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Chapter 1 & Chapter 2 (p. 50-53)
Accounting Information Systems: An
Overview & Transaction Processing
Romney and Steinbart (2018)

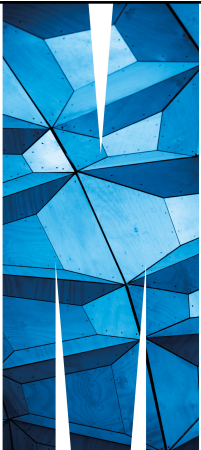
Chief Examiner Edward Tello
Semester 2, 2018

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Learning Objectives - Chapter 1

- Distinguish between data and information:
 - Discuss the characteristics of useful information.
 - Explain how to determine the value of information.
- Explain the decisions an organization makes:
 - The information needed to make them.
 - The major business processes present in most companies.
- Explain how an AIS adds value to an organization.
 - How it affects and is affected by corporate strategy.
 - The role of AIS in a value chain.



What is an Accounting Information System (AIS)?

- **AIS** is a system that collects, records, stores, and processes data to produce information for decision makers.
- It consists of:
 - People who use the system
 - Processes (procedures and instructions)
 - Technology (data, software, and information technology)
 - Controls to safeguard information

?????





The Role of Accounting & Accounting Information

What sort of decisions need to be made within a company that require IS?



For example, when the business needs to decide how much inventory to order for the coming month. When deciding how much to pursue from suppliers, an organisation needs to estimate its expected sales

Source: Considine et al. (2012), Accounting Information Systems



What is a System?

•System

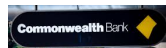
- A set of two or more interrelated components interacting to achieve a goal.

•Goal Conflict

- Occurs when components act in their own interest without regard for the overall goal.

•Goal Congruence

- Occurs when components acting in their own interest contribute toward the overall goal.



From "The man who blew the whistle on CBA"
...He described an "aggressive sales-based culture wherein advisers pushed clients into inappropriately high-risk products both to earn bonuses and 'avoid getting the sack'"
<http://www.afr.com/business/banking-and-finance/financial-services/the-man-who-blew-the-whistle-on-cba-20140627-j61mp>

Tiny Fiji Airways banks huge profit and rewards employees

"Credit must be given to all our hard-working and dedicated staff. It's extremely important that they share in the success of our company. The profit share and bonus programme is testament to our commitment to our people."
<http://blogs.crikey.com.au/planeetaking/2015/02/23/tiny-fiji-airways-banks-huge-profit-and-rewards-employees/>



Data vs. Information

- To understand what AIS is, we need to introduce some key terms and establish a context for study.
- **Data** → (re. singular from *datum*). Raw inputs of IS. I.e., data might be the customer, order and payment details that are gathered in day-to-day business activities
- **Information** → Processed or value-added data. Information is data which have been manipulated or summarised to highlight trends or features

Blair and Boyce (2006)

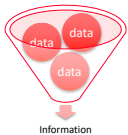


Data vs. Information

- **Data** are facts collected, recorded, and stored in the system
- **Data** → Insufficient for decision making
 - A fact could be a number, date, name, and so on.

For example:

2/22/14
ABC Company, 123,
99, 3, 20, 60



Information

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Data vs. Information

Can you give me an example??

Think about a spreadsheet which gives the raw sales figures for each product line for each financial quarter over a year. These raw figures require a great deal of processing – producing a graph or chart or report



Managers use the information & apply their knowledge to make decisions or plans

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Decision Quality ?

- Information helps us make better decisions

• ???



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Information

- Information gives companies Competitive Advantage (Porter and Millar, 1985)
- In any company, information technology has a powerful effect on competitive advantage in either cost or differentiation
- “The question is not whether information technology will have a significant impact on a company’s competitive position; rather the question is when and how this impact will strike. Companies that anticipate the power of information technology will be in control of events”

<https://hbr.org/1985/07/how-information-gives-you-competitive-advantage>
Source: Harvard Business Review (see **Reading List** on Moodle - voluntary)



Value of Information

- Information is valuable when **the benefits exceed the costs** of gathering, maintaining, and storing the data.

