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Enabling the Management evolution in Information Technology domain: analysing the Incremental and Tangible Management by Outcome (IT MBO)

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Abstract: **Management is an evolving practice based on the evolution of knowledge that is required to be applied to solve real-life problems. These real-life work problems and the implementation of knowledge to resolve them is done in the form of projects. With the omnipresence of digitalization, the 21st century, and hereon, we are heavily dependent on how we manage our Information Technology projects. And thus, the management of Information Technology projects becomes one of the most critical aspects of applying knowledge and to sustain further evolution. In this respect, we have to consider, what are some of the limitations as well as what are the indicators of the natural evolution of management in the Information Technology domain. There are different structures in which Information Technology projects are categorized, and there are many management principles, practices, and methodologies aligned with each of them. But we have to find a common strand that would act as a unifying factor that is bound to the basics and provides for the minimum required to sustain this evolution. This study is aimed at finding this factor (or factors) that unifies, simplifies, and standardizes any Information Technology project. Incremental and Tangible Management by Outcome (IT MBO) is the logical evolution of management in the Information Technology domain, which is analysed through a structured literature review and extensive background industry work building on the two most important constructs of 'incremental approach' and 'tangible output'. This paper would explain the analysis of suitable literature review for Incremental and Tangible Management by Outcome (IT MBO), its application for an Information Technology project, and its relationship with these constructs.**

Keywords: **Management, Incremental approach, Tangible output, Knowledge Work, Delphi, Information Technology.**

I. INTRODUCTION

Incremental and Tangible Management by Outcome (IT MBO) is a logical evolution of management for Information Technology projects. IT MBO works at two fronts, one, it simplifies and standardizes the workings of an IT project, and at the same time, it also handles the two crucial contributors to this methodology which are 'incremental approach' and 'tangible outcome'. We have analyzed a set of IT project management methodologies, such as PRINCE2, PMBOK, Agile, Scrum, KANBAN and DevOps (among many others) to realize that the journey in project management that started with the need to give a structure to ensure the success of an Information Technology project has got into the complexity of

technology adoption, tool selection, and assimilation. It should have primarily catered to the success of the project (outcome-oriented) and enabling the process and people to be at their efficient best. An extensive structured literature review to analyze the factors contributing directly (or potentially) to management in the Information Technology domain, exhibits a very clear indicator on this count, exhibiting the relationship that this study captures as Incremental and Tangible Management by Outcome. Furthermore, it establishes knowledge as the base considering Information Technology enterprise as a knowledge-based enterprise and people involved as the knowledge worker. It establishes a multiplicative impact of people, process and product in an Information Technology projects which starts from the basic knowledge to solve a real-life problem, where the knowledge has to ensure compliance with the SLA (Service Level Agreement) and KPI (Key Performance Indicator) for the success of the Information Technology project.

$$\text{IT MBO} = \sum_{n=\text{knowledge}}^{\text{SLA, KPI}} \text{People}(n) * \text{Process}(n) * \text{Product}(n)$$

Figure 1: IT MBO as a summation of People, Process and Product

The study further aims to study the relationship of Incremental and Tangible Management by Outcome (IT MBO) with its two main components, incremental approach and tangible outcome-

$$\text{IT MBO } \alpha \ f \text{ (Incremental Approach)}$$

$$\text{IT MBO } \alpha \ f \text{ (Tangible Output)}$$

Figure 2: IT MBO as a function of Incremental Approach and Tangible Output

This study describes how to define the Incremental and Tangible Management by Outcome (IT MBO) and through a detailed and systematic literature review coupled with extensive background industry work and understanding of project management methodologies, it has been able to decipher these basic relationships. These relationships are then utilized to build hypotheses to establish Incremental and Tangible Management by Outcome (IT MBO). The study has worked through several techniques to finalize a suitable methodology to test the hypothesis. In subsequent sections, the study would describe the underlying systematic literature review, hypothesis, methodology, findings, and conclusion.

