

Performing Inquisitive Study of PM Traits Desirable for Project Progress

Sobia Zahra, Ambreen Nazir, Asra Khalid, Ayesha Raana, M. Nadeem Majeed

Department of Software Engineering, University of Engineering and Technology, Taxila, Pakistan
Email: zahra.sobia@gmail.com, ambreen_nazir_ms@yahoo.com, asra_05@yahoo.com, ayesha.raana@yahoo.com, nadeem.majeed@uettaxila.edu.pk

Abstract—The accountability of a project's success/failure lies on shoulders of a PM (project manager). Undoubtedly, project management is tough task to bring about and this is the most challenging role within the project. The project manager role varies from project to project and may include communication & negotiation with stakeholders, along with leadership and management of the project. Therefore he must possess both hard and soft skills besides education and expertise to drive his team towards excellence. This scientific documentation presents an ideal blend of responsibilities and skills essential for a project manager to cope with the changing project environment. Technical skills necessary for an IT project manager, further elaborates this study.

Index Terms—PM, Project Management, Responsibilities, Skills.

I. INTRODUCTION

The need and interest of project management is growing from the time it is recognized as a separate discipline. In ancient times, some practices and techniques were used to manage the projects which mean that project management is actually an ancient concept. However people at that time don't consider their practices and techniques, noteworthy.

In current era project management has emerged to be an interesting and inevitable discipline which encompasses planning, organizing, motivating and controlling the resources to meet customer needs [1]. The professional having knowledge and skill to manage the project in limited resources is called project manager. He has the responsibility of initiating, planning, executing and closing the project [1], ultimately delivering a product, project or service that fulfils stakeholder needs.

For successful completion of a project, PM needs to do something more than just keeping the project on track. They have to drive their teams to produce excellent results [2]. They understand the crucial need to communicate, negotiate and integrate work across different departments. Therefore PM must possess knowledge, skill and expertise to handle project's technicalities as well as people involved in the project. PM must be able to adapt themselves to the changing demands of the project and the team.

Brief overview of project management is presented in

Section II of this research paper. Section III illustrates the roles of project management necessary for project execution. Then we covered some of the essential responsibilities of the PM towards the project in Section IV. To perform these responsibilities PM needs some skills, which are presented in Section V. Section VI refers to technical skills essential for an IT PM to lead high-tech projects. Conclusion is presented in Section VII.

II. LITERATURE REVIEW

Project [1] is a temporary endeavor undertaken to complete some task, it has a beginning and end. For accomplishment of project with limited resources we need management.

Project Management [1]: The application of knowledge, skills, tools and techniques to carry out projects activities in order to meet stakeholder's needs and expectations from a project. The management of project related activities within a specified time, cost and performance standards along with good customer relations.

Some of the key components of project management environment are Stakeholders, clients, politics, market conditions, competitors, new technologies, rules and regulations, own company's organizational structure & economic conditions.

Since 1960s project management started to emerge as field before that there was no concept of project management as a field. The importance of project management increases when organizations started to observe how much proper collaboration and communication between team members is important when they are from different departments working on a single project [3].

The father of scientific management Frederick Taylor was the person who introduced concept of management first time. He introduced the concept of efficient work instead of hard work that was the concept to increase productivity before management. From there work on management started and then another big name in history of management is Henry Gantt who introduced Gantt chart a major element of project management field. Then in 1990s Microsoft enhance these by adding link lines to Gantt chart. From evolving and new contributions are coming in this field with the passage of time [3].

