

# AMITY JOURNAL OF MANAGEMENT

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**Is Contribution-related Pay A Better Proposition than Performance-related Pay (prp) or Competence-related Pay? – A Theoretical Perspective**

**Prof. (Dr.) R.C. Sharma**

**An Assessment of Wildlife Tourism Photography in Nature and Eco-tourism Destination - A Case of India**

**Dr. Saurabh Dixit**

**Mobile Healthcare Deliveries in Maternal and Child Health: A Case Study of Low and Middle-income Countries**

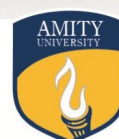
**Vani Aggarwal and Dr. Meenal Sharma Jagtap**

**Sustained Firm's Performance through Knowledge Management & Dynamic Capabilities**

**Sunali Bindra and Dr. Saurabh**



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# AMITY JOURNAL OF MANAGEMENT

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## CONTENTS

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VOLUME VI      NUMBER 1

January - June, 2018

---

IS CONTRIBUTION-RELATED PAY A BETTER PROPOSITION THAN  
PERFORMANCE-RELATED PAY (PRP) OR COMPETENCE -RELATED  
PAY? – A THEORETICAL PERSPECTIVE 1

*Prof (Dr) R. C. Sharma*

AN ASSESSMENT OF WILDLIFE TOURISM PHOTOGRAPHY IN  
NATURE AND ECO-TOURISM DESTINATION - A CASE OF INDIA 10

*Dr. Saurabh Dixit*

MOBILE HEALTHCARE DELIVERIES IN MATERNAL AND CHILD  
HEALTH: A CASE STUDY OF LOW AND MIDDLE-INCOME  
COUNTRIES 14

*Vani Aggarwal and Dr. Meenal Sharma Jagtap*

SUSTAINED FIRM'S PERFORMANCE THROUGH KNOWLEDGE  
MANAGEMENT & DYNAMIC CAPABILITIES 33

*Sunali Bindra and Dr. Saurabh*

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## FROM THE DESK OF THE EDITOR

Warm welcome to the Volume VI, Issue I of "Amity Journal of Management (AJM)".

We have successfully published five issues of Amity Journal of Management on various sub-titles like- Management of Social and Economic Issues; Role of Service Sector in Growing Indian Economy; Human Resource and other Contemporary Issues; People, Service and Beyond.

It is all because of readers' reviews and comments we are able to increase the quality standards of our articles/research papers/book reviews etc.

This edition has four comprehensive research papers on - Human Resource Management, Photography in Eco-tourism and its role in Promotion of Destination, Role of Mobile Health Care in Service Sector and Knowledge Management and Sustained Firm's Performance.

First Paper is a comparative study between contribution related, performance related

and competency related pay system and it is concluded that contribution related pay system is more effective than other two pay systems. Second paper is an overview of the perquisite use of nature and wildlife photography for tourists and travelers. Third paper is a study on mobile health care facilities and practices adopted in low and middle income countries for maintaining maternal and child health. Fourth is a conceptual paper, which proposes a framework and discusses the possibilities of superior firm's performance by defining dynamic capabilities through knowledge management.

Enjoy your reading and keep suggesting us for the continuous improvement in the quality of our journal.

**Prof. (Dr.) Anil Vashisht**

Chief Editor - AJM

# IS CONTRIBUTION-RELATED PAY A BETTER PROPOSITION THAN PERFORMANCE-RELATED PAY (PRP) OR COMPETENCE -RELATED PAY? – A THEORETICAL PERSPECTIVE

Prof (Dr) R. C. Sharma<sup>1</sup>

## ABSTRACT

*The present paper aims at highlighting the basic philosophy of both 'performance- related pay' and 'competency – related pay' and spelling out the intricacies of these two systems of pay pointing out how the 'contribution-related pay' system is better than the aforesaid two pay systems. It has been pointed out that while the performance- related pay is an output driven approach, the competency- related pay is an input- (Competence-) oriented approach. Whereas the performance- related pay approach suffers from the drawbacks like over- emphasis on quantitative, and often unrealistic targets, financial incentives are short lived, difficulties in measuring individual performance objectively, and so on, the competence-related pay approach presents two typical questions, viz. Are we paying for 'competencies' (i.e. how people behave), or 'competences' (i.e. what people have to know and be able to do to perform well), and then how to measure all these? The other question is: Are we paying for the possession of competence or the use of competence? These questions create a lot of confusion.*

