



**ICTICT417**

**Identify, evaluate and apply current industry-specific technologies to meet industry standards**

**Learner Guide**

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# Getting Started

## About this unit

This unit describes the performance outcomes, skills and knowledge required to identify, evaluate and apply industry specific technologies to ensure that the quality of the entire business process is maintained to the highest possible level.

## Elements and performance criteria

Elements define the essential outcomes of a unit of competency. The Performance Criteria specify the level of performance required to demonstrate achievement of the Element. They are also called Essential Outcomes.

Follow this link to find the essential outcomes needed to demonstrate competency in this Unit: <http://training.gov.au/Training/Details/ICTICT417>

# Icon Legends

	<p><b>Learning Activities</b></p> <p>Learning activities are the tasks and exercises that assist you in gaining a clear understanding of the content in this workbook. It is important for you to undertake these activities, as they will enhance your learning.</p> <p>Activities can be used to prepare you for assessments. Refer to the assessments before you commence so that you are aware which activities will assist you in completing your assessments.</p>
	<p><b>Readings (Required and suggested)</b></p> <p>The required reading is referred to throughout this Learner Guide. You will need the required text for readings and activities.</p> <p>The suggested reading is quoted in the Learner Guide, however you do not need a copy of this text to complete the learning. The suggested reading provides supplementary information that may assist you in completing the unit.</p>
	<p><b>Reference</b></p> <p>A reference will refer you to a piece of information that will assist you with understanding the information in the Learner Guide or required text. References may be in the required text, another textbook or on the internet.</p>
	<p><b>Self-check</b></p> <p>A self-check is an activity that allows you to assess your own learning progress. It is an opportunity to determine the levels of your learning and to identify areas for improvement.</p>



## Topic 1 – Identify and evaluate technologies

As an ICT professional, you are counted on by your clients or employers to understand and apply technologies in the workplace. Most people are not as excited about technology as you might be. Specifically most of your customers will dread changes to technology! So, you'll need to be very careful about introducing new technologies into a business. Today, most businesses rely very heavily on technology, so changes you make can have a very large financial impact - positive or negative.

When we talk about "technology", you should keep several types of ICT technology in mind - software (e.g. teleconferencing), hardware (e.g. Solid-State Disk Drives) and services (e.g. mobile phone service). Some, like web-based applications, are a cross between the two.

This unit introduces a process to carefully identify, evaluate, apply any new technology, as well as measure the results after.

This learner guide addresses the first step: Identifying and evaluating new technologies.

As this unit is delivered online, if any terms or concepts are used but not explained, or if you need more clarification, be sure to search online or contact your teachers for support.

## Identifying new and useful technologies

Technology we bring into a company might be solving a problem, or it might be improving one of the company's processes in some way they didn't know could be improved. Both ways are great for bringing value to a company.

For example, a company might have a problem of keeping records organised for the purposes of being audited. You might bring a document management system into the company in order to solve this problem. Or, you may learn about USB flash drives with built-in encryption, and realise this would improve the company's security, and minimise their risk of loss. Both examples highlight how your knowledge of new or unknown-to-you technology might help your company.

### Keeping Up

One of the more enjoyable aspects of the Information Communication Technology industry is how often new technologies become available, and how fast things change. This means that part of your job is to constantly stay informed on technology trends and what's currently available.

For example, at the time of this writing, two major technology trends are drastically changing the ICT landscape. They are:

- > The move away from the desktop PC to powerful, connected mobile devices has affected the design of websites and applications and promises to do much more. It has put computers in the hands of many people who were previously uninterested, and has allowed employees to work from anywhere.
- > "The Cloud" for storage and applications. More people and organisations are storing their using online services because of cost benefits, as well as features like automated backups, sharing, and access from anywhere on the globe.

	LEARNING ACTIVITIES	ACTIVITY 1
<p>There are other ICT trends at happening right now. Identify two more of your own and explain how they're changing ICT and where you think they're going.</p>		

## Quality of information sources

Today, we're spoiled, and sometimes overwhelmed, by the amount of information available to us. Staying current in order to learn about technologies means you're going to want to tap into some of those information sources. But quality varies - anybody who's accidentally gotten sucked into reading a disagreement in the comments section of an article knows exactly what low-quality information (i.e. "noise") is like. On the other end of the spectrum we have sources like trade journals (magazines) and review sites.