Eddie Fisher [4] found from a deep analysis of

academic management process and other places where management is required that management of people is very important for project management. In today's changing working environment significance of management has increased dramatically from 1990s. Now customers expect to be delivered high quality product without any compromise on their requirements. Customer doesn't accept a service or product which is not according to their requirements such as a web site has limited theme color choices etc. Due to these reasons companies has changed their structure and way of working. So most of the companies involve management in their work practice because it help them to work in less cost and organized manner ,so that they can get best from their restricted human resources in a way that they can get competitive advantage and they have satisfied customer which will help them to grow their company. In this paper only managers from telecommunications, engineering and banking are considered so the data for this research is also limited to these industries. This paper revealed expertise and behaviors that can help PM to become better in managing employees in their projects and to make successful delivery of project possible in current changing and competitive working environments. In this research some responsibilities that are expected from PM are mentioned. PM should show and take interest in people they are working with. PM should understand moods and emotions of people. This will help them to understand their attitude in future which can help them to plan ahead to avoid conflicts. Now it is quiet common that a team may consist of members from many countries or different cultures so manager should know beliefs and values of all of them so that they can manage them effectively. One more thing is that knowing people management skill is not only thing required for success; manager should also have technical of application of tools and techniques. Mean both technical and people management skills are important. All the findings that are discovered in this paper need to be applied by the manager so that manager can see output of the application of these rules so that they can find whether these rules need to modify or they need some betterment. In this paper a set of six specific managing people skills and behaviors related to these skills are identified which include following skills: understanding behavioral characteristics, leading others, influencing others, authentic behavior, conflict management and cultural awareness. For each skill behavior is described that must be taken by the manager. It is claimed that finding of this paper can be compared with body of knowledge and this research propose many new ideas to make people management more effective.

Ralf Muller and Rodney Turner [5] writes in their paper that they amount of time a manager stay in his field depends upon compatibility of his characteristics with the required characteristics of his position. More he is capable of his position more he can stay on his job. To find the characteristics we can use profiling of all successful managers. Characteristically combination of behavioral, temperamental, emotional and mental

attributes of a leader is called his profiling. All these are used to identify management style of a person. So in this paper a questionnaire is used that was web based and was worldwide. The purpose of paper was to identify leadership profile of successful PM in projects of different fields. In this study all the profiles of successful leader is observed and it is identified that leadership characteristics required for a particular project vary with type of project. The results of all the analysis showed that leadership competency required for a project depends upon type of project. A profiling method was used whose purpose was to find most accurate leadership characteristics for different types of projects. The findings of this method showed that for successful managers there is high expressions of an IQ sub-dimension (critical thinking) and three EQ sub-dimension (conscientiousness, motivation and influence) for all type of projects. But for other dimensions it varies from project to project. The results of this research provide sound base to the results of Dulewicz. He identified leadership characteristics of different projects of varying complexity. But in this paper research is done for projects from different fields rather than complexity. The leadership style found in this research resemble with the previous findings related to this research study.

Steven Flannes [6] mentioned in his paper related to people skills for project management topic that these skills greatly depends upon the ability of effective communication between two persons, working effectively as leader in different scenarios, usages of a system that can separate people according to their skills, encourage people working as a group or alone, efficiently managing clash between individuals or team, cope with personal and professional tensions, and actively taking part in career development. All these skills can be learned to some extent through paper reading but one can only learn it completely by practice these skills in their real life. One can apply these skills in different scenarios like formally or informally depends upon working environment and social setting of an individual. Process of completing work in technological world is revolutionized due to growth of virtual teams, impact due to globalization, rearrangement of how work is done in organizations. Not like past a person expert in technical skills can say that he can have a successful career as now to have success not only technical but also people skills are very important as a manager one should take steps to improve his/her people skills in this way they can succeed.

Janice Thomas and Thomas Mengel [7] discussed the viewpoints and notions for managing projects education environment at a superior stage that might facilitate in growing the aptitudes and skills for steering vibrant environment of organizations and for handling intricate projects. As the curiosity about project management is tremendously increasing so in their research they particularly illustrate the advancement in project management and project management education. Their main center is to give emphasis to teaching and education and delivering "know how" on knowledge fields. Their training management program exhibits that how

consistency can be achieved in training programs and what arrangements are needed for building specialized professionals for managing projects. Next they discussed major requirements needed for training projects managers to handle complexities and presented an inclusive model of PM development. Ultimately they put light on the features of a suitable framework of project management education that squeezes ambiguities and undefined potentials. Up till now projects are kept on failing at an astounding speed. In the meanwhile, our projects are becoming tricky day by day plus they keep on achieving appreciation in both investigation and performance. Therefore, presently there is a strong need of bendable learning environment that gives chances to project management practitioners for widespread learning as well as facilitates in developing a learning society that mutually inquire present theories and practices and make an effort in building up novel techniques.