II. LITERATURE REVIEW

A systematic literature review was conducted to understand the evolution of management with its explicit and implicit implications for management in the Information Technology domain, considering knowledge, knowledge work, knowledge worker, and knowledge enterprise in this context. The set of papers were selected considering the above as the basic theme, in a 20-year duration spanning the year 2000 to 2019. The study has made a primary note of 106 papers (selected from a pool of more than 250 relevant papers), noted below, and observed the key contributors that emerged when analyzed for this study. The study observes that for a knowledge enterprise, and the study considers Information Technology enterprise as a knowledge enterprise, the critical contributors are people, process, and product, augmented by communication and coordination.

With the study of literature and suitable analysis of the same, the paper aims to flag that there is an evolving trend of management where the big business aligned management is now moving to entrepreneurial management, involving IT industry, and where every stakeholder is a knowledge worker and thus everyone needs to manage their work. Every stakeholder must understand the management required to help excel at their defined job roles and responsibilities. It must be differentiated against the traditional set-up where there was a category of worker (also labor) which needed to be

managed by another set of stakeholders, managers. In entrepreneurial management for new-age business, the hierarchical level of worker and manager is blurred, and everyone is an equal partner, here equality infer it's a weighted equal, and weight is in proportionate to every individual's defined job role and responsibilities. Also, there would still be a role for managers in Information Technology, but it is also true that every stakeholder will have to take some responsibilities of management, as it will be an inherent demand for the job. No job in Information Technology is a mundane mechanical job; there is a necessity of knowledge, innovation, smart hard work, communication, and continuous learning and development. It is imperative thus, to drive 'Incremental & Tangible Management by Outcome (IT MBO)' as the preferred management concept to maximize the productive implementation of management. And this is true for every entrepreneurial venture, with Information Technology as the backbone.

The study also addresses the 'emergence of management'. Management, per se, is not tangible that emerged suddenly, though the tangible outcome is an important construct for successful management, especially in the Information Technology domain, where the requirements are both explicit and implicit. Management is a set of intangibles that guides all the stakeholders in an enterprise. Management was intrinsically woven in human history- cavemen/ women's survival is a story of management, the Harappan civilization, its propagation, survival, and then decimation is a case study in management. The ancient Indian account of 'Chanakya-neeti' includes management principles. The management of erstwhile Egyptian rule, the emergence and sustenance of Jesus, the spread and supremacy of the Roman Empire, and then the Roman church, the survival of ancient tribes in India, Africa, and America are all varied flavors of management principles and practices. And each of them is an enterprise. Each of them has multiple stakeholders, doing some enterprise, and creating some tangible output (Gilbert et al, 2006).

The study suggests the advent of new-age entrepreneurial awakening, where management to serve big business must pave the way to management to aid and enrich every stakeholder of an enterprise, irrespective of size or scale. Information Technology projects are the application of knowledge to solve real-life problems. Any stakeholder (manager, etc.) contributing to an Information Technology project is conditioned and compelled by the project management methodologies and the nature of the project in taking any decision. It is always the nature and circumstances of the projects aided by the project management methodologies which creates the decision, that is articulated by those in authority. Managers do the translation & channelization of decisions, which may be right or wrong. Groups of people never take decision in isolation, if they do, it would invariably be catastrophic from a management perspective (no matter what the outcome). The project management dictates, and the stakeholders follow. This is where the study suggests that an incremental approach serves best. At each stage, the decision can be built on each iterative phase, with definite corrective actions for each of these stages (Madhere S, 1995). The individual stakeholder or group (people) is always a factor, along-with process and products which forms the independent factors but never the absolute factor. It must cater to the delta, as risk & mitigations, in an iterative approach. Management, expressed through a multiplicative summation of these three attributes is the dependent factor, and other environment variables (including the socio-politico-economic) define the slope. All the experiences of management, in this study, indicate and validate this relationship. Information Technology project is the reality; management is a phenomenon.

Information Technology projects would merit management intervention for its successful implementation, but it may choose to adhere to some of its principles and practices or neglect some.

