

# CODE TODAY, DEADLINE TOMORROW: PROCRASTINATION AMONG SOFTWARE DEVELOPERS

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## Problem to be Solved

- What is **Procrastination**?
  - "A voluntary delay of an intended course of action despite expecting to be worse off for the delay" (Steel, 2007).
  - Well-studied in psychology and academic settings (students).
- The Research Gap:
  - Little is known about why *software developers* procrastinate.
  - Existing SE research focuses on:
    - Burnout & Happiness
    - Work-life balance
    - ADHD
  - Missing: A dedicated investigation into the triggers, effects, and mitigation of procrastination specifically for developers.

Problem to be Solved

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## Why is Software Development Different?

- Unique Challenges in Software Engineering:
  - High Cognitive Load:** Abstract and complex tasks requiring deep focus.
  - Interdependence:** Collaborative work where one person's delay blocks the team.
  - Pressure:** High-paced development, job security fears, and AI uncertainty.
- The Stakes (Why it matters):
  - Impacts **Productivity & Code Quality**.
  - Affects **Mental Health** (Stress, Well-being).
- Core Questions:
  - How does it affect work?
  - What triggers it?
  - How can it be managed?

## Methodology

TABLE I  
PARTICIPANT DEMOGRAPHIC INFORMATION

Pt	Age	Job Title	Exp	Work Setting	Industry
P1	24	SW Dev Intern	3-6	Hybrid	Software
P2	23	SW Engineer	3-6	In-person	Marketing
P3	35	SW Engineer	6+	Remote	Software
P4	40	Eng Manager	6+	Remote	Ins.
P5	30	SW Dev	3-6	Hybrid	Fin.
P6	31	Sr Res Engineer	6+	Remote	Software
P7	29	App. Scientist	3-6	In-person	E-commerce
P8	32	Sr Staff SW Eng	6+	Remote	Software
P9	28	Res Scientist	6+	Hybrid	A&E
P10	40	Data Engineer	3-6	Hybrid	A&E
P11	30	SW Engineer	6+	In-person	Software
P12	38	Data Eng. Manager	3-6	In-person	A&E
P13	26	Data Engineer	3-6	Hybrid	A&E
P14	26	Data Engineer	3-6	Hybrid	Fin.
P15	37	Applied Scientist	6+	Hybrid	Software

Pt: Participant Id, EXP: Years of experience, Ins.: Insurance Technology, Fin.: Personal Finance, A&E: Automotive & Energy

- Qualitative Study:
  - Participants:** 15 Professional Developers (Recruited via snowball/convenience sampling).
  - Diversity:** Varied experience (Intern to Sr. Staff), industries (FinTech, Automotive, Software), and work settings (Remote, Hybrid, In-person).
- Data Collection:
  - 90-minute semi-structured interviews.
  - Focus on real-life examples of "Active" vs. "Passive" procrastination.
- Analysis:
  - Inductive Thematic Analysis (Open coding → Axial coding).
  - Validated by **Member Checking** (participants confirmed the findings).