That said, sometimes comments point out a critical error or important exception to what the author is saying.

The exact ranking of quality might be subject to opinion, but from low to high, we might rank information sources in ascending order of quality like this:

- > Forum (lowest)
- > News website
- > Blog
- > Wikipedia
- > Review website
- > Trade journal
- > Manufacturer's website
- > Personal experience (highest)

As you go higher in quality, the information should have more details, more hands-on testing, and the author should have more credentials - years of experience, affiliations, education, etc.

If you're thorough, the highest quality information will be your personal experience.



## LEARNING ACTIVITIES

## ACTIVITY 2

One good news site for technology is Slashdot (<http://slashdot.org>). Find two sources you like of a type low on the list, and two examples from high on the list. Consider monitoring these in order to stay up on the latest technology. Good ways to monitor: Special "visit weekly" bookmarks folder, RSS feed reader, email subscription.



## LEARNING ACTIVITIES

## ACTIVITY 3

A little-known feature of Wikipedia is the "Create a book" feature. You might find this useful for organising, saving and presenting information you find on Wikipedia to others. Give it a try and see if you find it useful.

Figure 1 – Wikipedia “book” feature

The screenshot shows a Wikipedia article page for "Objective-C". The page title is "Objective-C" and it is described as "From Wikipedia, the free encyclopedia". The page content discusses Objective-C as a general-purpose, high-level, object-oriented programming language used by Apple for the OS X and iOS. A sidebar on the left contains links for interaction, toolbox, and print/export options, with "Create a book" being highlighted with a red oval. The main content area includes a table of contents and various sections of the article text.

# Evaluating technology

This part of the process is critical and uses your full knowledge, experience, and critical thinking skills. Questions you might ask during this phase:

- > How does this technology address the needs of my organisation? What problem does it solve?
- > What requirements does this technology have?
- > What are the initial costs? Ongoing costs?
- > What changes will be required in our organisation's ICT systems?
- > What changes will people have to make?
- > What happens if it goes horribly wrong?
- > Can we go back to the way we used to do things if it fails?
- > How secure is it?
- > How usable is it?
- > How customisable is it?
- > How good is its performance?
- > Can its performance be measured?
- > What environmental and resource impacts will it have?
  - > Consumables (saved or used)
  - > Energy
  - > Obsoleting, and causing the disposal of, other technology
  - > Travel increase/reduction?
- > What other risks are there?

## Industry standards

This unit particularly concerns itself with compliance or the ability to meet industry standards, therefore it is important that you understand what this means.

Industry standards apply in many different industries and information technology is no different. It may be possible that you may need to ensure that the solution complies not just with information technology industry standards but also other industry standards that apply to the operation in question. For example if you were installing a solution for a bank you may need to consider also industry standards that apply to the banking industry.

An industry standard is defined at <http://business.yourdictionary.com/industry-standard> as:

'A voluntary industry-accepted benchmark for products or practices. For example, industry standards for computer hardware and software allow consumers to purchase software programs that run satisfactorily on any computer.'

The key points are that the standards are about how an industry expects things to be done, they may be detailed in formal standard documentation (e.g. ISO/IEC 12207 Systems and software engineering - Software life cycle processes) or less formally as expectations of the given industry. Perhaps they might be set by industry groups and members may be required to conform to obtain certification or similar.

When you choose a new technology there may be no specific standards available for use of that technology, but what there will likely be are a variety of different existing standards that can be applied to the new technology. Some examples include:

- > Security and privacy requirements
- > Accessibility requirements
- > Ethical behaviour
- > Workplace health and safety
- > Change management processes
- > Risk analysis and management

There are a variety of reasons to follow standards, they include the fact that they make things operate as expected and allow members of the industry to learn from past experiences.

Imagine the Internet if there was no compliance with standards, how would pages integrate, how would our browsers work and the networks that underpin all that communication integrate?

When you are working through this unit be sure that you consider what industry standards might exist or apply to your technology. It is difficult to guide you in what standards to consider given the vast array of technologies that might be considered by students. Perhaps the technology you will be considering may not have been in existence when this material was written; such is the pace of the information technology industry.

## Finding Problems – digging deeper

It has been said that there's not enough time in one lifetime to make all the mistakes yourself. What can we do to avoid some mistakes? Research! You should continue your evaluation by digging deeper for problems you might have.

