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Enhancing communication and collaboration in collaborative projects through conflict prevention and management systems

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Since the 1990s, conflict prevention and management (CPM) systems are increasingly used by a variety of organizations in order to improve work environments and to reduce the cost of conflict. CPM systems are a set of measures that interact with each other to prevent conflict escalation and help manage conflicts if they arise. Geographically, CPM systems are particularly important in North America, but also are gaining prominence in other countries, including Germany. While most examples of these systems are in the corporate sector, systems also exist in governmental institutions, hospitals, and educational institutions. About 30% of the U.S. Fortune 1000 companies used CPM in 2011 and the increased prevalence of CPM in both US federal agencies and US headquartered international agencies, such as the World Bank, is observable. Yet, the use of CPM is not yet prominent in collaborative projects.

Scientific research projects are prone to the detrimental effects of conflict, much like private companies or public agencies, especially if they are large-scale, interdisciplinary agglomerations of multiple research institutes from different countries, often including high stakeholder involvement. In addition, such projects rely mainly on virtual communication and are time-limited. These characteristics, coming together make such projects complex organizational settings that are challenging to manage because of the inherently high risk of conflict. The likelihood of collaboration is threatened by the very complex organizational structure built to support it. Team processes and project outcomes are harmed if not well managed. An additional challenge faced by third-party funded projects is that there are usually limited resources available for coping with conflict costs, including delays in delivery, poor data, staff absenteeism, replacement of staff, and extensive conflict management processes. Well-known coping mechanisms,

such as budget top-up or time extensions, are difficult to obtain under third-party funding.

The foundation of successful collaboration includes good communication and teamwork. Information sharing and knowledge creation depends on well-functioning relationships and communication between project partners. This is particularly true in a project setting defined by a limited lifetime, which makes on-time performance crucial in order to achieve project goals. With increasing task complexity, it is not just more time, more cooperation and more communication among project members that is required, but also more instructions from project management. Significant delays, increased reminders before task completion, as well as an increase in stress and dissatisfaction can result from such high levels of resource investment. Hence, relationships and good communication play an important role in creating a productive work environment that helps achieve project goals. However, most project frameworks, particularly in the sciences, fail to explicitly consider and openly address these issues.

Projects that acknowledge the need for so-called meta-communication to facilitate collaboration and organizational effectiveness are mainly found in the fields of biomedical and public health sciences. Here, individual measures, such as training on group processes, communication, and conflict management are increasingly integrated into collaborative research initiatives, such as large research and training centers. Some also offer on-demand mechanisms, such as mediation, in case of conflict. Still, frequently the majority of projects neither incorporate measures of meta-communication nor embed it strategically.

To fill this gap while supporting the building and sustaining of relationships between different project members, CPM systems are a suitable tool. Initially, the introduction of so-

<https://doi.org/10.1016/j.orgdyn.2017.10.004>
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called alternative dispute resolution mechanisms focused on labor–management conflicts, usually related to violations of policy, contract, or law. These systems sought to reduce litigation processes and conflict costs. Since the 1990s, conflicts in groups and team-based work settings have been identified as a major contributor to organizational malfunctioning. Consequently, the focus has shifted from estimating efficiency only in terms of savings toward a more value-based approach related to improving work quality and employee satisfaction, as well as an increase in productivity. This put social conflict, between employees and groups of employees, squarely in the domain of organizational conflict management. This in turn resulted in the diversification of conflict management measures toward preventive measures, such as training in communication and conflict management.

The purpose of this paper is to analyze the effects of a CPM system in a collaborative research project. We examined the following research question: what effect does a conflict management system have on communication and collaboration in a large-scale international, interdisciplinary project?

To answer this question, we studied a food security project with high stakeholder involvement. This food security project exemplifies the complexity of collaborative projects. Such projects are initiated to address societal challenges, such as hunger and malnutrition. Hunger and malnutrition are targeted by a global development agenda. They require joint action of multiple actors to find solutions. The Trans-SEC project was selected as a case study not only because of its organizational structure, but because it also integrated a CPM system into its project design.