*However, the 'contribution-related pay approach' is the combination of the output driven approach of performance- related pay and the input- (competence-) oriented approach of competence-related pay, and is an attempt to embrace the advantages and exclude the shortcomings of the aforesaid two pay systems. It has therefore, been proved to be much more convincing than either performance- or competence-related pay.*

**Key Words:** Competences, Competencies, Competence, Contribution

## INTRODUCTION

Whether an employee should receive 'performance-related pay' (PRP) or 'competence related pay' (CRP), has always been a debatable issue. However, it should be known that both PRP and CRP are two major types of contingency pay, the other types being contribution-related pay, skill-based pay, shop- floor incentive and bonus schemes, salesforce incentive schemes, executive incentives and bonus schemes, employee and executive share schemes, team rewards, gain sharing, profit sharing, profit-related pay and other cash payments<sup>(i)</sup>. Thus, contingent pay covers the various forms of additional financial rewards i.e. which are in addition to the base rate of pay. <sup>(ii)</sup>

Anyway, in the present paper, an attempt has been made to discuss at length the difference between performance-related pay (PRP) and competence-related pay (CRP)

besides highlighting the various issue related to performance-related pay (PRP) and competence-related pay (CRP) and spelling out how contribution-related pay is a better proposition than the performance-related pay (PRP) and competence-related pay (CRP)

## Performance - Related Pay

Despite negative reports from many research projects and opposition from many trade unions, performance pay is quite popular and continues to be a traditional constituent of the pay packet of (i) most sales personnel who get it in the form commission based on their performance, (ii) shop- floor employees who get it based on the quantum of their output, and (iii) executives who get it normally in the form of bonus/ profit-related pay/ gain sharing/ profit sharing/ etc.

Performance-related pay links pay progression to a performance rating which is usually conducted during a performance review though some organizations conduct it

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at a different time exclusively for performance-related pay purposes.

Performance is usually applicable in the case of individuals though attention is also being paid to performance criteria related to team work.

Before spelling out objectives of performance-related pay, it may also be pointed out that there is distinction between 'performance' and 'contribution'. While 'performance' refers to what an employee achieves, 'contribution' refers to impact made by that employee on the performance of the team and the organization. <sup>(iii)</sup>

## **OBJECTIVES**

Coming to objectives, it may be mentioned that the main objectives of performance-related pay may comprise: (i) to motivate every employee to perform better and put his heart and soul into his job, (ii) to attract and retain high quality employees who are hard working, (iii) to make employees result and performance -oriented and change the work culture accordingly, (iv) to reduce supervision, (v) to focus on the key performance issues, (vi) to reduce cost of production, (vii) to help in raising the standard of living of employees, (viii) to encourage teamwork and innovation etc, (ix) to reward employees according to their contribution, and (x) to make obvious to the employees that the organization is genuinely concerned with output/ performance.

### **Why PRO is Criticized?**

Despite several advantages of PRP, it is not without its criticism. The main disadvantages include: it has been often observed that financial incentives are short lived and lose their momentum in the long run; since the additional payments as per PRP schemes are not very significant, they do not attract quite a good number of employees especially those who are not hard working or who are less confident; in the urge to earn more, some employees work beyond their capacity which may affect their health adversely; in order to earn more, employees care only for the quantum of their output and do not pay adequate attention to the quality of their

product; some employees pay less attention towards reducing wastage and damage to the plant, machinery and equipment, because their priority is to increase output; at times, it may also affect teamwork adversely; and finally, in a good number of cases, it is not possible to measure individual performance objectively and accurately.

But whatever is stated above is not the whole truth because it should not be forgotten that "the achievement of a reward is a tangible means of recognition and can therefore, provide a less direct but possibly longer-term motivation. <sup>(iv)</sup>"

### **What should be ensured Before Introducing PRP?**

It is not that performance related pay can be introduced any fine morning. There are certain pre-requisites that should be ensured before launching the performance-related pay (PRP) system. For example, it should be ensured that PRP should not only fit the culture of the organization but also support it. PRP should also be able to act as a lever to change the culture as and when needed. Secondly, the top management should be firmly committed to PRP and able to work with the processes of PRP. Besides, not only the line managers should be staunch supporters willing to own PRP, the employees too should have a feeling that they will be benefitted if PRP is introduced. All the departments, especially the HR department, and management must have the confidence that they will make PRP work.

