MGMT3335 Enterprise Systems

Master Revision Notes · Exam-Focused Synthesis

Built strictly from the unit lecture transcripts, the sample exam paper, and its marking guide. Every framework, definition, advantage, limitation, and example below is grounded in those sources. Where sources differ, the discrepancy is flagged. Highest-value material is the implementation life cycle (Section A of the exam) and process modelling (Section B).

1. Unit Map

Three connected pillars

Pillar	What it covers	Why it connects
A. Enterprise systems and ERP fundamentals	What an ERP is, the information-system model, integration, modularization, evolution (MRP to postmodern), market and vendor tiers, deployment models, architecture, database, configuration vs customization, best practices.	Defines the artefact that is later selected, justified, modelled, and implemented. The "what" and "why".
B. Business process management and modelling	Business processes, Porter value chain, BPA / BPR / BPI, process discovery, levels of abstraction, SIPOC, IGOE, process maps, BPMN, model quality.	An ERP only works if business processes align with it. Modelling is how the "as is" and "to be" are captured before and during implementation.
C. ERP implementation	SDLC and ERP life cycle, readiness, business case, feasibility, selection, governance, conversion strategies, change management, testing, data migration, go-live, post-implementation.	The "how". Turns a justified business case and aligned processes into a live, adopted system.

How they flow

Recognise organisational silos and the need to integrate (A) → analyse and model current processes, decide on redesign or improvement (B) → assess readiness, build the business case, run feasibility, select a vendor, govern the project, manage change, convert, go live, and support (C). Change management runs through every implementation phase.

Most examinable (mapped to the sample paper)

Q	Topic tested	Where in these notes
A1 (10)	Business case and its relation to feasibility assessment	§5.3, §5.4
A2 (10)	Five activities in a typical ERP selection process	§5.6
A3 (10)	People-related issues in ERP implementation and how to deal with them	§5.10
A4 (10)	Purpose and content of the go-live readiness process	§5.12
A5 (10)	Three feasibility types and how each supports ERP implementation	§5.4
B1 (20)	SIPOC for the motor-claim handling process	§4.4, §7
B2 (30)	BPMN model of the motor-claim handling process	§4.7, §7

Section A: six questions, answer five (50 marks). Section B: answer all, SIPOC and BPMN on one worked scenario (50 marks). Section A is entirely implementation and justification; Section B is entirely process modelling.

2. Enterprise Systems and ERP Fundamentals

2.1 What an enterprise system is

Definition. A large-scale application software package whose core aim is to integrate information generated across the different functions and locations of a multinational or distributed organisation into one central place, and to standardise business processes.

Information system model. An ERP is one type of information system. An information system is a collection of **people, processes, technology and data** working together: it takes data as input, processes it, and produces a more valuable output as information or knowledge. ERP components mirror this: hardware, software (including the database), information, business processes, and people (end users and IT staff).

Purpose / why organisations use it. Integrate information for a single version of truth; provide real-time access for correct, timely decisions; standardise processes using embedded best practices; support growth, new branches and new countries (regulations and tax reporting are embedded); replace legacy systems; improve business processes, working capital and company growth.

THE SILO PROBLEM IT SOLVES

A traditional functional hierarchy creates siloed, self-contained units focused on functional goals. Limitations: inward looking, duplicate information, communication gaps, complexity and bureaucracy. ERP replaces a function focus with an **end-to-end process focus** that spans departments around a centralised data repository (worked example: a procurement manager must pull from finance, engineering, production and QA; in a silo this is slow, costly and creates bottlenecks).

TWO INTEGRATION TYPES

- **Logical integration:** shared understanding of information between stakeholders (not physically visible).
- **Physical integration:** seamless connectivity between data systems.

MODULARIZATION

The system is built from modules targeted at departments (for example sales and distribution, purchasing, HR). With cloud delivery, firms buy only the modules they need, which gives flexibility and saves money. Buying related modules from one vendor improves integration. Third-party add-ons supply missing functionality; middleware provides generic interfaces that help modules integrate.

ADVANTAGES AND LIMITATIONS OF INTEGRATION

Advantages	Limitations
Enhanced integration; increased revenue; competitive advantage; improved information visibility; real-time data; best practices embedded.	Expensive; return on investment may not be visible in the short run; standardisation can reduce creativity / uniqueness; information security risk from centralising data in one place.

TYPES OF ENTERPRISE SYSTEMS

ERP (integrates finance, HR, CRM, documents); **CRM** (manages customer relationships, suited to customer-oriented firms such as banks); **SCM** (tracks and manages the supply chain end to end); **Knowledge management systems** (organise documents, cases and knowledge sharing).

2.2 ERP characteristics and evolution

ERP is the first generation of enterprise system, built on a well-structured central database accessed through front ends; it is cross-functional, process-centred, and historically a back-office "backbone".