A useful web search technique is to look for problems other users are having with a technology (or specific product) you're evaluating.

- > Do they seem like problems you might have?
- > Was their application of the technology similar to the one you have planned?
- > How was their problem addressed by the community of other users (e.g. via a forum, Stack Exchange, etc.)?
- > How was their problem addressed by the company's support team?
- > Was a solution achieved?

To do this, you might use Google with the technology name and a negative word. This can teach you a lot more about the true nature of the technology than looking at a glossy brochure or well-designed web page.

	LEARNING ACTIVITIES	ACTIVITY 4
	<ol style="list-style-type: none"><li>1 Try Googling "Google docs problem", "Google docs data loss", and "Google docs bug" and see what you come up with. If you were a fan of Google docs before, are you more or less confident about the service now? If you're not familiar with Google Docs, replace that phrase in the searches above with a technology you know.</li><li>2 "Annoyances" is another useful negative work in searches. Try "Office 365 annoyances"</li><li>3 Are there other negative search terms you like?</li></ol>	

Other sources of problems are:

- > Stack Exchange (or any peer-weighted information source)
- > User forums – anybody having difficult problems? Are there solutions? Does the company get in and answer anybody?

- > Bug trackers for the product – how many outstanding bugs are there? What's the oldest?  
How quickly do they get addressed? Fixed?
- > Tech support from the companies offering the technology – Is there a knowledgebase available? What response time do they guarantee?

## Classifying technology (broadly)

As you learn, you'll find similarities and patterns that allow you to classify technology. For example, we've already mentioned how information technology can be categorised into hardware, software or service. Other classifications might be:

- > subscription or outright purchases
- > hosted on-site or remotely
- > communications or information technology

Understanding the basics - the who, what, where, when, why and how - will help you understand the best way to classify a particular technology (and the choices within it).

Can you think of any other ways of classifying information and communications technology?

One thing to start thinking about at this point - how will you measure the technology's success in your organisation?

	LEARNING ACTIVITIES	ACTIVITY 5
A famous and useful concept is the "Pareto Principle". If you don't know what that is, look it up and develop an understanding of the different ways it shows up and how you might use it in the IT industry.		

# Classifying technology (specifically)

Whatever technology you're evaluating, you'll undoubtedly find several products that provide it. For example, there's not a single printer, internet service provider, operating system, or office suite. During your evaluation, you'll need to classify these various offerings.

Here are two ways you might find useful to classify specific products offering a technology.

## Comparison matrix

This is a way of taking a lot of specifications, feature lists, and articles and compiling it all into one easy-to-see chart.

Below is a fairly typical example of a feature matrix.

Software	Maintainer	Development status	Repository model	Concurrency model	License	Platforms supported	Cost
AccuRev SCM	AccuRev, Inc.	actively developed	Client-server	Merge or lock	Proprietary	Most Java Platforms (Unix-like, Windows, Mac OS X)	Non-free Quoted on an individual basis.
Bazaar	Canonical Ltd.	actively developed	Distributed <sup>[nb 1]</sup>	Merge	GPL	Unix-like, Windows, Mac OS X	Free
BitKeeper	BitMover Inc.	actively developed	Distributed	Merge	Proprietary	Unix-like, Windows, Mac OS X	Non-free Quoted on an individual basis.
CA Software Change Manager	CA Technologies <sup>[1]</sup>	actively developed	Client-server	Merge or Lock	Proprietary	Unix, Linux, Windows, i5/OS	Non-free Named licenses available with volume discounts available
ClearCase	IBM Rational	actively developed	Client-server	Merge or lock <sup>[nb 2]</sup>	Proprietary	Linux, Windows, AIX, Solaris, HP UX, i5/OS, OS/390, z/OS,	Non-free \$4600 per floating license (held automatically for 30-minutes minimum per user, can be surrendered manually)
Code Co-op	Reliable Software	actively developed	Distributed	Merge	Proprietary	Windows	Non-free \$150 per seat
Codeville	Ross Cohen	official site <sup>[2]</sup> offline; latest release July 13, 2007; 5 years ago	Distributed	precise codeville merge	BSD	Unix-like, Windows, Mac OS X	Free
CVS	The CVS Team <sup>[2]</sup>	maintained but new features not added	Client-server	Merge	GPL	Unix-like, Windows, Mac OS X	Free
CVSNT	March Hare Software <sup>[3]</sup> and community members	maintained and new features under development	Client-server	Merge or lock	GPL or proprietary	Unix-like, Windows, Mac OS X, i5/OS	Free for older version or £85 commercial license for latest version of CVS Suite or Change Management Server

