Web Application

Learning Outcome

4.2.1 Describe the differences between web applications and native applications.

4.2.2 State and apply usability principles in the design of web applications.

A web application is an application stored at a remote server that requires a web browser as a client to run and internet for data/resource transfer.

Whereas, a native/desktop application is an application designed to serve standalone machines that don't require the internet for its operation. Example of desktop applications are Microsoft Words, Microsoft Excel, Notepad.

Web Applications	Native Applications/Desktop Application
Deployment and maintenance (updates) for a	Deployment and any maintenance/patch are
web-based application require deployment on	done on individual client machines
a single set of server machines.	separately.
Web applications can be accessed from	As desktop are confined to a standalone
anywhere (most locations), so there is no	machine, so they can be only accessed from
location constraint.	the machines they are deployed in.
Web applications are platform-independent,	Desktop applications need to be developed
they can work in different types of platforms	separately for different platform machines.
with the only requirement of a web browser.	(Windows, Linux, Unix, Mac etc)
Web applications are at higher security risks	Desktop applications, on the other hand,
as they are inherently designed to increase	have better authorization and administrators
accessibility.	have better control, hence more secure.
Web applications rely heavily on internet connectivity, for their operation.	Desktop applications don't require the internet for their operations. Some applications just require internet connectivity at the time of updates.

Web Application Usability Principles

Web applications are designed to provide access to information and services for a variety of users from different backgrounds. Usability is one important factor for the quality of a web application. It is defined by 5 quality components:

- Learnability: when the users first encounter the web application, how easy is it to learn to navigate in the system to perform basic tasks?
- Efficiency: how fast can the users perform tasks after knowing the system?
- Memorability: if the users have not used the system for a long time, how easy is it to recall the functionality of the system without relearning?
- Errors: possible errors that users make, and how the system help users to recover from errors?
- Satisfaction: how pleasant is it for use?

Web applications are products without manuals and we don't expect people to be patient to figure out how the application works. It has become a very popular marketing platform for business and companies put usability on top priority to attract customers. Online retail website also needs to be explicit and easy to use for more efficient transactions.

Human-computer interaction experts has developed plenty of principles, Nielsen's 10 principles, Norman's rules, Tognazzini's 16 principles and Shneiderman's 8 golden rules. They covers all the important rules but differs in the way how rules are organized. Here we will discuss Nielsen's 10 principles developed by Jacob Nielsen and Rolf Molich in 1990.

(Resource: https://www.nngroup.com/articles/ten-usability-heuristics/)

1. Visibility of System Status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

For example, when we upload a file into Google Drive, the colour change shows the progress and the message above shows time left to complete the task.



An online flight search engine uses a loader to show the progress while users are waiting.

Flights	Hotels	Packages	Hot Deals	Car Hire	Vouchers	Check In	Passport Blog	Mastercard
Search > Select Flig	ht > Review > Checko	ut						
Singapore to	Osaka (Return)						
Travel Dates Thu 21 Jun 2018	8 — Mon 02 Jul 2018	Class Economy	Passengers 1 adult					Edit Search 👻
Tot • • flight o	tal			Searching fo	r your perfect	flight now		

2. Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

3. User control and freedom

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

For example, an online shop allows the user to adjust the number of items to purchase, and even to remove the item by clicking the cross sign.



The attachment in Gmail can easily be removed as well.



If the user accidentally clicked the button to delete a post in Google Classroom, the system popup message allows undo of this action.

Saved posts	(1)	^
Drafts (1)	Delete draft?	×
	CANCEL	

If we accidentally deleted an email, it is possible to undo the process to retrieve the mail.



4. Consistency and standards

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

For example, two hotel booking website below both put currency choices and login options on the top right corner. The form to fill in is on the left side while advertisements or promotions are on the right side.

Booking.com	S\$ 🗃 Refer Friends & Earn List Your Property Register Sign in
Hotels & Homes Flights Car Rentals Airport Taxis	
Find Deals for Any Season From cozy country homes to funky city apartments Destination, property name or address: More places than you could ever go (but you can try!) Check-in Check-in Date	Melbourne 2,009 properties Contract of the second
agoda Rooms Flights Airport transfer Today's deals	SGD SIGN IN CREATE ACCOUNT
HOTELS, RESORTS, HOSTELS & MORE Get the best prices on 1,900,000+ properties, worldwide All Rooms Homes	SAVE AN EXTRA 10% on select destinations
Q Enter a destination or property	Our best prices are even lower, updated every day! Pay no commissions or fees, ever. VIEW TODAY'S DEALS LIST YOUR PLACE TODAY
10 Jun 2018 11 Jun 2018 Sunday Monday	
2 adults, 0 children V SEARCH	INSIDER DEALS DROP PRICES BY UP TO 30% Sign in now for member-only deals

5. Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

For example, Google search offers the correct word for my wrong spelling.

optymistic	Ŷ
optimistic optimistic meaning optimistic quotes optimistic nihilism optimistic in chinese optimistic meaning in tamil	

When the user sends an email without the subject or text, the webmail application will pop out a message for correction.

mail.google.com says		
Send this message without a subject or text in t	he body?	
	ОК	Cancel

6. Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

For example, a mobile web application shows past search history for users to retrieve.

Q Search products or stores	8	CANCEL
Recent Searches		CLEAR
panado		
Tomato Sauce		

Oyster Sauce

Another example is a search engine which offers suggested contents to the user.



7. Flexibility and efficiency of use

Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

For example, an experienced user will explore the tools to search for webpages published within certain period of time.

	web application usability					ļ	, Q	
	All Ir	nages	News	Videos	Maps	More	Settings	Tools
	Any time	Al	l results 🔻					
~	Any time		ability	v checklis	st for we	b apps - InVis	ion Blog	ability
	Past hour		p.con	n/blog/usab	ility-checkl	ist-for-web-apps/	▼	
	Past 24 h	ours	napter m. Yoi	r you'll list the u'll learn abo	e key scree out the 5 key	ns of your web ap /	plication and run a usat	oility
	Past weel	c			-			
	Past mon	h	Usal	bility & U	X Desigr	n - Insights an	id Top Tips	
	Past year		sultin Neb A	g.com > Lat Application	os & Article Usability B	es > Web Applicati est Practices. The	ons ▼ discipline of web applic	ation
	Custom ra	inge	ad, ev	ver-evolving	topic.			

8. Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

Examples includes search engines:



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9. Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

ign in	Register	6
You entered an email address, that doesn't match. <u>I forgot</u>	'password combination	
Email Address		
test@gmail.com		
Booking.com Password		
Forgot your password?		
Sigi	n in	
Or sign in w	ith one click	
F Sign in with Facebook	G Sign in with Google	
Make changes to a booking with and PIN	n your confirmation number	
By logging into an account, you're agree	ing with our Terms & Conditions and	

When the user enters a wrong login information, the message is shown in red. A few options are given to the user to resolve the problem: either re-enter the correct account, or sign in via Facebook or Google, or click the link 'I forgot' to trace the password.

10. Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.