Benefit (i.e., improved decision making) – **Cost** (i.e., time and resources used to get the information)

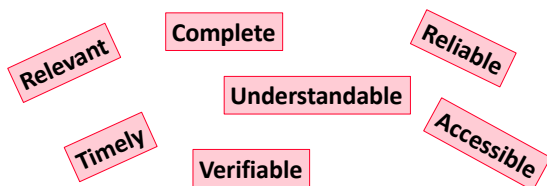


Value of Information



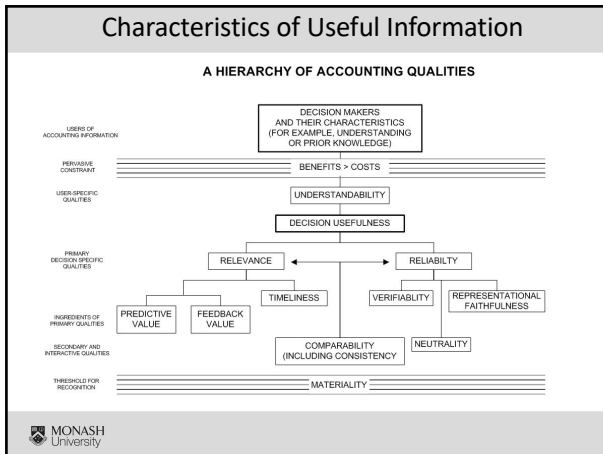
What Makes Information Useful?

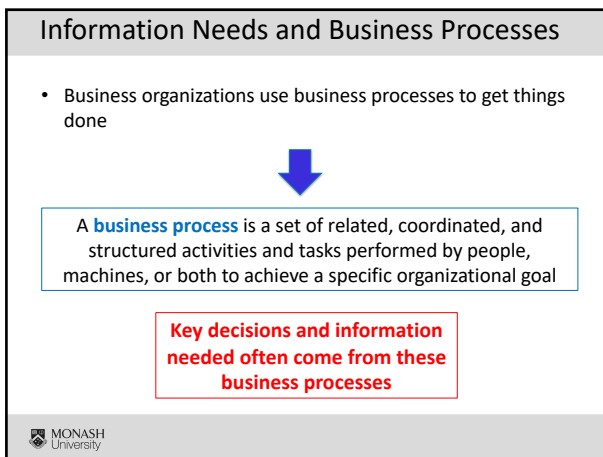
There are 7 general characteristics that make information useful:

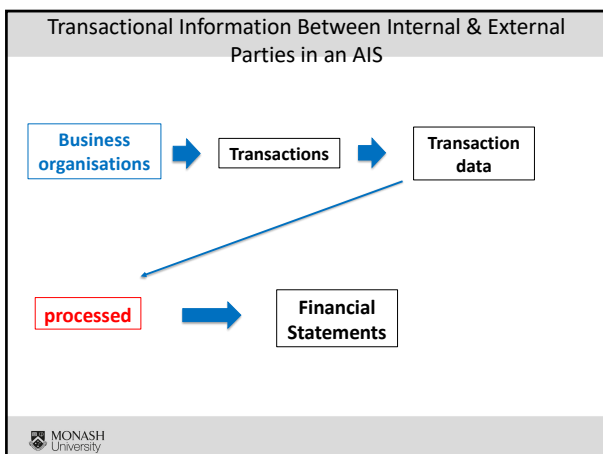


Are these characteristics familiar to you?

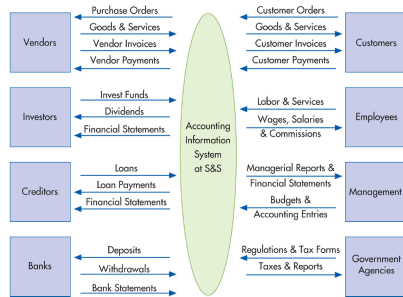








Interactions Between AIS and Internal and External Parties



Basic Business Processes

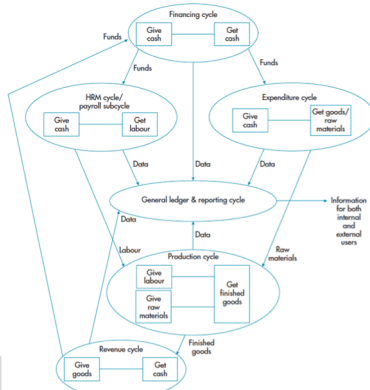
- Transactions between the business organization and external parties fundamentally involve a **"give-get" exchange**

What are the 5 major Business Processes or Transaction Cycles?

