MODELING CONFLICT DYNAMICS IN PROJECT TEAMS: AN INTEGRATED APPROACH TO CLASSIFICATION, PREDICTION AND MANAGEMENT

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Annotation (English)

The article addresses the modeling of conflict dynamics in project teams as a factor that directly affects team effectiveness, decision quality and project stability. Conflicts in project teams arise from misaligned goals, the distribution of roles, divergent personal interests and communication deficiencies, yet their developmental dynamics are rarely analyzed in an integrated way, and most existing models are not adapted to local project contexts. The aim of the study is to classify the types of conflict that occur in project teams, to model their dynamics, and to develop an integrated model for their assessment, prediction and management. Drawing on analysis and synthesis, expert evaluation, iterative analysis and econometric methods, the study examines how task, relationship and process conflicts evolve over the project life cycle and how they influence performance. The findings show that conflict is not a static event but a dynamic process whose trajectory can be modeled and managed; a structured, integrated model improves the quality of managerial decisions, strengthens team stability and enhances overall project performance, particularly in the educational sector.

Keywords: conflict dynamics; project teams; conflict modeling; task conflict; relationship conflict; process conflict; conflict management; integrated model; team performance; project management.

Аннотация (на русском языке)

В статье рассматривается моделирование динамики конфликтов в проектных командах как фактор, непосредственно влияющий на эффективность команды, качество принимаемых решений и устойчивость проекта. Конфликты в проектных командах возникают вследствие несогласованности целей, распределения ролей, расхождения личных интересов и недостатков коммуникации, однако их динамика развития редко анализируется комплексно, а большинство существующих моделей не адаптированы к локальному контексту проектов. Цель исследования — классифицировать типы конфликтов, возникающих в проектных командах, смоделировать их динамику и разработать интегральную модель их оценки, прогнозирования и управления. На основе методов анализа и синтеза, экспертной оценки, итеративного анализа и эконометрических методов исследуется, как конфликты задач, отношений и процессов развиваются на протяжении жизненного цикла проекта и как они влияют на результативность. Результаты показывают, что конфликт является не статичным событием, а динамическим процессом, траекторию которого можно моделировать и которым можно управлять; структурированная интегральная модель повышает качество управленческих решений, укрепляет устойчивость команды и повышает общую эффективность проекта, особенно в сфере образования.

Ключевые слова: динамика конфликтов; проектные команды; моделирование конфликтов; конфликт задач; конфликт отношений; процессный конфликт; управление конфликтами; интегральная модель; эффективность команды; проектное управление.

Annotatsiya (o'zbek tilida)

Maqolada loyiha jamoalarida konfliktlar dinamikasini modellashtirish jamoa samaradorligi, qaror qabul qilish sifati va loyiha barqarorligiga bevosita ta'sir ko'rsatuvchi omil sifatida ko'rib chiqilgan. Loyiha jamoalaridagi konfliktlar maqsadlarning nomuvofiqligi, rollar taqsimoti, shaxsiy manfaatlarning farqlanishi va kommunikatsiyadagi nuqsonlar tufayli yuzaga keladi, biroq ularning rivojlanish dinamikasi

kamdan-kam hollarda kompleks tahlil qilinadi, mavjud modellarning aksariyati esa mahalliy loyiha kontekstiga moslashtirilmagan. Tadqiqotning maqsadi — loyiha jamoalarida yuzaga keladigan konflikt turlarini tasniflash, ularning dinamikasini modellashtirish hamda ularni baholash, prognozlash va boshqarish bo‘yicha integral modelni ishlab chiqishdan iborat. Tahlil va sintez, ekspert baholash, iterativ tahlil va ekonometrik usullar asosida vazifa, munosabat va jarayon konfliktlarining loyiha hayot sikli davomida qanday rivojlanishi va samaradorlikka ta’siri o‘rganilgan. Natijalar shuni ko‘rsatadiki, konflikt statik hodisa emas, balki traektoriyasini modellashtirish va boshqarish mumkin bo‘lgan dinamik jarayondir; tizimli integral model boshqaruv qarorlari sifatini oshiradi, jamoa barqarorligini mustahkamlaydi va, ayniqsa, ta’lim sohasida loyiha samaradorligini yaxshilaydi.

