DIR worked with the committees to provide background information and consider how agencies might be impacted if the use of a specific open standard document format was mandated. Although DIR favors open standards to ensure that public records are available to the people, it recommended that any new standards should be consistent with records retention requirements and support accessibility standards to make information available to all.

Interim Committee Report Recommendations

Both the Senate and House interim committees reached the conclusion that the state should not adopt a specific open standard document format, leaving agencies free to use the office productivity application and document formats that best meet their own business needs. The committees suggested that DIR develop information technology policy to promote accessibility and interoperability and to develop guidelines to help agencies determine whether to purchase open or proprietary applications during their normal office productivity application upgrade cycles.

8 ISO/IEC 26300:2006, Open Document Format for Office Applications (OpenDocument)

9 ISO/IEC 29500:2008, Office Open XML File Formats

Use of Open Standard Document Formats

Since the first bills recommending adoption of a specific open standard for document formats were filed, the technology landscape has changed. Initially, ODF was implemented in a few open source office productivity applications. Currently, ODF is implemented in almost all popular proprietary applications, including Microsoft Office suites. The desire to use an open standard document format no longer rests on the choice of office productivity application.

In support of the Texas Legislature's goal of interoperability and easy availability of government information to citizens, each agency, in developing its migration plan, is encouraged to consider the suitability of using office productivity applications that comply with open standards for government documents.

Comparing Office Productivity Applications that Support Open Document Formats

In some legal and regulated environments, an exact document layout or visual appearance is important to the validity of official communications or legally binding transactions. Because support of open standard document formats does not guarantee fidelity among office productivity applications, selecting an appropriate application requires an examination of application functionality and interoperability.

Interoperability is "the capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units".[10]

If a document can be successfully transferred among various office productivity applications, without the end user being aware of the unique characteristics of each application, then interoperability is high. On the other hand, if the user has to be aware of the unique characteristics, then interoperability would be considered poor.

Open standard document format interoperability concerns include:

- visual appearance of the document at various levels
- structural changes to the document (headers, paragraphs, tables, accessibility elements) upon editing
- changing behavior of links, references, or embedded objects
- loss of document metadata or extensions
- runtime behaviors occurring in scripts, macros, and other forms of executable logic

Different applications have different feature sets, which are independent of the functions provided. A document could be created using a feature of one application that is absent in another application, even though both applications support the desired document format. Depending on the feature in question, a document element could be displayed but not be editable, displayed and damaged if the user tries to edit it, or invisible when opened in an alternative application.

The following chart lists some office productivity applications available on the market that support specific open document standards.

10 ISO/IEC 2382-01, Information Technology Vocabulary, Fundamental Terms

Office Productivity Applications that Support Open Document Standards

Application	Native Formats *	Platform Requirements	Conversion	Market Share	Ease of Format Conversion	Fidelity of Format Conversion
Adobe BuzzWord	Stored on server; downloads are converted to desired format	Web-based only files, requires Adobe Flash	Imports and exports plain text (.txt), Rich Text Format (.rtf), Microsoft Word (.doc and .docx), and Open Office (.odt) files. Exports to Adobe .pdf, .html, and .epub	Very limited	Difficult for anything except supported formats	Limited support, generally poor, good for PDF conversions
Corel WordPerfect	.wpd .odt .pdf	Windows	Native filters and utilities	Approximately 9%, strong in government agencies	Native support for 60 different file types	Variable, dependent on features used in original application
Google Docs	Stored on server; downloads are converted to desired format	Web-based only files, requires Javascript and cookies	Has indicator that object didn't translate	Limited, gaining momentum	Difficult for anything except supported formats	Limited support, generally poor
IBM Lotus Symphony	.ccf .ctf .wr1 .wrk	Windows Linux	Native filters and utilities	Stronger market share	Native support for many different file types	Generally high, 100% with ODF
Microsoft Office 2007/2010	.doc/.docx .xls/.xlsx .ppt/.pptx .pps	Windows Mac	Utilities and plug-ins	Approximately 90%	Moderately difficult for anything except supported formats	Generally good except for advanced features
Oracle Open Office	.sxw .sxc .sxi	Windows Linux Mac Solaris	Scrubber program plug-ins (library of plug-ins) provided as part of Oracle's suite – install with product (not automatic)	Growing market share, popular with tech-savvy consumers	Easy once plug-in modules are installed	Variable, dependent on features used in original application
Zoho	Stored on server; downloads are converted to desired format	Web-based only files, requires Javascript	Native filters and utilities	Very limited	Easy for supported applications only	Limited support, generally poor

