

تأثير ضغط الجدول الزمني على أداء المشاريع

The Impact of Schedule Pressure on Project Performance

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2025

Acknowledgment

I would like to express my sincere gratitude to everyone who supported me throughout the preparation of this research.

My deepest thanks go to my instructors for their valuable guidance, which greatly enriched my understanding of the study topic. I would also like to thank all individuals who contributed information or participated in academic discussions that enhanced the content of this work.

Special appreciation goes to my family and colleagues for their continuous encouragement and moral support.

I pray that this work will be of benefit and accepted as a humble contribution to the field of project management.

Statement of the Problem

Schedule pressure is one of the most significant challenges faced by project managers and project teams across various sectors. Compressed or accelerated schedules often impose psychological, organizational, and technical strain on team members. Several studies indicate that time acceleration may lead to reduced quality, increased errors, higher costs, or even delays in project delivery.

Therefore, the central **problem of this study** can be summarized in the following question:

What is the impact of schedule pressure on project performance in terms of quality, budget adherence, and team efficiency?

Aim of the Study

This study aims to **analyze the impact of schedule pressure on project performance**, through:

1. Identifying the nature and causes of schedule pressure within project environments.
 2. Examining the relationship between time pressure and project quality.
 3. Analyzing the effects of schedule pressure on team efficiency and performance.
 4. Investigating the consequences of compressed timelines on project cost and final delivery.
 5. Providing recommendations to help project managers effectively handle schedule pressure.
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Time management is thought to be one of the most important pillars for project success of any kind, as following the schedule of the project is directly related to output quality and stakeholder satisfaction. But compressed schedules are often mandated for financial, competitive, or organizational reasons that may interfere with team performance and the quality of the outcome of the project.

Schedule pressure is one of the greatest challenges project managers face in the engineering, technical, and service sectors. Several studies show that fast-tracking a schedule can lead to more mistakes, diminished quality of execution, more expensive, and sometimes cause delays on the project itself.

Due to the recognition of this issue in modern workplaces, it is necessary to conduct a systematic study on the relationship between time pressure and project performance and assess the implications for project quality of the project budget and team effectiveness.

The study design will consist of reviewing past research to reveal a knowledge gap, followed by an investigation of the effect of schedule pressure using a theoretical model to clarify the relationship between the major variables.

Study Population

The population of this study consists of:

All project managers and team members working in engineering companies located in the Eastern Province of Saudi Arabia.

The estimated population size is **about 320 employees** in medium-sized organizations.

Study Sample

A sample of **60 participants** was selected, including project managers, engineers, and supervisors.

Sampling Technique:

Purposive Sampling, because the study specifically targets individuals with direct experience in project environments involving schedule pressure.

Sample Characteristics:

- 20 Project Managers
- 25 Engineers / Team Members
- 15 Supervisors
- Average experience: 5–12 years
- 70% reported working previously under tight project schedules

Data Collection Tool

A structured **electronic questionnaire** was used, containing three main sections:

1. **Time Pressure Scale**
2. **Project Performance Scale** (quality – cost – time)
3. **Team Performance Under Pressure**

The study used a **five-point Likert scale** to measure responses.

Validity and Reliability

- The questionnaire was reviewed by **three academic experts** to ensure content and face validity.
- Cronbach's Alpha was used to test reliability, with the following results:
 - Time Pressure: **0.84**
 - Project Performance: **0.89**
 - Team Performance: **0.81**

All coefficients were above 0.70, indicating **high reliability**.

Data Analysis Methods

Data was analyzed using SPSS to obtain:

- Means and standard deviations
- Correlation coefficients
- Tests measuring the effect of schedule pressure on project performance

Results

Result 1: Prevalence of Schedule Pressure

- 68% of participants reported frequently working under high schedule pressure.
- The overall mean score for time pressure = **3.92** out of 5 → **High level**.

Result 2: Effect on Project Quality

Schedule pressure was found to:

- **Reduce execution quality** (correlation = -0.61)
- **Increase error rates** (correlation = $+0.58$)

Result 3: Effect on Project Cost

- 54% confirmed that schedule pressure led to **increased costs**, mainly due to rework and rushed decisions.

