Analysis of Project Communication on Smart Card Implementation in XYZ Malaysian Higher Education

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ABSTRACT - Project communication is the exchange of project-specific information with the emphasis on creating understanding between the sender and the receiver. It reflected simultaneously to be an indispensable tool to manage project resources systematically. Communication through coordination and cooperation are common approach used for project scheduling, planning and control while collaboration establish the concrete result. Therefore, communication still remained as the main connector above all. Poor communication skill can cause anger, misunderstandings, conflict and distance that eventually influence project process significantly and lead to project failures. Analysis study was conducted to the 'hiatus' smart card project implementation in XYZ Malaysian higher education with emphasize the point of communication as the important point should be considered without eliminating other knowledge management area which also important in succession of project. In addition, the analysis study conducted to give limelight specifically towards the smart card implementation in higher education as the reference of other project in preventing project failure happen.

Index Terms – Smart Card, Project Communication, Communication Plan, Information Distribution

I. INTRODUCTION

Nowadays, the smart card is widely used with the advantage of capability to store a lot of information with high level of security, reliability and durability. It commonly use in the world of business, education, healthy, transportation and organizations. For instance, smart card is used, as a kind of digital money called "*purse*" in some retail outlet such as 7eleven and Wal-Mart. In health care use smart card in their system when a patient comes, doctor just uses the patient's smart card to get their recent critical information that can reduce amount of time such as Lombardy in Italy that uses smart cards in their medical system. It is part of the European *netcards project*, which tried to replace paper with electronic documents. Meanwhile, smart card is also used in Singapore as the integrated service to store monetary value, it called EZ link where person could use it for public transport as well as some food court, tool road system, supermarket and parking payment.

Smart card divided into two basic types: contact and contact-less [5]. A contact card contain a small gold chip about half an inch in the length placed inside the card which is needed insertion of the card into a reader like telephone card, credit card and ATM card while a contact-less card has a microchip and antenna inside the card. Instead of inserting the card, it just passes the card close to the smart card reader for transmitting data. Generally, most application tends to use contact-less type when it should perform transactions as soon as possible such as touch n' go, entrance access or other action with less consent of privacy and security. In addition, there is another type of smart card called '*Combi Card*' acts as both contact and contact-less which contained a microchip, bar code, optical code, picture and signature in a single card to increase convenience and benefits.

From the definitions, the smart card is mini computer that made from a type of plastic card that similar in the size of credit card or ATM card. Sometime called "chip card" because there is microchip (integrated circuit) embedded into the card contain a microprocessor and memory that allow storing, updating, recording and processing data. Provide high level of security with ability to execute cryptographic algorithms and maintain its durability. Moreover, the microchip can be programmed for multi-applications in a single card that will be inserted all information into the card chip which can be used through the smart card reader by just insert or touch it. In Malaysia, the same principle of smart card already being implemented in the official card namely *MyKad* as multipurpose application namely identity information, driving license, health information, passport, e-cash, touch n' go, ATM and digital certificate.

In this paper, we will discuss another implementation of smart card project in XYZ Malaysian Higher Education that collaborated with another third party namely institution of bank and smart card vendor. The discussion will focus more on the communication point which specifically touch literature review in project communication based on *PMBoK* (Project Management Body of Knowledge) and *CMMI* (Capability Maturity Model Integration) as well as smart card project background while the rest discusses about communication plan, performance reporting, information distribution and communication barriers.

II. LITERATURE REVIEW

Communication is the oldest respected achievements in the history of humankind. It has been around ten thousands years in the history as the practical activities of humankind. *PMBoK* has special chapter was devoted to the area of communications to reinforce its importance in the context of projects [1] as one of the nine project management knowledge areas. Communication is an overarching theme that requires a body of knowledge that extends beyond the context of project involve four processes to assure that the generation, collection, distribution, storage and presentation of project information be adequately done at the right time namely communication planning, information distribution, performance reporting and manage stakeholders.

Importantly, communication with stakeholders is often required to ensure a stable of relationship as well as to check the functionality of each project task concisely. An effective communications strategy is the key to implementing and focusing the shared vision throughout the project [3]. It encounters the changes problem incurred during the tasks process by fixing the current schedule to avoid interruption and conflict. Define the objective of each communication activity to be clearly to satisfy the relevant stakeholders from resistance to go along with the activities plan. Communication plan focused on the public awareness, perception enhancement and motivation development with specific and detail plan involve activities and phase plan to support. However, many authors argue that the communication process in project management is strongly associated with the success or failure of project activity [1][4][7][8] because its term of regularly and common activities in our lives.