Deborah H. Stevenson and Jo Ann Stark weather [8] targeted their research towards inquiring which human attributes are essential to attain the success of projects. They wanted to recognize and access those proficiencies that are significant in the eyes of IT managers and decision makers for sensational project manager. In phase 1 of their research, they listed 15 attributes of managers which are of extreme importance for hiring manager for the project. In phase 2, the arrangement of these attributes was done by higher IT executives' worldwide, so that while hiring process everyone should be aware of the ranking of these criteria's. This ranking resulted in six significant skills: headship, the capability of interacting at every level, oral and written abilities, and the talent to cope with complexities and modifications, and beside these other competencies needed such as knowledge, practice, technical and exertion. They compared these results with the previous research study of soft skills and they became astonished to observe that multi-level communication criterion is ranked at the as level of leadership. Multi-level interaction not only includes communicating with executives and different group members but with diverse stakeholders like end users. All the social skills are circulating around communication by some means. IT professional who hires managers for the projects gives more importance to work experience and knowledge while IT executive pay attention to the ranking of the criteria's. The inequality in judgments recommends that what IT managers are actually staring at in the PM and what self-sufficient IT enrollment corresponding persons are looking for, both encounters a great contradiction but whatever the criteria they are applying; both aim at recruiting highly deserved employees for managing projects.

Anne Marando [9] discovered the primary supposition that can effectively weigh scale between hard and soft skills. She inquires about healthy program of study to upgrade projects and program management professionals that keep a healthy balance of critical hard and soft skills of projects and their managers. The talent to successfully handle projects and plans has grown to be an essential skill. Though many PM fails to direct their projects in the

right way just because the lack of management skills which are usually known as 'soft skills', including headship, interaction, concession, potential management, manipulation, indicate problems, and making supervisory decisions. Soft skills are mainly elusive, a solid output or any deliverable is not demanded and they commonly worked without any pattern and tools. In reverse 'hard skills' are more practical facet of PM's responsibilities, commonly indulge with the formation of concrete outputs like WBS (Work Breakdown Structure), project calendar, CPD (Critical Path Diagram), financial plan, control panel and onwards, and these skills often integrate with pattern and tools. The program of study she offered is not attached to the PMI standards basically it is lined up, and it can be tailored up according organization's size, structure and tradition.

Ira Pant, Bassam Baroudi [10] focused on the enrichment in the project management education and importance of incorporating enormous human skills characteristics into the management discipline. Project management allows organizations to improve overall performance by integrating, planning and controlling schedule and such endeavors having great influence on organizational performance. Successful project management based on a mixture of skills (interpersonal ability, technical competencies, cognitive aptitude) and the ability to realize the situation, people and then showing appropriate leadership response. Projects are simply an amalgamation of human sensations and potential about the efficient usage of multiple resources. Most of the organizations agree that project success is not possible without understanding the people (who take-on the project) and management skills. The PMBOK authors must take a more unbiased approach in dealing with the soft and hard skills for success in the project management education. The educators of the project management educational institutions must take the ideas of students about importance of the people skills' role in the project success.

S. El-Saba [11] identified and rated the attributes and skills of an effective PM in their research work. Large and miscellaneous set of people are attached with project and PM try to get things done by them regardless of having little direct control over most of these people. Effective management rests on three basic developable skills. These are human skill (mainly concerned with working people. Having this skill a PM can sense needs and motivation of people, communicate with them appropriately), conceptual skill (conceptual and organizational skills are inter related, PM perceive the general environment, have clear vision of goals and focus on the totality of the project), and technical skill (it involves specializes knowledge and analytical ability, PM should have relevant experience of the technology required for the successful completion of the project). The result of the evaluation of the PM's human skills done in this paper showed that the technical skills, comparatively speaking, have the least influence and human skills have the greatest. Project and functional manager have sharply different attitude, both roles have

need of ingenuity. PM must have the ability to use multi-disciplinary resources efficiently and they can control their career towards success by developing the knowledge and skills mentioned in the paper. The selection and training of PM could be conducted with greater reliability.