Thirdly, the organization should be in a position to evolve methods of measuring performance fairly and consistently. The management, especially the HR department, should have a clear understanding of the language of behavioural competences. Then, there should be a possibility of making the process of PRP an integral part of business planning. PRP should also have the support of the communication system of the organization. There should also be an efficient and effective process of performance management enabling the measurement and assessment of performance against the targets and standards prescribed.

Possibilities for evolving effective guidelines on how pay should increase within the pay structure already operational and, above all, there should be adequate chances of having desired control over PRP so that it works within reasonable costs.

Then the management should not only be capable of planning objectives appropriately in full agreement but also assessing levels of competence of personnel of the organization. The management should also be capable of meaning as well as rating the performance of the employees of the organization.

It is also necessary that the HR department of the organization should be competent enough of extending the guidance and providing necessary support besides making available the desired resources. The managers should be able to manage PRP in their departments at their own and should not depend much on the support of others especially the HR department. It is equally important that managers should be effective in “using the PRP as part of a total performance management process which will involve joint assessments and agreements of performance and individual development need.”<sup>(v)</sup> It has also to be ensured that costs incurred on introducing the PRP are just and also capable of far exceeding the cost of the scheme.

It has also to be found out if PRP will be instrumental in accelerating performance of the organization concerned.

However “Armstrong and Murlis<sup>(vi)</sup> have suggested the following factors to be taken into account while introducing PRP in an organization: matching the culture (i.e. successful PRP schemes need to match the culture and core values of the organization); linking PRP to performance management processes; balancing performance measures (i.e. a balanced mix of both input and process factors (skills and competences) and output factors (performance and contribution)); flexibility (in the criteria for reward and the method of payment); teamwork (i.e. the significance of teamwork should be recognized in structuring the scheme and also in designing critical success factors and

performance indicators.); avoiding short-termism (i.e. not to focus attention only on short - term results at the expense of more important longer - term objectives); involvement in the design process (of the PRP schemes); and getting the message across.

Thus, we see that there should be full scope for cost effectiveness besides the reward synchronizing with the expectations of employee concerned. It is also to be ensured that there exists a fair and effective mechanism for measuring performance and contribution made by the employees and that there is a link between performance-related pay and contribution of employees and subsequent reward to the employees.

### **Developing a PRP Scheme/ Programme**

PRP is not a magic wand which will resolve all the motivational as also performance problems of an organization. Hence, no PRP programme should be introduced in a haste as it is a very sensitive matter. The top management should be made fully aware as to what PRP is capable of doing and what it is not capable of doing. The key considerations explained in the foregoing paragraphs should be taken due care of before venturing into the launching of a PRP programme.

“Although it is difficult to work out a rigid sequence of steps to be undertaken while developing a PRP programme, yet the sequence of activities being spelled out in the subsequent lines may prove quite useful and effective. First, the objectives of introducing a PRP development programme be clearly spelled out i.e. why do we want to introduce a PRP programme. What is it that we are looking for out of such a programme? Then we should find out whether the organization is ready for introducing a PRP programme. To answer this problem, we have to assess whether the culture of the organization is appropriate for introducing the PRP and in the same way whether the PRP is appropriate to the culture of the organization. We should go ahead only if the answer to both questions is in affirmative. The other questions to be answered in this

respect may include like: Are the attitudes of the employees and the management conducive for the initiation of PRP programme and further that whether there exists the performance management and other relevant processes wanted for the effective working of PRP'. It has also to be assessed whether the employees possess the required skills and resources. Again it has also to be ascertained whether the costs involved in developing and operating the PRP programme will be able to generate enough additional performance.