* Documents uploaded to web-based applications are stored in undisclosed native formats. When stored documents are downloaded, they are converted to the desired format.

Document Fidelity in Office Productivity Applications

The following list represents features and functions in office productivity applications that should be reviewed for differences in function and appearance between the currently used application and the candidate applications. Determine a threshold for degree of fidelity and take note of whether the applications look and act differently; for example, .rtf and .txt strip formatting to some degree.

Word Processing

- Alignment
- Tables
- Images/objects
- Formatting (size, font, color, margins)
- Styles (heading, title, subtitle, etc.)
- Header/footer
- Templates
- Columns
- Watermark
- Accessibility criteria
- Print options
- Table of contents
- Comments
- Track changes
- Protect document

Spreadsheet

- Complex formulas
- Macros
- Add-ons/extended features
- Formatting (size, font, color, margins, numbers)
- Header/footer
- Tables/charts
- Print options
- Comments
- Conditional formats
- Accessibility criteria
- Pivot tables
- Sort and filter
- Groups
- Track changes
- Protect sheet/workbook

Presentation

- Animations
- Templates
- Themes
- Formatting (size, placement, font, color)
- Header/footer
- Print options
- Comments
- Layout
- Sound/video
- Accessibility criteria
- Protect presentation

Installed Base of Office Productivity Applications

Across the United States, the dominant office productivity application is Microsoft Office, with more than 90% market share and de facto standardization of .doc, .xls, and .ppt formats and Adobe .pdf for non-editable document interchange.[11]

Sun, IBM, Google, and some other companies have developed viable alternatives for office productivity applications in the marketplace. ODF-centric applications, such as Oracle Open Office (formerly StarOffice), IBM Lotus Symphony, and Google Docs, represent less than 4% of the currently installed base of office productivity applications in U.S. organizations.

Results of the 2009 Information Resources Deployment Review indicate that Texas state agencies mirror the nationwide trend. For 89% of state agencies, the majority of files they create and maintain exist in the Microsoft Office suite formats. Eighty-seven percent of agencies also have a large number of files in .pdf format. Only 6% indicated that they save or maintain files in .odf or the native format of an open source application.[12]

Conclusions

DIR supports the use of open standards. DIR also encourages agencies to conduct an analysis of their own technology environments to determine if they should make use of open standards for document formats. In developing their business cases, agencies may want to consider vendor strength and long-term support for open and de facto standards.

Credible publishers with a stake in the long-term survival and evolution of the standard must support implementation within their applications to ensure interoperability and practical deployability. Specification of ODF and/or OOXML as tactical standards for office productivity applications does not provide any guidelines or context for practical cost containment or management. Office productivity applications should be selected through a business case analysis to determine the greatest value to the state, agency, and constituents. Document formats[13] supported by the application may be a consideration.

DIR encourages agencies to take a practical approach to tactical IT deployment guidelines as part of an effective strategic IT governance program.

11 Darnee Phipps, The Advisory Council. Personal Advisory Report, April 9, 2010.

12 State of Texas, Department of Information Resources, 2009 Information Resources Deployment Review.

13 Regardless of format used, agencies need to adhere to 13 TAC §6.96, Maintenance of Electronic Records Storage Media, to ensure retrievability of usable, readable files.