Pinto and Mantel [13] mentioned communication as the ten critical factors that could be generalized to wide variety

of project types and organization as base for a measurement instrument.

PROJECT MISSION	Initial clearly defined goals and general directions.
TOP MANAGEMENT SUPPORT	Willingness of top management to provide the necessary resources and authority or power for project success.
PROJECT SCHEDULE/PLAN	A detailed specification of the individual action steps for project implementation.
CLIENT CONSULTATION	Communication, consultation, and active listening to all impacted parties.
PERSONNEL	Recruitment, selection, and training of the necessary personnel for the project team.
TECHNICAL TASKS	Availability of the required technology and expertise to accomplish the specific technical action steps.
CLIENT ACCEPTANCE	The act of "selling" the final project to its ultimate intended users.
MONITORING AND FEEDBACK	Timely provision of comprehensive control information at each stage in the implementation process.
COMMUNICATION	The provision of an appropriate network and necessary data to all key actors in the project implementation.
TROUBLESHOOTING	Ability to handle unexpected crises and deviations from plan.

TABLE 1. COMMUNICATION IN CRITICAL SUCCESS FACTOR

Information is a power and those who have it will hold the key to project success through proper and effective communication process. Communication is the primary basis for acquiring knowledge about the task at hand and understanding the project performance under task process. In the present information-drive society, having access to project information paves the way for every individual's contribution. Ruuska [14] in table 2 explained the importance of communication form to connect environment with people in the organizational various dimensions. Project manager plays the key role as the integrator who links together project phase and activities.

OPERATIONS SUPPORT
Communication is needed to turn out the project's services and products and bring them to the client and end-users.
PROFILING
Communication is needed to create a desirable image or service profile for the project.
INFORMING
Communication is needed to tell what is going on in the project.
ENGAGING
Communication is needed to initiate the members of the project team into the project type of work and working methods.
SOCIAL INTERACTION
People are social and *communication* is needed for gratification of social needs.

TABLE 2. THE DIMENSIONS OF ORGANIZATIONAL COMMUNICATION

In spite of the important of communication, the selection of capable project team member really influence to the final result. Project leader who have good communication and management skill but the team member could not cooperate because lack of understanding, purpose, culture, etc will disrupt the project tremendously. When select the committee or member to be included in project, the track record relate to responsible skill, achievement and project experience should be outlined deeply to prevent the number of problem and surprises may pop up while the implementation process run.

As a result, communication approach or utilization might be insufficient, of poor quality, or one-way process. In project, there are two fundamental ingredients; those are people motivation or desired and effective swapping of ideas. Both of them are mutual dependent, without people; there is no action will be executed and without communication; there is no one knows what they could achieve. Communication is similar like engine oil that need to be applied to the equipment otherwise equipment won't start or, if it does, it will rapidly falter and grind to stop. Therefore, it also needs to be permanently recycled and regularly replaced with the new one while the old one becomes no longer usable. However, what the quality of the oil? Too slight or too thin in the octant impact the effectiveness quality; too thick or too much influence the performance quality.

III. SMART CARD PROJECT IMPLEMENTATION

Communication management already recognized as the key role in the project management that influence more to the success failure of the project [1][4][7][8] while specifically mentioned that information acquisition and sharing throughout the project are the critical [9]. The smart card project implementation in XYZ Malaysian higher education in this case involve the bank, institution and vendor as the stakeholder with objective to make cashless, automatic and secure smart card. The smart card project initiative comes from bank's side with intention to increase their number of customer in higher education environment. It would become ideal initiative smart card that has multiple functions such as medium payment for outlets and canteen as credit point without using money anymore, taking money from ATM machines, security lock and open laboratory, attendance and absent system and further possible development application in the future. Project time based on the agreement between institution and bank is 10 years sign *deal on* while the project cost carried on by bank utterly except the renew process. Project scope is planned on institution authority that selected *the coop* as representative of the project while bank concern more in ATM function only. The vendor provides the hardware and software at the beginning level involves the construction and installation part.

