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Chapter 7

Control and Accounting Information Systems

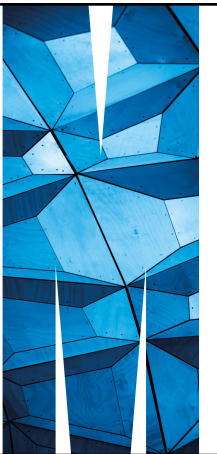
Romney and Steinbart (2018)

Chief Examiner Edward Tello
Semester 2, 2018

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Learning Objectives (1 of 2)

- Explain basic control concepts and why computer control and security are important.
- Compare and contrast the COBIT, COSO, and ERM control frameworks.
- Describe the major elements in the internal environment of a company.
- Describe the control objectives that companies need to set and how to identify events that affect organizational uncertainty.

Learning Objectives (2 of 2)

- Explain how to assess and respond to risk using the Enterprise Risk Management model.
- Describe control activities commonly used in companies.
- Describe how to communicate information and monitor control processes in organizations.

Terminology

- Any potential adverse occurrence or unwanted **event** that could be injurious to either the accounting information system or the organization is referred to as a **threat**
- The potential dollar loss should a particular threat become a reality is referred to as the **exposure** or **impact** of the threat
- The probability that the threat will happen is the **likelihood** associated with the threat



Why are threats to Accounting Information Systems increasing?



Increasing threats to AIS

Some reasons for the failures of controlling security and integrity in organisations:

- ✓ Access of information
- ✓ Difficulty to control information on distributed networks
- ✓ Customers and suppliers can access to each other's systems and data

E.g. EDI



What are Internal Controls?

It's the process implemented to provide '*reasonable assurance*' that control objectives are met

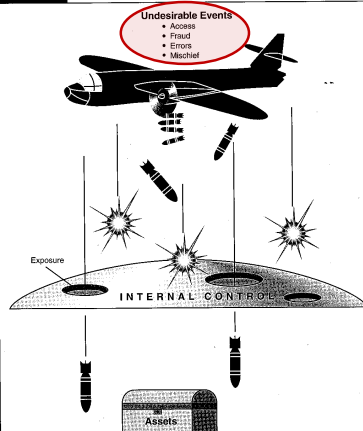
Why '*reasonable assurance*'?



FIGURE 3-3 Internal Control Shield

Internal Controls

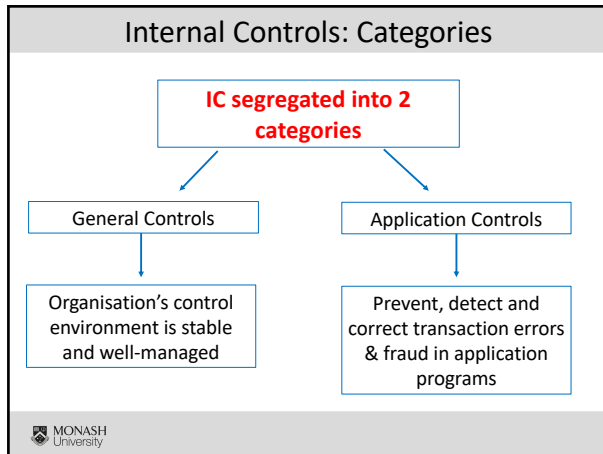
Figure from: J. Hall
"Accounting Information Systems", South Western



Internal Controls (IC)

Which objectives should be achieved?

- Safeguard assets
- Maintain records in sufficient detail to report company assets accurately and fairly
- Provide accurate and reliable information
- Prepare financial reports in accordance with established criteria
- Promote and improve operational efficiency
- Encourage adherence to prescribed managerial policies
- Comply with applicable laws and regulations



Internal Controls: Categories

- **General Controls**
 - Make sure an organisations' information system & control environment is stable and well-managed
 - For example (Zonneveld & Fox, 2004) :
 - Controls over data centre operations or
 - Access security controls

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Internal Controls: Categories