Appendix B:
Cost Model for Application Migration

Before making the decision to upgrade or replace the current office productivity application, agencies should determine the costs associated with moving to the next version of the current application, moving to a different application, or continuing to use the current application. Selection of a migration alternative should be based on a positive return on investment reflecting either direct cost savings or a reduction in total cost of ownership, as indicated by the business case.

If an agency chooses to skip a new release of the current application, it should be aware that migrating to the following version may incur substantial future costs.

The following table may be tailored for use in recording projected application migration costs. The table includes the following migration alternatives.

- No upgrade – continue using current version of office productivity application.
- Minor upgrade – move from the current application to a candidate application that is very similar and compatible; for example, migrating from MS Office XP to Office 2003 or from Office 2007 to 2010, where document formats and user interfaces are similar.
- Major upgrade – move from the current application to a candidate application that is significantly different; for example, migrating from MS Office 2003 to Office 2007 or 2010, where the document formats and user interfaces are very different. Any migration that involves IT touching the image along with changes to the format of the application or output could be considered a major upgrade. Major upgrades are likely to need some level of training for the users.
- Vendor switch – moving from the current application version to another vendor's application; for example, moving from MS Office to an alternative application such as OpenOffice.org, where the user interface may or may not be similar.

Direct and indirect costs for each alternative are included.

- Direct costs are costs that can be easily and conveniently traced to the particular cost object under consideration; for example, labor, training, software licensing, technology upgrades, and support. Direct costs include costs associated with strategy development and the migration effort.
- Indirect costs are costs that cannot be easily and conveniently traced to the particular cost object under consideration; for example, costs associated with business impact, such as productivity loss, risk of failure, and technology obsolescence.

Office Productivity Application Migration
Cost Analysis Template

Projected Costs		Cost Factors	MIGRATION ALTERNATIVES							
			No Upgrade		Minor Upgrade		Major Upgrade		Vendor Switch	
			Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
DIRECT COSTS	Strategy Development	Assessment effort								
		User profile/needs								
		IT inventory								
		Requirements								
		Analysis								
		Business case documentation								
	Migration Effort	Licensing/usage/subscription								
		Labor[14]								
		Technology upgrades								
		Hardware								
		Network components								
		Operating system								
		Compatibility testing								
		Accessibility testing								
		Training/Retraining								
		Deployment staff								
		Post-deployment support staff								
		End users								
		Deployment								
		Support/help desk								
INDIRECT COSTS	Business Impact	Disruption vulnerabilities								
		Productivity loss								
		Document conversion								
		Technology obsolescence								
		Risk of failure								
Total Direct Cost										
Total Indirect Cost										
TOTAL COST										

14 Labor costs may be included with other factors or may be a stand-alone factor.

Appendix C:
Determining Proposed/Post-Migration Technology Environment

1. ***Perform a gap analysis.***

   Perform a gap analysis to determine the compatibility requirements among the operating system, other applications, hardware, network, and the candidate office productivity applications. The information collected will be used to identify the technology environment required for the migration.

2. ***Specify a proposed/post-migration technology environment based on gap analysis.***

   Consider the following:

   - standardizing or minimizing operating system and hardware configurations reduces maintenance and support costs
   - reducing maintenance and support costs can often recoup the replacement hardware capital costs
   - standardizing operating system and hardware configurations minimizes compatibility issues
   - the agency's ability to deliver critical application testing and deployment services may be impeded by operating system and hardware complexity
   - operating systems that are or will soon be unsupported by vendors should be eliminated
   - identifying a target number of total configurations
   - exploring open source alternatives such as Linux as an option for meeting organizational requirements
   - adhering to best practice of using only well-defined and widely available versions of Linux, such as Red Hat, Centos, or Ubuntu, if open source is an option
   - the increasing use of Apple computers in the workplace
   - performance of and delivery options for alternatives may impact network requirements
   - identifying hardware requirements for specific, organizationally required applications, which might include:
     - additional memory
     - additional CPU processing power
     - need for 32- or 64-bit architectures
     - local storage or disk requirements
     - special input/output device requirements
     - interoperability with assistive technologies for accessibility
     - security requirements restricting use of flash drives or other local removable storage
   - planning for technology changes such as availability of mobile devices, increased bandwidth, and wireless networks
   - identifying planned changes to business operations such as user groups, working practices, and scale and/or location of operations