Figure 2 Source: [http://en.wikipedia.org/wiki/Comparison\\_of\\_revision\\_control\\_software](http://en.wikipedia.org/wiki/Comparison_of_revision_control_software)

You will determine what the columns are depending on characteristics of the technology that are important in your situation. If your chart gets too wide, consider splitting it up into two or more.

While you're coming up with categories or features to put across the top, make sure to keep in mind your needs (technical) and your user's needs (usually different than yours). For example, you'll care a lot about how easy it is to get data out of a particular system for backing up. Your users though, will care a lot more about a context-sensitive built-in help system.

When you're evaluating features, keep the Pareto Principle in mind.

	LEARNING ACTIVITIES	ACTIVITY 6
Can you find a decent comparison chart of a technology you're interested in? Review sites sometimes do them, as does Wikipedia. Try adding the words "matrix", "comparison" or "chart" to your search.		

## Costing

Putting dollar values on every aspect of competing offerings is a great way to roll a lot of data into a single number - and a number that business people listen to. For example, Product A costs \$1000 less per year to license than Product B, but you estimate it is difficult to use and will cost the company 100 man-hours per year. You might value employee time at \$100/hr, which means Product A has an additional cost of \$10,000 per year, meaning it's actually \$9000 more expensive than Product B.

You can do this for many but not all features. For example, if an online office suite (e.g. Google Docs) provides file-locking, which prevents two users from editing the same file at the same time, you might determine that saves \$7500 of your time. That means other offerings that do not have that feature will cost \$7500 more in your time. You can put a value of \$7500 on this feature. But it might be tougher to put a dollar value on features like a large number of fonts available.

Other features may seem like you can't put a price on them, but be creative. For example, the remote multiple-collaborator feature of Google Docs might eliminate the need for a particular employee to make a monthly trip to the company headquarters for day-long meetings. Travel costs, and getting that specific task done quicker both can be given dollar amounts and included in your evaluation.

Here is a contrived cost comparison spreadsheet. Note that the features chosen are different between the options, so that cost differences can be calculated. If they all provide an important feature, that would just have the word "included" for all three offerings, and there would be no cost to going with the competitor's solution. If the term "Cost" for a feature confuses you, perhaps mentally substitute "Value of saved time" for "Cost".

Total Cost of Ownership										
Competing Online Office Suites										
		Full-text search		File Locking		Version Control		Compatibility with .docx		Total Cost
Initial Cos (\$/yr)		Hosting Cost (hrs/year)	Cost (\$/year)	Cost (hrs/year)	Cost (\$/year)	Cost (hrs/year)	Cost (\$/year)	Cost (hrs/year)	Cost (\$/year)	(\$/year)
Google Docs	\$3,032	\$100	50	3000	Included		Included		125	7500
Office 365	\$5,043	\$125	Included		Included		300	18000	Included	
Zoho Office	\$1,000	\$50	Included		125	7500	Included		125	7500
<b>Inputs:</b>										
Hourly rate (\$/hr) 60										

Figure 3

A technology will likely be looked at for the money it will save. A frustrating IT environment (slow network, hard-to-find documents, etc.) raises employee stress which results in more departures. Those departures cost the company money in lost knowledge, training and productivity while their replacement is found. As an IT professional, you're in a position to use technology to make their work environment run as smoothly as possible, saving the company money.

Other sources of costs: Lost time, lost data, lost opportunities with customers, inefficiencies, wasted resources, poor communication, and compliance mistakes (eg. lawsuits, fines). Note that if you choose a technology poorly, you may end up adding to these costs rather than saving them!

### Can you think of any other source of costs that technology might save?

This all seems very negative. After all, a technology might make money for a company too. And you can put a dollar value on those opportunities. Technology might allow a company to complete projects quicker, come up with (or capture) better ideas, foster better collaboration, or attract more customers with better service, or version control.