In a knowledge-based enterprise (Information Technology enterprise), every stakeholder practices management. It is defined by the individual roles and responsibilities. The role of the manager has a set of management principles and practices that they are responsible for (Chan Y, 2000). Just as every other role has its own defined set of management principles and practices to perform. Every stakeholder in a knowledge-based enterprise must understand, apply, and enrich suitable management practices, as the role demands. The study discusses management as an intrinsic & ever-present function that is present in every Information Technology project. The study argues that management is available with every stakeholder of an institution (in a knowledge-based institution) and thus the management principles apply to & must be practiced by every stakeholder of an institution as per the defined roles and responsibilities of each stakeholder. The study aims to cultivate this and analyze its evolution to create a conceptual model which will simplify, streamline and standardize the overall project management with a focused approach to success (outcome-oriented) and improved efficiency for each of people and product (Narayanaswamy et al, 2013). The study considers management to be an ever-existent function, which is in a continuous process of understanding, analysis, enrichment, conditioning in the form of modern management methodologies.

The study describes the understanding of management and its evolution through a corollary with the study and evolution of physics. Just as physics can be described as the study of nature and natural phenomena, management can also be described as the study of institutions and institutional phenomena. Just as physics does not create nature, management does not create Information Technology projects. Nature is truth and physics is a means to understand, analyze, enrich, and codify the nature and natural phenomenon. The institution is truth and management is a means to understand, analyze, enrich Information Technology projects and its principles & practices. Physics can help enable a favourable natural phenomenon and can also help sustain and improve nature. Management can also help enable a favourable output for an Information Technology project and can help sustain and improve it. Through a judicious implementation of management principles, the success and sustainability of an information technology project can be augmented. But just as laws of physics can't function in isolation and must always consider environment variables/ forces (such as a frame of reference, etc.), the management principles are not and can't be implemented in isolation (in the absolute absence of any environmental factors/ forces). The knowledge-based enterprise, primarily the Information Technology and Information Technology enabled Services, must go beyond customer satisfaction to creating a customer value proposition. In an Information Technology project, the customer may not necessarily be always able to visualize, may not know, may not understand, may not appreciate, may not value the business proposition, or provide for the 'how' of it, but, based on the identification of your core service offerings, new age business must go ahead and serve the customer and design tangibles (SLA/ KPI) (Fernandez & Fernandez, 2008). As a project's tangible output, it would create a great value proposition as well as mature the customer, though it may in cases, at the face of it, lead to initial customer disenchantment as you are prioritizing customer service delivery over customer satisfaction. In an Information Technology project, final delivery (also known as go-live or production release) is a measure of the definitive tangible output. The bedrock of intangible service delivery, also in the context of IT/ ITeS delivery is to contextualize it with tangibles- primarily Service Level Agreements (SLA) and Key Performance Indicators (KPI).

The study also analyzes the differentiation between management and economy. It agrees with Maslow's Criticism, *"Maslow pointed out that the demand for responsibility and achievement may well go far beyond what any but the strong and healthy can take. He sharply criticized Drucker and McGregor for "inhumanity" to the weak, the vulnerable, the damaged, who are unable to take on the responsibility and self-discipline which Theory Y demands. Even the strong and healthy, Maslow concluded, need the security of order and direction; and the weak need protection against the burden of responsibility. The world is not, Maslow concluded, peopled by adults. It had its full share of permanently immature."* But this study opines that the primary reason behind creating work, worker, and working is to provide every willing individual from the society suitable labor for their livelihood and to care for those who can't or won't labor (Senge, 2003). Everything else, though important and imperative, is secondary. It applies to any work project, and here the Information Technology project, is understood to be a work project to solve a real-life problem. The Incremental and Tangible Management by Outcome (IT MBO) is therefore always focused on the incremental approach and tangible output, so every effort is channelized to ensure we have an outcome. It gives precedence to outcome over every other contributing factor. It considers people as the primary independent factor with aided impetus on communication and coordination. To reemphasize, in a new-age enterprise, every stakeholder manages & works as per assigned roles and responsibilities. Job level and the hierarchy merely design the span of control and place in the hierarchy to enable proportionate decision making. Individual contributor is a very important and critical function in knowledge-based enterprise working on Information Technology projects. Information Technology-based new-age enterprise is a knowledge-based industry, where the people, product, and process are all knowledge-based. Here, every job must be asked the same question, of "greatest possible contribution this job can make", and every stakeholder must have management responsibilities & avenues to upgrade and enrich, that has become a weighted equal in management parlance (where weight is in proportion to the defined job role and responsibility).