- user productivity and desirability of new features in refreshed applications
- cost/benefit of early adoption of technology
- cost savings due to lower power consumption of the newer hardware platforms
- identifying system requirements for enterprise-specific work flows such as automated e-mail responses
- usefulness of vendor-embedded manageability and security tools
- quality of service and support
- the need for collaboration software to be tightly bound to the office productivity application
- document standardization and archiving requirements
- security requirements and regulations such as HIPPA or OSHA that might affect timing of refresh
- the effect of cloud-based technologies and architectures on technology refresh decisions

3. ***Assess the proposed/post-migration technology environment specification.***

   Use the following criteria to help guide the decision process:

   - prioritize efforts and focus based on value delivered
   - enable delivery of business functions and processes (business perspective)
   - enforce any regulations that affect organization (regulatory perspective)
   - rationalize and reduce costs and increase overall value (financial perspective)
   - seize improvement and manageability opportunities (technology perspective)
   - align business, technology, and financial perspectives

4. ***Update the specification based on the assessment of the proposed/post-migration technology environment.***

Appendix D:
Agency Technology Migration Strategies

Agency technology migration strategies contain a set of guidance and considerations used to govern hardware, operating system, software, and network migration planning. Once established, agency technology migration strategies should be managed and maintained continually.

In developing the content of technology migration strategies, consider the following:

- the length of time the candidate software has been on the market and/or if the first major service pack has been released
- operating systems, hardware, and application replacement cycles are tied together for efficiency and cost savings
- advances in technology such as availability of mobile devices, increased bandwidth, and wireless networks
- limitations of the current technology environment such as network bandwidth, support issues, and application and hardware obsolescence
- security risks of older systems
- enforcement of end-of-life policies to control support costs
- purchasing slightly more expensive hardware with extra memory to extend the life of systems by several years
- regulatory requirements that will affect the refresh decision are addressed, such as a need to maintain records in a retrievable state for a certain period of time
- support of a particular system or application has been phased out

Appendix E:
IT Asset Inventory

An IT asset inventory is a list of hardware, software, and associated characteristics that are currently deployed in an agency's infrastructure. Once established, the IT asset inventory should be managed and maintained continually.

IT asset inventories should contain the following content:

- the as-is snapshot of the current technology environment
- product life cycle maturity information
- details necessary to survey current status and enable future improvements
- details to enable a gap analysis to determine additional hardware, operating systems, software, and network technology required to transition to the "future" state
- compatibility information about specific hardware platforms that are tied to a specific software application
- data that can be used in cost-saving negotiations for license renewals
- data that can be used to facilitate alignment with agency goals and technical strategies
- other information as appropriate

Appendix F:
Assessment of End-User Needs

Using a chart similar to the User Profile Matrix sample on the following page can help agencies determine their end-users' needs for office productivity applications. End users should be grouped in categories determined by their functional needs. Three or four categories should be sufficient.

- Create and define categories based on job activities, application requirements, and skills. Different groups may use different features of the office productivity application (low-end to high-end).
- Identify the practices/features of office productivity applications used for each group.
- List the user skill levels within each group.

The completed matrix is an inventory of the office productivity application functions used, skill levels, and business dependencies per functionality group. It should help to assess whether the current technology is appropriate for the needs of the user group.

While end-user needs may vary significantly, implying a need for different migration timelines, office productivity application migrations should not be treated as isolated events, but rather as a part of a master organizational plan.

Charts similar to the examples provided in Determining Training Needs on the following page may be used to identify end-user training needs.

- Document the number of FTEs allocated to each end-user category.
- Identify training options for each group.