Mark Keil, Hyung Koo Lee and Tianjin Deng [12] emphasized the Delphi method which is a group decision-making process involving three phases (brainstorming, narrowing down, and ranking). Extensive variety of disciplines (public administration, social work, operations management, and information systems) can use this method. In this method a panel is formed by the selection of domain experts. Each panel expert must have to give input regarding area interest and these inputs are summative into a list of unique items. The items of the list are offered back to the panelists for grading. The mean rank for each item is then computed, and each panelist is asked to compare this mean ranking with the original ranking done by him/her. To reach an acceptable level of group consensus, this ranking process carries on in an iterative manner. The mean rank of each category skill show that communication was the highest ranked category, leading by team management, project management, and people skills. After ranking, the top five IT PM skills are: leadership, verbal communication skills, scope management, listening skills, and project planning respectively. Method used in this paper suggests that a core set of skills allied with project management are just as important for IT PMs to master as for any other type of PM.

III. ROLES OF PROJECT MANAGEMENT

Role of project management is not limited to just one aspect, it encloses three major dimensions i.e. Technical, transactional and transformational. [13]

A. Technical Dimension

This dimension is all about overcoming the technical issues of the project, where ever they come across during project lifecycle. For that, PM must be well aware of major technicalities of the project. Though he needs not to know all the technical aspects in depth but still he should possess hands-on expertise to cope the technical challenges of the project, to some extent. He should know when to appreciate his team, and when to offend them for their substandard performance. Technical dimension encompasses task related to definition of project and its planning, activities necessary for execution of project definition in accordance with planning, and finally activities for controlling the project to ensure the quality of project.

B. Transactional Dimension

Project management role in this dimension is to make workflows and then to ensure project execution in accordance with these workflows. Transactional activities start with development of baseline parameters and matrices to be used in execution phase. Then during execution phase performance is reviewed and reported

based on developed parameters to ensure successful execution of project within time and budget. At this point PM works as Manager rather than a leader.

C. Transformational Dimension

This dimension focuses on activities related to leadership. In this dimension PM acts as a project leader. Soft skills like communication skills, people skills, negotiation skills, are desired to accomplish transformation activities. PM needs to be most effective in this dimension to succeed in project by focusing people management. Communication skills, negotiation skills and conflict resolutions are keys to flourish in this dimension.

IV. RESPONSIBILITIES OF PM

To manage a project is not a straightforward task, rather a PM faces challenging environment and it demands a lot from him. His job is to manage the people, technology, and change in order to accomplish goals, achieve targets, and deliver a better quality project on time and within budget.

Robert Goatham says "As PM, juggling all of the balls is important, but keeping your eye on the right ball is the key to delivering truly successful projects" [15]

PM have to fulfill following broad requirements for successful completion and delivery of project.

A. Identify Stakeholders and Analyze their Needs and Expectations

When a project starts the first and foremost thing is to identify all the people having something on stake for corresponding project. A project effects or is affected by numerous people and organizations, so firstly project manager should be well aware of all of these stakeholders. Afterwards he has to communicate with them to gather their requirements for the project, which will help to define the scope of project later on.

B. Manage Project Professionally from Start

Define and review project scope and project objective by conducting regular control and review process. Also identifies major project risks at the very start of the project and carefully gathers and documents all the requirements.

C. Reduce Rework on the Project

Possess capability of managing ambiguity, uncertainty, surprises, rapid change, and a less defined environment. As literature shows that 25%-40% spending on project is wasted due to rework and 70%-80% rework cost is due to errors in listing down requirements of project. So best requirement elicitation approach should be adapted and manager should collaborate with stakeholders and define complete / accurate business requirement at the start, to reduce rework.

D. Control Change

Change is unpredictable and it is everywhere. So a

major responsibility of PM is to monitor and control the change. At the start of project he should have establish a direction/baseline which will help for variance measurement throughout the project. Mostly “Change request” comes from project team, customers, upper management and supplier- being PM don’t ever make a mistake to sit and watch your team to execute and deliver the project rather properly manage change requirements during project life cycle.

E. Improve Communication

PMI says that 90% of project issues arise due to communication problem. Manage the project team by creating an environment encouraging to the delivery of the quality product in the most cost-effective manner.

PM can achieve this in case he pursue following points.

- Make the tasks clear to all team members
- Make priorities of these tasks also clear
- Clarify expected level of quality to all the team
- To ensure that assigns person on the project do not deviate cultural norms and standards of parent organization
- To make different operational island of the company closer to each other for cross functional communication towards common goals and objectives
- To balance interest of different stakeholders amicably

As well as manage a healthy relationship with the clients by using direct however formal and complete reporting format that compliments a respected and productive relationship.