### Can you think of any other ways a technology might make money for a company?

Again, remember to keep the interests of your various stakeholders in mind (users, management) as well as your own. Always think "How does this benefit my customers? Why would they want to put the effort into learning this?" If you're a valuable and loyal employee, your interests will be theirs too, they just might not be technically aware enough to appreciate the same things you do.

## Acquiring technology

Once you've decided on a technology, and a particular solution delivering that technology, you'll need to acquire it. The highest quality of information is first-hand experience. We'll cover testing in a later topic guide, but let's cover how you acquire technology in order to test it.

Generally, you can obtain technology many ways:

- > Demo license/unit
- > Purchase
- > Lease/borrow

Vendors will usually be willing to do you favours in hopes of gaining your business. For example, maybe they can bend the company's rules and get you 10 evaluation licenses instead of the usual one. Your power to get favours from vendors will depend on the size of your organisation, and how large of an eventual purchase you're considering. Personal charm can go a long way too. If you're considering a large purchase, a vendor should at least provide demo copies, demo licenses, or demo units (in the case of hardware) for you to evaluate.

Later, once you've decided to deploy a technology, you might consider purchasing the technology in stages in order to lessen risks or to ease the organisational change.

Good vendors will make downloading evaluation copies of software, or trialling a service very easy in order to get your business. Trials may either be reduced in features, time limited or both.

Make sure you also acquire (usually by downloading) any user manuals, installation guides, or other vendor-provided documentation.

Have you ever acquired technology in a work situation, and if so, how did you do it?

# Summary

This topic guide has introduced you to the idea of using your creativity and analytical skills, as well as information sources, to analyse technologies you might be considering applying to an organisation.





## Topic 2 – Applying technology to solve organisational problems

Once you have used your information gathering and organising skills with critical thinking skills to evaluate a technology, it's time to apply the technology.

Of course, you will not just apply the technology to the entire organisation immediately, as a surprise for everyone to discover when they come to work the next day. To be a competent ICT professional, there is a lot more up-front work required before deployment or installation.

As you know, this unit introduces a process to carefully identify, evaluate, and apply any new technology, and measure the results after.

This topic guide addresses the second step of our process: applying a technology. This step is such an important and involved step, we actually need to break it down further into three steps again:

- > Prepare to apply (i.e. plan and test)
  - > Test the technology
  - > Prepare a plan to apply the technology (i.e. install, deploy, etc.)
  - > Test that plan.
  - > Communicate with your customers
- > Actually apply (i.e. execute your plan)
- > Review (i.e. verify it went OK)

This may seem like overkill, but having a framework to guide your activities will help you stay sane in the face of all this work, as well as make sure you do not forget anything. When you use a framework, you will automatically be organised and you can focus your attention on the important aspects of the work.

## Preparing to apply: testing

At this point you will have learned about what the technology does, how it works, what its features are, and how they apply to the problem or opportunity within your organisation. If you are proceeding you must have determined the technology is applicable to your problem and you've selected specific products implementing that technology. You've acquired that product. The next step is to test it.

### Testing philosophy

Testing is a science in itself, but a few mental models and slogans, can be useful. Testers are thorough, ruthless, and perhaps a bit paranoid. They believe things like:

- > "If it hasn't been tested, it doesn't work."
- > "If something can go wrong, it will."

ICT professionals dislike surprises and dislike finding out about problems with their work from other people.

### Testing the Technology

This is a critical step. You have now obtained the technology and it is time to put it through the wringer. Does the technology "work" - that is, does it do correctly everything it's meant to?

You need to make sure the technology:

- > Works as claimed
- > Does what you need
- > Doesn't have any side-effects (i.e. doesn't break other systems)
- > Is reliable
- > Complies with relevant industry standards

Testing needs to be thorough, exhaustive, and organised. If there is a problem down the track, it may be useful to be able to show that your testing methods and record keeping were of high quality.

Tests should be organised into a matrix, and progress tracked. This is easily done with a spreadsheet, as shown in Figure 4 on the next page.