User Profile Matrix—Sample

Application Functions	Basic Single-Task Worker	Basic Multitask-Oriented Worker	Knowledge Worker	Specialized Worker
Word processing, spreadsheet, presentation	Not used or limited use	Basic functions	Advanced functions	Requires format fidelity for exchanging documents
Real time collaboration)	Not used	Limited use	Minor use	Major use
Communications server	Not used	Limited use	Minor use	Major use
Personal database	Not used	Limited use	Minor use	Major use
Create/use spreadsheet macros	Not used	Runs few	Runs many	Creates
Create/use complex stationery and forms	Not used	Runs few	Runs many	Creates
E-mail application usage	Not used or limited use	Uses Web Access	Uses Web Access or specific application	Requires specific application
Exchange documents internally	No, or limited use	Yes	Yes	Yes
Exchange documents externally with users of known office applications/formats	No	Yes	Yes	Yes
Exchange documents externally with users of unknown office applications/formats	No	No	Yes	Yes
Office productivity functionality embedded in business process	No	May use	May use	May use
Single work location	Yes	Yes	No	No
Multiple work locations with good connectivity	No	Yes	Yes	Yes
Multiple work locations with variable or unknown connectivity	No	No	No	Yes
Computer equipment	Desktop	Desktop, laptop	Laptop, PDA	Laptop, smart phone

Determining Training Needs

Total Users by Category	Basic Single-Task Worker	Basic Multitask-Oriented Worker	Knowledge Worker	Specialized Worker
Total number of workers				
Number of novice end users				
Number of proficient end users				
Number of expert end users				

End-user Training Needs	Basic Single-Task Worker	Basic Multitask-Oriented Worker	Knowledge Worker	Specialized Worker
Need instructor-led overview				
Need instructor-led, hands-on training				
Need computer-based training				
Need e-learning based training				

Appendix G:
Migration Readiness Assessment Checklist

For Assessment of:	
Agency Name	
Project Name	
Phase/Release	
Date	

Criteria	Yes/No/NA
Does the currently used office productivity application fulfill business needs?	
Are any agency business functions strongly linked to the current office productivity application?	
Does the new application provide important features that are unavailable in the current application?	
Does the new application comply with applicable accessibility regulations and policies?	
Is the new application more stable or reliable?	
Have you compared office productivity application alternatives to see if they meet the needs of your work force?	
Will costs be significantly reduced by moving to another application?	
Will you be looking at significant training costs for bringing users up to speed?	
Will the new release affect agency information worker productivity negatively?	
Is the new version of the application being accepted and adopted by other agencies and industry in general?	
Is your existing vendor dropping support for the current application?	
Is vendor support (security patches, etc.) critical to the agency's decision to migrate or not?	
Does the agency have staff that can support the application after the vendor has withdrawn support?	
Will the agency need to modify licenses to refresh the office productivity application?	
Can or should the agency or part of the agency switch to an alternate office productivity application supplier?	
Has the agency identified compatibility issues with current or candidate application with other applications or with external customers or business partners?	
Will the agency's current hardware have capacity and performance capabilities to support the new version of the application?	
How well does the office productivity application function with the current operating system?	
Does the agency need to update or change operating systems?	

Criteria	Yes/No/NA
Does the new operating system provide important built-in features?	
Does the new operating system support your installed hardware base?	
Will the new application require significant administration?	
Is the agency prepared to allocate the necessary people and resources to support the new application?	
Has the agency considered alternate delivery options, such as SaaS?	
Have network requirements for enabling application availability been addressed?	
Does the agency need to update or change network technology?	
Does the agency need to increase network bandwidth?	
Have networks been optimized to enable application performance?	
Should the agency skip the new version or defer migration to a later date?	
Does the agency risk increased support costs if it chooses not to upgrade or replace the current application?	
Has the agency identified risks associated with operating an obsolete application?	
Has the agency considered all implications and risks of skipping or deferring refresh?	
Will the agency be able to handle a major update at a later date if it skips a version upgrade?	