Review those on pages 32-33



Basic Business Processes



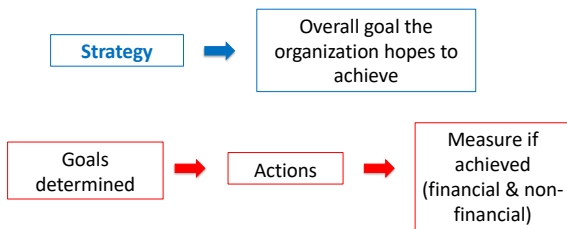
How Does an AIS Add Value to an Organization?

- A well thought out AIS can add value by:
 - Improving the quality and reducing the costs of products or services
 - Improving efficiency
 - Sharing knowledge
 - Improving efficiency and effectiveness of its supply chain
 - Improving the internal control structure
 - Improving decision making



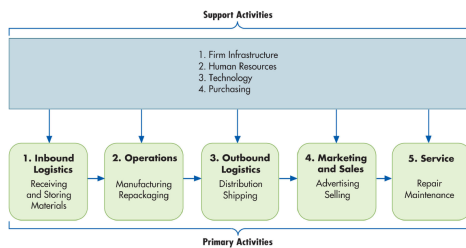
AIS and Corporate Strategy

- An AIS is influenced by an organization's strategy

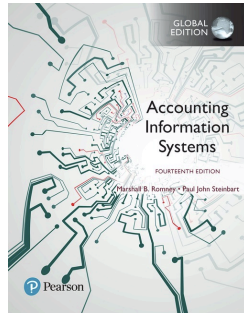


AIS in the Value Chain

- The **value chain** links together the different activities within an organization that provide value to the customer



Chapter 2 (p. 50-53)
Overview of Transaction
Processing and ERP Systems
Romney and Steinbart (2018)



Learning Objectives

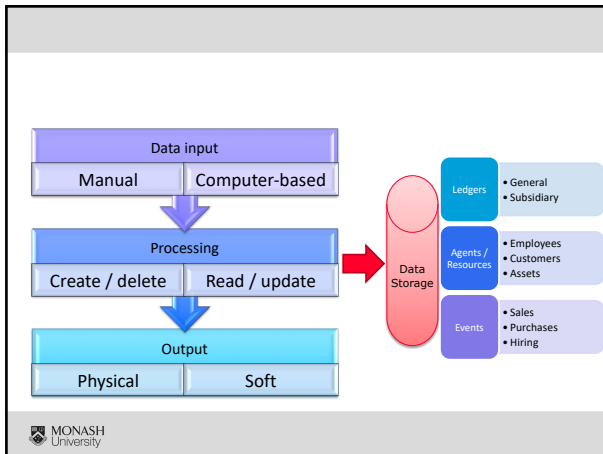
- Describe the data processing cycle used to process transactions, including how data is input, stored, and processed and how information is outputted. 
- Discuss how organizations use enterprise resource planning (ERP) systems to process transactions and provide information.

Importance of Good Data!!



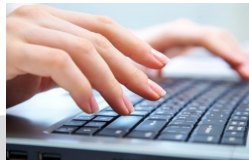
Incorrect data can lead to bad decisions,
embarrassment and angry users





1) Data Input

- Steps in Processing Input are:
 - ✓ Capture transaction data triggered by a business activity (event)
 - ✓ Make sure captured data are accurate and complete
 - ✓ Ensure company policies are followed (e.g., approval of transaction)



1.1) Data Capture

- Data collected for an activity includes:
 - Activity of interest (e.g., sale)
 - Resources affected (e.g., inventory and cash)
 - People who participated in the activity (e.g., customer and employee)

Data captured comes from source documents!