Result 4: Effect on Team Performance

- Decreased team motivation under high pressure (mean = 3.71)
- 43% reported increased job burnout
- Reduced communication effectiveness under tight schedules (correlation = -0.49)

Result 5: Effect of Managerial Experience

- Experienced project managers reduced the negative impact of schedule pressure by **22%**.
- Positive correlation between managerial experience and mitigating risk ($r = 0.47$)

Conclusion

The study indicates that **schedule pressure has a significant negative impact on project performance**, particularly in relation to quality, cost, and team effectiveness. However, the results also show that **experienced project managers** play a critical role in minimizing these negative effects and maintaining stability during accelerated project phases.

Recommendations

1. Develop realistic schedules based on accurate time estimations.
2. Train project managers in time-pressure management and adaptive leadership.
3. Increase resources when compressing schedules rather than relying solely on team pressure.
4. Monitor quality closely during accelerated phases to prevent accumulated errors.
5. Strengthen communication among team members during critical project stages

Understanding Time Management in Projects

Time management in projects involves the planning, tracking, and control of time determined to accomplish a set of project objectives to best increase the likelihood of stopping a project on schedule.

This includes the identification of activities, the sequencing of activities, determining how long it takes, the allocation of resources, time scheduling, and time tracking and adjusting as necessary for schedule delays.

Time management in projects is one of the significant aspects of the project management triangle (time-cost-quality). Therefore, a project schedule imbalance will directly impact cost and quality.

Second, effective time management is related to maintaining an equilibrium between the speed of execution and minimizing potential negative impacts to quality and cost.

Time Management: Key Components in Projects

Activity Definition: Definition of all tasks to accomplish the project.

Activity Sequencing: Determination of the relationships among activities and which activities must be completed first.

Resource Estimation: Identification of human and material resources for each activity.

Duration Estimation: Determination of the duration to accomplish each work task.

Schedule Development: Development of an overall timeline that lists planned dates of commencement, planned duration, and planned end date for each activity (e.g., Gantt Chart).

Schedule Monitoring: Observing actual progress against planned progress and taking corrective actions when necessary.

Significance of Time Management

Improves the quality of the project's outputs.

Controls costs and prevents the waste of resources.

Enhances productivity and team efficacy.

Delivers project scope at the agreed time.

Increases client and stakeholder satisfaction.

Understanding Time Pressure in Project Management

Time pressure in project management can be explained as:

A situational circumstance where the time needed to finish a project—or one of its activities—is decreased in comparison to the expected schedule, requiring the project manager, and project team to increase their work pace to meet the shorter timeline.

Time pressure can occur if deadlines become more fixed/rigid than the expected available time lent—due to either internal factors, such as planning the work poorly, or external factors, like client demands, or occurring by chance, such that the project work required accelerating the schedule.

The primary characteristics of time pressure in project management:

Reducing time to complete tasks without sufficient adjustments in resources.

Increasing demand for quicker decision-making throughout project activities.

Increasing risk by impacting quality and cost.

Increasing the level of pressure on the project team to complete tasks in shorter timeframes.

The Consequences of Time Constraints on Project Teams Completing Tasks

Time constraints are thought of as one of the most powerful influences on a team's performance on the project. Time pressure happens when the team must perform the task in a time frame that is less than is required to perform the task effectively. Time pressure brings about behavioral organization and productivity consequences that impact the overall project outcomes and quality.

1. Behavioral and Psychological Consequences

Elevated Stress and Exhaustion

Quicker schedules elevate both psychological and physical stress levels of the team, leading to both mental and physical exhaustion.

Lower Job Satisfaction

An employee may have the impression that they are less valued when they are expected to achieve the same performance levels within a shorter timeframe and are given fewer resources and lower levels of support.

Increased Chance of Burnout

Heavy workloads accomplished within a shorter timeframe contribute to continuous fatigue and less willingness to perform by team members.

2. Organizational and Managerial Consequences

Reduced Communication of the Team

When under significant time pressure, there is much less time for meetings and coordination leading to a reduced level of communication.