Appendix H:
Considerations for Skipping Versions

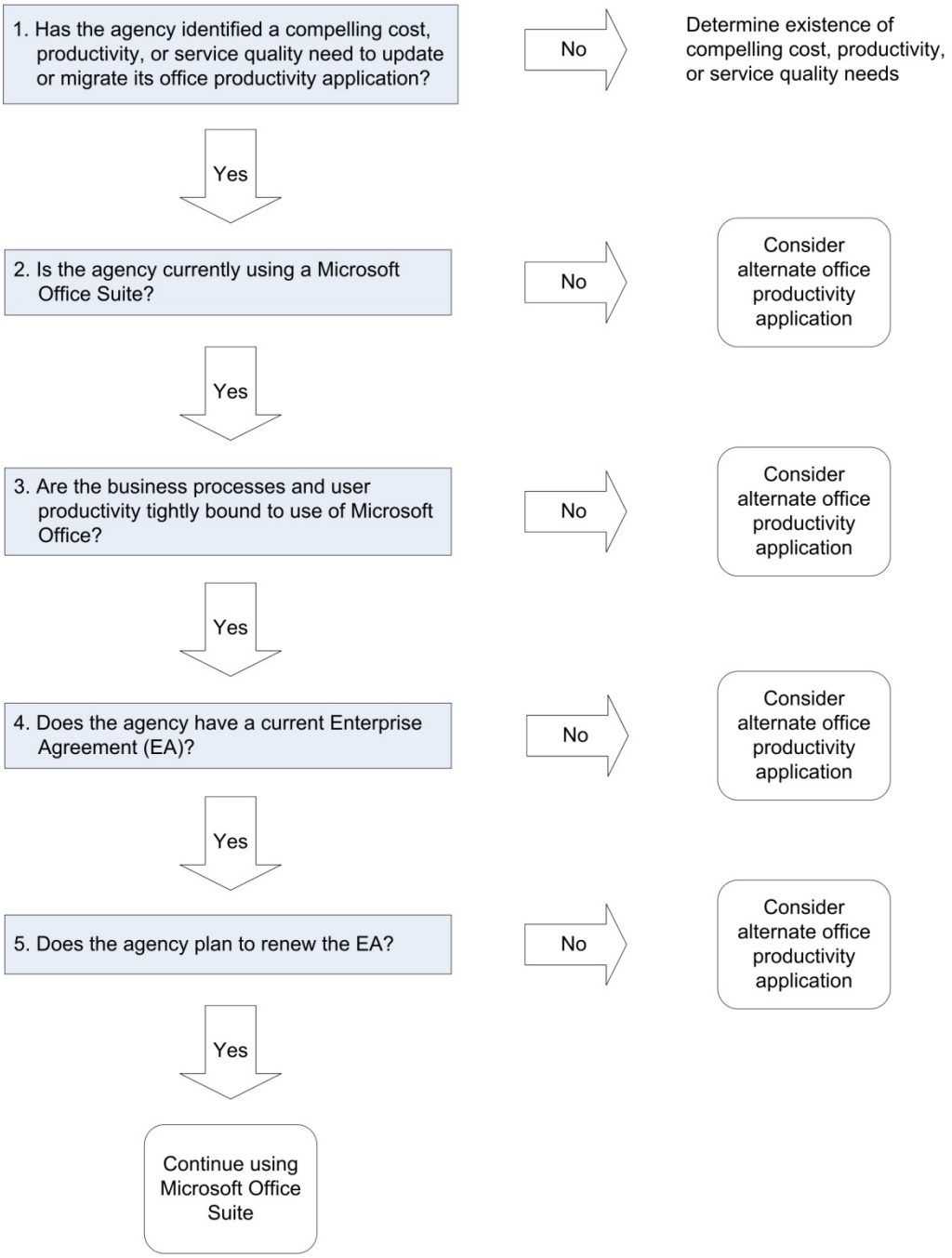
Skipping versions of software and/or operating systems may provide immediate capital savings but might result in a larger than expected expenditure when version obsolescence compels migration. An agency that skips a version entirely may find itself forced to perform forklift migrations off its old operating system or application and onto the new ones. If an agency finds itself under budget constraints when it is forced to migrate off an obsolete application, there may be no money to pay for the license upgrades, hardware upgrades, software upgrades, or the labor needed to complete the project.