F. Deliver Project Results within Time and Budget

Meeting deadlines and budget is important factor to keep the stakeholder satisfied. But quality of project should not be affected at any rate. Therefore PM can’t take the project lenient; he has to ensure delivery of quality product keeping time and budget limit in mind.

G. Define Critical Path to Optimize Resource

Every project is made of series of connected activities. These activities can be done in series or parallel. So sequencing of these activities is also a demanding task for PM. For optimal sequence of activities there is an approach to identify critical path – longest path in project with no slack time. PM has to identify critical path for ideal use of resources to accomplish project’s activities.

H. Close the Project

Last but not least, PM critically reviews all phases of Project management. He analyzes all review notes and discusses them with concerned stake holders. Finally, lessons learnt during project lifecycle are documented and communicated to other PM.

To meet all the above requirements, PM must possess some commendable skills.

V. PM’S SKILLS

Project management roles point out that a project needs to be managed by considering three different dimensions, so the PM needs to be multi-talented personnel having expertise in project domain as well. He has to deal with project scope, time, and cost and communicate all the information to the stakeholders. He has to keep an eye on the team and their performance to get the optimal results. Therefore the PM must be a skilled personal having a good mix of both hard and soft skills.

A. Organizational and Planning Skills

PM must possess skills to plan, organize, control and monitor the project. Budget and schedule planning and controlling must be done with concentration to drive the project towards success.

B. Communication Skills

PM is responsible for assigning duties to the project team and most importantly he need to effectively communicate all the duties across the team. Even spectacular project planning is worthless, if it is not properly communicated. Therefore PM must ensure that every team member is well aware of his duties and all the stakeholders are communicating with each other. Good communication skill demolishes plenty of problems thus it is considered among the most important leadership skills. [8]

C. Change Management

In project management change is inevitable. PM must possess knowledge and expertise to deal with change request that might be coming from project team, sponsors, market or stakeholders. PM must have ability to face the changing requirements and adapt according to the situation.

D. Personal Skills

To gain maximum output from the project team, PM must quickly develop positive relationships with the team and all other stakeholders. Firstly, select the right personnel for the job and then develop their expertise level about the project. Team members look forward to PM whenever they face any obstacle, so PM must be able to identify the root cause of the problem and then resolve it accordingly. He should sustain and motivate the team by showing positive attitude towards the problem coming in the way. A good manager must know how to tackle with the people to maximize project profit. [14]

E. Negotiation Skills

PM has a lot of responsibilities but at the same time he possesses less authority so he is nothing without negotiation skill. He has to deal with all the stakeholders of the project and it is not necessary that all stakeholders wants common requirements out of the project. So PM needs to effectively communicate them, all the tradeoffs and negotiate with them to agree upon some common objective. PM’s ability to negotiate directly affects projects quality and success. [16]

F. Technical Skills

Besides soft skills PM must have good technical skills. Joel Gross, the founder and CEO of Coalition Technologies, says that a good PM "must have solid knowledge of the platforms, software and programs that your company regularly works with, even if your job is not actually technical". [17] Some other skills of a good PM are as under.

- Ability to follow problem to its details while at the same time standing apart so as to see the big picture.
- Knowledge & understanding of physiology & human behaviour, organizational behaviour and interpersonal behaviour.
- Goal Orientation and customer focused required.

VI. INFORMATION TECHNOLOGY PM

Though it is not crucial for PM to have technical expertise, but it is good to have a PM with technical experience because of underlying facts [18].

- Subject matter experts generally turn out to be good PM
- Technical PM gets respect and regard from the team members.
- It is better to have technical experience at first hand, rather than depending upon someone in the team-as he/she might not be trust worthy.
- It is easier for team members to dodge non-technical PM about schedule and completion dates, but technical PM identifies these ridiculous schedules at first place.
- Technical background of PM counts a lot in small team where he has to be more involved to the impediments.

Hence it is better to choose PM having notable technical skills. In this section we will specifically focus on IT industry. Global computing firm IBM identified that 54% of software project fails due to poor project management [19]. This means that there is a vital need to improve project management rapidly and PM is the main entity in project management. Though significant PMs' skills are mentioned in last section but here we will cover some additional practices which PM must follow to improve the success rate of IT industry.