Reduced Innovation and Quality of Decisions

If teams are dedicated to just meeting deadlines then decisions are made in a hurry and without the detail needed to make a high-quality decision.

Increased Conflict in the Team

Working under higher stress levels and at a higher working tempo.

3. The Productivity and Technical Impacts to the Project

Decreased Quality of Work

Increased time pressure leads to increased speed of work, which makes it more likely for technical mistakes to happen and additional work to happen.

Paradoxical Delays in the Project

Time on fixing mistakes from rushed work generally causes more delays

than would have happened if the team was working on a normal timeline.

Reliance on Quick and Incorrect Solutions

There is a possibility that the team could leverage a shortcut way of work that would diminish how accurate, and the quality of the final solutions would be.

Reduced Long-term Efficiency of the Team

A constant state of overexertion reduces team productivity and has long-lasting consequences about efficiency to perform on future projects.

4. The Effect on Project Relationships

Strained Relationships Between the Management and Teams

Teams may feel that management is applying pressure and not taking into account that humans have limitations on capacity and workload.

Reduced Collaboration Between Departments

Each department's focus is on fulfilling the task as quickly as possible, which removes any possibility of coordination and integration with other departments.

Conclusion:

Time pressure creates a detrimental effect on project teams in the arena of stress, efficiency of performance, increasing error rates, and lower standards of job satisfaction. These particular impacts dissipate into the overall efficiency of the project, and eventually incur higher costs and reduced efficiency in the long-term.

Is the Experience of the Project Manager Contributory for Managing Time Pressure? (An Answer Based on the Literature)

Current research studies within the literature on project management highlight the important role a project manager's experience plays in diminishing the detrimental effects exerted on performance by time pressure. The higher the level of experience a project manager possesses with time, planning, resource management, risk management, and leading a team, the better they can manage time pressure without greatly compromising performance.

Experience of the project manager can be demonstrated within three dimensions:

1. Better Planning and Task Assignment

A project manager with experience has a greater opportunity to estimate delays in tasks, thus producing a more realistic time schedule that will often reduce the exposure to time pressure.

2. Optimizing Risk Assessment

An experienced project manager finds it easier to search or anticipate possible delays from risks and take action to mitigate the impact of those delays through techniques such as alter the project path or shift resources.

3. Managing Team Performance Under Pressure

An experienced project manager can help energize the work team, resource the work distribution, reducing stress levels and assure the negative effects of time pressure on the quality of their work and or overall performance are minimized.

4. Quicker and More Accurate Decisions

When time is of the essence, the speed of decision-making and the accuracy of the decision are paramount. An experienced project manager can make relevant and well-thought-out decisions without hastily making decisions that can negatively impact the outcome of the project.

5. Appropriate Use of Time-Management Tools and Techniques Such as:

Critical Path Method (CPM)

Earned Value Analysis (EVA)

Schedule compression techniques (Fast Tracking & Crashing)

These tools also provide a means of monitoring a project when time is needed to expedite a project.

Research Conclusion

Yes, the experience level of the project manager is a key and significant factor in reducing or minimizing the effect of schedule pressures on the project performance.

The more experience a manager has planning, leading, and making decisions, the lower the adverse impact of time compression, resulting in improved project performance outcomes in the areas of quality, cost, adherence, and the capacity to build, lead, & execute a team.

****Rationale for the Selection of Research Type Descriptive-Analytical****

This research study adopts the descriptive-analytical approach for a number of reasons, both scientific and methodological. Initially, the stated phenomenon of schedule time pressure is a naturally-prevalent aspect of project environments and one which cannot be induced in an experimental design without influence on the actual workflow. Hence, the descriptive approach is the most reasonable in determining the existence of the phenomenon in its natural settings, as encountered by actual projects. Next, it allows the analysis of relationships between independent and dependent variables, since the study is concerned with time pressure as an independent variable intended to affect project performance (referred to as quality, cost, and team efficiency) as a dependent outcome.

