Teams and Project Performance: An Ability, Motivation, and Opportunity Approach

Àngels Dasi, Torben Pedersen, Livia Barakat and Tiago Alves

Abstract

This paper analyses the relationships between project performance and a team's ability, motivation, and opportunity (AMO). In particular, we apply the AMO framework to the team level to determine which combination of AMO factors is best for project performance in terms of financial gains. We compare an additive model, a multiplicative model, and a constraining factor model of interplay among the AMO factors to determine project performance. In so doing, we consider differences in project complexity. We test our hypotheses on a sample of 285 projects undertaken by teams at InterCement, a multinational producer of cement, lime, and special mortars headquartered in Brazil.

Keywords: Project performance, ability, motivation, opportunity, project complexity

Teams and Project Performance: An Ability, Motivation, and Opportunity Approach

Introduction

Firms use team-based projects to manage activities and resources in an integrated way, and to share knowledge and best practices internally (Gupta and Govindarajan, 2000; Sydow, Lindkvist, and DeFillippi, 2004). Project teams are temporary associations of employees who work together to achieve a pre-defined objective within a limited time span. As such, team members are interdependent in the performed tasks (Gladstein, 1984; Guzzo and Dickson, 1996). When examining the factors that contribute to a project's success, scholars have pointed to the resources and competences held by team members, the human resource management (HRM) practices applied, and the characteristics of the performed task (Floricel, Michela, and Piperca, 2016; Popaitoon and Siengthai, 2014).

A recent review concludes that 'by drawing on theoretical and methodical resources from the HRM field, project studies can benefit from a more refined focus on levels of analysis and practices' (Keegan, Ringhofer, and Huemann, 2018, 129). We respond to this call by bringing together the HRM literature on work performance and the literature on project performance.

Work performance has been widely studied as a function of employee´s ability (A), motivation (M), and opportunity (O), which together form the AMO framework (Blumberg and Pringle, 1982; Boxall, 2003). The literature has mainly applied AMO at the individual level to study its effects on employees´ outcomes (Andreeva and Sergeeva, 2016; Beltran-Martin and Bou-Llusar, 2018; Siemsen, Roth, and Balasubramanian, 2008). Some studies have focused on the reinforcing effects of ability, motivation, and opportunity (Kim, Pathak, and Werner, 2015; Reinholt, Pedersen, and Foss, 2011), while others have highlighted that one of the three factors might be a constraining factor creating a bottleneck for performance

(Siemsen, Roth, and Balasubramanian, 2008). However, the exact interplay among the AMO factors is still an open issue. In this study, we address this gap in the extant research by comparing three competing models of interplay among the AMO factors (an additive, a multiplicative, and a constraining factor model) in terms of their effects on project performance.

In addition, while most other studies have been conducted on individual level with a focus on individual performance, we conduct the analysis at team level and with the focus on the performance of teams. The point is that one cannot simply aggregate from individual level to the team level and expect the AMO factors work in the same ways on both levels (Klein and Kozlowski, 2000). In fact, the team level involves interactions among the team members that introduce a different dynamic. As such, we respond to the call of extending AMO research to the team level by Jiang, Takeuchi, and Lepak (2013). More specifically, we analyse how a team's ability, motivation and opportunity affect project performance in terms of financial gains. In so doing, we consider the character of the project, especially its complexity. Thus, our research questions are: In what ways do a team's ability, motivation, and opportunity affect project performance? How do these factors interact? To what extent is the effect dependent on the characteristics of the project?

We conducted our study at InterCement, a multinational producer of cement, lime, and special mortars headquartered in Brazil. InterCement is particularly suitable for this study because of its focus on teams in conducting process and management innovations. In fact, it was recognized as one of the five most innovative companies in the construction materials and decoration sector in the Valor Brazil Innovation Yearbook (Strategy&PwC, 2018). We test our hypotheses on 285 projects.

We contribute to the literature in two ways. First, we explore the predictive capacity of the AMO model at the team level and thereby extend the literature that has mostly focused on the individual level. By advancing our understanding of the antecedents of project performance, we hope to help managers to more efficiently allocate their teams' competences and resources. Second, we compare three alternative models of the interplay among the AMO factors, and we introduce project complexity as a contextual variable that affects the optimal combination of the AMO factors.

AMO Models and Project Performance

Firms make extensive use of teams as a way of integrating and recombining knowledge in order to reach project goals. Previous research has analysed variables like the team's size and composition, its motivation, the degree of difficulty in goals, and the type of leadership as predictors of project performance and effectiveness (Gladstein, 1984; Guzzo and Dickson, 1996; Keller, 1986). In the project management literature, HRM practices are found to affect project organization and performance in multiple ways (Belout and Gauvreau, 2004) - see Huemann, Keegan and Turner (2007) and Keegan, Ringhofer and Huemann (2018) for excellent reviews on the cross fertilization between the HRM and project management.

The HRM literature proposes that performance is an outcome of three factors: ability (A), motivation (M), and opportunity (O) that together form the AMO framework (Blumberg and Pringle, 1982; Boxall, 2003). Ability, which refers to the capacity to perform, is closely connected to the knowledge base and skills. Motivation includes attitudinal variables, as it refers to an individual's willingness to perform. Opportunity reflects the means through which abilities and motivation can be converted into outcomes (Jiang, Takeuchi, and Lepak, 2013). While there is empirical evidence of the positive impact of each AMO factor on performance (Caliguri, 2014), less is known about their complementarity or whether one of them is more important under certain conditions (Kim, Pathak, and Werner, 2015; Siemsen, Roth, and Balasubramanian, 2008). Therefore, scholars have called for empirical explorations of how ability, motivation, and opportunity work together to create value (Argote, McEvily and Reagans, 2003).

This is particularly imperative at more aggregated levels (e.g. team level), because of the dynamics and interactions among the members that constitute the teams (Popaitoon and Siengthai, 2014). Team ability is different from the sum of the individual members' abilities as it includes the synergies and interdependencies of skills among them (Zhao and Anand, 2009). The same is true for team motivation and team opportunity, which relate to complementarity and variation among the team members, rather than just the sum of the individuals. The very reason for forming the teams in the first place is that some synergies are created by putting the individuals together. Therefore, the most effective combination of AMO factors at the team level might very well be distinct from the most effective AMO combination at the individual level.