- **Application Controls**
 - The objective of application controls is to ensure that (Bellino & Hunt, 2007):
 - Input data is accurate, complete, authorised and correct
 - Data is processed as intended in an acceptable time period
 - Data stored is accurate and complete
 - Outputs are accurate and complete
 - A record is maintained to track the process of data from input to storage and to the eventual output
 - For example:
 - Logic Tests
 - Validation checks

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Internal Controls: Functions

By **function**
(3)

- Preventive Controls
- Detective Controls
- Corrective Controls



Functions of Internal Controls (3)

- **Preventive controls**
 - Deter problems from occurring
 - For example, think of required fields when shopping online
- **Detective controls**
 - Discover problems that are not prevented
- **Corrective controls**
 - Identify and correct problems; correct and recover from the problems



For example, think about a company that uses information systems
Read each option and decide what type of control each one is:

1) The organisation has a firewall in place, what kind of control activities

??



2) The organisation carries out regular system scans

??



3) But a virus attacked the system, IT staff used a virus protection software to remove the virus that corrupted programs

??



Control functions

Preventive, Detective or Corrective?

1) Bank reconciliation	??
2) Resubmitting transactions for subsequent processing	??
3) Video surveillance	??
4) Hiring Policy	??
5) Controlling access to resources	??



Regrettably, not all organisations have an effective internal control system

e.g.
US FBI → IT infrastructure vulnerabilities & security problems





Legislation that affects Internal Controls

- **Foreign Corrupt Practices (FCPA)**
 - US legislation passed in 1977 to:
 - Prevent companies from bribing foreign officials to obtain business
 - Requires all publicly owned corporations to maintain a system of internal accounting controls.





Legislation that affects Internal Controls

• ASX Corporate Governance Guidelines

- Lay solid foundation for management and oversight
- Structure the board to add value
- Promote ethical and responsible decision-making
- Safeguard integrity in financial reporting
- Make timely and balanced disclosure
- Respect the rights of shareholders
- Recognise and manage risk
- Remunerate fairly and responsibly

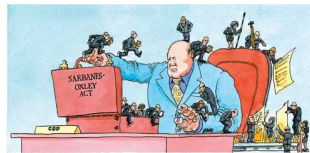


Legislation that affects Internal Controls

• US Sarbanes-Oxley (SOX) act (2002)

- Applies to publicly held companies and their auditors to:
 - Prevent financial statement fraud
 - Financial report transparent
 - Protect investors
 - Strengthen internal controls
 - Punish executives who perpetrate fraud

Read 'The Unexpected Benefits of Sarbanes-Oxley' by Wagner and Dittmar (2006) (see [Reading List](#) on Moodle – recommended / voluntary)



Source: Corporate Justice Blog (2010)

'The Unexpected Benefits of Sarbanes-Oxley'

- Broad areas in which SOX compliance benefited firms' governance, management, and investors include:
 - Strengthening the Control Environment
 - Improving Documentation
 - Increasing Audit Committee Involvement
 - Standardizing Processes
 - Reducing Complexity
 - Minimizing Human Error

Source: Wagner and Dittmar (2006) – see [Reading list](#)

After the SOX was passed, the SEC mandated management:

✓ ???



Control Frameworks

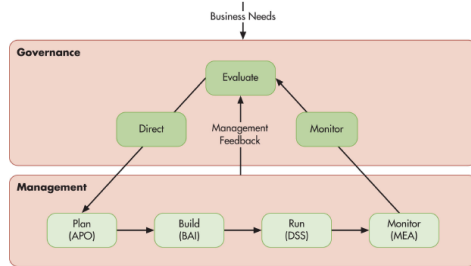
- **COBIT**
 - Framework for IT control
- **COSO**
 - Framework for enterprise internal controls (control-based approach)
- **COSO-ERM**
 - Expands COSO framework taking a risk-based approach

COBIT Framework

- Current framework version is **COBIT5**
- Based on the following 5 key principles:
 - Meeting stakeholder needs
 - Covering the enterprise end-to-end
 - Applying a single, integrated framework
 - Enabling a holistic approach
 - Separating governance from management



COBIT5 Separates Governance from Management



Components of COSO Frameworks

COSO-IC

- Control (internal) environment
- Risk assessment
- Control activities
- Information and communication
- Monitoring