The project's CPM system was initiated at the project's kick-off conference and until the end of the project different activities and on-demand services were offered. At least one team reflection session and one training on communication and conflict awareness were offered per year. During the trainings input on conflict communication and facilitation was given and space provided for the reflection of conflict experience. Each training lasted two days. The activities were combined with the project's annual status conferences. This combination of events increased the possibility of project members to attend. The combination reduced expenditure of project partners for travelling and accommodation. There was no participation fee. An external consultant facilitated the activities. The individual was contracted by project management for the project's lifetime. The consultant also facilitated crucial processes that had high conflict potential, such as board meetings, and mediated employee conflicts. In addition, internal conflict contact points were appointed at each member organization for cases of conflict and a national CPM coordinator was elected for Tanzania.

To assess the effects of the CPM system, we looked at the project members' evaluation of the effects and learnings of CPM related to communication, collaboration, and efficiency of work. As CPM systems may impact both employers (here the project itself) and employees (the project members), we distinguished between effects on the project members and the organizational level of the project as well as the interlinkages between them.

In short, we analyze a CPM systems as an organizational support tool to see if interpersonal relations and organiza-

tional effectiveness improve. Does a CPM system help project managers and team members deal effectively with the (negative) dynamics of organizational life within a temporary research project?

TRANS-SEC

Trans-SEC is an interdisciplinary research project on food security with high stakeholder involvement (www.trans-sec.org). The project aims to improve the food situation for the most vulnerable, rural populations of four villages in Tanzania. There is a variety of key local and regional stakeholders. The project consortium is composed of more than 120 scientists and non-scientists with consortium members from 14 different institutions. The majority of them are based in Germany or Tanzania, while others come from Kenya and the USA. The institutions include universities, national and international research centers, as well as NGOs. Although the overall research process is centrally driven by the four project managers based at a German research center and a Tanzanian university, many research activities with substantial responsibilities are delegated as work packages to partner institutions. The project management team integrated a CPM system in the project design in order to ensure an efficient and motivating work environment as well as high quality output.

The CPM system goals were to: (1) attain a high degree of collaboration by (a) improving communication and (b) positive interactions among between project members in order to realize improved communication flows so as to mitigate asymmetries in information among project members; (2) minimize conflict escalation; (3) ensure efficiency regarding scientific output; and (4) establish inter-organizational trust for future collaborations.

CPM-Survey, Data, Indicators and Sample Composition

To analyze the effects of the CPM system on project collaboration, a quantitative web survey was conducted after three years, near the end of the project's first funding period. The survey consisted of 26 questions on frequency, type, and causes of conflict, (b) coping mechanisms, and (c) an evaluation of conflict prevention and management.

To evaluate the extent that the CPM system achieved its aforementioned goals, the survey included a set of selected indicators. Table 1 lists the items and their primary relation to one of the CPM system goals; relations to other goals may also exist. The indicators mostly focus on the measures and activities connected to communication aimed at conflict prevention, while others address the direct handling of conflict. Two items were deliberately worded negatively in order to allow people to voice their discontent with the CPM system. The order of the items was varied randomly between respondents to prevent order effects.

In total, 89 project members responded to the survey, a response rate of 71.2%. Of the respondents, 40.0% were female and 60.0% male; regarding nationality, 50.6% were Tanzanian, 39.6% were German, and 9.9% reported some other nationality including Brazilian, British, Cameroon, Indonesian, Mexican, Nepal, and Ugandan. Overall, 52.8%

Table 1 Goals of CPM and Related Survey Items

Focus	Indicator	Goal
O	“CPM improved communication among Trans-SEC members.”	Good communication
P	“CPM made me address problems more openly.”	
O	“CPM created an open and trustful work environment.”	Positive interaction
O	“CPM facilitated intercultural understanding.”	Low conflict escalation
O	“CPM reduced internal conflict in Trans-SEC.”	
O	“CPM prevented the escalation of conflict.”	
O	“CPM helped to address intercultural conflicts.”	Work efficiency and outputs
P	“CPM did improve the way I handle conflicts in my work environment.”	
O	“CPM increased project outputs such as deliverables and scientific publications by tackling project internal conflicts.”	
O	“CPM built inter-organizational trust and fostered the establishment of networks for future cooperation.”	Overall assessment
O	“CPM resources should be spent on field research related activities instead.”	
O	“Personally, I would recommend including a CPM system in every large interdisciplinary research project.”	
P	“CPM does not make any difference to me.”	Overall assessment
P	“CPM provided me with knowledge and skills on conflict management that I can use beyond Trans-SEC.”	