In the new age enterprise of Information Technology projects, project management is a function of a finite customer requirement that it aims to cater, through an outcome-oriented approach. The customer requirement with an outcome-oriented approach would determine the project management for that specific project in a new age enterprise of Information Technology. For example, an Information Technology project to create a search engine that intends to operate in 30 countries (localization for 30 countries) and has an algorithm to provide meaningful search outcomes for 50 domain items, with 100 verified search outcomes per domain, per search. This compared to another search engine that can be accessed from any location (no localization) with a single algorithm for every search and no verification of search

outcome. The study suggests that, with the advent of digitalization, it is all about the outcome-oriented approach in catering to your intended customer segment, while focusing on your core service offerings and prioritizing customer delivery over mere customer satisfaction. It is the core customer requirement, specialization, and customer delivery, that defines the management of an Information Technology project, that is, the multiplicative summation of people, process and product including their inherent risks and environmental factors, measured from an initial knowledge base to definitive Service Level Agreements (SLAs) and Key Performance Indicators (KPIs). Incremental and Tangible Management by Outcome (IT MBO) is defined as the function of intended customer requirement (both explicit and implicit) worked through an outcome-oriented approach (which is tangible output with an iterative approach). The implementation of management principles and practices must be holistic. Here, being holistic would mean efficient utilization of people, along-with process, and product (Baumol, 2004). The study suggests that it is not merely whether the project is catering to stated or implied customer requirements driven through continued technological evolution, but the project management must adapt and align with the technological evolution of shape, size, efficiency or feature, etc.

Management is intrinsically there if any institution exists. Information Technology projects and enterprise can be used interchangeably here to study management, through an addendum that enterprise is an institution with the tangible or intangible outcome and with a clear assertion that from management perspective every institution is an enterprise (Quinn, 2005). Information Technology projects are ever-evolving, just as religion as an institution, or civilization as an institution, etc. and thus management practices are ever-evolving. Just like physics has always existed, meaning, the study of nature and natural phenomenon has always existed, and nature always operated with whatever everybody now considers and understand to be a physical phenomenon, for as long as nature has existed. It can't be said that physics has emerged in so & so decade (differentiating between the modern concepts of physics as a branch of knowledge against the existence of physics as the defining function that explains nature). It can of-course be said that the branch of knowledge that is physics, emerged in so & so decade. Similarly, the study implies that it can't be said (must not be said) that management (as the study of Information Technology projects and institutional phenomenon) emerged in so & so decade, but that the term 'management' emerged. From top-level to managers at each level, and now for service industries, enabled through Information Technology, it is 'now' most true than ever, that 'every stakeholder' in an enterprise (and particularly in an IT services and IT-enabled services sector) contribute to 'what our business is and what it should be' (Drucker, Peter, 1973). They must contribute to management practices and principles. It must, therefore, consider every stakeholder's management and try to align every stakeholder's management. This, while respecting and realizing the role of 'manager' as supervisor and decision-maker at different levels (hierarchies) in the chain of command. Management practices are not the exclusive domains for the designation or role of managers. Every stakeholder of a knowledge-based enterprise performs management functions invariably, to manage one-self, the effect it creates on the peer, overall chain, and environment variables (Carayon et al, 2006). It is high time management principles are democratized. To reiterate, every stakeholder in knowledge-based enterprise practices and contributes to the management function. In this regard, the manager is just another role of the enterprise chain that performs and contributes to the management function. Overall, Incremental and Tangible Management by Outcome, would consider the definite attributes of People, Process, and Product and further analyzes the constructs of incremental approach and tangible output.