Kalit so‘zlar: konfliktlar dinamikasi; loyiha jamoalari; konfliktlarni modellashtirish; vazifa konflikti; munosabat konflikti; jarayon konflikti; konfliktlarni boshqarish; integral model; jamoa samaradorligi; loyihalarni boshqarish.

1. Introduction

Conflict is an inherent feature of collaborative work, and project teams — temporary, goal-oriented and multi-stakeholder structures — are particularly prone to it. According to the widely cited CPP Global Human Capital Report, 85% of employees at all levels experience workplace conflict to some degree, and employees in the United States spend on average 2.8 hours per week dealing with conflict, equivalent to roughly $359 billion in paid hours in 2008 [1]. In project environments, where resource, time and budget constraints intersect with the involvement of many stakeholders, unmanaged conflict can erode performance, delay deliverables and undermine team cohesion.

In project teams, conflict arises from a combination of organizational and interpersonal factors: misaligned goals, the distribution of roles and responsibilities, divergent personal interests and deficiencies in communication. Formal conflict-management procedures, however, frequently fail to ensure full team effectiveness, because they treat conflict as an isolated incident rather than as a process that develops over time. The dynamic, evolving nature of conflict — the way it escalates, de-escalates and transforms across the project life cycle — remains insufficiently modeled, especially in the context of national and educational-sector projects, where internationally developed frameworks have not been fully adapted.

The aim of this article is therefore to conceptualize and model the dynamics of conflict in project teams, to classify conflict types and to propose an integrated model for assessing, predicting and managing their development. This contributes both theoretically — by integrating dispersed conflict models into a single dynamic framework — and practically, by improving the quality of decision-making, work effectiveness and team stability.

2. Theoretical Framework and Literature Review

The scientific study of conflict in organizations has produced several complementary streams that inform the modeling of conflict dynamics.

Process models of conflict. Pondy’s seminal model conceptualizes organizational conflict as a sequence of episodes — latent, perceived, felt, manifest and aftermath — rather than a single event [2]. This staged view is foundational for any dynamic model, because it locates conflict on a temporal trajectory. Tuckman’s model of group development (forming, storming, norming, performing) similarly embeds conflict, in the “storming” stage, within the natural evolution of a team [3].

Typologies of conflict. A major advance was the distinction between task, relationship and, later, process conflict introduced and validated by Jehn [4]. De Dreu and Weingart’s meta-analysis showed that both relationship and task conflict are, on average, negatively associated with team performance and member satisfaction, challenging the earlier assumption that task conflict is purely beneficial [5]. Amason further distinguished functional (cognitive) from dysfunctional (affective) conflict in strategic decision-making [6]. These typologies provide the variables that any conflict-dynamics model must track.

Dynamics and transformation. Jehn and Mannix’s longitudinal study demonstrated empirically that high-performing teams display a distinctive temporal pattern of conflict, confirming that conflict is dynamic rather than static [7]. Greer, Jehn and Mannix extended this by showing how one conflict type

transforms into another over time [8], while O'Neill and colleagues recently integrated conflict states and processes into a unifying framework [9].

Conflict-management styles. The Thomas–Kilmann two-dimensional model (assertiveness × cooperativeness, yielding competing, collaborating, compromising, avoiding and accommodating) [10] and Rahim's organizational conflict inventory [11] provide the managerial levers through which dynamics can be influenced. Deutsch's theory of constructive and destructive processes [12] and Coser's functions of social conflict [13] supply the broader theoretical foundation, and the reviews of Wall and Callister [14] and Tjosvold's notion of the "conflict-positive organization" [15] emphasize that conflict can be harnessed productively.

Modeling approaches. Because conflict is dynamic and involves feedback loops, system-dynamics modeling [16] and game-theoretic models of cooperation [17] offer formal tools for representing escalation and resolution over time. Within project management specifically, the PMBOK Guide treats conflict management as a core interpersonal and team skill [18].

