

Section 1.1 Context and Background (10%)

Purpose

Introduce the research area and demonstrate understanding of the broader field.

Step 1: Introduce the Research Field

Explain the broad area where your research belongs.

Examples:

- Artificial Intelligence
- Cybersecurity
- Data Mining
- Internet of Things
- Cloud Computing
- Blockchain
- Educational Technology

Guiding Questions

- What is the field?
- What does it do?
- Why is it important?

Example

Artificial Intelligence (AI) refers to computer systems capable of performing tasks that typically require human intelligence, including learning, reasoning and decision-making [1]. AI has become one of the most influential technologies of the twenty-first century, with applications in healthcare, finance, transportation and education [2].

Step 2: Describe the Current State of the Field

Discuss what is currently happening in the field.

Guiding Questions

- How widely is the technology being used?
- What are recent developments?
- What challenges still exist?

Example

Recent advances in generative AI and large language models have accelerated the adoption of AI solutions across industries [3]. However, concerns regarding data privacy, algorithmic bias and transparency remain significant challenges [4].

Step 3: Discuss Recent Research and Trends

Review 3–5 recent studies.

Template

For each paper discuss:

- Author(s)
- Year
- Main contribution

- Relevance to your topic

Example

Kumar et al. [5] developed an AI-based medical diagnosis system achieving an accuracy of 94%. Similarly, Chen and Wang [6] proposed a deep learning framework for disease prediction. These studies demonstrate the growing effectiveness of AI in healthcare applications.

Section Checklist

- ✓ Introduced research field
 - ✓ Discussed current state
 - ✓ Included recent developments
 - ✓ Used literature support
 - ✓ Applied IEEE citations
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Section 1.2 Research Problem (7%)

Purpose

Clearly identify the specific problem your research intends to solve.

Step 1: Define the Problem

Write a concise problem statement.

Template

Despite advances in _____, there remains a significant challenge in _____.

Example

Despite advances in AI-based healthcare systems, there remains a significant challenge in ensuring transparency and explainability of automated clinical decisions.

Step 2: Explain Why the Problem Exists

Discuss current limitations.

Guiding Questions

- What is not working?
- What gaps exist?
- Why have existing solutions failed?

Example

Existing AI diagnostic systems often operate as black-box models, making it difficult for healthcare professionals to understand how decisions are generated [7]. This lack of explainability reduces trust and limits adoption in clinical environments.

Step 3: Support with Literature

Use at least 3–4 references.

Example

Several studies have highlighted concerns regarding model interpretability and accountability [7], [8]. Regulatory frameworks increasingly require explainable decision-making processes, yet current solutions remain inadequate [9].

Section Checklist

- ✓ Clear problem statement
 - ✓ Supported with literature
 - ✓ Identified research gap
 - ✓ Explained importance
-

Section 1.3 Research Aim and Objectives (10%)

Purpose

Explain what the research intends to achieve.

Step 1: Write the Research Aim

The aim should be one clear sentence.

Formula

To investigate/develop/evaluate/design _____ in order to _____.

Example

To develop an explainable artificial intelligence framework for healthcare diagnosis that improves transparency and trust in clinical decision-making.

Step 2: Develop SMART Objectives

Objectives should be:

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound

Example Objectives

1. To conduct a systematic review of explainable AI techniques used in healthcare.
 2. To identify limitations of existing diagnostic AI models.
 3. To design an explainable AI framework for healthcare diagnosis.
 4. To evaluate the framework using selected healthcare datasets.
 5. To compare the proposed framework against existing approaches.
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Common Mistakes

- ✗ To study AI.
- ✗ To learn about healthcare.

✓ To evaluate the effectiveness of explainable AI techniques in improving diagnostic transparency.

Section Checklist

- ✓ One clear aim
 - ✓ 4–6 measurable objectives
 - ✓ Objectives aligned with aim
-

Section 1.4 Significance of the Research (3%)

Purpose

Explain why the research matters.

Step 1: Academic Importance

Discuss contribution to knowledge.

Example

The study will contribute to the growing body of knowledge on explainable AI by identifying effective approaches for improving transparency in healthcare systems.

Step 2: Technical Importance

Explain technical benefits.

Example

The proposed framework may improve the interpretability of AI models, enabling healthcare practitioners to better understand automated recommendations.

Step 3: Societal Importance

Discuss broader impacts.

Example

Improved transparency may increase trust in AI systems, leading to wider adoption and potentially better healthcare outcomes for patients.

Step 4: Practical Applications

Identify real-world applications.

Example

Potential applications include:

- Clinical decision support systems
 - Hospital management systems
 - Remote healthcare platforms
 - Medical diagnosis tools
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Section Checklist

- ✓ Academic benefits

- ✓ Technical benefits
 - ✓ Societal benefits
 - ✓ Practical applications
-

Suggested Structure for Submission

1. Introduction

1.1 Context and Background

(500–700 words)

- Overview of field
- Current state
- Recent developments
- Literature discussion

1.2 Research Problem

(300–400 words)

- Problem statement
- Current challenges
- Research gap
- Literature support

1.3 Research Aim and Objectives

(200–300 words)

- Research aim
- Research objectives

1.4 Significance of the Research

(250–400 words)

- Academic significance
- Technical significance
- Societal significance
- Potential applications

References

(Minimum 10 IEEE-formatted references)