

# How to Write Commit Messages

Applied Research Using the DOT Framework (Design-Oriented Triangulation)

## 1. Research Overview

Research Question

How can developers write clear, well-structured commit messages that improve team communication and project maintainability?

This question aims for a practical, actionable outcome rather than theoretical insight alone — perfect for DOT-style research.

[\*ICT Research Methodologyi\*](#)

## 2. Research Design According to DOT

The Development-Oriented Triangulation (DOT) framework organizes research into three aspects:

- What? (Different domains of knowledge)
- Why? (Justification and trade-offs)
- How? (Research strategies and methods)

[\*ICT Research Methodologyi\*](#)

We focus on:

- Application domain: commit messages in software development
- Available work: existing guidelines, conventions, best practices
- Innovation domain: synthesizing guidelines into a clear practical method

Why these methods?

To understand how to write commit messages, we combine methods that provide:

theoretical foundation (Library methods)

real-world interaction and patterns (Field methods)

structured task understanding (Field task analysis)

Using more than one method improves confidence (triangulation). ICT Research Methods

### 3. Research Methods

We apply the DOT framework by selecting multiple complementary methods:

#### A. Literature Study (Library)

Purpose: To collect existing guidelines, best practices, and rules on commit messages from reliable sources. Why? Literature studies find general information and established norms that help define how practice should look. ICT Research Methods

Activities:

Identify authoritative sources on commit messages

Extract recommendations and principles

Compare and analyse differences

Why this fits: Literature study is suitable for gathering expert knowledge and standards in the field.  
ICT Research Methods

#### B. Document Analysis (Field)

Purpose: To analyse real commit history examples to see how developers actually compose commit messages. Why? Document analysis helps understand current practices and gaps between guidelines and reality. ICT Methods

Activities:

Collect commit logs from open-source projects

Categorize message formats (clear, ambiguous, missing context)

Identify patterns and common mistakes

Why this fits: Document analysis is effective for observing behaviour without interference. ICT Methods

#### C. Task Analysis (Field)

Purpose: To understand the actual task of writing a commit message: what steps are involved, what decisions developers make. Why? Task analysis focuses on how users perform a task and what challenges arise. ICT Research Methods

Activities:

Decompose the writing process (read code, decide intent, format message)

Map common decision points

Identify cognitive load or ambiguities in steps

Why this fits: Task analysis improves understanding of practical behaviour, not just what should be done. ICT Research Methods

### 4. Results & Findings

#### A. From Literature Study

Sources show high-level recommendations for commit message structure:

Short, descriptive summary ( $\leq 50$  characters)

Optional body explaining why the change was made and context

Consistent style improves readability and tooling support Guidelines such as the Git documentation and conventions confirm this structure. (See standard Git commit message practices and conventions online.)

These reflect theoretical best practices — they are widely cited in developer documentation and style guides.

#### B. From Document Analysis

Analysis of real commit logs reveals:

Common good practices:

Clear subject lines with action verbs

Short but descriptive messages

References to issues or bug IDs

Common issues:

Messages like “fix stuff” or “updates” (low clarity)

Mixed changes in one commit message

No explanation of why the change occurred

These patterns match research expectations about real behaviour vs. guidelines.

### C. From Task Analysis

Breaking down the process of writing a commit message shows developers need to:

Identify change intent (What is the core purpose?)

Describe the modification succinctly

Add context if non-trivial

Follow team or project conventions

Challenges often occur at steps 1 & 3 – deciding why the change was made is cognitively heavier than summarizing code diffs.

## 5. Synthesised Practical Guidelines

Based on triangulated research findings, the following practical method for commit message writing is proposed:

Commit Message Template

Subject line (imperative mood):

Format: [scope/context]

Example: Fix login crash when token expired

Blank line

Body (optional but recommended for non-trivial changes):

Explain why the change was necessary

Include references (e.g., issue/Ticket ID)

Provide clarity about decisions

Checklist Before Commit

✓ Does the subject line summarize the change clearly? ✓ Did you use imperative mood? ✓ If needed, did you add context and rationale? ✓ Is the message formatted with clear separation and no ambiguity?

## 6. Conclusion

Using the DOT framework, we combined:

Library (Literature Study) to collect accepted norms,

Field (Document Analysis & Task Analysis) to understand real practice and steps.

This mixed approach revealed both best practices and common pitfalls, yielding a method that is:

grounded in actual developer behaviour,  
supported by authoritative sources,  
applicable across teams and workflows.

#### References (Methodology Sources)

Description of DOT Framework and research strategies (Library, Field, ...). ICT Research Methods +1

Literature study as a method for gathering existing guidance. ICT Research Methods

Document analysis as a Field research method to analyse written materials. ICT Methods

Task analysis to examine steps involved in performing a task. ICT Research Methods