3. Materials and Methods

A complex methodological approach was applied. Through analysis and synthesis, existing international models and theories were studied and their applicability to the project-team context was assessed. Expert evaluation, based on interviews with specialists, was used to identify conflict types and to estimate their level of impact. Iterative analysis was applied to study the stages and dynamics of conflict development. An econometric approach was used to identify the relationships between conflicts and project performance, time and resource constraints.

The research object is the activity of modeling and assessing conflict dynamics in project teams; the research subject comprises the organizational and economic relations that arise during this process in educational-sector project teams. The principal research questions concern the main conflict types and their developmental dynamics, the relationship between conflict development and project performance, the adaptation of foreign models to local conditions, and the predictive value of an integrated model.

4. An Integrated Model of Conflict Dynamics

Building on the literature, the study proposes an integrated model that combines three dimensions. The first is a typology layer that classifies each conflict as task, relationship or process conflict [4], [5]. The second is a dynamic layer, derived from Pondy [2] and Jehn–Mannix [7], that tracks each conflict through latent, perceived, felt, manifest and aftermath stages across the project life cycle. The third is a management layer, derived from Thomas–Kilmann [10] and Rahim [11], that maps appropriate handling styles to each conflict type and stage.

The model treats conflict as a feedback system: unresolved task conflict can transform into relationship conflict — an escalation loop — whereas timely collaborative resolution generates trust that dampens future escalation, forming a balancing loop [8], [16]. Expert weights and econometric estimates are used to parameterize the strength of these relationships, allowing the model to predict the likely trajectory and performance impact of a given conflict and to recommend a corresponding management response.

5. Results and Discussion

The analysis confirms that conflict in project teams is best understood as a dynamic process rather than a discrete event. Task conflict, when managed early and collaboratively, can have a constructive effect on decision quality, whereas relationship conflict and unresolved, escalated conflict consistently reduce performance and satisfaction — a pattern consistent with De Dreu and Weingart [5] and Behfar and colleagues [19]. The transformation of task conflict into relationship conflict emerged as a critical risk point, in line with Greer and colleagues [8].

The integrated model offers three practical advantages. First, by classifying conflict type and stage simultaneously, it enables earlier and more targeted intervention than formal procedures that react only to manifest conflict. Second, by representing escalation and de-escalation as feedback loops, it supports

prediction rather than mere description. Third, by linking conflict states to management styles, it converts diagnosis into actionable guidance [10], [11], [20].

In the educational-sector project teams examined, the main drivers of conflict were role ambiguity, goal misalignment and communication gaps — the same factors identified in the international literature — but the limited prior adaptation of foreign models to local conditions reduced the effectiveness of existing formal procedures. This supports the central premise that internationally developed models require contextual adaptation. The scientific significance of the study lies in integrating dispersed conflict typologies, process models and management frameworks into a single dynamic model; its practical significance lies in improving decision quality, work effectiveness and team stability.

6. Conclusion and Recommendations

The study demonstrates that modeling conflict dynamics enables project teams to move from reactive conflict management to proactive conflict governance. The proposed integrated model — combining a typology layer, a dynamic stage layer and a management-style layer within a feedback-system logic — provides a structured tool for classifying, predicting and managing conflict over the project life cycle.

For practitioners, the following recommendations are proposed: (1) diagnose conflicts by both type and stage rather than treating them as uniform incidents; (2) intervene early in task conflict to prevent its transformation into relationship conflict; (3) match conflict-management styles to the conflict type and project phase; (4) invest in conflict-management training, which the evidence links to better outcomes [1]; (5) clarify roles and goals at project initiation to reduce structural conflict drivers; and (6) adapt international models to national and sectoral contexts rather than transferring them mechanically.

Future research should validate the model on a larger and more diverse sample of project teams, incorporate real-time data and simulation to refine its predictive parameters, and extend it to virtual and cross-cultural project teams.

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