Solid State Drive Testing - Corsair SSD4503-3		Result	Requirement	Pass/Fail	Notes
Performance	Cached Read speed				
	Cached Write speed				
	Randomised Cached R/W speed				
	Uncached Read speed				
	Uncached Write speed				
	Randomised Uncached R/W speed				
OS Compatability	Linux	Recognised by OS			
		OS turns on SSD specific features (eg. TRIM)			
		OS turns off swap and/or moves swap			
		Supports 3 partitions			
		Formattable			
		Quick formattable			
	Windows 8	Recognised by OS			
		OS turns on SSD specific features (eg. TRIM)			
		OS turns off swap and/or moves swap			
		Supports 3 partitions			
		Formattable			
		Quick formattable			
Application Compatability	Office 2010	Can be installed			
		Launch time			
		Can open and save files (> 10 MB)			
	Audacity	Can be installed			
		Launch time			
		Can open and save files (> 10 MB)			
Durability					
FINAL RESULT: <input type="text"/>					

Figure 4 A sample test plan

Your tests should cover:

- > All claimed features (this is debatable - perhaps you would just test the features that met your customer's needs)
- > Different systems (e.g. tablet, desktop)
- > Different operating systems
- > Any other different environment the technology will be used in
- > Simulated problems, errors and misuses

Your job is to come up with a list of exhaustive tests that subject the technology to stresses that are at least as strenuous as what it will encounter when you deploy it. Your goal is to try to break the technology.

You should come up with scenarios, and then simulate the scenarios. How well does the technology deal with a network outage (and restored service)? How well does the technology deal with a power outage? What happens when the license expires? Are upgrades easy? What happens if the maximum number of users is exceeded? How well does it deal with a large number of records? Be prepared to push the boundaries and ensure that you know what those boundaries are.

Remember, the technology will probably be used for years longer than expected, and strained beyond its original, designed capacity. Simulate those situations to avoid surprises later.



## LEARNING ACTIVITIES

## ACTIVITY 7

- 1 Use the web to research white box testing, black box testing, and acceptance testing.

You should have software skills to automate testing as much as possible. Leaving something running for days, hammering on the technology randomly, is going to bring up far more problems than just you clicking madly for a few hours.

- 2 Use the web to research some automated software testing solutions. How do they work? How do you control them? How do they detect problems?

Decide on what "passing" means. Must the technology satisfy all criteria? Obtain a certain score?

Once the technology passes your testing, it will be ready to put it into beta testing.

Now might be a good time to review whether or not the technology still meets the original goal - of solving a problem within the organisation. Also, review any requirements the technology has and make sure your organisation meets them.

## Beta testing

Your test strategy may include a partial roll-out where you install the technology on a limited basis (e.g. on just a few desktops). This is called beta testing. This will allow you to put the technology in the hands of the actual customers who will be using it. They will use it in ways you might not think of on your own. This is the idea that "more eyeballs are better". From them you will solicit feedback via email or through an automated "analytics" system of some sort.

Once the technology passes beta testing, you're almost ready to deploy it.

# Preparing to apply: installation customisation

One of the ways you can provide benefit for the organisation is by customising the software for your organisation's particular needs. This is done prior to installation so that your customisations are rolled out with the installation

Customisation can be through many mechanisms:

- > Settings
- > Installation of 3rd party modules
- > Paring down of features
- > Simplifying user interfaces
- > Writing scripts and other automation

The intent of all of these is to make the technology more functional and easier for your users.

For example, while testing PDF printing software, you notice that it always attempts to save files to the desktop. Your users are usually creating PDFs of documentation for storage on the company-wide server. You don't see any way to set a default directory in the program's interface. You Google this "annoyance" and find there's a registry setting which sets the default directory. You write a .reg file to perform this, and include the installation of that file in an installation script you're writing as part of your installation. The time saved seems trivial, but what if that time is multiplied by 5000 employees using the program 100 times in a year?

# Preparing to apply: installation planning

You need a plan for installing (applying, switching-over, etc.) the technology to your company. Installation could involve installing software on users' desktop, mobile device or phones. It could involve changing the configuration of your network (firewalls, routers, etc.). It could involve connecting the new technology to an existing technology. Figure out what you're going to need to do, in what order, and make a plan.



## LEARNING ACTIVITIES

## ACTIVITY 8

Search the web for “planning an installation” (interestingly, including the “an” in a Google result yields better results). Also try “installation checklist” or whatever else you think would work. You’re looking for a serious installation plan, like one from Microsoft, IBM, Oracle, Cisco, etc. Look it over and decide – is it more or less rigorous than the method recommended here? Does it include steps that aren’t obvious?