Initial work assumed an additive or linear model in which any increase in one of the three factors had a direct, positive effect on performance (Boxall and Purcell, 2003; Cummings and Schwab, 1973). In an additive model, each factor has instant, linear and independent effects on performance (Cummings and Schwab, 1973). One implication of this model is that the absence of one of the factors can be offset by an increase in the other two factors in terms of performance. However, in most cases this model does not accurately reflect how the AMO factors determine project performance.

Team members need the right skills to perform tasks that are generally characterized by (sequential or reciprocal) interdependencies. A lack of these abilities is seldom offset by willingness or organizational support. In such cases, the tasks will be delayed or performed poorly, thereby affecting the performance of the entire project (Garud and Kumaraswamy, 2005; Gladstein, 1984). Similarly, we expect the team's motivation to be a factor that cannot be offset by the other two factors. A high level of team motivation is related to trust and collaborative behaviour in which individuals strive to achieve collective outcomes (Cabrera and Cabrera, 2005; Collins and Smith, 2006). Low levels of motivation might imply that team members trust each other less or they may not commit to the project's goals, resulting in relationship conflicts and poorer performance (Liang et al., 2007; Liu, Keller, and Shih, 2011).

With regard to the opportunity factor, there is empirical evidence of the importance of the individual's positioning (Reinholdt, Pedersen, and Foss, 2011) and organizational support (e.g. empowered leadership and management's commitment) for project performance (Gardner, Wright, and Monyihan, 2011; Srivastava, Bartol, and Locke, 2006). However, beyond this direct effect, we expect organizational support to reinforce team members' abilities and motivation by strengthening their knowledge base through internal knowledge sharing and reinforcing their self-confidence. Consequently, models that account for complementarities among the AMO factors might better predict performance at the team level.

In fact, some investigations have highlighted specific conditions that might either have a reinforcing effect between factors -the multiplicative model- (Kim, Pathak, and Werner, 2015; Reinholdt, Pedersen, and Foss, 2011) or a constraining effect -the constraining factor model-. The latter occurs when one of the factors acts as a bottleneck and makes the impact of additional investments in the other two factors insignificant (Siemsen, Roth, and Balasubramanian, 2008).

The multiplicative model claims that the three factors reinforce each other (Jiang, Takeuchi, and Lepak, 2012). The team's ability is expected to positively interact with the team's motivation by reducing role confusion and increasing feelings of efficacy and commitment (Gardner, Wright, and Moynihan, 2011). High levels of efficacy are positively related to teams' performance (Srivastava, Bartol, and Locke, 2006). As mentioned above, the opportunity factor also has reinforcing reciprocal effects with ability and motivation. First, opportunities like training and professional recruitment increase the team's abilities. Second, when leaders are supportive and involved, team members can learn from their tactical and managerial skills, and receive guidance on how to apply their knowledge (Gardner, Wright, and Moynihan, 2011; Srivastava, Bartol, and Locke, 2006). Along the same lines, a team with a richer knowledge base has more opportunities to find solutions internally, thereby promoting knowledge exchange, which also strengthens the development of a collaborative climate (Jiang, Takeuchi, and Lepak, 2012).

We also expect a reinforcing effect between motivation and opportunity in relation to project performance. First, members who perceive that their contributions are highly valued by others or that others might help in their future career development feel obligated to reciprocate, which enhances the collaborative climate (Cabrera and Cabrera, 2005; Gagné and Deci, 2005) and affective commitment (Gardner, Wright, and Moynihan, 2011). Second, highly supportive teams with empowered leadership raise the level of intrinsic motivation by allowing individuals to be autonomous. In addition, these contextual conditions allow individuals to share their own ideas and potential solutions.

Therefore, a multiplicative model that includes interactions among the three factors might better explain projects´ performance. Accordingly, we hypothesize:

H1a: The multiplicative model is a better predictor of project performance than the additive model.

However, teams do not always benefit from the complementarities among the three factors. Team-working dynamics and characteristics (e.g., the complexity of the project, the tacitness of the knowledge being shared) might call for a different model. At the individual level, Siemsen, Roth, and Balasubramanian (2008) apply the notion of resource constraints to the AMO framework for individuals' knowledge sharing and propose a constraining factor model (CFM). They identify cases in which the value of one factor (i.e., the minimum for ability, motivation, or opportunity) acts as a bottleneck in such a way that unless a minimum level is reached, the other factors have limited effect. For example, in a context without any motivation, this factor may act as a behavioural constraint for improving project performance even in the presence of high ability and opportunity.

The CFM proposes that the factor that is present to the least extent has the greatest effect on the team's performance because it constrains the effects of the two other factors if it is too low. Therefore, increasing the level of the lowest factor will strengthen the other factors as well (Siemsen, Roth, and Balasubramanian, 2008). In fact, project teams establish a division of labour based on abilities, especially when their members are already specialized and accustomed to handling certain tasks. For these reasons, a failure to achieve the minimum level of one of the factors (e.g., lacking a certain ability needed to perform a task) postpones, at least in the short term, the achievement of potential synergies related to the other factors and affects the project's performance. Therefore, we hypothesize:

H1b: The constraining factor model is a better predictor of project performance than the additive model.

A key characteristic that might illuminate which of the two suggested models is the most appropriate is the complexity of the project, which is a relevant source of uncertainty and risk (Floricel, Michela, and Piperca, 2016). In this paper, we focus on short-term projects that aim at improving efficiency. These projects are more exploitative of extant knowledge, and their level of complexity varies depending on factors like the institutional environment's complexity or organizational complexity (Floricel, Michela, and Piperca, 2016). Thus, we differentiate between simple and advanced projects (Baccarini, 1996; Geraldi, Maylor, and Williams, 2011).

Simple projects are characterized by less variety, fewer tasks, and lower technological and structural complexity (Baccarini, 1996). Therefore, the interdependencies in simple projects are straightforward and easier to manage (Geraldi, Maylor, and Williams, 2011). It is possible to identify and foresee the tasks that have to be undertaken and plan how to perform them with less uncertainty (Geraldi, Maylor, and Williams, 2011) about potential problems. If problems do occur, the members of the team are expected to possess the abilities and experience needed to address them. In contrast, advanced projects are characterized by high levels of structural complexity owing to interactions among a large number of elements. Team members managing complex projects often confront confusing and unpredictable situations in which present knowledge and experience might be of little use (Baccarini, 1996; Geraldi, Maylor, and Williams, 2011). In these projects, it is more difficult to identify and define possible courses of action and to manage the interdependencies among team members.