Source Documents

- Captures data at the source when the transaction takes place
 - Paper source documents
 - Turnaround documents
 - Source data automation (captured data from machines, e.g., Point of Sale scanners at grocery store)



Sales Order

ADD-ON SALES ORDER FORM

[Street Address] P.O. NO.
[City, ST, ZIP Code] DATE
[Phone] (Fax) CUSTOMER ID [ABC12345]

VENDOR [Name] [Company Name] **SHIP TO** [Name] [Company Name]
[Street Address] [Street Address]
[City, ST, ZIP Code] [City, ST, ZIP Code]
[Phone] [Phone]

QUANTITY	ITEM #	DESCRIPTION	UNIT PRICE	NOTES	LINE TOTAL
	C506A	Private Label Average		Must call for reconfirmation and pricing	
	C502	Home Pro Speaker		4 Case Minimums, 28 pr Case Must call for reconfirmation and pricing	
	AB24	Ground Greens (12 @ \$15.00)	\$19.99		
	AB26	Ground Greens (12 @ \$15.00)	\$19.99		
	AB22	Perky Greenhouse (12 @ \$11.30)	\$12.34		
	AB21	Perky Greenhouse (12 @ \$11.30)	\$12.34		
	AB20	Ground Greens (12 @ \$15.00)	\$19.99		
	AB19	Jump Start Auto-On Sales CD	\$19.99		
	AB18	Ground Greens (12 @ \$15.00)	\$19.99		
	AB17	White Greens (50 @ \$2.00)	\$2.34		
SUBTOTAL					
SALES TAX					
TOTAL					

* Prices subject to change without notice
* Sales tax calculated at time of purchase.

Paper-based source documents?? Pros vs Cons??

- **Advantages:**
 - o Record available (cybersecurity) & easier to operate system for a micro business (e.g. a club)
- **Disadvantages:**
 - o For most organisations, data eventually needs to be entered into AIS (digitised), no interactive data entry controls & environment

Turnaround Documents

FEEDBACK TURNAROUND DOCUMENT

INSTRUCTIONS Listed in Section "K" are strictly based on the original claim. To expedite payment, have the correct information in the original form and clearly "P" that corresponds to the original form. Do not add any new information and return the form by **JANUARY 31, 2018**. See your provider manual for assistance regarding the completion of this form.

FEEDBACK BLOCK	ORIGINAL INFORMATION	DATE	TIME
1	101 CONTROL NUMBER	0112	111107 SMITH WINE
2	102 CONTROL NUMBER	0112	111107 SMITH WINE
3	103 CONTROL NUMBER	0112	111107 SMITH WINE
4	104 CONTROL NUMBER	0112	111107 SMITH WINE
5	105 CONTROL NUMBER	0112	111107 SMITH WINE
6	106 CONTROL NUMBER	0112	111107 SMITH WINE
7	107 CONTROL NUMBER	0112	111107 SMITH WINE
8	108 CONTROL NUMBER	0112	111107 SMITH WINE
9	109 CONTROL NUMBER	0112	111107 SMITH WINE
10	110 CONTROL NUMBER	0112	111107 SMITH WINE
11	111 CONTROL NUMBER	0112	111107 SMITH WINE
12	112 CONTROL NUMBER	0112	111107 SMITH WINE
13	113 CONTROL NUMBER	0112	111107 SMITH WINE
14	114 CONTROL NUMBER	0112	111107 SMITH WINE
15	115 CONTROL NUMBER	0112	111107 SMITH WINE
16	116 CONTROL NUMBER	0112	111107 SMITH WINE
17	117 CONTROL NUMBER	0112	111107 SMITH WINE
18	118 CONTROL NUMBER	0112	111107 SMITH WINE
19	119 CONTROL NUMBER	0112	111107 SMITH WINE
20	120 CONTROL NUMBER	0112	111107 SMITH WINE
21	121 CONTROL NUMBER	0112	111107 SMITH WINE
22	122 CONTROL NUMBER	0112	111107 SMITH WINE
23	123 CONTROL NUMBER	0112	111107 SMITH WINE
24	124 CONTROL NUMBER	0112	111107 SMITH WINE
25	125 CONTROL NUMBER	0112	111107 SMITH WINE
26	126 CONTROL NUMBER	0112	111107 SMITH WINE
27	127 CONTROL NUMBER	0112	111107 SMITH WINE
28	128 CONTROL NUMBER	0112	111107 SMITH WINE
29	129 CONTROL NUMBER	0112	111107 SMITH WINE
30	130 CONTROL NUMBER	0112	111107 SMITH WINE
31	131 CONTROL NUMBER	0112	111107 SMITH WINE
32	132 CONTROL NUMBER	0112	111107 SMITH WINE
33	133 CONTROL NUMBER	0112	111107 SMITH WINE
34	134 CONTROL NUMBER	0112	111107 SMITH WINE
35	135 CONTROL NUMBER	0112	111107 SMITH WINE
36	136 CONTROL NUMBER	0112	111107 SMITH WINE
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92	192 CONTROL NUMBER	0112	111107 SMITH WINE
93	193 CONTROL NUMBER	0112	111107 SMITH WINE
94	194 CONTROL NUMBER	0112	111107 SMITH WINE
95	195 CONTROL NUMBER	0112	111107 SMITH WINE
96	196 CONTROL NUMBER	0112	111107 SMITH WINE
97	197 CONTROL NUMBER	0112	111107 SMITH WINE
98	198 CONTROL NUMBER	0112	111107 SMITH WINE
99	199 CONTROL NUMBER	0112	111107 SMITH WINE
100	200 CONTROL NUMBER	0112	111107 SMITH WINE