Therefore, the lack of attention of member the coop that consists of the volunteering staff with lack of specific expertise in information system and minimum executive support causes struggling to implement the idea at initiative level. Technical and managerial issues arise significantly especially where there is no clear communication standard involves performance reporting and idea materializing. The case of attendance system in example; it disrupted the whole business process because it could not encounter the dynamic situation and change problem such as student forget to bring smart card, entrust attendance to friends, class changes suddenly, absent record control, etc. It led to some of student being barred from exam as the 80% mandatory presence in the class. Other case for example, to implement cashless payment to the canteen and outlets among institution, the coop also got rejection where mostly the seller prefer to accept cash payment rather than credit point while subscribe administration process is bothersome by some sellers' thought. The issue here, that coop could not estimate the level of readiness the environment to have something new impacted the resistance appears tremendously.

Furthermore, database immigration as the need of dual card identification process on the application also has many

challenges. The privacy issue involves the third party installation part is dragging to the delays and assurance problem. Academic and record division is reluctant to hand over the student data before the administrative command from the executive. Although the problem solve at the moment after the coop's approach but the same case recur if student or staff lost their card; or the problem in student's movement level from foundation to degree level that basically they need the new student card.

The communication between stakeholders also did not goes well where each of them have their own objective cause management of project task was done separately. Therefore, the separate progress goes worst where it began isolating between each other task. Lack of communication plan and difficulties as the task failure reason to reach the decision making especially the coop that have limited authority and mandate based on policy to organize inside the institution. At the end, the coop could not deliver what they promised and some application implementation delayed due unknown time while other task implementation involves bank necessity got quite success. However, many project failures occur as the result of a combination of causes and the involvement of various groups both within and outside the organization as Imamoglu and Gozlu mentioned [11] with emphasize human resource, project value, support and authority aspects so it explained the project communication strategy has the key role in the smart card implementation project. Hence, the executive, project manager, project member, bank, vendor should have understanding of their own role in the smart card project because it will affect the eventual outcome of the project significantly.

As briefly, to achieve the initiative of smart card become successful, it should be mutual dependent integration with higher educational legacy system so the implementation could goes smoothly such as *Library System* to ease of use every library facilities like borrowing, searching, online database, etc while *Attendance System* should help the documenting process but it should have mechanism to encounter possible disruption to assure recording truancy and absent accordingly. Afterwards, *Access Control System* to check the user right in utilizing some service like postgraduate laboratory, parking sloth, library entrance, etc to effectively reduce the possibility in harming the others specifically and institution generally. Moreover, *Student and Staff Management System* is also important to be integrated to manage and control clearly profile for example CGPA, publication, research and status like active, move, graduate, suspended, etc while *Financial System* enable students to monitor and keep track their transaction towards various outlets, photocopy center and balance of fee, payment and fines.

IV. PROJECT COMMUNICATION PLAN

Carvalho's survey [4] presented that just a few project manager realize and develop the project communication plan while the others thought It just for complex project needs the existence of formal communication plan as protocol and guideline whereas the ongoing communication is essential ingredients to any project. The great challenge to be faced in developing communication plan due to the dynamic condition of project posed combination of three element namely complexity, uncertainty and speed [8][9] while others like frequency, distribution, resource and medium information are the important factor influences.

The smart card project implementation in this case don't develop project communication plan whereas several party involvement with different goals, expectations, behaviors and cultures need specific detailed plan for collaboration between them in assuring tasks success. The differences may cause problems in development project; one stakeholder has focus on business and another more in education. Therefore, the needs to bring the communication plan into the project development have importance to help recognize problems of the project during development and address in a time-based report. Therefore, project team could know the feedback from stakeholders frequently as well as prioritize work to reduce the chaos and misunderstandings among shareholders. It also helps make work environment much friendly by handling the changes incurred during the operation as up-to-date work focus. In addition, improvement professional relationships, performance increase and avoid conflict could be considered as the communication plan importance.

FIGURE 1. PRINCETON PROJECT COMMUNICATION PLAN METHODOLOGY

To begin communication plan, the key element need to be configured systematically which include what (strategy), who (target), when (frequency), type (method) and purpose which focus on identifying project stakeholder, communication objective and determine communication medium. The type of communication plan approach could be regular, on going, one time and event driven. Understanding communication timing is also very important which deserve as the continuous activity as possible. Understanding and defining key element help to develop the effective communication plan with conjunction to budget and objective. A good project communication plan is started from beginning and the assessment should consist S.M.A.R.T categories [15].