Under such conditions, we expect the two competing AMO models—the multiplicative model and the CFM—to differ in terms of their ability to predict performance. On the one hand, we expect the CFM to be the optimal model for simple projects, as it reflects the idea that minimum levels of ability, motivation, and opportunity are required for the synergies among the AMO factors to unfold. The investment of more resources does not provide significant complementary benefits because of the simplicity of the tasks and the low level of uncertainty. For these reasons, we hypothesize:

H2a: When teams undertake simple projects, the constraining factor model is a better predictor of project performance than the multiplicative factor model.

On the other hand, we expect the multiplicative model to be a better predictor of performance for advanced projects. Team members allocated to advanced projects generally have a minimum level of ability, as they are assigned to projects based on their abilities. We also expect the presence of some level of motivation related to possibilities for career development (extrinsic motivation) or task identification (intrinsic motivation). We also expect these teams to have some organizational support, as their projects are more likely to be of strategic relevance. Under these conditions, investments in one AMO factor trigger synergic effects in at least one of the other factors. For instance, the implementation of training programs aimed at augmenting the members' knowledge should enhance feelings of competence and increase members' motivations (Lee-Kelley, 2006). Similarly, increasing the frequency and strength of communication between members should increase members' knowledge and help them adjust to unexpected environmental changes (Floricel, Michela, and Piperca, 2016). Because of the structural complexity and uncertainty, advanced projects require that all three AMO factors complement each other along the entire scale in order to achieve the project goal. Thus, we hypothesize:

H2b: When teams undertake advanced projects, the multiplicative model is a better predictor of project performance than the constraining factor model.

The identification of the factor that matters most for each type of project is highly relevant, as it helps managers better allocate resources. In the case of simple projects, we argue for the existence of a constraining factor—team ability—that acts as a bottleneck for the two other factors. For simple and relatively predictable tasks, the key factor is a certain level of ability, as the success of the project is mainly determined by team members' cognition.

Individual cognition is related to the knowledge the individual possesses as well as the processes of knowing, attending, remembering, and reasoning (Helfat and Peteraf, 2015). When individuals face routine or familiar tasks, their response can be quasi-automatic if they retrieve the knowledge needed from their memories (Helfat and Peteraf, 2015). In this sense, education and experience are valuable inputs for individuals making decisions on simple projects, as they can lead to heuristic processes and speed in mental processing. As the level of uncertainty in simple projects is expected to be low, individuals should not need to undertake more sophisticated processing of information in order to create new, innovative solutions. Instead, they need to apply their extant knowledge and experience to the specific tasks. Therefore, we suggest:

H3a: When a team undertakes simple projects, the constraining factor is the team's ability.

When teams manage complex projects with difficult, highly interdependent tasks and in which unforeseen problems might arise, their performance is determined by complementarities among the three factors. From self-efficacy theory (Bandura, 1977; Ajzen, 1991), we know that individuals' perceived self-efficacy (ability) depends on their own judgments regarding how well they can execute the courses of action required to deal with specific situations. Gagné and Deci (2005) argue that self-efficacy is directly related to intrinsic motivation, as it triggers feelings of competence and autonomy. Teams with the right knowledge and experience might feel more confident when facing complex and difficult tasks. Moreover, they can perceive such complexity as interesting and challenging, which promotes feelings of autonomy and intrinsic motivation.

Along the same lines, team's motivation interacts with the organizational support (opportunity). Like individual behaviour, a team's actual behaviour depends on its perception of control, that is, the extent to which it believes that, in general, its performance is determined by that behaviour (the internal control) and by other contingencies (the external control) (Ajzen, 1991; Lee-Kelley, 2006). When performing simple projects, teams might believe that most things are within their control, such that they depend less on external circumstances. However, as advanced projects are characterized by high levels of uncertainty and ambiguity the locus of control would be viewed as more external. Therefore, the more confident and motivated the team the more it will be able to convince the organization to provide the required training, financial support, and extra time needed to conduct the tasks (Lee-Kelley, 2006). Highly supportive organizations will accept part of the responsibility and stand by members. Managers can provide support in different ways e.g. by providing up-to-date and relevant information that guides the team's behaviour and by creating a supportive climate that reduces feelings of fear, anxiety, or stress (Srivastava, Bartol, and Locke, 2006).

As argued above, the team's motivation plays a key role in releasing the complementarities among the AMO factors in advanced projects. Hence, we hypothesize:

H3b: When a team undertakes advanced projects, motivation moderates the team's opportunities and its ability to perform by increasing the positive effect of team ability and team opportunity on performance.

Methods

We test our hypotheses in the context of the Brazilian multinational, InterCement. The company produces and sells cement, lime, and special mortars all over the world. It has 40 business units (mainly cement factories) spread across eight countries: Brazil, Argentina, Paraguay, Portugal, Mozambique, Cape Verde, Egypt, and South Africa. It exports to 17 countries, has 7,735 employees worldwide who generate a total of EUR 1.9 billion in revenue (2016).

Knowledge management is a corporate function at InterCement, as the transfer of best practices for application across the organization is a viewed as critical. One key knowledge-management initiative is the Continuous Improvement Program, which has had a direct impact on the company´s overall performance with about EUR 2.5 million in savings per year.

The purpose of the Continuous Improvement Program is to establish, monitor, and foster improvement projects. As InterCement is a commodity firm, these projects usually aim to reduce costs or to increase the sustainability of the products. In general, the projects target energy efficiency, the use of alternative raw materials, or cost reductions (e.g. to develop new chemical substances to improve the cement's quality and to reduce the thermal consumption of the accumulated kiln). As such, the program encompasses incremental projects that focus on improvements in existing processes (i.e., solution-oriented projects) rather than radical innovations.

Approximately 150-200 projects are undertaken within the Continuous Improvement Program each year. Most projects last for one year and some for up to two years. Thus, the company typically has about 300 continuous improvement projects underway. In order to promote and keep track of these projects, InterCement uses a PDCA (plan, do, check, act) tool through which all information is entered into an online platform that is accessible by all business units.[1]

Typically, the corporate systems director defines the program's objectives for the year, which then trickle down into the organization. Each unit has its own systems manager, who proposes continuous improvement projects that fall within that unit´s responsibility and that are in line with the premises established by headquarters. The unit's systems manager assigns a project leader to handle the day-to-day work and operational issues of projects being undertaken in that unit. See Appendix 1 for a more detailed description of the workings of projects and the role of managers.