Era	System
1960s	Inventory management and control
1970s	MRP (Material Requirements Planning): plan materials
1980s	MRP II (Manufacturing Resource Planning): manufacturing focus
1990s	ERP: integrated features
2000s	Extended ERP / ERP II: more features, process viewpoint
2013 on	Postmodern ERP: modularization, buy-what-you-need modules

ERP II moved from optimising resources and inward focus toward collaboration, supply-chain focus, outward focus and e-business. It supported B2B, B2C and B2E functions (for example SCM, cost and performance management, product life-cycle management, supplier relationship management, HR, CRM). **Postmodern ERP** modules split into **administrative** (accounting and finance, HR, procurement) and **operational** (manufacturing, SCM, order management), and added business intelligence, enterprise asset management and e-commerce.

BEST PRACTICES AND ACCELERATORS

Best practice: a process generally recognised as more effective and efficient than others in a certain industry. ERP vendors embed best practices because their systems have been tested across many organisations. **Accelerators** are industry-specific versions (for example mining, education) that embed domain best practices. **Benefits:** high data security, increased productivity, high customer service, visibility, ability to forecast against industry norms. **Issues:** not all best practices suit every firm; loss of uniqueness; conflict with corporate goals or culture; may force changes to processes, structure, culture and require user assistance. Either align processes to the ERP or customise the ERP to the processes.

2.3 ERP technology, architecture and database

THREE DATA TYPES IN THE ERP DATABASE

Type	Nature	Examples
Master data	Static, relatively permanent	Supplier, employee, product, customer masters; fixed assets, departments, licences
Configuration data	Sets up the system to support operations	Default language, fiscal year, credit-check rules, plants (factories), sales orgs, warehouses, distribution channels
Transaction data	Dynamic; records consequences of executing processes	A sale: combines customer master + configuration (currency, language). Transaction = master data + configuration data.

Databases are relational (tables plus relationships, for example one-to-many between order and product). Large firms use Oracle, IBM DB2, and in-memory databases (data in RAM) for fast real-time access; SAP uses HANA; the unit software (Odoo) uses PostgreSQL (open source).

ARCHITECTURE

ERP architecture is usually **package-driven** (set by the vendor) and is best kept flexible. **Logical architecture** shows how the system is organised (hardware, database, business models, UI). **Physical architecture** shows how physical components are arranged. Application structure has three layers: presentation, business logic, and database management.

Architecture	Idea	Trade-offs
Centralised / mainframe	Mainframe plus "dumb" terminals (no processing)	+ Reliable for transaction-intensive industries (banking, airlines). − Easily overloaded.
Client-server (2-tier)	Clients have processing power; connect to a server	+ Simultaneous updates, security via authorization, distributed workload. − Network dependent, costly to maintain.
Three-tier client-server	Adds an application tier between client and database	+ Better security, more manageable maintenance. − Expensive, complex to develop.
Web-based	Adds a browser tier	+ Improved access, easy open-standard integration. − Network dependence, security concerns.
Service-oriented (SOA)	Functionalities delivered as services on request (for example ERP requests customer data from CRM)	Principle-based; consumer requests, provider supplies.
Cloud	IT services and resources over the internet, on demand	Pooled resources, virtualization. Layers: IaaS, PaaS, SaaS (ERP via URL and login, cancel subscription when done).

2.4 Configuration, customization and bolt-ons

Approach	What it is	Notes / limits
Configuration	Selecting parameters (tick boxes, values) to tailor the system without touching code: currency, language, time zone, tax rules, dollar limits, customer rules. Essential to make the system usable.	Cannot add missing functionality; cannot, by itself, connect third-party systems or add database fields.
Customization	Altering the program code to add or change functionality. Needed when the system cannot otherwise be used.	High risk and cost; must be done by experts; changes can break integrated parts; vendors often will not support self-changed code; most systems are customised despite the advice to minimise it. Customisable items: reports, interfaces, conversions, enhancements (user exits / break points); modifications (fundamental code change) are rarely done.
Bolt-on / third party	Integrate external software for operational reasons or to add missing functionality (for example RFID, EDI, barcode, imaging).	Decide integrate (share data directly) vs interface (copy data across). Consider technical expertise and timing of upgrades. Vendors may bundle preferred third parties.

2.5 ERP market and deployment

Tier	Profile	Examples named in the unit
Tier 1	High complexity, expensive, many industry solutions, large companies, strong global support	SAP S/4HANA, Oracle, Infor LN / M3
Tier 2	Medium complexity and cost, fewer industry solutions, mid-market	Upper: Microsoft Dynamics 365, IFS, Sage Enterprise. Lower: NetSuite, IQMS
Tier 3	Low complexity and cost, few industry solutions, small companies	Sage, ECI, SYSPRO

Open source ERP (for example Odoo, formerly Open ERP): source code access, free to distribute, free community version plus paid enterprise version. Pros: flexibility, no single-supplier reliance, cost savings, community support, suits small firms. Cons: harder to find external expertise, vendors less financially stable (could vanish), internal technical complexity to deploy and maintain.