III. RESEARCH WORK

A. Hypothesis

The study started with understanding and analyzing the natural evolution of management and focused on its implementation for Information Technology projects. Further, it analyzed and worked through available project management methodologies to substantiate the implication of this evolution. Ultimately, it came up with the question, 'How can we make an IT project outcome-oriented?'. This question served as the base for this study, and through the systematic literature review and industry work, it observed the relational approach to justify the same.

The two main constructs of the incremental approach and tangible output were observed as part of the initial work. Both these constructs, incremental approach and the tangible outcome are testable through an Information Technology project and they would be defined by the study subsequently through a set of measurable parameters. The study analyzed these constructs to establish that,

"Incremental approach is a contributing factor to outcome-oriented project management"

"Tangible output is also a contributing factor to outcome-oriented project management"

The systematic literature review and its indicators (as described in Table 1) and the industry work indicators (as illustrated through Figure 1 and Figure 2), along with the widely prevalent Information Technology project management methodologies and standards of Agile, PRINCE2, PMBOK, KANBAN, SCRUM, DevOps, etc. also substantiates the findings of the conceptual model on which this study builds on. It manifests as,

If an Information Technology project follows an iterative approach, then it would enable outcome-oriented project management.

If an Information Technology project aims for tangible output at each project phase, then it would enable outcome-oriented project management.

This relationship was tested to hypothesize that-

Ho1- Incremental approach does not contribute to outcome-oriented project management

Ha1- Incremental approach contributes to outcome-oriented project management

Ho2- Tangible output does not contribute to outcome-oriented project management

Ha2- Tangible output at each project phase contributes to outcome-oriented project management

B. Methodology

The study explores various methodologies to find the best fit to test the hypothesis. The nature of this hypothesis is such that it needs to be studied and analyzed for an Information Technology project over a defined period. It would also require defining attributes for the construct under study and validate them with run-time project data. The study considered three methodologies, survey, case-study, and Delphi technique. A survey was already considered as a method to understand and analyze a wider group of participants which proved the convergence to the underlying evolution of project management methodologies and adherence to its principles and practices (Jain, Ravi & Preetam, Abhishek, 2020). The study would consider the case study approach in verifying the conceptual model, as future work. Delphi technique was selected as the methodology for this study, keeping in mind the 'estimate-test-estimate' feature. The study has created the baseline estimate based on the structured literature review and real-time industry experience, which would be tested through this study, and the conclusion would be the next set of estimates, in the form of a conceptual model with suitable inputs arrived based on the study responses. The Delphi technique allowed for a focused set of experts who would provide an anonymized response, thus eliminating any bias. Also, because the study was involved with real-time Information Technology project, the Delphi technique helped ensure we do not need to get into any confidential project data and kept the focus on project management attributes only.

The Delphi technique implementation started with a select group of fifteen experts, who are working in mid to higher-level management, with extensive experience of handling multiple Information Technology projects of varied domains, in a distributed landscape. This was conducted over six months, from December 2019 to June 2020, when the respondents were working for different projects, a large client project from FMCG (Fast Moving Consumer Good) in India, a leading client in Telecom domain in Singapore and a leading client in Banking domain from the US, among others. As has been noted earlier, none of the discussion ever involved any project related confidential data, it was only restricted to project management principles and practices. The responses were anonymized, and only collective responses were provided back to the respondents.

The study had one facilitator and fourteen experts, the facilitator had utilized the systematic literature review and their own industry experience in-line with the hypothesis under test, to discuss and explain the two constructs of 'incremental approach' and 'tangible output'. This estimation started the Delphi sessions, which were conducted in-person and on-call. The study defined the total number of sessions at four and the first session was conducted as an open-ended session where attributes were defined for each of the two constructs. Subsequent sessions involved sharing questionnaires to map each of the attributes and participants were encouraged to provide free-flowing information, based on their extensive & credible past work experience, but also the current project experience to get the run-time inputs. After the five sessions, the responses were collected, and their mean and median scores were computed to comment on the findings.