A. Effective Project Planning and Direction

It is well understood that a PM has to plan the project but the need of the hour is to plan comprehensively with clear goal and directions [19]. IT PM must use some approved methodology including processes, rules and some software tools for planning purpose like project plan and ACRI log [19]. A good IT PM exploits his time in suitable distribution of resources, assigning activities and defining responsibilities clearly. This will reduce the rework and helps to achieve the goal with better quality.

B. Effective Management

The proliferation of IT market is major challenge for IT PM. New models, devices and platforms are being launched on monthly basis. So, in IT industry change management must be proactively planned as overlooked change requirements are the key factor for the failure of IT projects. Risks involved in the change requests must be identified and communicated across all the concerned departments [19].

C. Enhanced Leadership Skills

In today's environment a PM needs to be flexible enough to embrace every suitable change that might help in project progress and success. He needs to focus on adding business value by leading the project rather than managing it. Today software delivery approaches – like agile and lean have shifted the role of IT PM from a director to a facilitator [2]. Leadership is not to give orders but to model the ways, enable others to act in a show and inspire shared values – it's all about creativity, inspiration and persuasion without direct authority. So IT PM in current era must possess leadership skills as well [20].

D. IT Skills

Traditional software delivery methods are blown up with processes adding little or no business value, so the organizations are trending towards lean software and agile development approaches [21]. PMI's Pulse of the Profession conducted a survey which exposed that high-performing organizations exploit agile practices twice as frequently as low-performing organizations. Other PMI research reveals that the projects become 16% more productive when they use agile approaches along with other traditional approaches [21]. These studies clarify the fact that if the IT professional don't possess knowledge about new development methodologies they can't become good professionals and PMs.

Cloud computing is another necessary IT skill a good manager must possess. PMI stated in Congressional IT Reform Forum [21] that "cloud computing is changing the way technology supports the business. Yet embracing that technology requires strong project management leadership and technical expertise to ease stakeholders and end users through the transition." Cloud computing is not limited to just safety and storage of data rather it requires competence in all aspects of IT, from privacy and security to data management and vendor service provision [21].

VII. CONCLUSION

Project Management is a demanding profession as learning never ends in PM life, he needs to put continuous efforts to flourish his career life. Nowadays technology is escalating at exponential rate so projects are becoming trickier with the progress of time. So to cope with today's changing environment and new market trends, PM must possess some remarkable skills and he

needs to enhance them periodically.

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Engr. Sobia Zahra has completed her BS Software Engineering degree in July 2012 from University of Engineering and Technology Taxila, Pakistan. Her areas of interest are Mobile Application Development, Web Development, Databases, Software Quality Assurance, Software Requirement Engineering and Operating System. Currently she is MS Scholar as well as Research Associate in the Department of Software Engineering at University of Engineering and Technology, Taxila, Pakistan.

Engr. Ambreen Nazir is a MS Scholar as well as Research Associate in the Department of Software Engineering at University of Engineering and Technology Taxila, Pakistan. She graduated from University of Engineering and Technology Taxila in Software Engineering in July 2012. Her areas of interest are Windows Application Development, Web Development, Databases, Software Quality Assurance, Software Project Management, and Software Requirement Engineering.

Engr. Asra Khalid is a MS Scholar as well as Research Associate in the Department of Software Engineering at University of Engineering and Technology Taxila, Pakistan. She graduated from University of Engineering and Technology Taxila in Software Engineering in July 2012. Her areas of interest are Mobile Application Development, Computer Graphics, Desktop Application Development, Object Oriented programming, Software Design & Architecture.

Engr. Ayesha Raana is a MS Scholar as well as Research Associate in the Department of Software Engineering at University of Engineering and Technology Taxila, Pakistan. She graduated from University of Engineering and Technology Taxila in Software Engineering in July 2012. Her areas of interest are Software Requirement Engineering, Software Quality Assurance and Operating System.



Engr. Muhammad Nadeem Majeed is PhD Scholar in Department of Computer Engineering at University of Engineering & Technology Taxila. He holds a MS degree in Computer Engg. from Center for Advance Engineering, University of Engineering & Technology Taxila and has 11 years teaching experience. His areas of interest are Computer Communication and Networks, Wireless Networks, Ad-hoc Networks, Software Requirement Engineering, Software Project Management and Advance Operating System. Nadeem has been striving to bring innovations in the said fields through his research.