The third step may involve taking a decision whether to introduce PRP or not. For this, we will have to take into consideration all the issues discussed earlier under the head, "whether to introduce or not the PRP". In case the answers to all such issues are conducive, we should move towards the next step i.e. identifying the objectives of PRP. A discussion in this regard has already been undertaken in the earlier paragraphs. The next step in the direction of developing PRP, which is vital for the success of PRP programme, is involving the employees of the organization. They should be briefed about the intentions of the management and that what the management intends to get out of such a programme. The suggestions put forward by the employees should be taken due care of. Then comes the next and a very important step i.e. designing the programme. This involves choosing the criteria for determining PRP onwards. However, an appropriate mix of : Input criteria, Process criteria and Output performance can also be considered. <sup>(vii)</sup>

Designing the PRP programme involves consideration of a lot of issues like availability of performance measures, which form of rating system to be used, how to ensure the fairness and consistency of ratings, whether PRP review should be separated in time from performance reviews, how the costs going to be controlled, use of performance matrices, maintaining the PRP, evaluation of the effectiveness of PRP programme, policies on the rate of progression , limits to progression within the

existing pay ranges, finalizing the PRP programme, and so on.

The next step involves briefing and training the line managers on the PRP programme. It involves making the line managers understand the programme, how it will function, and what benefits are likely to accrue to them, and the like.

The next step is concerned with the implementation of the PRP programme. In this direction, PRP should be started with pilot scheme so that it may enable the management to understand the principles, advantages and problems. Only thereafter when necessary precautions have been taken, the PRP programme should be launched. In the initial stages, the PRP programme should be properly monitored so that the probable problems can be visualized and solutions worked out.

The next and final step in developing a PRP scheme programme is the evaluation of the scheme i.e. whatever was intended of the PRP scheme could be achieved or not. Whether the scheme could be monitored consistently well? Were the persons entrusted with the implementation of the programme could perform their job well? Who will be responsible for overcoming the problems and taking corrective steps? A detailed discussion in this direction is curtailed in the subsequent pages.

### **OPERATING THE PERFORMANCE RETAILED PAY (PRP)**

As stated earlier also, the most typical PRP system usually uses valuable progression within a pay range. The main operational features of the aforesaid system, according to Armstrong and Murlis<sup>(viii)</sup> ,may involve: basis characteristics, valuing aggregate, size of increase, progression rates and limits, progression guidelines, use of performance matrices, and control.

### **EVALUATING PRP**

At the end of stipulated period, PRP programme should be evaluated to know whether the desired outcomes could be obtained or not and then taking corrective

steps. This can be achieved by finding out the extent to which the desired objectives of PRP programme have been achieved. How much costs were incurred on the implementation of the PRP and what advantages could be obtained i.e. how much PRP could be effective in implementing the performance of individuals, teams and organization as a whole. How do the organization personnel feel about the programme?

Whether the employees concerned feel that their expectations with regard to the quantum of reward have been met? Whether the rewards are linked to key and measurable areas of performance? Whether any modifications in the existing PRP programme are required? Whether the existing PRP programme should be allowed to continue as such or its alternatives should be identified? Such queries will go a long way in sustaining and improving the PRP programme developed and making it effective.

### **WHETHER TO INTRODUCE OR NOT THE PRP**

Keeping in view the pros and cons of PRP, its introduction everywhere cannot be recommended point blank. There are many ifs and buts. Much depends on the objectives of the organization, cultural orientation of the organization, working environment of the organization, and so on. However, PRP may be deemed necessary in certain organizations because of market compulsions so as to secure an edge over their competitors. The very belief in the soundness of the contention that employees should be paid accordingly to their contribution, goes in favour of introducing the PRP. It is a different story whether their belief proves true or not. However, the very introduction of PRP in an organization gives an obvious message to the employees that the organization attaches a great importance to performance and therefore, the employees are supposed to focus on their output. All the same, there are several difficulties in the implementation of PRP as are obvious from the studies concluded by Purcell, <sup>(ix)</sup> Bowey and Kesslev. <sup>(x)</sup>

### **What is the alternative to PRP?**

The traditional approaches to performance-related pay which involve rating performance against quantitative targets and using a formula to determine the pay increase, have met severe criticism from both trade unions and academics. Line managers too have doubted the practice of PRP. All such criticism compelled, specially in 1990s, to look out for the alternative and led to the emergence of the concept of 'competence-related pay' (CRP), a brief about which is as follows:

### **COMPETENCE RELATED PAY**

In competence-related pay, employees receive financial rewards in the shape of increases to their base pay by reference to the level of competence they demonstrate in carrying out their roles. It is a method of paying employees for the ability to perform now and in the future. <sup>(xi)</sup>

There are several perspectives on what competences are and what they are supposed to achieve. Are they a skill that can be learned and developed, or, are they a trait that includes attitudes and motives? Do competences focus on the minimum requirements that the organization needs to stay in business, or do they focus on outstanding performance? Are they characteristics of the organization or of the employee? Unfortunately, the answer to all of these questions is "yes" <sup>(xii)</sup>. There is no unanimity among the authors on several issues in this regard. Competences can therefore be a number of things and as a result of that, they stand in danger of becoming nothing. That's why, competency-based pay systems are rarely used in a stand-alone form as the only means of determining reward. Current practice in competency-related pay is diverse, with many different methods of linking competences to individual reward being used. Only a minority of organizations have chosen to link competency and pay. Overall, there is no evidence in recent years of a growth in the popularity of competency-related pay schemes.

## WHAT IS COMPETENCE?

According to UNIDO (2002), competency is a set of skills, related knowledge and attributes that allow an individual to successfully perform a task or an activity within a specified function or a job. <sup>(xiii)</sup> Boyatzis' (1982) definition of competency states that "a job competency is an underlying characteristic of an employee - i.e. motive, trait, skill, aspects of one's self- image, social role, or a body of knowledge which results in effective and/or superior performance in a job."<sup>(xiv)</sup>

Early conceptions<sup>(xv)</sup> of competencies focused on the following five areas:

1. Skills (demonstration of expertise)
2. Knowledge (accumulated information)
3. Self- concepts (attitudes, values, self- image)
4. Traits (general disposition to behave in a certain way)
5. Motives (recurrent thoughts that drive behaviours)

However, TRW competency model<sup>(xvi)</sup> classifies human resource competencies as (i) Human resource expertise (provide leadership and teach others to: attract, develop and retain only the best talent, champion process improvement and apply technology, implement creative rewards and recognition, and create internal environment second to none, (ii) Change management (Capture on organizational dynamics, mobilize the organization through the articulation of a vision, demand creative solutions and quick results, seek out and share the best practices, and make project management a core skill), (iii) Personal credibility (meet commitments and keep confidences, take accountability for results, communicate clearly and persuasively, collaborate and network to build relationships, respect and leverage diversity, model TRW's core values), and (iv) Global business partnership (regard the customer as paramount, drive actions based on competitor and industry knowledge,

influence organizational objectives, priorities and processes, insist on business and HR strategy integration, and consider the global impact on decisions).

## What Information should be collected?

There are a number of schemes proposed for classifying competencies.<sup>(xvii)</sup> For example, one of them uses three groups: (i) personal characteristics, (ii) visionary, and (iii) organizational specific.

## RESULTING STRUCTURE

Usually, competency-based structures are designed with relatively few levels. There may be four to six, and relatively wide differentials for increased flexibility.

Of late, "increasingly organizations are finding that success depends on a competent workforce. Paying for competence means that organization is looking forward, not back."<sup>(xviii)</sup> The overemphasis laid on quantitative, and often unrealistic, targets in performance-related pay (PRP) is avoided. Competence-related pay (CRP) appeals to employees because it rewards employees for what they are capable of doing, not for results over which they might have little control as, at times, other uncontrollable variables come into vogue.

## Why Competency-Related Pay?

Competency -related pay is desirable because it encourages competency development and further that it also encourages employees to take ownership of their own development besides helping to integrate role and generic competences. More importantly, it focuses attention on the requirement of higher levels of competence.

## Why Competency- Related Pay is not Recommended?

Competency-related pay is usually not recommended because in it costs are likely to go up if people are paid for competences they rarely use or do not use at all. Competency-related pay also involves considerable resources for training and support besides making high demands on the commitment and skills of line managers. Costs are also involved in terms of

assessment and documentation of competence levels as these are costly propositions as also time consuming, and so on.