Delaying migration to a new version of an application may be advantageous as it takes some time for independent software vendors of mission-critical applications to support the applications on the new operating system. However, continued use of outdated software or operating systems will likely consume some of the apparent savings by increasing technology maintenance costs or possibly leaving the agency with limited or no support of the obsolete operating system or application.

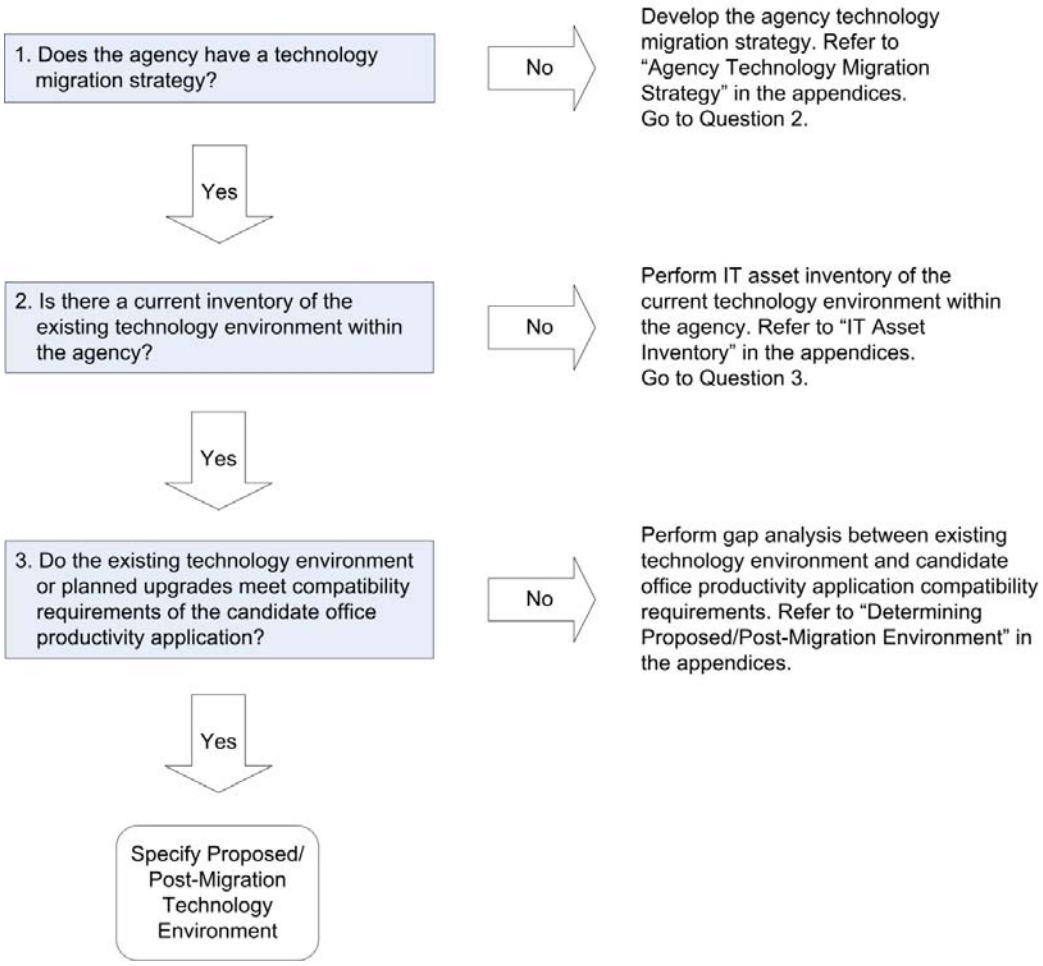
Typically, when a new version of an operating system is released, there is a short period of time when new computer models can be purchased with either the old operating system or the new operating system pre-installed. Normally, original equipment manufacturers deliver drivers for the older operating system on all models until market conditions indicate that the need to support older versions is no longer viable. They begin phasing out support of old drivers on newer computer models as the new operating system becomes more widely used. Trying to purchase new equipment that supports the older operating system becomes increasingly difficult and costly because supplies diminish and prices on those few models become less negotiable. One way an agency can minimize risk is to phase in the new operating system through the purchase of new PCs using a three- to four-year replacement cycle. By pairing the hardware refresh with the operating system refresh, the agency minimizes the risk that the system will be incompatible or expensive to support.

