Lecture Objectives

• to be aware of some typical computer-based information systems within business organisations
• to understand concepts and principles of basic business systems

Types of Information Systems

• There is a range of information systems to serve the varied needs of users:
  • Transaction processing systems
  • Electronic commerce
  • Process control systems
  • Business Intelligence Systems
  • Knowledge-based systems: Expert systems, Neural networks,
  • Multimedia systems
  • Office automation systems
  • Geographical information systems
Transaction Processing Systems (OLTP)

- OLTP: On-Line Transaction Processing Systems
- capture, process and store business events
  - transaction – any business related event
  - eg. payment to employees, sales to customers
- deal with basic business operations and functions
  - eg. payroll systems, billing systems, ordering systems
- high volume of data
- objectives
  - efficient data capture, movement and processing
  - integration with other information systems
  - providing information to the business
  - developer needs to understand basic business processes and business information needs

Electronic Commerce

- business conducted electronically through computer-to-computer exchange of standard business transactions
- possible because of international communication networks (eg. internet)
- requires high level of inter-organisational co-operation and standardisation of data formats across multiple business functions

Process Control Systems

- similar in nature to OLTP, but require the system to have in-built capability to receive information from its environment and respond immediately to given stimuli without operator intervention (real time)
- range from the very simple (thermostat for air conditioner) to the very complex (online shopping)
- requires the developer to understand the way the system works and the nature of the specialised technology required – appropriate technical expertise is necessary
Business Intelligence Systems

- general term to cover a variety of types of system which aim to support management decision making
- based on aggregate transactions, not individual ones
- provide basis for management action

E.g. management information systems, decision support systems, executive information systems, data warehouses, customer relationship management systems

Other Types of Information Systems

- Decision Support Systems (DSS)
- Executive Information Systems (EIS)
- Knowledge based systems
- Expert systems
- Multimedia systems
- Office automation
- Geographical Information systems

Types of information systems

- a large and ever-expanding range of specialised software is available for all these types of system
- each type of system requires a particular set of technical skills on the part of the system developer
- different types of system tend to have different types of key users involved in their development – executives, managers, knowledge workers, clerical workers, etc.
- different system development approaches are needed for these different types of systems
- if you become involved in any area you will need to learn a whole new set of skills, reference literature, software etc.
Example basic business systems

- Supermarket
- Supplier of product to Supermarket
- Supermarket’s bank

Basic Business Systems

- Large business organisations process the majority of routine transactions with information systems
- Many also use business intelligence systems to understand the data collected.
- Systems analysts need a working knowledge of business principles and basic business systems

Basic Business Systems

- Typical organisational units and systems:
  - Customers
  - Accounting
  - Materials/Purchasing
  - Human resources
  - Production
  - Marketing
Business applications for information

- Customers:
  - customer history, customer orders
- Accounting:
  - Accounts payable, accounts receivable, general accounts
- Materials:
  - Assets, consumables, inventory control

Business applications for information

- Human resources:
  - Payroll, personnel
- Production:
  - Planning, scheduling, requisitions
- Marketing:
  - Sales, promotion and publicity

Basic business cycles

- Inventory (purchasing & receiving)
- Inventory (finished products/services)

SUPPLIER --- Products --- THE BUSINESS --- Products --- CUSTOMER

Money --- Accounts payable --- Money

Money --- Accounts receivable --- Money
Basic business applications

Order entry & invoicing

To meet customers’ demand (customer orders) for goods or services. Request payment for goods or services supplied to the customer.

Information required:
- Up-to-date records of goods available or service providers
- Customers’ credit status
- Location of goods.
- What goods were packed and despatched
- Which carrier delivered the goods, and when
- How much was request in payment from customer; when?

Order entry & invoicing process

- Order processing:
  - Verify order; check customer credit rating
- Order filling:
  - Verify stock available; pick stock
- Order packing and delivery:
  - Produce packing slip (or invoice); prepare delivery docket
- Invoicing (billing):
  - Produce invoice for customer; Send copy invoice to accounts receivable
Order entry & invoicing

Information produced:
- Picking slip: assists warehouse staff to locate goods (what, where, in what order)
- Packing slip: has freight data for transport (e.g. weight, volume, quantity, handling)
- Delivery docket: accompanies goods and provides proof of delivery and is often a copy of the invoice
- Backorder: created when stock is not available and a customer’s order is “held” until it can be filled
- Credit note: issued to customers for returned goods – inventory and accounts receivable notified

Order entry & invoicing

- Data accessed:
  - Customer, inventory, supplier and product files
- Links to other subsystems:
  - Inventory control, and accounts receivable (debtors) subsystems

Inventory control information systems

To ensure adequate stock levels to satisfy customer demand while minimising costs of holding stock

Information required:
- Stock on hand: quantity of stock currently held
- Reorder point: when to order more stock
- Reorder quantity: how much to order
Inventory control

- EOQ (economic order quantity): the ideal quantity to order to minimise BOTH ordering costs (clerical processing, handling) and holding costs (purchase, space, maintenance, investment loss)
- "Just in time": alternative approach of producing goods at the latest possible time
- Stocktaking: a count of physical stock to compare with expected quantities
- Stock demand patterns: may be constant demand, seasonal demand, increasing or decreasing trends

Inventory system processes

- Report stock status; produce inventory status report (on hand – not on hand – on order)
- Produce purchase orders; produce reorder report
- Add new stock (on delivery); adjust quantity on hand (when stock sold).
- Set stock reorder points (safety stock levels, lead times – time it takes to get stock from supplier to warehouse)
- Stocktakings of stock on hand; Produce stocktake report
- Accept returned goods; return/write down faulty goods.