[1] The PDCA is a management tool based on the Lean Six Sigma/total quality management principles. Other articles, such as the case study on ASUS by Chen and Belcher (2010) or the study of Maruta (2012), cite the use of PDCA as important for a firm´s absorptive capacity, innovation, and improvement.

Each project comprises a project leader, team members (6.4 team members on average, with a range from 2 to 19), and specific goals, including expected financial results. The project leader continuously enters information on the project's performance into the online PDCA platform, which is monitored by corporate management. The estimated financial gains are reported at the end of each year, while the realized financial gains are reported when a project is finalized.

In this paper, we use data on projects finalized in 2015 and 2016, which we combine with HR data on each project-team member. The project data, which were reported through the online platform, capture the workings of the project and include information on goals, project nature, team composition, meeting frequency, team involvement, reported problems, actions, and performance. The HR data provide basic information on all involved team members, including details on hierarchical position, function, department, level of education, and membership on other project teams. As we are able to use the HR data to calculate the compositional features of project teams (the team level measures), these two data sources allow us to examine the interactions among the team members' skills (ability), the team's behaviour (motivation), and contextual factors (opportunity) in relation to project performance. Therefore, the data are particular suitable for testing our hypotheses regarding the effects of team-level AMO factors on project performance. The data are unlikely to suffer from common method bias, as we draw from two separate data sources that are relatively objective (data reported in the online system and monitored by higher levels in the company, and fact-based HR data).

Measures

All of the applied variables are single-item measures that are calculated based on one of the two data sources: project data or HR data. The project data is based at the project level, while the HR data has the individual as the unit of analysis. We use the HR data to calculate the composition of team members on different dimensions, such as education, management position, and project overload, which enables us to aggregate the individual-level information to the project level not by calculating the means for the individuals but by using the diversity among team members to construct compositional measures at the team level. As such, all variables are tangible measures rather than intangible, latent constructs.

Dependent variable

Our dependent variable is project performance, which is measured as the financial gains obtained by the team at the end of the project. These financial gains are reported by the project leader and monitored by corporate management, which checks the accuracy of the uploaded information. Although project performance has different dimensions and can be measured in various ways, we follow Dvir, Raz, and Shenhar's (2003) suggestion to focus on the key stakeholder's objectives. In this case, the key stakeholder is corporate management, which initiates projects and promotes knowledge sharing and financial goals. Nevertheless, we conducted different robustness checks with alternative specifications of project performance, including time spent, delays, gaps between financial targets and final results, and goal achievement (as a percentage), but none of these alternative specifications provided more robust results.

Independent variables

The independent variables are the AMO factors of ability, motivation, and opportunity. Ability is measured as the percentage of the project members in each project with a university degree. Education is described by Blumberg and Pringle (1982) as one of the variables related to the ability component. From the HR data, we obtain information on the educational level (i.e., elementary school, high school, technical education, or university degree) of all project members and then calculate the share of project members with a university degree for each project (average of 8% for all projects). Highly skilled team members is typically the critical factor in realizing complementarity among the individual skills of the team members. A similar measure of team ability was applied by Bailey, Berg, and Sandy (2001).

Team participation serves as a proxy for motivation, as it measures the percentage of project members actually involved and engaged in the team's meetings with the monitoring body (average of members in each meeting over the total number of members in the project) (reported in the project data; average of 72% for all projects). High team participation in these meetings reduces free riding, enhances the cross-fertilization of ideas, increases the generation of solutions, and leads people to act (e.g., fewer delays that might affect costs). High participation implies that team members collectively impact the knowledge, mindset and motivation of the team (Keegan, Ringhofer, and Huemann, 2018). As such, we follow Bailey, Berg, and Sandy's (2001) logic of measuring the tangible behavioural outcome of motivation in terms of engagement and commitment rather than attempting to measure some intangible aspect of the minds of individuals. Employee participation in problem solving and decision making has been applied to operationalize motivation to collaborate and share knowledge (Kim, Pathak, and Werner, 2015).

Opportunity is measured as the percentage of project members in management positions. The HR data for each project member include information on hierarchical position, which spans eight levels from blue-collar worker (lowest level) to CEO (highest level). The three highest levels (i.e., CEO, directors, and managers) hold management responsibilities. For each project, we calculate the share of project members with management responsibilities (average of 3% for all projects). A higher share reflects an opportunity, as it implies that the decision makers are close to the project, thereby providing more direct access to resources and increasing awareness of external circumstances that might hinder the project's success.

Previous studies on the AMO model have argued that higher managerial hierarchical levels and autonomous job designs have more potential to affect the total quality management system and generate superior work performance (Waldman, 1994). Similarly, Bos-Nehles, Van Riemsdijk, and Kees Looise (2013) operationalize opportunity as the situational support received from the corporation (e.g., from HR professionals in the context of HRM project implementation). Likewise, in the context of continuous improvement projects, we operationalize opportunity as the support and involvement of management in those projects.

Control Variables

We include three control variables. The size of the project team, which is measured as the number of members within a team (average of 6.4 for all projects), is a structural variable that reflects the amount of knowledge the team has as well as its ability to handle the job (gathered from project data). The premise is that the bigger the team, the more knowledge it has and the easier it is to carry out more actions. The share of overloaded project members is a cognitive variable that is measured as the share of project members involved in more than 10 projects at the same time (according to the corporate manager systems; gathered from HR data; average of 30% for all projects). This variable controls for the possibility that team members may struggle to complete the focal project because they have too many other commitments. The number of problems identified captures unforeseen difficulties in the project (gathered from project data; average of 5.1 for all projects). The identification of a problem implies an escalation to a higher level that leads to additional actions. Such awareness reduces over-confidence and allows for early action to be taken.

In addition, we undertake a split-sample analysis into simple and advanced activities. This distinction is based on the systems manager's classification using the guiding criteria of the complexity of the project (i.e., a dummy variable; gathered from the project data). In simple projects the solution typically is known, while in advanced projects one does not have knowledge or control to establish the outcome. As the systems manager supervises all projects in his or her unit, he or she is well positioned to compare the projects and identify those that are simple or advanced.

Model Specification

Three different models—additive, multiplicative, and constraining factor—are used to test the relationships between project performance and the three factors of ability(A), motivation(M), and opportunity(O) (Kim, Pathak, and Werner, 2015; Siemsen, Roth, and Balasubramanian, 2008).