COSO-ERM

- Internal environment
- Objective setting
- Event identification
- Risk assessment
- Risk response
- Control activities
- Information & communication
- Monitoring

Review the 17 principles of COSO's IC on page 229

COSO ERM

Things we need to define to manage risks effectively:

- "how we do business"
 - management philosophy, style, and risk appetite
- Objectives: "where we want to be"
 - Corporate, business, and operational strategy
- Events we want to manage
- Risks we face, and how we should respond to risks
- How we want to manage events and risks (control activities)
- The information we need and gather and give out to conduct and manage the business
- How we will monitor what is happening and our progress towards goals



e.g. ERM → Company ABC could look at the **control activities** for the **operation objectives** in its **Asian Division**

Internal Environment

- Management's philosophy, operating style, and risk appetite
- Commitment to integrity, ethical values, and competence
- Internal control oversight by Board of Directors
- Organizing structure
- Methods of assigning authority and responsibility
- Human resource standards



Objective Setting

- **Strategic objectives**
 - High-level goals
- **Operations objectives**
 - Effectiveness and efficiency of operations
- **Reporting objectives**
 - Improve decision making and monitor performance
- **Compliance objectives**
 - Compliance with applicable laws and regulations



Event Identification

- Identifying incidents both **external** and **internal** to the organization that could **affect the achievement of the organizations objectives**
- **Key Management Questions:**

✓ ???



Risk Assessment

Risk is assessed from 2 perspectives:

- **Likelihood**
 - Probability that the event will occur
- **Impact**
 - Estimate potential loss if event occurs

e.g.
Earthquake?

**Risk
Assessment
Matrix**

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	M	H	H	E	E
Likely	M	M	H	H	E
Possible	L	M	M	H	E
Unlikely	L	M	M	M	H
Rare	L	L	M	M	H



Source: <http://www.dpmc.gov.au/implementation/policy.cfm>
(Australian Government, Department of the Prime Minister and Cabinet)

Risk Assessment

Types of risk:

- **Inherent**
 - Risk that exists before plans are made to control it
- **Residual**
 - Risk that is left over after you control it



Risk Response

- **Reduce**
 - Implement effective internal control
- **Accept**
 - Do nothing, accept likelihood, and impact of risk
- **Share**
 - Buy insurance, outsource, or hedge
- **Avoid**
 - Do not engage in the activity



All management control systems depend on knowing objectives and risks

- The Committee of Sponsoring Organizations of the Treadway Commission (COSO) defines **risk** as:
 - “the possibility that an **event** will occur and adversely affect the achievement of **objectives**” (COSO, 2004 p.37)
- To identify the correct **control**, you must know what **risks** are present in the environment being controlled
- To know what **risks** are present, you need to know which **objectives** you want to achieve
- Thus...

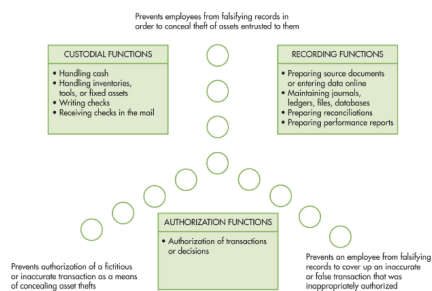


Control Activities

- 1) Proper authorization of transactions and activities
- 2) Segregation of duties
- 3) Project development and acquisition controls
- 4) Change management controls
- 5) Design and use of documents and records
- 6) Safeguarding assets, records, and data
- 7) Independent checks on performance

Review the 7 categories of control procedures on pages 238-243

2.1) Segregation or Separation of Accounting Duties



2.2) Segregation of Systems Duties

- Segregation of systems duties as to divide authority and responsibility between the following systems functions:
 - System administration
 - Network management
 - Security management
 - Change management
 - Users
 - Systems analysts
 - Programmers
 - Computer operators
 - Information system librarian
 - Data control



Information & Communication

Communication must occur internally and externally to provide information needed to carry out day-to-day internal control activities



All personnel must understand their responsibilities!!



