

Professional Practices in IT (CS 4001)

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Course Instructor(s)

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Sessional-II Exam

Total Time (Hrs): 1

Total Marks: 42

Total Questions: 4

Roll No

Section

Student Signature

Attempt all questions. Write your answer for Question 3 directly on the question paper. Answer the remaining questions on the answer sheet in the same order as they appear on the question paper. All of your descriptive answers must be in the form of bullet points. Each bullet point must be less than three lines on the answer sheet. Longer answers in the form of paragraphs will be discarded.

CLO 4: Articulate and reflect on the industry expectations of competence and conduct in computing professions

Question1: A company is evaluating two projects, Project X and Project Y. Each project requires an initial investment of \$40,000. Costs (represented as negative values) are shown in brackets. The expected cash flows for the next four years are as follows: [4+4+1]

Project X:

Years	Cash Flows
0	(\$40,000) = -40000
1	\$12,000 , (\$2000 maintenance cost) = $(12000-2100)/(1+.08)^1 = 9900/1.08=9166.67$
2	\$15,000 , (\$3000 additional expenses) = $(15000 - 3307.5) / (1+.08)^2 = 11692.5/1.1664 = 10024.43$
3	\$18,000 , (\$1500 additional expenses) = $(18000-1736.43) / (1+.08)^3 = 16263.57 / 1.259712 = 12910.669$
4	\$20,000 = $20000/1.360 = 14705.88$

$$NPV = -40000 + 9166.67 + 10024.43 + 12910.669 + 14705.88 = 6807.649$$

$$NPV = 6807.649$$

Project Y:

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Years	Cash Flows
0	$(\$40,000) = -40000$
1	$\$20,000, (\$1500 \text{ maintenance cost}) = (20000-1575)/(1+.08)^1 = 18425/1.08 = 17060.18$
2	$\$18,000, (\$2000 \text{ additional expenses}) = (18000 - 2205.5) / (1+.08)^2 = 15794.5/1.1664 = 13541.23$
3	$\$15,000, (\$2500 \text{ additional expenses}) = (15000-2897.06) / (1+.08)^3 = 12103/1.259712 = 9607.75$
4	$\$10,000/(1+.08)^4 = 10,000/1.360 = 7352.94$

$$\text{NPV} = -40000 + 17060.18 + 13541.23 + 9607.75 + 7352.94 = 7562.1$$

The company uses a discount/interest rate of 8% and inflation 5%.

Tasks:

- Calculate the NPV for both Project X and Project Y.
 $X = 6807.649$
 $Y = 7562.1$
- Determine which project the company should choose based on the NPV.
Project Y being higher NPV

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Question 2: Company Background: XYZ Corporation is a global manufacturing company producing high-end consumer electronics, operating in various countries across continents. The company offers a diverse range of products, including smartphones, laptops, home appliances, and wearable tech. The company has its headquarters in Country A but has several regional offices in Country B, Country C, and Country D.

XYZ Corporation has grown rapidly over the past decade, expanding its operations from just 500 employees to over 15,000 worldwide. To manage this growth, the company implemented a variety of strategies across different departments, which led to discussions about the type of organizational structure and management style it uses.

Departmental Breakdown:

- Headquarters:
 - The top leadership of XYZ Corporation, including the CEO, CFO, and COO, are located at headquarters.
 - All major decisions, such as new product launches, budgeting, and strategic directions, must be approved by the CEO.

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- There is a clear hierarchy in the decision-making process, and department heads must report to their direct supervisors before presenting any significant idea to the CEO.
- 2. Regional Offices:
 - Each region (B, C, and D) has its own regional office that oversees operations specific to its geography.
 - The regional offices have autonomy in marketing and minor operational decisions, like adjusting pricing or distribution strategies, based on local market conditions.
 - They, however, must follow the corporate guidelines when it comes to branding, product features, and high-level financial policies.
- 3. Research & Development (R&D) Department:
 - The R&D department is divided into specialized teams working on different products, like smartphones, laptops, and wearables.
 - Cross-functional collaboration is highly encouraged. For example, the wearable tech team often collaborates with the smartphone team to share technological insights and align product innovations.
 - The teams regularly hold meetings to brainstorm new features and enhancements, and any idea developed is evaluated by the department heads before being escalated to senior leadership.
- 4. Operations Department:
 - The operations department has different product teams. Each product team (e.g., smartphones, laptops, home appliances) has its own operational units handling production, supply chain management, and quality control.
 - These units operate independently to a large degree, although final decisions related to cost reduction, major investments, or factory expansions are made at the corporate level.
- 5. Sales and Marketing Department:
 - The sales and marketing teams are divided by geography, with separate teams handling each region's customer base.
 - Marketing strategies are often adapted locally, and regional managers have the flexibility to run campaigns that resonate with the local culture.
 - However, branding and messaging need to align with global standards set by the HQ, and any significant changes to a campaign require HQ's approval.
- 6. Human Resources (HR) Department:
 - XYZ Corporation's HR department oversees talent acquisition, employee benefits, and organizational policies.
 - While HR strategies such as employee training programs or recruitment policies are set at the headquarters, local offices are allowed to adapt policies to fit cultural or legal requirements.
 - Performance reviews and promotions are handled primarily by local offices, but all major promotions to higher managerial levels must be reviewed by HQ.

Question 2.1: Is XYZ Corporation centralized or decentralized? Also, justify your answer how each of these are beneficial to the company. [1+2]

Answer: Centralized. Major decisions are controlled by headquarters, while regional offices have limited autonomy.