1 2 3
4 5 6

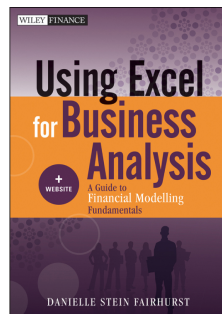
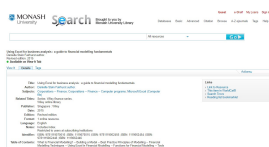
- Source data is captured
 - In machine-readable form
 - At the time of the business activity
 - e.g. ATMs; point-of-sale (POS)



Spreadsheet Basics & Introduction to Financial Modelling

Source material:

Fairhurst (2015) – Chapter 2 (pp. 33-38, 41-43), Chapter 5 (pp. 97-111, 119-126)

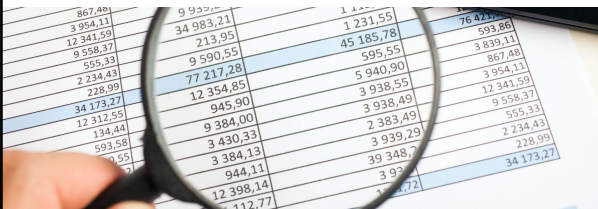


Learning goals

- After studying the readings in the online reading list, you should be able to
 - Explain the different types of cell referencing methods supported by Microsoft Excel
 - Be familiar with some of the basic design guidelines used by experienced users when they develop a spreadsheet model



Part 1: Design Guidelines



Well designed spreadsheets are...???



- **Likely to meet user requirements**
- **Easy to understand**
 - Users can see how to use
 - Others can make future changes
- **Reliable**
 - Tested rigorously
 - Few “existing” or “potential” errors
- **Flexible**
 - modular
 - easy to modify
 - can be re-used for similar applications
- **Efficient**
 - computer resource usage (i.e. use efficient formulas)
 - User’s time (i.e. designed to suit user, not programmer)



Spreadsheet design guidelines (1)

- **Don’t hard-code numbers** into formulas (Fairhurst pp. 23-28, 40)
 - E.g. =PMT(5%, B23, \$150000)
- Formulas that perform the same calculation in a row or column **must be consistent** (Fairhurst pp. 23-28, 41)
 - E.g. These formulas to calculate compound growth from a base amount in B7 and B8 show the same values, but only one is good practice