The additive model claims that the three AMO factors are independent of each other (different aspects) but they all affect project performance. The specification comprises the main effects:

$$\text{Project performance}=a_0+a\ \mathrm{A}+a_2\mathrm{M}+a_3\mathrm{O}+\varepsilon.$$

The multiplicative model suggests that the three factors are interdependent and that they reinforce each other. It adds three interaction terms to the specification:

$$\text{Project performance}=a_0+a_1\mathrm{A}+a_2\mathrm{M}+a_3\mathrm{O}+a_4\mathrm{AM}+a_5\mathrm{AO}+a_6\mathrm{MO}+\varepsilon.$$

The logic here is that the three AMO factors are complementary in driving project performance and that the complementarity is across the entire scale—a lower level of one factor will reduce the reinforcing effect of the other factors, while high values of one factor will strengthen the amplifying effect of the other factors. As such, it imposes a continuous change in the size of the reinforcing effect over the whole scale.

The constraining factor model also proposes complementarity among the three factors. However, it only does so at the extremes rather than across the entire scale. In this model, a factor with a low value might act as a bottleneck and have a deterring effect on the two other factors without having an amplifying effect at the other end of the scale. The constraining factor model is specified as follows:

$$\text{Project performance}=a_0+a_1\text{A}+a_2\text{M}+a_3\text{O}+\Theta_A(a_7+a_8\text{A}+a_9\text{M}+a_{10}\text{O})+\theta_O(a_{11}+a_{12}\text{A}+a_{13}\text{M}+a_{14}\text{O})+\varepsilon.$$

Θ_A and θ_O are dummy variables that are set equal to 1 if **A**(bility) or **O(**pportunity), respectively, are the minimums of the A, M, and O values, and 0 otherwise. Here, **M**(otivation) is the omitted variable, which implies that the effect of motivation if motivation is at the minimum is given by a_2, but the effect of ability if ability is at the minimum is given by a_1+a_8. Similarly, the effect of opportunity if opportunity is at the minimum is given by a_3+a_{14}. If, when a factor is at the minimum, these effects are greater than the coefficients obtained for the same factor in the additive model, then that factor is a constraining factor that has a stronger effect when it is at the minimum than otherwise.

When calculating the dummies Θ_A and θ_O for when ability and opportunity, respectively, are at the minimums in our dataset, we find that ability is at the minimum in 33% of the projects and opportunity is at the minimum in 30% of the projects (while the omitted category of motivation is at the minimum in 37% of the projects).

Results

We obtained full information (no missing values) and conduct our analysis for 285 projects that were finalized in 2015 or 2016.

As the variables were measured using different scales, we standardized all variables (mean=0 and standard deviation=1) before conducting the analysis. We took this step because we apply interaction effects and because we compare the minimum values across the three AMO factors, which only makes sense if all variables are on the same scale. The correlation matrix is shown in Table 1. None of the independent variables have correlations that indicate problems of multi-collinearity, as all correlations among the independent variables are below the commonly accepted threshold of 0.4. The highest correlation of 0.36 is between team size and overload, which is expected. We did run the model without team size and results remained qualitatively the same. Also, both motivation and opportunity are positively correlated with project performance, while ability is uncorrelated.

****************Table-1-about-here*****************

The results of the three alternative specifications of the impact of the AMO factors on project performance are listed in Table 2. The table includes nine models, as each of the three alternative specifications is conducted for "all projects" (Models 1-3), "simple projects" (Models 4-6), and "advanced projects" (Models 7-9).

****************Table-2-about-here*****************

The significance of the solutions and explained variances of Models 1-3 comprising "all projects" indicate that the multiplicative model shows the best solution with an F-value of 6.25 and an adjusted R-squared of 0.14, while the CFM has an F-value of 3.56 and adjusted R-squared of 0.11. The additive model is almost as good as the CFM with a higher F-value but a lower adjusted R-squared. Therefore, we have to reject Hypothesis 1b, which suggests that the CFM is superior to the additive model, while we can accept Hypothesis 1a, which proposes that the multiplicative model is superior to the additive model. In the multiplicative model, the main effect of motivation and the interaction effects between opportunity and motivation and between opportunity and ability are positive and significant.

When considering the simple projects (Models 4-6) and the advanced projects (Models 7-9) separately a richer picture emerges. For advanced projects, the multiplicative model clearly obtains the best solution with an F-value of 9.62 and an adjusted R-squared of 0.40, which is in line with Hypothesis 2b. This indicates that the AMO factors are complementary and that they reinforce each other not just at the extremes but across the entire scale. For simple projects, the results are more ambiguous, as the CFM obtains a slightly higher adjusted R-squared but a slightly lower F-value than the two other models. Therefore, Hypothesis 2a is only partially confirmed.

If we compare the two additive models (Models 4 and 7), we find that ability is significant for simple projects but not for more advanced projects. On the other hand, motivation and opportunity seem important for advanced projects but less so for simple projects. This is further confirmed in the multiplicative models (Models 5 and 8), where the interaction effects for motivation and ability and for motivation and opportunity are highly significant for advanced projects, while no interaction effects are significant for the simple projects. Therefore, we can further qualify our initial findings—the complementarity among the AMO factors for the advanced projects is closely related to motivation, which amplifies the two other factors across the whole scale (and not just at the extremes). This confirms Hypothesis 3b.

The CFM adds to these findings in the sense that ability turns out to be a constraining factor in the case of simple projects (Model 6), where the coefficient for ability is 0.36 (0.28+0.08) when ability is the lowest of the three factors. This is clearly higher than the coefficient of 0.15 in the additive model (Model 4), which indicates that ability is more important for simple projects when it is the lowest than motivation and opportunity. Both motivation and opportunity obtain lower values in the CFM (0.05 and 0.01, respectively) than in the additive model (0.09 and 0.08, respectively), which indicates that they are not constraining factors. Therefore, Hypothesis 3a is confirmed.

In the case of advanced projects (Models 7 and 9), only opportunity obtains slightly higher coefficients in the CFM (0.28+0.02=0.30) than in the additive model (0.27). However, this increase in the coefficient is not significant.