Computerised inventory systems assist with accurate and up-to-date information and calculations of past and future demand.

Inventory control

- Data about stock items typically required:
  - Descriptive: Description, price, unit of measure, cost, supplier
  - Reordering: reorder point, reorder quantity, safety stock level, seasonal variation
  - Status: quantity on hand, quantity on order, quantity on backorder
  - Historical: qty sold last month, last year, month-to-date, year-to-date
- Stock item codes or SKU barcodes are used
Inventory control

- Data accessed:
  - Stock/product file (includes stock movements and stocktake data).
- Links to other subsystems:
  - Order entry
  - Accounts receivable
  - Warehouse system (often source of physical stock location data)

Accounts receivable (Debtors)

To minimise the outstanding debt to the business from customers, produce regular requests for payment (statements)

Information required:
- Customer debts owed and payments made (account balance)
- Length and extent of individual outstanding debts (delinquent debtors)
- List of all customers showing total balance owing as well as amounts overdue 30, 60 and 90 days.

Accounts receivable (Debtors)

- Major outputs (Information produced)
  - Statements: a request for payment usually issued monthly, lists transactions during the period and aged account balance,
  - Remittance advice/payment slip: for customer to make payment
  - Sales journal: a list of all sales made in chronological order showing date, amount, customer, salesperson, sale transaction details
  - Cash receipts journal: a list of payments in chronological order showing date, amount paid, payment details and invoice or statement the payment relates to
  - Aged debtors list
  - General ledger transaction summary
Accounts receivable processes

- Record sales (invoices) to maintain sales journal
- Record payments to maintain cash receipts journal
- Record credit notes in the sales return journal
- Calculate customers’ account balances:
  - Balance forward: apply payment to oldest transaction first
  - Open item: apply each payment to a specific transaction
- Produce customer statements
- Produce summary of transactions for the general ledger

Accounts receivable (Debtors)

- Data accessed:
  - Customer files
- Links to other subsystems:
  - Data from order entry and invoicing is used to maintain customer account balances and delinquent debtor data is fed back
  - Summary of transactions is input to the general ledger system

Accounts payable (creditors)

To keep track of debts payable by the organisation to its suppliers (e.g. purchase of raw materials for production, finished goods for retail, services etc)

Information required:
- Appropriate time for payment (cash flow)
- Any discounts offered by supplier for early payment
(Most businesses are carried “on account” by their suppliers)
Accounts payable (creditors)

- Major outputs (information produced):
  - Cheques: drawn on appropriate account to pay suppliers
  - Remittance advices: what is being paid for
  - Cheque register: record of all cheques written with for whom, for how much and which invoices (the business must assign its own reference or voucher number to each invoice for tracing)
  - Cheque reconciliation: list of all cheques and their status—cancelled, cashed, paid, outstanding
  - Manual payments: must be recorded

Accounts payable (creditors)

- Major outputs (Information produced):
  - Up-to-date accounts payable register: list of all new charges made to the creditors system in chronological order with date, amount, vendor, general ledger accounts affected, transaction details
  - Open item report: invoices due for payment
  - Cash requirements report: all items past due, currently and optionally due
  - Vendor analysis report: analysis of this year’s activity for comparison
  - General ledger distribution

Accounts payable processes

- Record vendor payables (invoices to pay)
- Determine payables this period and payables held over
- Process payables this period
- Process payables summaries: reports, general ledger distribution, expense reports
General ledger (G/L)

- “general”: many areas
- “ledger”: place to keep accounting records
- Consolidates all financial transactions to summarise financial activity by account number, changes to assets and liabilities, and to profit and net worth
- Major inputs (information required):
  - Chart of accounts, journal vouchers, G/L summaries
- Major outputs (Information produced):
  - Balance sheet, profit and loss statement, consolidated G/L, trial balance report

General ledger (G/L)

- Chart of accounts: codes different types of assets, liabilities, revenues and expenses into specific accounts
- Balance sheet: compares assets with liabilities to determine net worth
- Profit and loss statement: shows expenses, revenues, and profit and loss for the accounting period (e.g. one month)
- Cash flow statement: flow of funds into and out of the business – increase or decrease

General ledger (G/L)

- Major inputs (G/L summaries or distributions):
  - Sales journal from invoice processing: may be an invoice summary report
  - Cash receipts journal from accounts receivable
  - Payables journal from accounts payable
  - Disbursements journal from the payables cheque register
  - Payroll journal from payroll cheques and other employee expenses
  - General journal of amounts outside these journals
General ledger (G/L)

- Record (post) all general (major) journal transactions
- Post subsidiary journals e.g. fixed assets
- Produce trial balance: a list of ledger account balances to prove that debits equal credits
- Produce financial statements

General ledger (G/L) processes

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Business records

- Double entry bookkeeping: the practice of recording equal credits and debits for every business transaction
- Importance of a clear audit trail:
  - Begin with G/L, trace an account entry to its subsidiary journal (e.g. sales journal), totals in the journal can be traced to daily batch balance totals, and individual transactions traced to customer orders etc.
Reference