– **Right way:**

	1	2
SALES		
Food & Drinks	=FV(\$C7:\$C14-1,\$B7,1)	=FV(\$C7:\$C14-1,\$B7,1)
Newspapers & Magazines	=FV(\$C8:\$C14-1,\$B8,1)	=FV(\$C8:\$C14-1,\$B8,1)
	=B16+B17	=C16+C17

– **Wrong:**

	1	2
SALES		
Food & Drinks	=B7	=FV(\$C7:\$C14-1,\$B7,1)
Newspapers & Magazines	=B8	=FV(\$C8:\$C14-1,\$B8,1)
	=B16+B17	=C16+C17

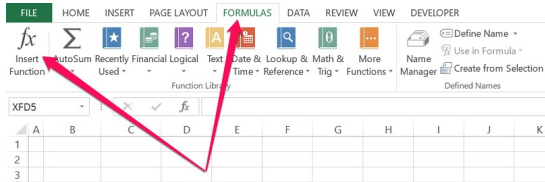


Guidelines (2): Make your work easy to understand

- Use meaningful report titles, row labels and column headings
- Include your **“name”** and a **“date/time stamp”** as a footer on reports (use Excel’s File/Page Setup command)
 - =TODAY()
 - =NOW()
- Where all values are expressed in thousands of units, include such units in titles (e.g. in \$000’s)
- Use range names in formulas (covered next...)



Part 2: Basic Excel Functions



SUM()

- This basic function is used to sum up a series of numbers
- You can add individual names by separating them with commas, and you can also specify a range of cells

	A	B	C	D	E	F	G
1			April				
2			Room				
3			Printing	\$6,250			
4			Stationery	\$5,280			
5			Staff Amenities	\$2,330			
6			Bank Charges	\$880			
7			Taxis	\$17,160			
8			Total Admin	\$34,100			
9			Insurance				
10			Rent	\$123,600			
11			Electricity	\$6,925			
12			Cleaners	\$7,560			
13			Total Property	\$149,005			
14			Grand Total	\$174,185			
15							

MAX()

- This function helps identify the **maximum** value
- The syntax is similar to SUM(); you can enter a range of cells, individual cells or combination of both

	A	B	C	D	E	F	G	H	I	J
1										
2		Jul	Aug	Sep	Oct	Nov	Dec	Max		
3	London	18.9	18.5	16	12.8	8.9	7.1	18.9		
4	New York	22.8	22.7	19.1	12.5	6.6	1.2	22.8		
5	Sydney	12	13.2	15.3	17.7	19.5	21.2	21.2		
6	Moscow	18.5	16.6	10.9	4.3	-2	-7.5	18.5		
7										
8										

MIN()

- This function helps identify the **minimum** value
- The syntax is similar to SUM(); you can enter a range of cells, individual cells or combination of both

The screenshot shows an Excel spreadsheet with the formula bar displaying `=MAX(B3:G3)`. The spreadsheet contains a table of average temperatures in degrees Celsius for five cities (London, New York, Sydney, Moscow) across seven months (Jul, Aug, Sep, Oct, Nov, Dec, Max). The values for the 'Max' column are 18.9, 22.8, 21.2, and 18.5 respectively.

	Jul	Aug	Sep	Oct	Nov	Dec	Max
London	18.9	18.5	16	12.8	8.9	7.1	18.9
New York	22.8	22.7	19.1	12.5	6.6	1.2	22.8
Sydney	12	13.2	15.3	17.7	19.5	21.2	21.2
Moscow	18.5	16.6	10.9	4.3	-2	-7.5	18.5

AVERAGE()

- As the name suggests, this function calculates the average, or mean of the numbers in the list
- The **AVERAGE** function only counts the cells with values

The screenshot shows an Excel spreadsheet with the formula bar displaying `=AVERAGE(B3:G3)`. The spreadsheet contains a table of average temperatures in degrees Celsius for five cities (London, New York, Sydney, Moscow) across seven months (Jul, Aug, Sep, Oct, Nov, Dec, Average). The values for the 'Average' column are 13.7, 14.2, 16.5, and 6.8 respectively.