Note: O = organizational, P = personal.

of respondents held junior-scientist positions (BA/MA/MSc students, doctoral students or postdocs), 28.6% held a senior scientist position, 9.9% were non-scientific project members, and 8.8% answered “something else.” For the purpose of our analysis, these last two groups (‘non-scientific’ and ‘others’) were combined and labeled “non-scientific.” Two-thirds of the respondents (66.3%) had worked on the project since its beginning, 21.4% joined later and were still working on the project, while 12.4% were no longer working on the project. For most respondents, working in a context with CPM was new (87.9%).

Effects and Learnings

Fig. 1 presents project member responses based on a five-point response scale from “strongly disagree” to “strongly agree.” The figure shows that the majority of project members perceived CPM favorably: more than 50% of respondents agreed or strongly agreed with 11 out of 12 of the positively worded items.

A great majority of project members recommended including a CPM system in every large interdisciplinary research project — the most positively evaluated item on the list. The remaining statements, ordered by decreasing levels of support, are improved communication, intercultural understanding, a trustful work environment, prevention of conflict escalation, addressing intercultural conflict, provision of knowledge and skills on conflict management beyond the project, establishing inter-organizational trust, reduced internal conflict, improved handling of conflicts, and addressing problems openly. More than a third of the respondents reported seeing an increase in outputs due to CPM.

Looking at the differences in agreement levels on organizational and personal impact, respectively, the results suggest that the perceived influence of CPM is more profound and stronger on the organizational than on the personal

level. This positive overall assessment of the CPM system is also mirrored by responses to the two negatively worded items: Only a fifth of the respondents felt that CPM resources should have been spent on field research activities, and less than ten percent felt that the CPM system made no difference to them personally. However, for two-thirds of the respondents CPM did make a personal difference. Overall, the project members clearly agreed with most of the positive outcomes of this project’s CPM system.

Further examination of the results show that 85% of the respondents who participated in workshops on communication and conflict management (strongly) agreed that CPM improved their conflict handling skills. Further, 90% of the participants felt that the workshop gave them the knowledge and skills that they can use beyond the project. These findings show that CPM is not only evaluated favorably by a majority of project members with regard to conflict prevention and management in the project, but that they also see long term benefits.

Table 2 compares the responses of those who (strongly) agreed with the given items by working position, that is senior scientist, junior scientist, or non-scientist staff. The differences are relatively minor for three items: prevented escalation of conflict; reduced internal conflict; rather field research. For the other items, larger differences exist, with senior scientists having the greatest number of agreement with 6 out of the remaining 11 items: 88% of the seniors recommended CPM systems in every large interdisciplinary research project. They perceived CPM as most helpful for facilitating intercultural understanding, addressing intercultural conflicts, and creating an open and trustful work environment. They also perceived CPM to be beneficial in the mid- to long-term. That is, they felt that CPM built inter-organizational trust and fostered the establishment of networks for future cooperation. Senior scientists (44%) related CPM to improved output. The group of juniors rated highest