Monitoring

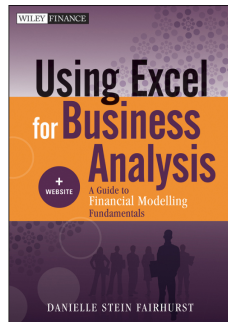
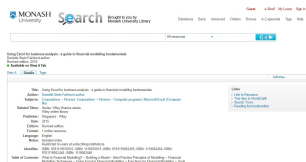
- Perform internal control evaluations (e.g., internal audit)
- Implement effective supervision
- Use responsibility accounting systems (e.g., budgets)
- Monitor system activities
- Track purchased software and mobile devices
- Conduct periodic audits (e.g., external, internal, network security)
- Employ computer security officer
- Engage forensic specialists
- Install fraud detection software 
- Implement fraud hotline



Review the methods of monitoring performance on pages 244-246

Financial Modelling: Lookup Formulas

Source material:
Fairhurst (2015) – Chapter 6 (pp. 140-152)



Excel in Financial Modelling

- For use in business analysis, the most useful functions fall into the categories of:
 - Logical functions (e.g. IF, AND, etc)
 - Aggregation functions (e.g. SUMIF, COUNTIF, etc)
 - Lookup functions (e.g. HLOOKUP, VLOOKUP, etc)**
 - Financial functions (e.g. NPV, IRR, PMT, etc.)



What if you need to look up larger lists or lists where you need to choose within a range of values???



Alternatives

- VLOOKUP
- HLOOKUP
- LOOKUP
- MATCH



VLOOKUP

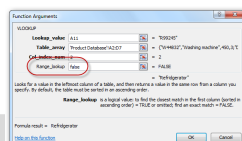
- **VLOOKUP** is an Excel function that allows you to search and retrieve a cell's content from another column
- In this case, the “**V**” stands for vertical & relies on looking up data from the leftmost column of a table, which is often on another spreadsheet
- It requires 4 arguments & allows the user to specify whether to use an exact match or close match
- It saves a lot of time and eliminates the chance of human error when you are searching a large database for a particular value

Source: Hennegar, A. (2018) – Productivity Portfolio

VLOOKUP

- **VLOOKUP(value, table, column#, type)**
 - **Lookup_value** = search value (in a column)
 - **Table_array** = range reference of the table;
 - **Col_index_num** = column number within the table containing the information to be returned.
 - **Range_lookup** = Also called TYPE. **FALSE** when an exact match is required.
- Returns **#N/A** if no match

Use **TRUE** to find an approximate match



HLOOKUP

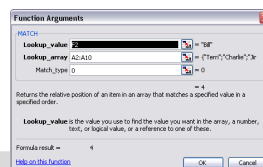
- It is the exact same function as **VLOOKUP**, but looks up data that has been formatted by rows instead of columns
- Format:**
 - Lookup_value** = search value (in column 1)
 - Table_array** = range reference of the table
 - Row_index_num** = row number within the table containing the information to be returned.
 - Range_lookup** = Also called TYPE. **FALSE** when an exact match is required.
- Returns **#N/A** if no match

Use **TRUE** to find an approximate match



MATCH

- Finds the location of a value in a range, returns the position of the value
 - MATCH(value to find, range to search, match_type)**
 - Type: **1** = largest value in range <= to lookup
 - 0** = exact match
 - 1** = smallest value >= to lookup value



Improving VLOOKUP with MATCH

- If the **'table array'** changes, there will be problems
- The best way around this is not to hard code your **'column number'** in your **VLOOKUP** formula
- How?
 - Nest the **VLOOKUP** with a **MATCH** function



VLOOKUP vs HLOOKUP vs LOOKUP

- The **LOOKUP** function allows a user to search for a piece of data in a row or column and return a corresponding piece of data in another row or column
- The **VLOOKUP** function is similar BUT only allows a user to search vertically in a row and only returns data in a left-to-right procedure whereas the HLOOKUP searches horizontally
- **BUT**
 - Although LOOKUP function is much simpler, the data must be sorted in alphabetical order or it won't work.
This does limit its usage significantly (Fairhurst, 2015)