The effect of increasing ability in the simple projects is greater than for the two other factors. In fact, when ability is the lowest, raising it by one standard deviation increases project performance by 0.36 of a standard deviation (Model 6), while it otherwise increases project performance by 0.32 of a standard deviation (Model 5). This is greater than the effects of increasing motivation or opportunity in simple projects. In advanced projects, increasing motivation by one standard deviation improves project performance by 0.96 of a standard deviation (Model 8), while the effects of increasing opportunity and ability by one standard deviation are 0.66 and 0.50, respectively.

Discussion

Studies of project performance and the application of AMO factors to work performance are hardly new. However, the ambition of this paper was to bring the HR literature on the effect of the AMO factors and the literature on project performance together. In particular, our aim was to scrutinize how ability, motivation, and opportunity interact in determining project performance. While numerous studies show that all three factors affect work performance at the individual level, we still have little knowledge of how they affect each other in determining performance at the team level.

An understanding of the mechanisms that promote project performance at the team level can help guide managers' allocations of resources to teams. Each of the three analysed models has different implications. Our study has shown that the interplay among the AMO factors depends on the teams’ work context. In simple projects, ability seems to be the key factor as both as a main effect and as a constraining factor acting as a bottleneck for project performance if it is too low. Firms undertaking simple, routine projects should prioritize those interventions aimed at achieving the minimum level of knowledge and skills needed within the team, so that members can apply their cognitive capabilities and efficiently make decisions. Other interventions aimed at increasing the team’s motivation by augmenting their participation (opportunities) through the involvement of top managers will have an insignificant effect unless the team has reached the minimum ability level. In this regard, our results extend those obtained by Popaitoon and Siengthai (2014). In their study they found a positive direct effect of teams´ realized absorptive capacity on their short-term performance, however HRM practices did not significantly moderate this direct effect. Our study shows a more nuanced view, distinguishing between simple and advanced tasks. We agree with Popaitoon and Sientghai (2004) that teams working with simple tasks and under time pressure are more focused on solving the immediate tasks at hand, and therefore having the right skills to exploit the absorbed knowledge is the key factor.

In the case of advanced projects there is more scope for an HRM intervention as the multiplicative model seems superior with significant interaction effects over the entire scale. In particular, our results highlight the pivotal role of motivation when teams perform interdependent, complex tasks. In other words, strong team motivation positively moderates the relationship between ability and project performance and the relationship between opportunity and project performance. Our study sheds light to Keegan, Ringhofer, and Huemann (2018) claim of lack of research on employee participation benefits for project-based organizations. Indeed, participation increases the sharing of tacit and explicit knowledge and motivates team members by increasing their feelings of competence and goals' commitment.

In addition, our study demonstrates how the dynamics associated with the complexity of the project impact the efficacy of the main antecedents of project performance. While simple tasks require managers to provide the team with the required cognitive capabilities, complex and uncertain tasks put the team's motivation at the centre of its knowledge-sharing processes. Consequently, our research is in line with recent theoretical developments that call for a better understanding of how contextual heterogeneity affects knowledge processes at lower levels of analysis (Foss, Husted, and Michailova, 2010).

In this study we have introduced team-level measures of the AMO factors as collective team factors are fundamentally different from the aggregation of individuals within the team. A team is not just a group of independent individuals. The team includes complementarities, synergies and interdependencies that go beyond the simple aggregation of its members. In fact, these collective features of the team are at the core of their existence.

Likewise, our research contributes to the HRM literature (Jiang, Takeuchi, and Lepak, 2013) by examining how differences in team's dynamics require different combinations of abilities, motivation, and opportunities. Teams are a relevant work context for employees. However, in order to increase a team's effectiveness, contextual factors should be considered. Such factors include uncertainty and task interdependencies that might require higher organizational support in order to release team members from the responsibility of coping with the complex project tasks. Thus, it is necessary to implement HR practices that effectively operate at the team level.

Our results have some noticeable managerial implications. In simple projects, the greatest improvement in project performance can be obtained by enhancing the team's ability, which can be achieved by selecting team members with the required knowledge and skills, or through training, communication, and incentives. In advanced projects, the greatest improvements in project performance can be achieved by increasing motivation. In addition to its own positive effect, this will amplify the effects of ability and opportunity.

Our paper suffers from several limitations. Even though we gathered our data from two sources, our measures are based on single items. Further research must explore other potential measures for capturing the collective aspects of the workings in teams. In addition, while our focus on one firm provided data on a large number of projects and teams, and enabled us to compare projects that varied in terms of complexity, it limits the generalizability of our conclusions. One way to extend our knowledge and derive a better understanding of the underlying mechanisms would be to conduct field experiments involving interventions related to teams' abilities, motivations, and opportunities.

References

Ajzen, I. 1991. The Theory of Planned Behaviour. *Organizational Behaviour and Human Decision Processes,* 50: 179-211.

Andreeva, T., Sergeeva, A. 2016. The More the Better… or is it? The Contradictory Effects of HR Practices on Knowledge-Sharing Motivation and Behavior. *Human Resource Management Journal*, 26(2): 151-171.

Argote, L., McEvily, B., Reagans, R. 2003. Managing Knowledge in Organizations: An Integrative Framework and Review of Emerging Themes. *Management Science*, 49(4): 571-582.

Baccarini, D. 1996. The Concept of Project Complexity –A Review. *International Journal of Project Management*. 14(4): 201-204.

Bailey, T., Berg, P., Sandy, C. 2001. The Effect of High-Performance Work Practices on Employee Earnings in the Steel, Apparel, and Medical Electronics and Imaging industries. *ILR Review*, 54(2): 525-543.

Bandura, A. 1977. Self-efficacy: Toward a Unifying Theory of Behavioral Change. *Psychological Review*, 84, 191-215.

Batt, R. 2002. Managing Customer Services: Human Resource Practices, Quit Rates, and Sales Growth. *Academy of Management Journal*, 45(3): 587-597.

Belout, A., Gauvreau, C. 2004. Factors Influencing Project Success: The Impact of Human Resource Management. *International Journal of Project Management*. 22: 1-11.

Beltran-Martin, I., Bou-Llusar, J.C. 2018. Examining the Intermediate Role of Employee Abilities, Motivation and Opportunities to Participate in the Relationship between HR Bundles and Employee Performance. *Business Research Quarterly,* 21: 99-110.

Blumberg, M., Pringle, C.D. 1982. The Missing Opportunity in Organizational Research: Some Implications for a Theory of Work Performance. *Academy of Management Review*, 7: 560-569.