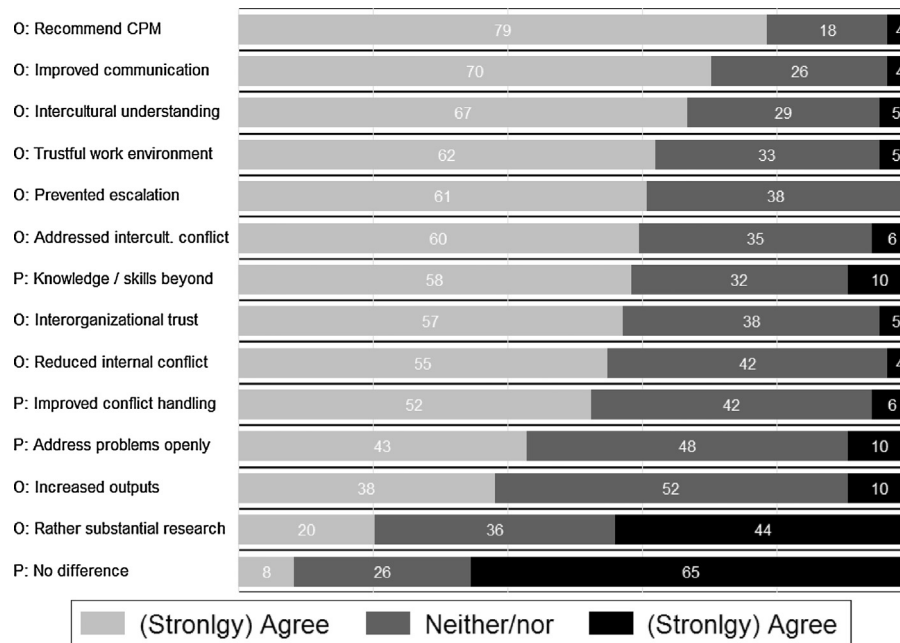


Figure 1 CPM Impact Evaluation by Project Members overall

Source: Trans-SEC CPM online survey, N = 84. Note: Figures based on project members’ responses to proposed statements on a five point scale; categories “agree” and “strongly agree” respectively “strongly disagree” and “disagree” are collapsed into one. O: organizational level; P: personal level.

(a) improved internal communication, (b) improved conflict management skills, and (c) increased knowledge and skills for use beyond the project. They were the group with the highest attendance in workshops on conflict awareness (51%) (compared to 42% of seniors and 38% non-scientific) and coaching (31%) (22% seniors; 20% non-scientific).

All of the non-scientific staff members stated that CPM made a personal difference to them. They also stated that they could address conflict more openly because of CPM.

DISCUSSION

These findings suggest that implementing a CPM system in a collaborative research project not only facilitates communication and collaboration, but it also contributes to team effectiveness. More than two-thirds of the project members agreed or strongly agreed that CPM improved communication among them. And about two-thirds felt that CPM created an open, trustful work environment. In doing so,

Table 2 Project Members’ Evaluation of CPM Impact by Working Position

	Working position			
	Overall %	Junior %	Senior %	Non-scientific %
O: recommend CPM	79	76	88	71
O: improved communication	70	76	64	64
O: intercultural understanding	67	62	88	43
O: trustful work environment	62	58	72	57
O: prevented escalation	61	60	60	64
O: addressed intercultural conflict	60	60	76	29
P: knowledge/skills beyond project	58	69	44	50
O: inter-organizational trust	57	58	60	50
O: reduced internal conflict	55	53	56	57
P: improved conflict handling	52	62	44	36
P: address problems openly	43	44	36	50
O: increased outputs	38	33	44	43
O: rather substantial research	20	20	20	21
P: no difference	8	11	8	0
N	84	45	25	14

Source: Trans-SEC CPM online Survey. Note: Figures indicate project members’ agreement with proposed statements on a five point scale; categories “strongly agree” and “agree” combined.

it facilitated intercultural understanding among project members.

Given this project brought together project members from multiple countries, institutions, and disciplines, these results are encouraging. Social and communication skills are needed for exchange among scientists of different disciplines. For complex tasks that require significant cooperation between partners, such skills are critical. At the beginning of a project, CPM can facilitate meta-communication in order to develop a jointly shared vocabulary and a jointly shared methodological approach. Further, CPM may help overcome common challenges faced by international projects, such as different concepts of time that result in (perceived) delays in communication or to different communication types (direct versus indirect). A CPM system that includes a component of conflict prevention is an effective tool to provide a forum to overcome these challenges. In the process of enhancing knowledge and skills related to communication, perception patterns and conflict dynamics provide new perspectives and possibilities to communicate and address challenges. If communication improves, this can positively impact individuals and the project by reducing conflict and transaction costs.