Figure 5 A sample installation plan

### Solid State Drive Installation Plan - Corsair SSD4503-3

Prepare	Purchase 1500 drives
	Partition drives
	Purchase copies of Norton Ghost
	Notify users of upcoming change
	Have final planning review meeting
Apply	Power on machine
	Clear system log
	Power off machine
	Install SSD in target machine
	Power on machine
	Ghost current HDD onto new drive
	Power off machine
	Remove HDD
	Label HDD with user and location
Review	Power on machine
	Check system log for errors
	Verify Windows has turned on TRIM
	Verify Windows has turned off swap
	File HDD on shelf

# Preparing to apply: testing the installation plan

If you're hoping to install the technology for 5000 employees, you'd better make sure the installation plan you're going to use works! Test it by doing it, on a small scale and in such a way that any problems will not impact your users.

# Preparing to apply: communication

No matter what, communication with your customers and management will be critical. Most people don't like surprises, businesses particularly don't like surprises, and users can very angry if you change something without informing them.

"Computer people" are known for being poor, or surly, communicators. This is a place for you to really shine and set yourself apart. By being a clear and friendly communicator in your workplace, you'll make friends instead of enemies, which is an excellent strategy for job security.

Clear communication, when it comes to technology, is a difficult skill to master. Your audience will vary from the technically savvy to technophobes that are not able to understand much of what you say. It is your job to simplify your explanations down to what the user needs to know and to state it in a way they can understand. You should do this without appearing to "talk down" to them.

You will probably find yourself needing to communicate in writing and verbally. When it comes to applying a technology, more is probably better. Send an email to affected employees detailing what it is that will be changing, give them sufficient detail to understand how this will affect their work and why and specifically how users will benefit. Be available for questions and discussions. Make sure to converse informally with other employees so they know the communication channel is open.

If the change is significant enough, be prepared to conduct formal information sessions and possibly training sessions. Prepare for these so that your communication is polished and easy.

Make sure you cover:

- > What is changing
- > Why it is changing

- > What benefits the users or organisation will realise
- > How users should change (behaviours, expectations, etc.)
- > Where to get additional help

## Applying – roll-out/installation

Now that testing is complete and your customers (or users or stakeholders) have been fully informed, it is time to finally take action. This could be installing some software, flipping a switch (literal or actual) or switching a new service on.

Because of all the up-front work you have done this will hopefully be the least surprising and least time-consuming part of your process.

For the actual installation, you should be working from your plan. It should preferably be written, and have been reviewed by other members of your team. Technology systems are so complicated and inter-related that no one person can know everything or predict side-effects. Consulting with internal experts (and vendors and other external experts) is a good idea.

Your plan for "installation day" could be broken down into: preparation (e.g. turn off power, gather tools and populate USB flash memory sticks), the actual installation, and review (verification) – sound familiar? These are the same three steps this module and this unit are broken down into.

Your installation should occur outside of office hours to minimise downtime of other employees. You should leave plenty of time to deal with any problems that arise. Where possible, you should be able to "undo" everything - backups and good documentation are essential for this part. Other people you might need should either be there or be available. Finally, you need to leave time to completely test the new installation.

What are some problems that you've seen happen with a technology installation?

## Review – verifying it worked

How you verify your installation worked will depend entirely on what technology you installed. Again, all the testing philosophies and your habit of near-paranoid completeness will be a valuable asset. Would you rather find a problem or have the president of the company find it?

*Example: For a VOIP roll-out you might make sure outgoing calls work for a sample of the office's handsets, and you might make a few incoming calls from the outside. You'll try the main number as well as direct-dial numbers. You'll try the local number as well as the national 1300 number.*

*You'll have someone helping you so you can hear the audio quality and test the audio delay. One good way to test delay is to have one person count to three, and the other person says "three" as soon as they hear "three". The first person can tell what the delay is by listening for the time between when they said "three" and when they heard "three" back.*

*You will be on the lookout for any oddities – e.g. delays in getting a dial tone. You might leave a connection going for several hours just to make sure it's still stable (you did this before during your testing the technology step, didn't you?).*

*You might check to make sure the system is logging calls the way you expect, and walk around the office a bit to make sure nobody's having trouble.*

Complete post-installation reviewing and evaluation of your new technology will be covered in the next topic.