SPECIFIC	Issues related to the fundamental project, e.g culture, behavior, skill, knowledge, attitude, requirement, etc (Initiation Plan)
MEASURABLE	Qualitative or Quantitative (Performance Reporting, Information Update, etc)
ACHIEVABLE	Goal and Objective (Awareness, readiness, supportive, etc)
RELEVANT	The factor influence and impact implementation process, e.g. commitment, consequence, achievement
TIME-BOUND	Scheduling, alternative and discipline.

TABLE 3. S.M.A.R.T CATEGORIES ASSESSMENT

The communications management plan can be formal or informal, highly detailed or broadly framed and based on the

needs of the project. It is designed to provide every member of the project the general framework of project strategy approach as well as the concrete relationship in the collaboration, to ensure the distribution, extraction, retrieval, collection of information run properly and to guide the project member on how important communication affect the project as whole. It also should be reviewed at regular intervals involve stakeholder who are closest to the project to ensure the communication process run well accordingly. Although communication plan already exist, the project member supposedly to act proactive to utilize every possible opportunities to increase the project profitability, sharing idea and discussion internal and external are really encouraging before executing the policy.
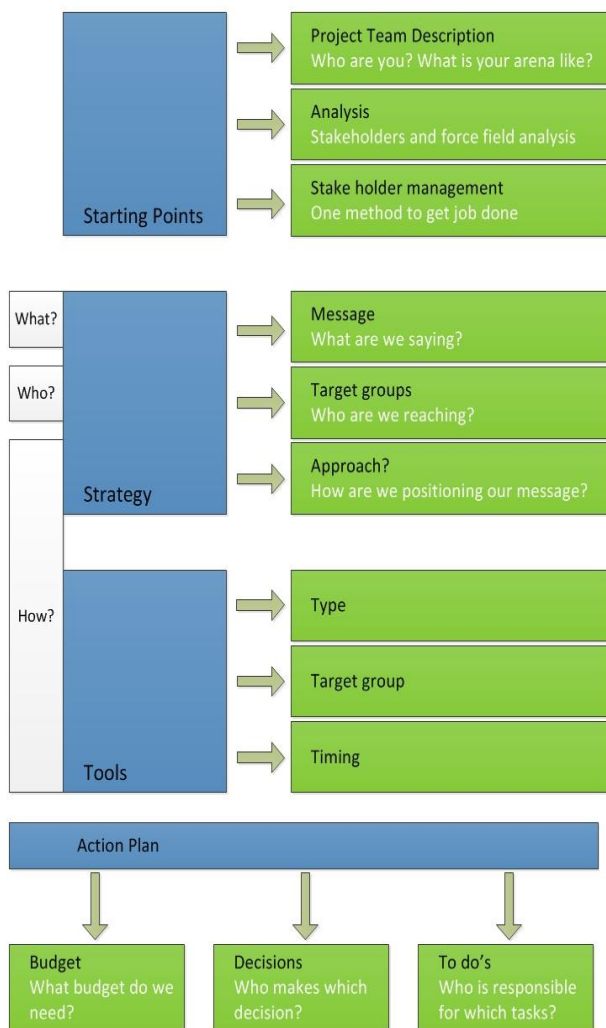
FIGURE 2. BUILDING PROJECT COMMUNICATION PLAN

Starting point in building communication plan with configuration essential element of project goals and assessment with SMART categories should be followed by developing strategy, tools and action plan to elaborate all of them. Analysis of matrix will help to formulate the key target, legal barriers, hierarchic protocol and communication channel in meeting project goals. It is really important in building this scheme of communication plan [15] based on the figure 2 before decide the strategy and tools which refer to essential element of project goals as well as the action plan which will organize the relevant main point specifically.