Bos-Nehles, A. C., Van Riemsdijk, M. J., Kees Looise, J. 2013. Employee Perceptions of Line Management Performance: Applying the AMO Theory to Explain the Effectiveness of Line Managers' HRM Implementation. *Human Resource Management*, 52(6): 861-877.

Boxall, P. 2003. HR Strategy and Competitive Advantage in the Service Sector. *Human Resource Management Journal*, 13(3): 5-20.

Boxall, P., Purcell, J. 2003. *Strategy and Human Resource Management*. Oxford, UK: Blackwell.

Cabrera, E.F., Cabrera, A. 2005. Fostering Knowledge Sharing Through People Management Practices. *International Journal of Human Resource Management*, 16(5): 720-735.

Caliguri, P. 2014. HRM Practices to Improve Knowledge Transfer Within MNCs. *Journal of International Business Studies*, 45: 63-72.

Chen, C.L.J., Belcher, S.M. 2010. The Importance of Absorptive Capacity in the Road of Becoming a "Giant Lion". ASUStek computer link. *Global Economic Review*, 39(3): 291-315.

Collins, C.J., Smith, K.G. 2006. Knowledge Exchange and Combination: The Role of Human Resource Management Practices in the Performance of High Technology Firms. *Academy of Management Journal* 49: 544-560.

Cummings, L.L., Schwab, D.P. 1973. *Performance in Organizations*. Scott, Foresman and Company, Glenview, IL.

Dvir, D., Raz, T., Shenhar, A. J. 2003. An Empirical Analysis of the Relationship Between Project Planning and Project Success. *International Journal of Project Management*, 21: 89-95

Fleury, A., Fleury, M. T. L., Borini, F. M. 2013. The Brazilian Multinationals' Approaches to Innovation. *Journal of International Management*, 19(3): 260-275.

Floricel, S.; Michela, J.L., Piperca, S. 2016. Complexity, Uncertainty-Reduction Strategies, and Project Performance. *International Journal of Project Management*, 34: 1360-1383.

Foss, N.J.; Husted, K., Michailova, S. 2010. Governing Knowledge Sharing in Organizations: Levels of Analysis, Governance Mechanisms, and Research Directions. *Journal of Management Studies*. 47(3): 455-482.

Gagné, M., Deci, E.L. 2005. Self-Determination Theory and Work Motivation. *Journal of Organizational Behavior*, 26: 331-362.

Gardner, T.M., Wright, P.M., Moynihan, L.M. 2011. The Impact of Motivation, Empowerment, and Skill-Enhancing Practices on Aggregate Voluntary Turnover: The Mediating Effect of Collective Affective Commitment. *Personnel Psychology*, 46: 315-350.

Garud, R., Kumaraswamy, A. 2005. Vicious and Virtuous Circles in the Management of Knowledge: The Case of Infosys Technologies. *MIS Quarterly*, 29(1): 9-33.

Geraldi, J., Maylor, H., Williams, T. 2011, Now, Let’s Make it Really Complex (complicated): A systematic Review of the Complexities of Projects. *International Journal of Operations and Production Management*, 31(9): 966-990.

Gladstein, D.L. 1984. Groups in Context: A Model of Task Group Effectiveness. *Administrative Science Quarterly*, 29(4): 499-517.

Gupta, A.K., Govindarajan, V. 2000. Knowledge Transfer Within Multinational Corporations. *Strategic Management Journal,* 21: 473-496.

Guzzo, R.A., Dickson, M.W. 1996. Teams in Organizations: Recent Research on Performance and Effectiveness. *Annual Review of Psychology,* 47: 307-338.

Helfat, C.E., Peteraf, M.A, 2015. Managerial Cognitive Capabilities and the Microfoundations of Dynamic Capabilities. *Strategic Management Journal*, 36: 831-850.

Huemann, M., Keegan, A., Turner, J.R. 2007. Human Resource Management in the Project-Oriented Company: a review. *International Journal of Project Management*. 25: 315-323.

Jiang, K., Lepak, D.P., Hu, J., Baer, J.C. 2012. How does Human Resource Management Influence Organizational Outcomes? A Meta-Analytic Investigation of Mediating Mechanisms. *Academy of Management Journal,* 55(6): 1264-1294.

Jiang, K.; Takeuchi, R.., Lepak, D.P. 2013. Where do we Go from Here? New Perspectives on the Black Box in Strategic Human Resource Management Research. *Journal of Management Studies*, 50: 1448-1480.

Keegan, A., Ringhofer, C., Huemann, M. 2018. Human Resource Management and Project Based Organizing: Fertile Ground, Missed Opportunities and Prospects for Closer Connections. *International Journal of Project Management*, 36: 121-133.

Keller, R.T. 1986. Predictors of the Performance of Project Groups in R&D Organizations. *Academy of Management Journal*, 29(4): 715-726.

Kim KY, Pathak S, Werner S. 2015. When Do International Human Capital Enhancing Practices Benefit the Bottom Line? An Ability, Motivation and Opportunity Perspective. *Journal of International Business Studies* 46: 1-22.

Klein, K. J., & Kozlowski, S. W. J. 2000. From Micro to Meso: Critical Steps in Conceptualizing and Conducting Multilevel Research. *Organizational Research Methods*, 3(3): 211.

Köhler, W. 1970. *Gestalt Psychology*: Liveright.

Lee-Kelley, L. 2006. Locus of Control and Attitudes to Working in Virtual Teams. *International Journal of Project Management*, 24: 234-243.

Liang, T.P., Liu, C.C., Lin, T.M., Min, B. 2007. Effect of Team Diversity on Software Project Performance. *Industrial Management & Data System*, 107(5): 636-653.

Liu, Y., Keller, R.T., Shih, H. 2011. The Impact of Team-Member Exchange, Differentiation, Team Commitment, and Knowledge Sharing on R&D Project Team Performance. *R&D Management*, 41(3): 274-287.

Maruta, R. 2012. Maximizing Knowledge Work Productivity: A Time Constrained and Activity Visualized PDCA Cycle. *Knowledge and Process management*, 19(4): 203-214.

Popaitoon, S., Siengthai, S. 2014. The Moderating Effect of Human Resource Management Practices on the Relationship between Knowledge Absorptive Capacity and Project Performance in Project-Oriented Companies. *International Journal of Project Management,* 32: 908-920.

Reinholdt, M., Pedersen, T., Foss, N. 2011. Why a Central Network Position isn't Enough: The Role of Motivation and Ability for Knowledge Sharing in Employee Networks. *Academy of Management Journal*, 54(6): 1277-1297.