## Other parts of your job

You've made sure the technology is addressing a problem (or bringing an opportunity). You have carefully tested and installed the technology, communicating to your users along the way. Is there anything else to do?

You'll need to provide documentation, training and technical support to your users.

# Summary

Applying a technology is a disruptive event in an organisation, and your job is to minimise the harm of this disruption. Through rigorous testing of the technology, and planning and testing of the installation process, you can bring value to the organisation by applying new technology.



## Topic 3 – Reviewing the technology application

Reviewing the new technology's impact on your organisation and the larger environment is an important feedback into the technology itself and your own process of evaluation. Has it been successful?

A rigorous process of collecting and analysing information post-application of the technology may be important for justifying the effort and expense, any additional effort and expense, and for showing your competency. After all the work you have done on the “evaluate” and “apply” phases, you might be tempted to skimp on this step, but don’t.

There is only one activity in this topic because you’ll be applying everything you learn here in the assessment.

# Data collection

"Key Performance Indicators" (KPI's) is an industry buzz-phrase for hard data like money saved, energy saved, CO<sub>2</sub> saved, and time saved. Management likes these sorts of indicators because they boil down a lot of complicated factors into simple numbers. To figure out what KPI's you should measure, review what your goals for the technology were and what measurements should be taken. What were your goals, and what do the measurements you planned for show? Section 1.3, during the evaluation phase, there was a suggestion for you to plan measurements. So at this point, after the installation, you should be ready to collect data.

Data might include:

- > Usage logs
- > Network traffic
- > Performance
- > Costs
- > Observations - when you walk around, do you see people using it?
- > User polls or questionnaires
- > Informal feedback from users

Remember to separate data collection from analysis. You're not making judgements on these things yet, just collecting the data.

	LEARNING ACTIVITIES	ACTIVITY 9
Thoroughly explore the Performance Monitor in Windows to learn about the various data that are available about the operating system's performance, and how it can be collected and organised. Similar tools might be available for a technology you're applying.		

# Analysis

For this part of the process, it may be useful to take the questions you used for evaluating the technology in [Topic 1 Evaluating technology](#) and turn them around:

- > Is the technology addressing the needs of my organisation?
- > Is it solving the problem it was meant to?
- > What did it require?
- > Is it requiring anything ongoing?
- > Is it requiring anything more than anticipated?
- > What changes did it require in our organisation's IT systems?
- > Are any additional changes to our organisation's IT systems required?
- > What changes did people have to make?
- > What failures have there been?
- > Have we needed to go back to the way we used to do things?
- > How secure has it been?
- > How usable is it?
- > Has it been flexible to keep up with any changes?
- > How good is its performance?
- > What environmental and resource impacts is it having?
- > Consumables (saved or used)?
- > Energy?
- > Obsoleting and causing disposal of other technology?
- > Travel reduction?
- > Have any new risks been identified?
- > Are users using it as expected?
- > Have any new features or uses been discovered?

Some of these are "soft" questions requiring your judgement to answer. And some can be answered with "hard" data you collected from Data Collection. Others might cause you to revisit and add to your data collection efforts.

You might look at this thoroughness as just part of being excellent at what you do, or you might look at it as covering yourself from any scrutiny or judgement from management. What questions are they likely to ask? If you had any critics at the beginning, what initial concerns that they had might they bring up again now that the technology is applied? Answering these first, on your own, will mean you're prepared if they come up in a meeting or audit.

## Summary

You can tell that reviewing performance is a looping process where you take the results and tweak settings, training, or usage patterns. Continual evaluation of a technology helps you recognise when it is due for replacement, or should simply be discontinued. In the first weeks after a new technology has been introduced, you will probably be actively evaluating performance indicators and tweaking usage and settings. The project will eventually move to a maintenance phase where you'll still monitor performance, but less frequently.

## Conclusion

These three topics have introduced you to a formal process of

- > identifying and evaluating a technology
- > applying a technology, and
- > reviewing a technology

This is a good way to break down an involved and perilous process. You might find that breaking the steps down further into prepare/apply/review steps is useful. Introducing a new technology into an organisation is perilous. There may be many gains to be made, but many dangers too. Your decisions will impact people and existing systems, and by being rigorous and thorough, you can make sure the positives of any technology change you introduce far outweigh the negatives