In addition, the descriptive-analytical approach allows for the collection of both qualitative and quantitative data, through the use of appropriate tools, such as questionnaires or interview occasions to inform collective interpretations, and support the ability to conduct statistical analyses. Finally, the descriptive-analytical study can assist with identifying the knowledge gap regarding the influence of time pressure on performance and assisting in recommendations to practically improve time management for a project. Hence, the research type is considered the most suitable given the study's design and purpose.

Overview of Past Studies: the consequences of time pressure in a project management context**

1. Directionality of Findings: increases in productivity vs. decreases in quality and well-being**

Systematic reviews and experiment studies provide a consistent story: time pressure produces a boost in productivity and performance speed, but decreases the quality of products and declines individual well-being (higher error frequencies, exhaustion, and less creativity). This is especially true in software engineering and technical fields.

2. Field Differences in Findings: Software, Construction, and Innovation Contexts**

Software engineering studies have shown that productivity gains are not without a cost in quality (e.g.: more coding defects), while studies in construction show schedule trade-offs and quality and cost effects from forcing previously-agreed timelines to be sped-up. Research on new product development presents mixed findings regarding collaboration and sharing information. Thus challenging any claims about opportunity's directionality across fields.

3. Behaviors: Limited cognitive processing and heuristics**

Under time pressure, employees lose the capacity to explore, assess, and evaluate alternatives which forces them to apply heuristics and rapid decision-making processes which detracts from the quality of performance and decline in creativity. This mechanism confirms the previous finding of diminishing qualitative performance even if quantitative performance benefits from increased productivity.

4. Influences on Team Dynamics and Communication

Research on the field shows that time pressure contributes to changes in eating patterns. It increases the flow of information within smaller subgroups but slows coordination between units. Time pressure can also heighten conflict and diminish psychological safety in teams, which affects team learning and limiting error correction.

5. Nonlinear Relationship and Moderating Factors

Time pressure is not always detrimental. Established research supports a nonlinear relationship (Yerkes–Dodson law), whereby performance is enhanced given a low to moderate level of time pressure; excessive time pressure results in deterioration of performance. Ascertainable moderators affect this relationship including temporal leadership, managerial experience, and organizational culture.

6. Effects on Decision-Making and Planning

When under time pressure, management practitioners tend to use schedule-compression strategies (e.g., fast-tracking or crashing) without comprehensive analysis of the risks associated with them, which typically introduces additional costs and rework. In some instances, hastening execution results in even longer delays and a budget increase.

7. Interaction With Other Factors: Estimation Errors, Organizational Culture, and Resource

Constraints

Multiple sources of research signify that time pressured originates in large part from inadequate time estimates, an urgency culture, or external stakeholder obligations. Attempts to address time pressure without addressing the root causes consistently create the possibility of construction issues.

8. Preventive and Mitigation Strategies

Evidence suggests that effective mitigation strategies include improved schedule estimation, managing risks early, strong temporal leadership, psychological safety of team members, and moving resources. These strategies not only diminish the negative effects of time pressure, but can also transform time pressure from debilitating to motivating.

9. Research Gaps

Lack of comparative local/Arab studies to link schedule pressure to measurable performance indicators of the engineering and service sector.

Need longitudinal surveys and field data investigating sources of pressure, means of managing pressure, and long-term outcomes. Lack of research examining the effectiveness of interventions in pressure management (e.g. training project managers in temporal leadership).

The purpose of the study was to investigate the way in which schedule pressure influences project performance in the context of quality, cost, and team output. The results demonstrated that compressed timeframes and accelerated schedules present a barrier to the performance of project managers and team members. The authors concluded that high time pressure negatively affected execution quality, raised the frequency of errors, increased project costs, and diminished team motivation and communication effectiveness. Yet, the study investigated the study again, and subsequently demonstrated the importance of having experienced project managers. By relying on experienced and skilled managers who possessed strong abilities related to planning, risk management, and leadership, the negative impacts of schedule pressure could be reduced, enabling project stability to persist despite high time pressure. Finally, the authors concluded that effective time management, realistic scheduling, and an experienced manager were critical to the successful pursuit of projects subjected to time pressure. Through a proactive approach, companies could balance the demands of compressed timelines, while continuing to deliver high quality products, remain cognizant of costs, and maintain team effectiveness.

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