Siemsen E, Roth AV, Balasubramanian S. 2008. How Motivation, Opportunity, and Ability Drive Knowledge Sharing: The Constraining-Factor Model. *Journal of Operations Management* **26**: 426-445.

Srivastava, A., Bartol, K.M., Locke, E. 2006. Empowering Leadership in Management Teams: Effects on Knowledge Sharing, Efficacy and Performance. *Academy of Management Journal*, 49(6): 1239-1251.

Sydow, L.; Lindkvist, L., DeFillippi, R. 2004. Project-Based Organizations, Embeddedness and Repositories of Knowledge: Editorial. *Organization Studies*, 25: 1475-1489.

Strategy&PwC. 2018. Ranking Valor Inovacao Brasil / Valor Brazil Innovation Ranking.

Waldman, D. A. 1994. The Contributions of Total Quality Management to a Theory of Work Performance. *Academy of Management Review*, 19(3): 510-536.

Zhao, Z.J., Arnand, J. 2009. A Multilevel Perspective on Knowledge Transfer: Evidence from the Chinese Automotive Industry. *Strategic Management Journal*. 30, (9): 959-983.

Table 1. Correlation matrix (n=285)*

	1	2	3	4	5	6	7	8
1) Project performance	1.00							
2) Ability	-0.01	1.00						
3) Motivation	0.27	-0.08	1.00					
4) Opportunity	0.17	0.01	0.14	1.00				
5) Overload	0.11	-0.16	0.11	-0.03	1.00			
6) Problems	0.08	0.01	0.15	0.01	0.08	1.00		
7) Team size	0.17	-0.34	0.34	0.05	0.36	0.17	1.00	
8) Difficulty	-0.06	0.03	-0.13	-0.10	-0.07	0.15	-0.06	1.00
Min. values	-0.31	-3.22	-1.39	-0.28	-3.01	-1.26	-0.92	0
Max. values	8.97	1.26	3.35	5.07	1.28	5.54	2.61	1

*All variables are standardized with mean=0 and std. dev=1 – except for difficulty that is a binary variable. Values above |0.12| are significant at 5% level of significance.

Table 2. Models of the effects of AMO on project performance for all projects and simple versus advanced projects

	All projects (N = 285)			**Simple projects (N = 166)**			**Advanced projects (N = 119)**		
	Additive model	Multiplicative model	Constraining factor model	Additive model	Multiplicative model	Constraining factor model	Additive model	Multiplicative model	Constraining factor model
	1	2	3	4	5	6	7	8	9
Ability (A) – a_1	0.05	0.01	-0.03	0.15*	0.07	0.08	-0.01	0.10	0.03
Motivation (M) – a_2	0.21***	0.21***	-0.01	0.09	0.14	0.05	0.26**	0.21**	0.05
Opportunity (O) – a_3	0.17*	0.11	-0.02	0.08	0.10	0.03	0.27**	0.19	0.02
A * M - a_4		0.02			0.10			0.34**	
A * O - a_5		0.23*			0.15			0.06	
M * O - a_6		0.24***			0.05			0.41**	
Min_{ab} - a_7			0.17			0.19			0.15
Min_{ab} * A - a_8			0.16			0.28*			0.04
Min_{ab} * M - a_9			0.40*			0.14			0.33**
Min_{ab} * O - a_{10}			0.22			0.16			0.26*
Min_{op} - a_{11}			-0.20			-0.16			0.19
Min_{op} * A - a_{12}			0.20			0.23*			-0.03
Min_{op} * M - a_{13}			0.31*			0.17			-0.09
Min_{op} * O - a_{14}			-0.03			-0.02			0.28*
Overload	0.07	0.08	0.09	0.07	0.07	0.09	0.03	0.05	0.04
Problems	0.03	0.02	0.01	0.01	0.01	0.01	0.01	-0.06	-0.05
Team	0.10	0.11	0.09	0.24*	0.23*	0.24*	-0.01	0.03	0.01
Intercept	0.01	-0.02	-0.11	0.02	0.03	-0.02	0.04	-0.17*	-0.24
R-squared	0.10	0.17	0.15	0.11	0.13	0.16	0.15	0.44	0.33
Adj. R-squared	0.09	0.14	0.11	0.08	0.08	0.09	0.10	0.40	0.24
d.f.	6	9	13	6	9	13	6	9	13
F-value	5.41***	6.25***	3.56***	3.31**	2.69**	2.31**	3.29**	9.62***	3.92***

*, **, and *** indicate significance at the 5%, 1%, and 0.1% levels, respectively.

Appendix 1. Corporate communication on the Continuous Improvement Program in 2016

- Focus on cost reduction, performance improvement, and enhanced productivity
- Planning phase to be concluded in two months
- Minimum of two people (technical staff) on each team for projects aiming at technical improvements
- Focus on short-term actions (maximum of three months to achieve expected results)
- Focus on specific goals
- Recommendation for project leaders: meet with the team twice a month (no less than monthly) to monitor the project performance. Advice for meetings:
    - Week 1: Spend 30 minutes per project; revisit its goal, identify problems, establish action plans, and enter key performance indicators into the system
    - Week 3: Spend 30 minutes per project and check action plans
- Project leaders must be aware of the great responsibility they have and must be committed to the results
- Focus on getting to the root of the problem to ensure that all projects are able to solve them
- Projects can be either short term (less than one year) or long term (more than one year); long-term projects need approval from the Corporate Systems Manager
- Dedicate more time to complex problems that require deeper analysis
- Follow the norms of financial gain
- Each unit should request at least one consulting meeting with headquarters (i.e., the Corporate Systems Manager), ideally before action plans are developed

The roles (and levels of responsibility) are:

- The **project leader** is in charge of defining the team and scheduling meetings with the team in order to check on the status and performance of the projects, identify problems, and develop action plans. He or she is also in charge of entering data into the online platform that creates the database. The project leader calls the team to every meeting.
- The unit´s **systems manager** is in charge of defining the country/unit´s project for that year. He or she must submit projects for corporate approval before delegating them to project leaders. The systems manager is also in charge of assigning project leaders and motivating them to get the best result from their projects.
- The **corporate systems manager** is in charge of following up on the results of the projects with each unit´s systems manager every three months through virtual meetings. He or she is also in charge of auditing two projects per country per month, and auditing all projects at the end of the yearly cycle.