C. Findings

The first Delphi session conducted was an open-ended session to set up the attributes for the two constructs of 'incremental approach' and 'tangible output'. The expert group decided on the final approach for this as, first, defining these set of attributes to describe each Information Technology project stage and then, to analyze and comment that at each of these project phase, does it correspond to 'incremental approach' and 'tangible output' and respond and discuss on it based on the project experience in run-time and other suitable considerations. The expert group came from different Information Technology project type, to cover a wider canvass, from presales to delivery, including support & maintenance and audit reporting. The experts came from various skill set around consulting, audit, analysis, development, testing, support & maintenance, and reporting, among others. This ensured a wider palette and a more exhaustive set of responses, as well as, ideation behind each response would be covered.

While describing the project phases, along-with the run time experience of each expert, the facilitator made available two sets of information. One, the gist of this study, its aims, and purposes as well as the systematic literature review, and second, the existing project management methodologies, such as PRINCE2, PMBOK, Agile, Scrum, KANBAN, DevOps, etc. As the experts also covered different skill sets, such as development or testing, they would also come with their understanding of an Information Technology project phase, in line with, say, a software development life cycle or software testing life cycle, etc. This served as the base response in defining the attributes for the project phases. The challenges around this were to navigate through the available knowledge and experience, mitigate the biases based on expertise in any particular skill or predominance of a particular project management methodologies. The underlying theme was to come to a standardized and unified phase item as attributes. After intense deliberations, the group, collectively came to a common conclusion, in defining these phases as-

1. Conceptualization
2. Design
3. Implement
4. Test
5. Rollout
6. Most Viable Product (MVP)
7. Product
8. Product Enrichment
9. Go-live

As described earlier, it catered to both the skill-based life cycle, such as, for software development life cycle in conventional mode, it would be requirement analysis, design, development, test, deploy, support & maintain and existing project management approach, such as for PRINCE2, starting a project, initiating a project, directing a project, managing a stage boundary, controlling a stage, managing product delivery and closing a project. There would similarly be different interpretation when viewed from, for example, a software testing life cycle or DevOps implementation or when following Agile methodology to run a project. The agenda of discussion was, what are the minimum but mandatory phases we run for an Information Technology project and the outcome was the 9 phases described above, with each phase catering to-

1. Conceptualization- scoping and managing essentials to start, run and close the project (what all it will take?), including Service Level Agreements (SLAs) & Key Performance Indicators (KPIs)

2. Design- convert the functional, non-functional and technical requirement into mockups, creating system and code level architecture and defining the standards for each stage

3. Implement- development of the features and their integration as part of the overall landscape

4. Test- performing quality assurance, quality control, and quality engineering activities

5. Rollout- alpha version of the integrated features in a controlled environment

6. MVP- the rollout of the integrated features as MVP in a distributed controlled environment

7. Product- deliver the integrated features as a business product to enable a business-driven evaluation and informed decision making

8. Product enrichment- feedback mechanism to enrich the business product from business and users (both internal & external) and other relevant stakeholders' input, including notes on any limitation (system, architecture, technical, functional, environmental, etc.) or future possibilities

9. Go-live- final output, where the product is made available to the intended end customer in an uncontrolled environment

The group unanimously agreed on these definitions and described the conditions for successful project implementation as-

- Necessary: Every Information Technology project must have a successful and sustainable Go-live
- Minimum: Every Information Technology project must have a stable final release
- Exhaustive: Every Information Technology project must lead to integrated feature/s which go through an end to end Product Lifecycle Management (PLM) cycle of product conceptualization to roll-back/ expiry, cutting across all intermediate phases

Each of these 9 phases could be utilized in a way as it suits the philosophy of each project, and there is no hard compartmentalization. The next three sessions were dealt with a questionnaire as below-