V. PERFORMANCE REPORTING

Report the task performance to the responsible task manager is another important factor in organizing project and emphasizing process improvement. It is equivalent in some term with evaluation of process that common used after performed some task. The reporting is not necessary frequently but it should be periodically to maintain task member's capability unless the kind of project involves high budget and limited time. The form of performance reporting could be oral, written and graphical or combination of them with mutually dependence on the organization culture. The written format could be by logbook, database viewer, evaluation form, review paper, etc. It is usually used in formal situation while management and identification of obstacle and challenge become important consideration. Meanwhile, oral performance reporting is infrequently; it usually involves some of document as part of; unless it already became organization standard or required for some urgent reason such as immediate decision, changes of duties, consultation, etc; the oral is being used.

Organization will be required to provide timely clarification and/or additional information to substantiate the content of the progress reports [2]. In addition, environment of trust will enhance the performance significantly, at least two fundamentals could be developing as solid basis communication those are stimulation and esteem [4]. Stimulation relates to motivation development on how manager or team member could fortify performance, balance allocation workload and encourage others to express idea. Meanwhile, esteem relates to openness building on how each of team members appreciate other's opinion, respect other's thought, assume commitment and admitting error.

In smart card project, all performance reporting should help answer the question *'What do I should know to ensure things get improve?'* to highlight and ensure attention is focused where performance needs to be improved based on coordination process, where others might have good ideas or *'How do I measure my own performance compare the others?'* to help comparison and manage risks in achieving its priorities and targets where control by manager will evaluate the task has been done so the weaknesses will be reduced. Target performance report is not limited only to the evaluating task but also evaluating impact and response. Another question could be asked *'Why I should report regularly to the manager while I have many things to do'* to realize the importance of control management of the project in respecting time and money consuming as well as scope.

Some aspects disrupted the performance reporting in smart card project when inter-organization communication process. The partner organization prefer to keep hidden certain information from the other party, with present general and basic information only while unnecessary information remained hidden inside their system whereas it might be useful information to the others. Therefore, same level of understanding also influenced much in this project, where one side more in academic concern but the other more in business profit-based concern, it leads to isolation of their own process and indirectly push away other organization support from the unrelated process. In addition, the specific term used in technical detail or literature review to report the performance also drags to blend the process such as *'burden rate'* or *'capital expenditure'* term refer to business or technology term such as *'data mart'* and *'metadata'* or maybe practical term like *'on hold'* or *'on the way'* that could

make non sense, confusion and misunderstanding in other's perception while in certain case the member more passive to respond its misunderstanding without doing synergy and consolidation with the others.

Best approach could bring effectiveness of performance reporting and improvement continuity by giving more opportunities to the task member. It could be in commenting their own manager or their own performance and reasoning on why their performance got failure or even success. It might led to align the commitment and obtained the same objective in the environment. It also reached the openness behavior and encouraged each other to sharing more and more information, resulted in project be successful where it counters the deadlock, isolation, nervousness, frightened and many issues. At certain level, team member also could evaluate their partner with suggest him politely to work together solve the problem. Some suggestions to improve performance reporting such as do evaluation part in smart card project especially and any other project generally. Response from outside team member, allowing sufficient time to complete assignment [13], do some social program to strengthen the togetherness and make basic point of evaluation also other task should be regularly to inform. Finally, performance report consideration should involve the timely communications interoperability, safety, security, capability and maintainability [3].

VI. INFORMATION DISTRIBUTION

Information distribution in smart card project is one of significant process in project communication management because the task manager needs to distribute some information of importance, purpose and objective smart card implementation to get environment awareness and support to the smart card system and also to get the acceptable from all of stakeholders. Otherwise, the system will be delayed to deliver and environment is not ready to use it. There are several important points in distributing information for smart card project in International Islamic University Malaysia.

First of all, same level of understanding in information distribution, the manager of the project order to team member to give general information as socialization to the environment about the purpose, objective and importance of smart card project in achieving the same understanding to all users about *'what is smart card project'*, *'how can we use it'*, *'what are the features of it'*, *'how it will useful to the students, staffs and shop owners'*, etc. Otherwise, the users will not satisfy about the project services especially, students who directly use this system and shop owners who utilize the credit balance. If the users agree with this system, the project group members can continue the project plan otherwise reorganize the socialization. Moreover, the project manager has to provide required information interchangeably to the project team members and appropriate stakeholders on a timely basis especially the bank that directly own interest in the project. Meanwhile, the communication skill also should consider in both sides; sender & receiver, if necessary exercise it through proper assessment [7] by understanding everything is about learning so information from sender will be clear, unambiguous and complete. Therefore, receiver can receive it correctly and understand it properly although it's not entirety but the important part delivered.