### **Introducing Competence-Related Pay**

Competence-related pay may be introduced only when the organization is ready for it which involves support from both top management and line managers and if frameworks for generic competence have been developed. It should also be ensured that the introduction of competence-related pay is likely to provide competence advantage and that effective performance management processes are in place. Besides, a broadband pay structure should also be in place and there should be involvement of employees in the development of competence-related pay program, and so on. Before introducing the competence-related pay, it should be ensured that all concerned like line managers, team leaders and employees are in line with the system and that all the intricacies of the system have not only been explained to them but also the system is acceptable to all. The competence-related pay should be introduced in phases and training programmes wherever required should also be chalked out. Monitoring of the programme at every stage and subsequent evaluation should also be attached due importance.

Thus, we find that though theoretically competence-related pay (CRP) system appears to be better but it is indeed difficult to carry it forward because of certain inherent weaknesses in this system pointed out earlier. Hence, there is a strong case for linking the pay to outcomes (performance) as well as inputs (competence). This gives rise to the concept of 'contribution-related pay.'

### **A Case for Contribution- Related Pay**

Though theoretically, competency-related pay appears to have overcome some of the major shortcomings of performance-related pay (PRP) but simultaneously it gave rise to a number of practical difficulties and consequently, competency-related approach (CRP) has never really taken off. Hence, in

order to take care of the advantages of both performance-related pay (PRP) and competence-related pay (CRP) and also to eliminate the shortcomings of the two, towards the end of twentieth century there emerged a new approach, viz. 'contribution-related pay' and a case for contribution-related pay was made by Brown and Armstrong (1999). They stated that "Contribution captures the full scope of what people do, the level of skill and competence they apply and the results they achieve, which all contribute to the organization achieving its long-term goals. Contribution pay works by applying the mixed model of performance management: assessing inputs and outputs and coming to a conclusion on the level of pay for people in their roles and their work; both to the organization and in the market; considering both past performance and their future potential.<sup>xix</sup> Soon, this approach became quite popular as is revealed by a CIPD survey (2003). This survey states that while a very few among respondent organizations had competence-based pay, around four times more of competence-related pay had performance-related pay, and around more than double of the organizations, if both the performance-related pay (PRP) and competence-related pay (CRP) are taken together, had contribution-related pay. However, there is no denying the fact that in addition to contribution-related pay, there are some other alternatives like spot rate system, etc.

### **What is Contribution- Related Pay?**

As stated earlier, contribution-related pay is a holistic process involving pay decisions based on the outcomes of the work carried out by individual employees as well as the levels of competence and competency influencing these outcomes.

Though contribution-related pay too, like any other forms of contingent pay, has the shortcoming of relying on managerial judgment and that it is not easy to manage it, yet it may be considered as the best option in most of the cases as has been reflected in several surveys. Its main characteristic is that increases in pay or bonuses are linked to

inputs (i.e. competence) and outputs (i.e. performance). Further, its main advantage is that it rewards people not only for what they do but also how they do it. All the same, it may be difficult to measure contribution and also it is easy to manage it appropriately.

### **When Contribution-Related Pay to be Introduced?**

The contribution- based pay is suitable only when a well- rounded approach covering both inputs and outputs is in place. It should therefore, be introduced when valid and reliable means of measuring performance are available in the organization and when it is expected that it will be instrumental in accomplishing the strategic goals of the organization. Similarly, it should be ensured that appropriate methods of evaluating levels of competence objectively are there and further that line managers are not only capable of and willing to assess contribution of employees but also capable of making as well as conveying contribution pay decisions. Besides, the employees should have faith and trust in the intentions of management and their trade unions accept the scheme and finally, there should exist effective performance management processes and procedures as also a competent HR department.

### **Developing and Implementing Contribution - Related Pay**

In order to develop contribution-related pay, it is essential, first of all, to study and analyse the ongoing processes, procedures, pay structure, methods of progressing pay, method of according bonuses, work culture and strategy of the organization. It should be followed by involving line managers in identifying the relevant aims so that the strategic goals of the organization could be accomplished. Then take decisions how the scheme will be operated i.e. what measures and processes will be taken to measure contribution, how pay increases and bonuses will be walked out, and so on. Simultaneously, competence framework be prepared, role profiles be spelled out and the performance management processes be developed wherever desired. This done,

pilot-tests should be conducted and corrective steps taken as per requirement and thereafter, the scheme be launched and evaluation be carried out periodically and remedial steps be taken as and when necessary.