Section A: Incremental approach contributes to outcome-oriented project management in Information technology domain, understood through each phase of a project, phases were defined in the first open-ended session and mutually agreed by all participants-

1. Conceptualization- Yes No
2. Design- Yes No
3. Implementation- Yes No
4. Testing- Yes No
5. Rollout- Yes No
6. Most Viable Product- Yes No
7. Product - Yes No
8. Product Enrichment- Yes No
9. Go-live- Yes No

Section B: Tangible output at each project phase contributes to outcome-oriented project management in Information technology domain, understood through each phase of a project, phases were defined in the first open-ended session and mutually agreed by all participants-

1. Conceptualization- Yes No
2. Design- Yes No
3. Implementation- Yes No
4. Testing- Yes No
5. Rollout- Yes No
6. Most Viable Product- Yes No
7. Product - Yes No
8. Product Enrichment- Yes No
9. Go-live- Yes No

For incremental approach, the expected working is that each of the phases gets iterated through a set of feedforward and feedback mechanism and there is always a provision for delta (δ) catering to this input, such as,

Conceptualization(δ)-> Design(δ)-> Implement(δ)-> Test(δ)-> Rollout(δ)-> Most Viable Product (MVP)(δ)-> Product(δ)-> Product Enrichment(δ)-> Go-live(δ)

The expert group response was to relate, respond, substantiate, discuss, and help arrive at a consensus on these counts.

In the case of tangible output, here in Information Technology parlance and for this study, tangible doesn't necessarily imply physical or material, tangible implies pre-defined and measurable. That is why, in the framing of Incremental and Tangible Management by Outcome (refer Figure 1) it was described as a multiplicative summation of people, process and product that starts from knowledge (to solve a real-life problem) and measures up to Service Level Agreement (SLA) and Key Performance Indicator (KPI). Each of these 9 defined project phases was analyzed for the possibility of the creation of the tangibles and measuring up on those.

After three further rounds of sessions, the final response set was-

Yes	1
No	0

Incremental approach contributing to outcome-oriented project management in Information Technology domain														
	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14
Conceptualization	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Design	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Implement	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Test	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rollout	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Most Viable Product (MVP)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Product Enrichment	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Go-live	0	0	0	0	0	0	1	0	1	1	0	0	1	1

Figure 3: Final Delphi session response, incremental approach to outcome-oriented management

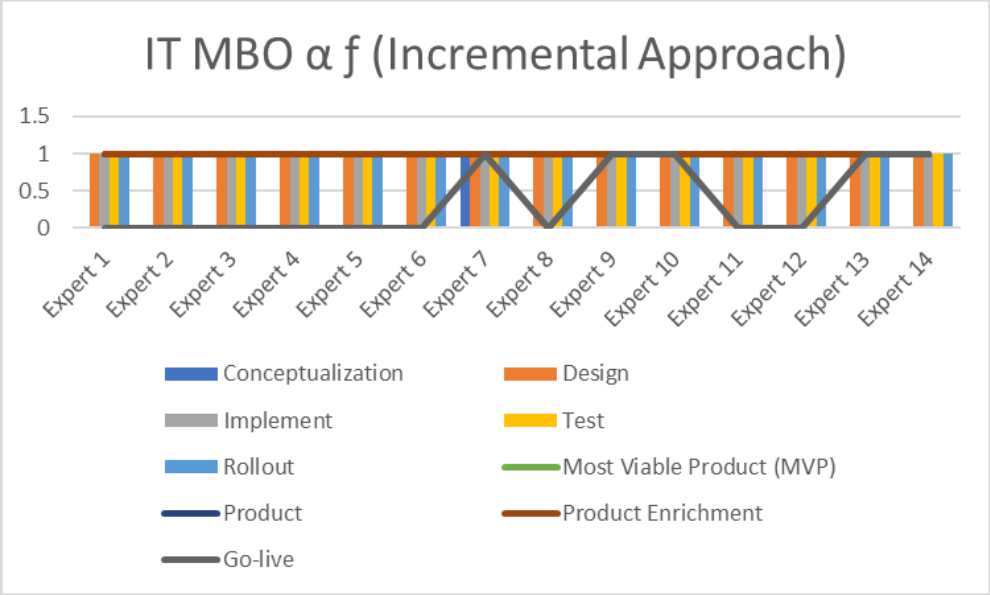

Figure 4: IT MBO *α ƒ* (Incremental Approach)