Deployment option	How it works	Key point
On-premise	Pay for licences, install on office machines	Secure; cannot access from elsewhere; internal IT expertise needed; near-unlimited customization; security managed internally
Hosted / private cloud	One-time licence plus subscription; installed on provider server; provider maintains	Subscription by company size and users; some on-site support per agreement
Public cloud (SaaS)	Rent the system; provider supports and maintains	Less internal IT expertise needed; limited customization and add-ons; security externally managed

Cloud delivery models: **public** (less confidential data), **private** (secure, confidential, core systems), **hybrid** (mix per application). Cloud-plus-on-premise can keep mission-critical modules (finance, sales) on premise and others on cloud. General ERP drawbacks: time consuming, high cost, technically sophisticated (training challenge), standardisation hard when processes do not match the system.

3. Business Processes and Redesign

3.1 Business process basics

Definition. A collection of linked activities employed by an organisation to produce a product or a service; completing the set of procedures accomplishes a business objective. A process has a beginning and end, inputs and outputs, sub-processes, actors, and metrics.

Classification	Detail
Generic vs unique	Generic processes (for example sales order processing) suit any organisation; unique are firm-specific.
Formal vs informal	Documented vs ad hoc.
Core / support / management	Core generates value and links to external customers (receive, approve, fill, deliver an order); support assists core (reorder supplies); management gives direction, rules and practices (evaluate vendors, sign contract, set sourcing).

Named process patterns: order-to-cash (customer order to payment after delivery, a sales process); quote-to-order (request for quote to order placed); procure-to-pay (buying from a supplier); issue-to-resolution (complaint to resolved); application-to-approval (application to approval outcome). Industry examples: manufacturing (assembly, quality inspection, production planning); healthcare (medical assessment, insurance claims); hospitality (reservations, check-in, check-out).

3.2 Porter value chain and BPA

Porter value chain. Core (primary) processes: new product development, operations, distribution, services, marketing and sales. Support processes: procurement, technology development, HR. Re-engineering core, value-adding processes that competitors cannot imitate yields the most competitive advantage; support processes must still exist for core to run.

Business process analysis (BPA). Examine the current state of a process to enhance efficiency. Steps: capture the **as-is**, identify the **performance gap** (for example a production cycle takes 5 hours; target 3.5), identify the **capabilities gap** (what is needed to close it), troubleshoot delays (for example work moving back and forth to inventory), redesign to the **to-be** (for example a lean technique to streamline). For ERP, BPA identifies whether the firm needs an ERP and how it will help. Best done **before** selection (clear visibility, right system chosen); a 2020 survey found most firms run it after selection, and most reported their key processes improved after ERP. Focus BPA on customer-facing, core competitive, high-volume / low-margin, high-defect, high-skill / labour-intensive, highly complex, specialised-resource, and obsolete-technology (legacy) processes. Aim at cost efficiency, customer satisfaction, standardisation, value-add, agility and scalability.

3.3 BPR vs BPI

Business Process Re-engineering (BPR)	Business Process Improvement (BPI)
Dramatic, radical redesign when cost, flexibility or quality cannot otherwise be met. "Don't automate, obliterate." High effort, potentially high value. First reassess whether it is needed (an efficient process may not need it; sometimes eliminate the process entirely).	Gradual, slow, incremental change. Lower effort, smaller gains. Steps: identify goals and objectives, compile and understand the process, analyse and measure, improve. Firms often make incremental improvements when going live with ERP. BPR may occur within BPI but is not mandatory.

BPR principles: involve people who use the process; centralise and coordinate dispersed work via integrated systems; combine parallel activities leading to the same outcome; focus on processes not tasks; automate manual, labour-intensive matching tasks; push decision points to staff via embedded application controls; capture data once at source to avoid re-entry.

Clean-slate BPR	Technology-enabled BPR
No technology drives the change; redesign from a blank sheet using an innovative mindset. Technology (ERP) considered late. Boosts creativity but less common today and can fail without a technology driver.	Technology drives the redesign. Identify process, determine requirements, select ERP / technology that matches, prototype, test, implement to-be. Technology (ERP) enters early. The dominant approach today.

3.4 Enterprise architecture and BPM

BPM uses methods, policies, metrics, management practices or software tools to continuously analyse, measure and improve processes (innovation can be business-model, technology, or process). It operates at three levels that must stay aligned: **enterprise** (strategy, process architecture, performance measures), **business process** (redesign, lean), and **implementation** (ERP installations sit here). **Enterprise architecture (EA)** translates business vision and strategy into effective enterprise change; it documents the as-is, defines the to-be, bridges strategy and transformation, and keeps process changes and IT adoption aligned with business need and value. EA frameworks follow: document current state, define future state, analyse gaps, plan, then implement.