	Jul	Aug	Sep	Oct	Nov	Dec	Average
London	18.9	18.5	16	12.8	8.9	7.1	13.7
New York	22.8	22.7	19.1	12.5	6.6	1.2	14.2
Sydney	12	13.2	15.3	17.7	19.5	21.2	16.5
Moscow	18.5	16.6	10.9	4.3	-2	-7.5	6.8

Part 3: Cell Referencing



Types of references

(Fairhurst 2015, pp. 119-122)

- Relative (e.g. B15)
- Absolute (e.g. \$B\$15)
- Mixed (e.g. \$B15, B\$15)
- Range name (e.g. SALES)



Referencing

- In Excel, **referencing** means using a cell's address (e.g. C5) instead of its value in a formula
- Referencing is also called "**soft-coding**", it has advantages over typing numbers directly into a formula (**hard coding**) (Maclean, 2016)
 - 1) Keeps complex formulas more organised
 - 2) Allows a model builder to add notes & documentation to explain assumptions about an input value
 - 3) Creates a general equation that can be used to compute an output for many possible input values
 - 4) When an input is used many times, referencing to a single source prevents errors
 - 5) Facilitates the use of other Excel features such as Goal Seek



Example

- B6 contains formula
=B5*(\$C\$1+1)
- When copied down, reference to **B7** turns into a Reference to **B6** (it is a relative ref)
- Reference to **\$C\$1** remains a reference to **\$C\$1** because it is an **absolute reference**

	A	B	C
1	Interest rate		0.09
2			
3	Cumulative earnings		
4	Year	Capital	
5	0	10000	
6	=A5+1	=B5*(\$C\$1+1)	
7	=A6+1	=B6*(\$C\$1+1)	
8	=A7+1	=B7*(\$C\$1+1)	



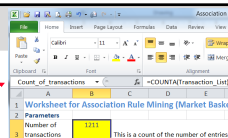
Cell Referencing Guidelines

- Use an **absolute** cell reference
 - when the cell referenced must remain unchanged, wherever the formula is copied
 - e.g. a constant used in multiple formulas
- Use a **mixed** cell reference
 - When the formula is to be copied both down and across, and the reference to a certain row or column (rather than a specific cell) must remain unchanged
 - e.g. Use \$A if all formulas must refer to the year number in column A
- Use **relative** cell references in all other cases



Use of Range Names

- **What is a range name?**
 - A name given to a cell or range of cells
e.g. B3 is called **Count_of_transactions**
- **How to define**
 - the Insert/Name/Define command or type name into the input area immediately above the column names
 - Try to show names somewhere in sheet
 - Depends on version: Insert/Name/Paste/Paste-List or Formulas/Name Manager, press Alt+Print Screen (to capture image), and then Paste
- **Why use?**
 - Provides information about the meaning of cells
 - Makes formulas more understandable
- **Things to watch out for:**
 - use brief and meaningful names
 - avoid range names that are also function names (e.g. SUM)
 - Excel usually defines range names as absolute references



Example of Range Names

- Formula with cell references:

ISNUMBER					
	A	B	C	D	E
1	Lease versus Purchase Model				
6	DATA:	Discount rate	12%		
7		Life of asset	4 years		
8		Salvage value	0		
9		Annual principal repayment	\$ 50,000		
10		Loan interest rate	5.65%		
11					
12	Option 1: Lease				
13	Period	Cash Flow	Discount	Discounted	
14	1-4	Annual cash flows: (Nominal \$)	Factor	Present Value	
15		Cash savings	80,000.00	=PV(Discount_rate,Life,-1,0)	\$242,987.95

- Formula with range names:

ISNUMBER					
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14	1-4	Annual cash flows: (Nominal \$)	Factor	Present Value	
15		Cash savings	80,000.00	=PV(Discount_rate,Life,-1,0)	\$242,987.95

2nd version is easy to understand, easy to maintain



Part 4: Developing Financial Models

Fairhurst (2015) – Chapter 2 (pp. 33-38, 41-43)



What is a Financial Model?