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Yes	1
No	0

	Tangible output at each project phase contributing to outcome-oriented project management in Information Technology domain													
	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	Expert 9	Expert 10	Expert 11	Expert 12	Expert 13	Expert 14
Conceptualization	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Design	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Implement	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Test	1	1	1	1	1	1	0	1	0	0	1	1	0	0
Rollout	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Most Viable Product (MVP)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Product Enrichment	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Go-live	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Figure 5: Final Delphi session response, tangible output to outcome-oriented management

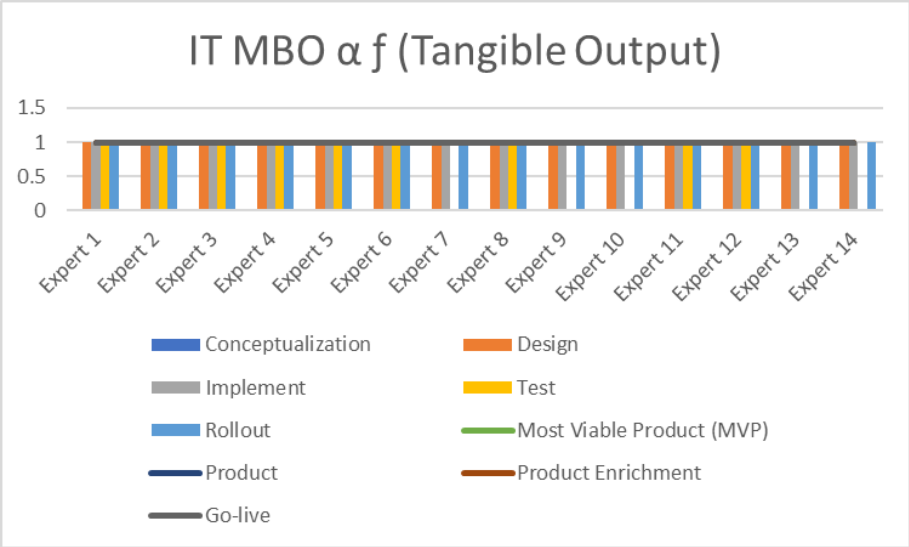

Figure 6: IT MBO *α ƒ* (Incremental Approach)

This result substantiates that the responses indicate us with information that may reject the null hypothesis.

Ho1- Incremental approach does not contribute to outcome-oriented project management

Ho2- Tangible output does not contribute to outcome-oriented project management

It would further allow the study to accept the alternate hypothesis-

Ha1- Incremental approach contributes to outcome-oriented project management

Ha2- Tangible output at each project phase contributes to outcome-oriented project management

IV. CONCLUSION

The study was aimed at understanding and evaluating management with an outcome-oriented approach based on the two constructs of incremental approach and tangible output. This method of Incremental and Tangible Management by Outcome (IT MBO) was verified through the Delphi technique to conclude that an incremental approach and tangible output does contribute to Management by Outcome. Further, the study defined a set of phases for an Information Technology project, from Conceptualization to Design, Implement, Test, Rollout, Most Viable Product (MVP), Product, Product Enrichment, and Go-live. The phases were not compartmentalized but to be utilized efficiently as per the need of the project and selected methodologies. It catered to an Information Technology project with an exhaustive span of presales to the delivery mode including consultation, analysis, audit & reporting. It covered the three core components of software development, testing, and support & maintenance.

The study would be carried forward by creating and augmenting a conceptual model that would be put to test through real-life Information Technology project through Incremental and Tangible Management by Outcome and the results would be analyzed for conformance and further improvements.

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