CPM facilitates conflict resolution. It minimizes the probability of conflicts from escalating. It helps address intercultural conflict. It increases an individual's competence to personally handle conflict. These results are even stronger among those who participated in CPM training. This finding is consistent with other studies. In short, CPM is a way to enhance project team effectiveness and prevent conflicts. This is an important aspect to note, as some conflict management models focus on conflict resolution, but neglect an emphasis on prevention.

While the prevention of conflict (escalation) can be considered crucial in any work environment, this is particularly important in a setting that is time-limited. If conflicts are addressed early on, then destructive effects, including reduced employee motivation, absenteeism, contract terminations, delays in delivery, and poor quality output can be mitigated. The CPM system designed for Trans-SEC, included an integrated component of conflict prevention as well as highly decentralized conflict management structures that were available in each partner institute and country. This provided a support structure well suited to the international and inter-organizational project environment. With regards to project output, CPM fostered the establishment of networks for future cooperation and it increased outputs.

An unexpected result is the senior scientists' strong support of the CPM system; a result that project managers and funding agencies should consider when planning projects. CPM's role in addressing intercultural conflicts and in facilitating an open and trustful work environment is important for effective collaboration.

Many seniors scientists are neither trained in human resource management nor in conflict management. The CPM system provided them relief by reducing conflict through preventive training and facilitating conflict management. This allowed them to concentrate on their core responsibility, namely their research.

This highlights the need to engage senior project leaders as early as possible in CPM implementation in order to gain and keep them promoters of it. They can assist with the

prevention of conflict by means of mentoring or coaching employees, by ensuring that CPM activities are funded, and by encouraging staff to participate in training, team reflection, and in conflict management sessions.

The human management skills learned in CPM workshops will likely be beneficial for the future careers of the junior scientists. Given that juniors usually make up the largest group in projects, and they are often in the early stages of their career, offering CPM might have the biggest impact for them in the long-term. CPM may very well contribute to the pool of employees who are prepared for future collaborations.

Looking at the non-scientific staff members, CPM had a positive influence on them because the CPM workshops included both scientific and non-scientific staff. This contributed to an open, respectful team culture. Further, simply knowing that a CPM system exists likely helps project members to be more tolerant toward diverse working cultures and communication patterns.

Initial spill-over effects support our positive findings on CPM. There was a positive impact of CPM beyond the project. Project members integrated CPM in subsequent projects. They set up CPM structures in their home institutions, as in the case of the Tanzania Federation of Cooperatives (TFC). They requested CPM workshops at their home institutions, and they applied CPM knowledge outside of work (e.g. on the community and family level).

CONCLUSION

Collaborative projects are complex organizations with a high risk of conflict and project failure. Collaboration, based on communication and human interaction, is crucial for project success. CPM is not yet prominent in these projects. Our results show positive effects of CPM on project members' communication and conflict behavior as well as on interpersonal trust and perceptions of work effectiveness. The positive support of CPM was found across all working positions, with a great majority recommending a CPM system for use in other projects. This suggests that CPM is a tool that benefits work collaboration. Our findings should encourage both project managers and funding agencies to continue integrating and funding team processes that support communication and collaboration, while minimizing the risk of conflict escalation and organizational failures.

ACKNOWLEDGMENTS

This publication is a product of the Trans-SEC project (www.trans-sec.org). The Federal Ministry of Education and Research (BMBF) funded and the Federal Ministry for Economic Cooperation and Development (BMZ) co-financed Trans-SEC. The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the BMBF or BMZ. The authors acknowledge the help provided by the Trans-SEC consortium throughout the data collection procedures. The authors would like to thank Christian Hochmuth, Dirk Sprenger, Jane Wambura and Felix Wendenburg for their valuable comments and advice during the planning and development of this study. Additional gratitude is owed to the *editor* and the *reviewers* for their time and valuable remarks.



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