Second, various channel to distribute information, seminar is one way in distributing information because we invite students, staffs and relevant stakeholders who directly involve in this system to participate by listening some important information of this project. Moreover, who do not understand about this system, they are encourage to ask directly to the project manager or who want to suggest about this system they are expected to speak out their mind openly. Having this kind situation help to increase understanding about what things to be improve and the user response to the project. In same way, the project manager should be flexible and ready to modify or change the plan and improve the system if it does not work as expected or satisfied by the users. After seminar, the project team member willingness to conduct and give an assessment to the user and stakeholders as project recommendation so it will conclude clearly the further strategy. These are the beneficial advantages of seminar in distributing information of the system.

Third, low cost and easy handle, in this case, we can use simple brochure be hanging on the wall to distribute information to make easy the *'will be'* smart card user read easily. In the brochure we are able to put numerous important information and full of smart card features that related with the system. Furthermore, brochure is one of the media that is easy to design, cheap and convenient for the users to wonder what is going on while putting the *suggestion channel* to reach in the brochure will help the collaboration later on from the students who want to suggest something to the system such as contact number or office address. Shop owner also could contribute with university *invitation campaign* by having some guarantee of their credit money if the system implement because for them, although at this time, it is comfortable to use cash rather than use credit card as the payment media in the transaction.

VII. COMMUNICATION BARRIERS

Actually, based on Carvalho's survey [4] indicated those physical, perceptual, emotion, cultural and languages barriers almost identical in every communication phase such as different languages or term between business and system, different perception, lack of project communication plan, different languages between client and member and resistance of sharing information respectively. At certain level, commitment as well as passive could become as communication barriers. To overcome communication barriers, such suitable project communication plan should be developed with accommodate formal and informal meetings, more communication channel establishment, rewards, praise or recommendation system, clarification and appreciation also technical training and workshop.

In spite of smart card project could be categorized as medium project but the obstacle could be quite risky. Facilitating the communication could influence and support other knowledge area in project management such as time, scope, cost, quality and so on, also basic process of group such as planning, executing and so on, then, it could lead the project to be successful. In addition, communication barriers are not only coming from internal or external sources but also due to the project communication process. It is important to paid attention to the factor lead to such as muddle messages where such misunderstanding could be arises, for example, first messages: *'Please come to the meeting **about** 8 o'clock tomorrow morning'* while second message: *'Please come to the meeting **at** 8 o'clock tomorrow morning'*. One word different only but it made first message muddle and second message is clear enough.

On the other hand, channel selection to deliver message also should be considered whereby the information such as *'Congratulation with your performance'* in oral channel is highly appropriate rather than *'CONGRATULATION'* in the chalkboard or in the SMS. Therefore, variation of channels helps receiver understand and appreciate the importance of message. Meanwhile, communication process is more likely to be interrupted due some pressing reason, emergency, a drop-in visitor or other member's curiosity. At certain level, lack of respect and attitude bring such disaster to the work team and flow process even it still kept hidden out of member but the condition will not same again with the previous. The polite interruption concerns much on how people do it physically together with voice management, basically to be safe, don't ask pressing questions or give incomplete instruction. To overcome communication challenges, Ready [6] suggest to choose task member well by put experience people in charge or hire a consultant; national is much better, set standards of every project phase and emphasize on team management culture. Those various communication barriers mentioned disrupt the performance of almost all task process in smart card implementation in XYZ higher education.

VIII. CONCLUSION

The analysis study of smart card implementation of XYZ Malaysia higher education indicated the lack of communication as the key factor lead to the failure where the attempt to achieve mandate from the executive, project member expertise, support and cooperation, lack of communication plan between stakeholders and comparison study to other relevant project in Malaysia are the segment that is identified to contribute much to the failure. Dvir, Raz, and Shenhar define project success factors such as meeting design goals, benefit to the customer, commercial success, and future potential of the project [16] while Kanter and Walsh define and declare functional requirements and control changes, develop realistic project schedules, match skills to needs at the proper time, know and respond to the "real" status of the project, establish and control the performance of the contractors are project success factors [17]. Therefore, a systemic and professional management of the communication segment is one of the significant success factors in managing any project.

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