# Result - 1

TABLE II NEGATIVE EFFECTS (✖) OF PROCRASTINATION, GROUPED INTO FIVE DIMENSIONS OF WORK.				
Negative Effect	Definition	Example	Pts	Freq
SATISFACTION & WELL-BEING				
Emotional Distress	Experiencing feelings of guilt, shame, frustration, and dissatisfaction.	"I generally don't feel good if I miss a deadline and knowing that I do my best to meet them." [P5]	36	
Anxiety & Stress	Increased levels of anxiety and stress resulting from close deadlines and incomplete tasks.	"The negative effect is that I feel more anxious, so the increase the level of anxiety." [P6]	18	
Lower Work-life Balance	Negative repercussions on personal life manifesting as poor work-life balance.	"The effect is on me especially and as regards my personal life." [P5]	9	
PERFORMANCE				
Reduced Indiv. Performance	Lower individual performance such as low-quality code and performance ratings.	"You know, it's kind of like becomes a performance issue, and that person is going to have a lower performance." [P4]	80	
More Technical Debt	Creating unresolved issues or dependencies that complicate future project stages.	"In that situation, I think it is a dependency, and things are getting left behind." [P14]	14	
Reduced Team Performance	The aggregated impact on team performance and morale when individual delays affect group projects.	"There are some consequences for the team and the business." [P7]	9	
Missed Deadlines	Direct outcomes of procrastination lead to delayed deliverables and failure to meet deadlines.	"Effect is the delay on the deliverable. The one thing that everything becomes late" [P1]	9	
ACTIVITY				
Less Produced Code	Reduced number of delivered code or features that need to be delivered by the deadline.	"Sometimes I produce less code, finish fewer features." [P8]	10	
COMMUNICATION & COLLABORATION				
Strained Team Culture	Strained relationships and disrupted team dynamics due to inconsistent task completion and delay in delivery.	"Procrastinating and not getting anything done for no reason or multiple times in a row is definitely going to affect their image and reputation particularly." [P13]	34	
Weakening of Trust	Destruction of trust among team members and supervisors due to recurrent procrastination.	"Trust also gets a little hurt." [P12]	9	
EFFICIENCY & FLOW				
Compensatory Effort	The necessity to make additional efforts to compensate for delays caused by procrastination.	"And you wind up pulling late nights and working extra hours, and the whole process is not particularly fun." [P8]	16	
Workflow Disruption	Breaks or interruptions in the flow of work due to delaying tasks.	"If I delay it, it might interrupt something else that I have to do" [P2]	16	
Cascading Delays	A cascading effect where initial delays lead to further delay in the project timeline.	"If I'm procrastinating and I can't finish the task, then that story has to get moved to the next sprint" [P10]	9	
Financial Implications	Increased cost allocation to tackle missed deadlines.	"...because this deadline was missed. We missed this many millions of dollars in hypothetical revenue." [P11]	9	

Results - 1

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# Result - 2

TABLE III POSITIVE EFFECTS (✔) OF PROCRASTINATION, GROUPED INTO FIVE DIMENSIONS OF WORK.				
Positive Effect	Definition	Example	Pts	Freq.
SATISFACTION & WELL-BEING				
Taking Breaks	Mental and Physical recovery due to long tasks.	"Maybe I'll have a better day of working if we stay like an extra couple minutes at lunch" [P2]	18	
Short Term Stress Relief	Temporary relief from stress through brief avoidance of the task.	"I have noticed the benefits would probably be more of a de-stressing kind of tool ...short-term de-stressing." [P5]	13	
Time for Personal Tasks	Completing personal responsibilities contributing to a better work-life balance.	"Meanwhile, someone else is doing the work. So, I'm procrastinating. But, like, I'm benefiting from it indirectly." [P1]	4	
Increased Confidence	Enhanced self-confidence by managing delayed tasks in a short time near the deadline.	"You get to realize how, like, how good you are at working things really quickly" [P1]	6	
PERFORMANCE				
Better Creativity	Having more time for reflection, exploration and generating ideas.	"During an eight-hour day, aside from a lunch break, taking a five to ten-minute break every hour can be very beneficial." [P7]	9	
ACTIVITY				
Avoiding Unnecessary Work	Delays in addressing a task leads to the issue resolving itself, saving effort and resources.	"Somebody makes a decision that overrides what you were going to build anyway, where there's unstable decision making in a company like that can resolve itself." [P4]	8	
COMMUNICATION & COLLABORATION				
Socializing at Work	Engaging in conversations, and building relationships at work.	"If we are really talking about interesting topics and to me, that is kind of procrastination for work that needs to get done." [P12]	4	
EFFICIENCY & FLOW				
Near-deadline Efficiency	Increased short-term efficiency close to the deadline.	"Definitely, if there is a deadline, it's gonna be peak efficiency." [P13]	14	