- 'A complex spreadsheet ... as long as a spreadsheet has inputs and outputs, and is dynamic and flexible - I'm happy to call it a financial model!' (Fairhurst, 2015)

Electrotech				
Resource available		Writing hours	Testing hours	
1	250		140	
Process variables		Writing hours	Testing hours	Profit per unit
2	Product	---	---	---
3	Generator	2	5	250
4	Alternator	3	2	150
Options				
Product	Number produced	Writing hours used	Testing hours used	Profit obtained
5	Generator	150	750	37500
6	Alternator	0	0	0
7	Total	150	750	37500

Developing Financial Models

- Considering the layout and design of a financial model is an important part of the model build
- It takes a unique mixture of logic, clarity of thought, and graphic layout skills by the financial modeller to build a well-designed model
- An Excel spreadsheet is simply the medium that we can use to create a financial model

Steps to Build a Model

1. **Design the high-level structure.** Okay, you're not going to know exactly what the layout of the model will be until you dig into it, but you should have some idea of the tabs. Start by assembling the data you have so far into the tabs as shown in Figure 2.5.
2. **Design outputs: summaries, charts, and reports.** Begin with the end in mind. By thinking about the output of your model early on in the process, you'll be more focused and will ensure that all of your calculations work toward the desired end result.
3. **Design inputs.** Thinking about the input design issues, get your input data into the right format or layout so that you can link your calculations to it.
4. **Plan calculations by breaking larger problem into smaller ones.** Now begin your calculations. You might begin by thinking that all expenses can go on one tab, but if staff costs, for example, begin getting rather complicated, you might decide that staff costs needs a tab of its own.
5. **Finalise outputs.** Link through your calculations to the outputs page. Test at every stage to make sure that the model makes sense and adjust as necessary.
6. **Design sensitivities and scenario analysis.** Once the model is working correctly, you can add sensitivities and scenario analysis. See "Overview of Scenarios Analysis Tools and Methods" in Chapter 11 for more detail to help you choose which methods of scenario analysis to use.
7. **Document as you go.** Assumptions documentation should not be left to the end. Do it as you go!



From Fairhurst (2015), Building a Model, pp. 42-43

Financial Model Layout

- Two typical layouts:

– Rectangular layout

Documentation	Advantages:
Input	easy to understand
Logic	easy to navigate around and print
Report	possible problem in inserting columns

– Separate into tabs

13	19	CookBks, pr trunks
14	20	ChildBks, YouthBks, CookBks,
15	22	YouthBks, CookBks, DoItYBks
16	25	YouthBks, CookBks, DoItYBks
17	27	ChildBks, CookBks, ArtBooks
18	28	YouthBks, DoItYBks



Why separate it into tabs or blocks?

- This is called **stratified design**
- It allows separation of functionality
 - Less prone to data entry error
 - Complexity can be hidden from user
 - Each tab can have very different settings
 - Don't need to overwhelm user with detail
 - Protect proprietary calculations (password protect make sheet hidden or "very hidden")



1) Documentation sheet contents

- **Introduction**
 - identifies the main purpose of the model
 - provides the user with a “map” of the layout of the model
- **Instructions**
 - explains how to operate the model
- **Assumptions**
 - lists any assumptions that are built into the model
- **Names Used**
 - identifies any range names defined
 - identifies any cells linked to other spreadsheets



2) Input (data) sheet

- **Contents**
 - Data only!!
- **Design**
 - Input area should look as much as possible like the manual form/s it is replacing (if applicable)
 - NO formulas where possible, except for data validation
 - validation formulas should be adjacent to the appropriate data value
- **Benefits**
 - Cleaner and easier for others to use
 - Dedicated input area reduces the chance of:
 - Writing over formulas
 - Entering data values in incorrect cells



3) Logic (calculation) area

- Use as a **“repository of complex calculations”**
 - Report area should contain only simple relative cell references to calculations performed in the logic area
- **Advantages:**
 - one-way dependency
 - changes can be made to the layout of the report without affecting the logic area
 - allows the logic to be split into smaller modules



4) Report area

- Report layout should be designed first
 - input and logic areas can then be designed to complement the layout of the report area
 - design process should involve the programmer and the user
 - most future changes will be made to the report area
- If the report is separate, can add a row, compress a section etc, without changing the model itself
- Saves time in the re-audit process