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Question 2.2: Does XYZ Corporation follow a bureaucratic or organic model? Also, justify your answer how each of these are beneficial to the company. [1+2]

Answer: Bureaucratic. Clear hierarchy, formalized roles, and centralized decision-making indicate a bureaucratic model.

Question 2.3: Is XYZ Corporation using matrix management? Briefly explain why and how? [1+2]

Answer: No. There's no strong indication of employees reporting to multiple managers across functions and regions.

Question 2.4: What type of organizational structure does XYZ Corporation have? Provide high-level organizational structure/diagram (organogram). [6]

Answer: Functional and geographical. Functional for departments (R&D, Sales, HR), and geographical for regional offices. Some product-based structure in operations.

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Question3: XYZ Company has the following items listed on its balance sheet. Please specify each of the listed items to be either Fixed Asset or Current Asset? Also, indicate how the value of each (whether in figures or words) should appear on the balance sheet? [10]

Asset	Current / Fixed	Value (figure or words) on balance sheet
Office Building	Fixed	Depreciated value
Cash in Hand	Current	As it is
Accounts Receivable	Current	As it is
Machinery	Fixed	Depreciated value
Inventory (raw materials)	Current	Cost value or Resale value (whichever is less)
Land	Fixed	Appreciated value.

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Prepaid Expenses (insurance)	Current	As it is
Vehicles	Fixed	Depreciated value
Bank Loan (repayable within 6 months)	EXCLUDE	EXCLUDE
Computers and Office Equipment	Fixed	Depreciated value

CLO 3: Demonstrate a familiarity with the main laws regulating ICT.

Question4: "In the July 2007 issue of The IT Professional Review, Johnson asserts that 'the software engineering profession faces challenges in meeting the criteria for recognition as a fully matured profession, particularly in areas of **regulation, accountability, and public trust.**' Critically evaluate this statement by answering the following questions briefly:

Question 4.1: Comparing software engineering with established professions such as medicine, law, and civil engineering, in terms of licensing requirements, formal education paths, and ethical obligations. [3]

Any brief/short answers around the following points.

1. Comparison of software engineering with established professions:

Licensing Requirements:

- **Medicine, Law, and Civil Engineering:** These professions require formal qualifications and licenses before individuals can legally practice. For example, doctors must pass board certifications, lawyers must pass the bar exam, and civil engineers must acquire professional engineer (PE) licenses. These licensing requirements are state- or country-regulated and ensure a standard of competency.
- **Software Engineering:** While there are certifications (e.g., from IEEE or ACM), there is no universally recognized, mandatory licensing body for software engineers. There are no legal restrictions on who can call themselves a software engineer, leading to varied skill levels across the profession.

Formal Education Paths:

- **Medicine and Law:** These fields require extensive education, often beyond a bachelor's degree, with formalized graduate training programs and specialization. Medicine requires a medical degree and residency, while law requires a law degree and passing the bar exam.
- **Civil Engineering:** Requires a specialized undergraduate degree, followed by professional certification exams. Higher levels of certification require further education and work experience.

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- **Software Engineering:** A variety of educational backgrounds can lead to a career in software engineering. While many universities offer computer science degrees, there is less emphasis on standardized postgraduate education or certifications. Many developers enter the profession through alternative pathways (e.g., coding boot camps, self-learning), which leads to inconsistency in skill levels.

Ethical Obligations:

- **Medicine and Law:** These fields have well-defined ethical codes enforced by governing bodies. Doctors follow the Hippocratic Oath, and lawyers have clear guidelines enforced by bar associations. Ethical breaches can result in revocation of licenses.
- **Software Engineering:** While organizations like IEEE and ACM provide codes of conduct, enforcement is often lax. There is no global body that governs software engineers, meaning ethical compliance is often self-regulated and highly variable across regions and organizations.

Question 4.2: Analyzing how the lack of standardized global regulations and certifications in software engineering impacts professional accountability and public trust. [2]

Impact of lack of standardized global regulations and certifications:

- **Professional Accountability:** Without global or regional licensing bodies, there is no clear accountability structure for software engineers. As a result, in cases of malpractice or negligence (e.g., a software failure that causes financial or personal harm), it is often difficult to hold individuals responsible in the same way a doctor or lawyer might be held liable for misconduct.
- **Public Trust:** The lack of a consistent standard for software engineering leads to varying levels of trust from the public. While some software engineers work to high standards, the variability in education and skill levels means the public may not have confidence in the profession as a whole. Critical software failures, such as those in banking, healthcare, or transportation, highlight the importance of professional accountability but often leave questions of liability unanswered.

Question 4.3: Proposing potential steps or initiatives that could elevate software engineering to the level of professional maturity seen in other fields, considering factors such as mandatory accreditation, continuing education, and legal responsibilities." [3]

Steps to elevate software engineering to the level of professional maturity:

- **Mandatory Accreditation:** Introducing globally or regionally recognized certifications could help standardize skill levels. For instance, similar to how civil engineers must pass PE exams, software engineers could be required to pass standardized exams to practice in high-risk areas (e.g., healthcare systems, defense).

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- Continuing Education: To stay current with rapidly evolving technology, software engineers could be required to engage in ongoing education. This could mirror how doctors and lawyers must complete continuing professional development (CPD) to maintain their licenses.
- Legal Responsibilities and Accountability: Laws could be introduced that require certain types of software (e.g., medical software, critical infrastructure systems) to be developed by certified professionals. Legal frameworks could also hold software engineers accountable for failures, making it necessary for professionals to carry malpractice insurance, as doctors do. This would ensure that ethical and technical standards are maintained.