Results - 2

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# Result - 3

TABLE IV PROCRASTINATION FACTORS WITH THEIR CATEGORIES*.		
Category	Factors	Frequency
Task-Related	Task Interest Level (56×, 15P), <b>Subjective Importance</b> (35×, 13P), Task Difficulty Level (28×, 13P), Task Vagueness (30×, 12P), Task Complexity (22×, 9P), Skill Proficiency (17×, 7P), <b>Dependency on Others</b> (4×, 3P)	192
Personal	Mental State (18×, 12P), Physical State (12×, 11P), <b>Uncertainty</b> (18×, 9P), Fear of Failure (13×, 5P), Personal Responsibilities (4×, 4P), <b>Fear of Judgment</b> (6×, 5P), Deadline Pressure (6×, 3P)	77
External	Distractions (19×, 11P), <b>Work Relationships</b> (6×, 3P), <b>Task Hierarchy</b> (11×, 5P), <b>Communication Issues</b> (16×, 9P)	52

\*The frequency of each factor during the interview and the number of participants is shown next to each factor in parenthesis with × and P deceptively; bolded factors reported by participants and are not found in the literature (Section III-A).

# Positives

## 1. High Novelty & Relevance:

- First dedicated study on procrastination in SE.
- Addresses a "taboo" topic that affects almost everyone.

## 2. Nuanced Perspective (The "Double-Edged Sword"):

- Moves beyond "procrastination = lazy".
- Acknowledges **Positive Effects** (Creativity, Incubation, Efficiency) which is counter-intuitive and insightful.

## 3. Actionable Outcomes:

- The mitigation table (Table V) is immediately useful for practitioners and managers.

Result - 3

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Positives

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## Negatives

### 1. Sample Size & Generalizability:

- **N=15** is standard for deep qualitative work, but small for generalization.
- Can we apply these findings to all millions of developers?
- *Bias*: Participants were recruited via snowball sampling (might share similar traits).

### 2. Self-Reporting & Recall Bias:

- Relies entirely on interviewees *remembering* why they procrastinated.
- People often rationalize their bad behavior (e.g., "I wasn't lazy, I was 'incubating' ideas").

### 3. Lack of Quantitative Validation:

- No correlation data. Does "Fake Deadlines" *statistically* reduce bugs? We don't know yet.

## Possible Future Work / Rating

### 1. Quantitative Validation:

- Large-scale survey (N > 500) to quantify the prevalence of these triggers and effects.

### 2. Tool Development (HCI/SE):

- IDE plugins that detect "stuck" behavior (e.g., no typing for 20 mins) and suggest **Task Decomposition**.
- AI-driven calendars that auto-schedule "boring" tasks during high-energy times.

Rating:(4.5/5)

## Discussion Points

### Discussion Topic 1: The Myth of "Good" Procrastination

- The paper claims "**Active Procrastination**" boosts creativity and efficiency.
- *Question*: Do you believe "incubation" is a valid part of the engineering process, or is it often just a rationalization for poor time management?

### Discussion Topic 2: Privacy vs. Productivity Tools

- The paper suggests tools like **IDE trackers** or even **biometric monitoring** (EEG/Heart rate) to detect distraction.
- *Question*: As developers, where do we draw the line? Would you consent to "Anti-Procrastination Surveillance" if it guaranteed higher productivity?

### Discussion Topic 3: Will AI Cure or Worsen Procrastination?

- The paper identifies "**Task Difficulty**" and "**Vagueness**" as top triggers for procrastination.
- *Hypothesis A*: GenAI (Copilot, ChatGPT) solves the "Cold Start" problem, lowering the barrier to begin.
- *Hypothesis B*: GenAI gives a false sense of speed, encouraging us to delay work because "the AI can generate it in seconds later."
- *Question*: In the age of AI coding assistants, do you foresee developer procrastination decreasing (easier to start) or increasing (over-reliance)?

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Thank you!