Cost and risk can be reduced by choosing the most appropriate migration technique and timing. Some migrations may provide opportunities to switch to alternative suppliers; in others, the current software may be the only viable choice. It is important to time the migration so that the agency realizes the maximum benefit from the newer software while minimizing the risk that the agency will be using unsupported applications and operating systems.

Office Productivity Application Migration Strategy
Decision Tree for Microsoft Office Users



Office Productivity Application Migration Strategy
Decision Tree for Technology Factors



Appendix K:
Open Standard, Open Source, Open Format

Excerpt from DIR's *Open Standard, Open Source, Open Format,* June 2008.

As the concepts of open standards, open source software, and open formats gain visibility, so does confusion as to what each term means. Following is a brief definition of each concept.

Open Standard

A *standard* is a basis for comparison; a reference point against which other things can be evaluated; an acknowledged measure of comparison for quantitative or qualitative value. Similar to a blueprint, a standard provides guidance to someone when they build something. Standards form the basis upon which weight, measurement, time, and currency are established.
An open standard is a standard that is not owned by anyone and can be used by everyone. Open standards enable products developed by different vendors to work together.

Open standards play a role in our lives 24 hours a day. The size and shape of electrical plugs and sockets are examples of open standards. The electronic devices that plug into those sockets are also examples of open standards. Even though these devices were designed and produced by different vendors, they work because of the standardization of the plugs, sockets, and the electrical power delivery.

In computers, open standards facilitate interoperability across diverse hardware and software products and services. As a result, it is equally possible for an open standard to be implemented in an open-source software package as it is in a proprietary software package.

Open Source Software (OSS)

Open source software is software in which the source code (the actual computer code the programmers wrote) is available to the general public for use and/or modification from its original design.

Open source does not necessarily mean *zero-cost*. A great amount of open source software is available at no charge, and many open source projects are developed by a community of volunteers. However, some commercial vendors enhance open source software and charge a fee.

Proprietary (closed-source) software is software owned by an individual or a company (usually the one that developed it). In contrast to open source software, the makers of proprietary software do not generally make source code available. There are almost always major restrictions on its use, and its source code is almost always kept secret. The software is usually made available to other parties under contract or licensing agreement.

Distinguishing Between Open Standards and Open Source

In the broadest sense, *open standards* are the result of a process for establishing uniform technical specifications. An example of open standards at work to achieve technological progress is the *Internet*; virtually all of the technology specifications on which it depends are open, as is the process for defining new ones. No matter which browser you use, you almost always see the same page in the same way. That is because web pages are written in a standard language, HTML.

Open Format

Whenever someone is writing an article, retouching an image, building a web page, listening to a song, or watching a favorite movie on a computer, they are using files. These files need to have a format in order to be opened, read, or modified. The format is what enables an application to interpret the raw data contained in the file.

File formats are marked in the extension of the file name, the characters after the period in the name of a file. These extensions are used by computers to identify how a file is to be used and what programs can be used to open it. For instance, this.wpd is a document created in WordPerfect.

A file format can be open or proprietary. An open format is a published specification, usually maintained by a non-proprietary standards organization, and free of legal restrictions on use. Open formats can be opened by a variety of manufacturers' products. In a proprietary format, only the software produced by the company who owns the specification of the format will be able to correctly open and read the data in the file.