### **CONCLUSION**

Thus, it is observed that contribution-related pay is a holistic process, taking into account all the aspects of a person's performance and competence. It is a good blend of performance-related pay and competence-related pay embracing the advantages and eliminating the disadvantages of both performance-related pay and competence-related pay, to a great extent. Hence, contribution-related pay is a better system than the performance-related pay and competence-related pay systems.

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## AN ASSESSMENT OF WILDLIFE TOURISM PHOTOGRAPHY IN NATURE AND ECO-TOURISM DESTINATION - A CASE OF INDIA

Dr. Saurabh Dixit<sup>1</sup>

### ABSTRACT

*Since ancient time, people travel for varied reasons. These reasons could be trade, adventure, leisure of any kind. (Dixit Saurabh, 2013). Tourism is a multifaceted activity. Wildlife photography is skill set or art of photography (to capture images) used for the documentation of animals, insects living in their natural habitat. It is a travel activity full of adventure (travel with risk in changed physical settings), as there is a lot of effort and patience required to capture and document animals, birds and insects with photographic skills etc. The present paper will provide a brief overview about the perquisite used for nature and wildlife photography for tourists, travelers.*

**Key words:** Eco-Tourism, Wildlife Conservation, Photoshop, Shading, Morphing, Anti-alisaing

### INTRODUCTION

Wildlife photography is skill set and art of capturing birds, insects, wild animals or spotting an animal that is living freely and happily in its natural habitat. Wildlife photography can show the beauty of the nature, landscapes, flora and fauna, animals and create awareness by showing their natural beauty. Wildlife photography can be performed in the events of eco-tourism which include jungle safari, bird watching, watching various majestic and endangered species in the flora-fauna of various natural habitats like majestic Tigers in Kanha (Madhya Pardesh)/ Pench, Asiatic Lions at Gir (Gujarat), bird watching at Chilka lake (Odisha, India), various animals in Sundarvan ( West Bengal and Bangla Desh), one horned rhino at kaziranga National park (Assam, India) etc. Wildlife photography can capture pictures of endangered species and animals at a risk of extinction and an awareness can be made among the people through documenting the animal and its beauty. Various NGO'S like Wildlife Conservation Trust (WCT) work for the conservation of wildlife, through documenting them and spreading awareness through various media and print forms.

Wildlife photography can also be a

recreational activity, volunteer activity as people visit various wildlife centuries, National parks, and wildlife conservation parks and Natural habit which are rich in its flora and fauna. Indian has a total of 21.23% forest cover with various forms of flora and fauna and has 90,000 different types of animals including over 350 mammals, 12,000 birds and 50,000 plants species. Both domestic versus international; inbound and outbound tourism can be promoted for wildlife photography in India, as it is rich in its geographic forms.

### Purpose of wildlife photography

- Educational
- Volunteer
- Recreational and adventure
- Knowledge enhancement
- Awareness

### Nature and Wildlife Tourism

Indian is a famous destination for wildlife. There is continuous traffic increment in various wildlife sanctuaries, parks.

Wildlife tourism is interaction with wild animals, habitats etc. Wildlife tourism is an upcoming area. People are interested to visit wildlife sanctuaries and capture memorable events. It is a life time dream for many to see rare species and have encounter with wildlife. There is continuous growth of tourism.

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On the other side, there is good demand of wildlife photography due to two reasons:

1. To capture good and memorable images to market the destination
2. To capture good and memorable images to keep for memory by the tourists, tour guides, local vendors and stakeholders.

### Tools for photography

Photography is based on few tools. These tools are very important. These are:-

1. A good camera
2. Tripod
3. Lenses

But, ultimately intelligence and skill set of a photographer is important. He can come out with memorable pictures.

### Types of photography

Photography is a complex activity. It depends on the purpose and objective. Roughly, it can be divided as:-

1. Areal
2. Modeling
3. Nature
4. Night
5. Adventure
6. Animal
7. Architecture
8. Aura
9. Medical

Wildlife photography is a combination of nature, adventure, night, animal and areal.

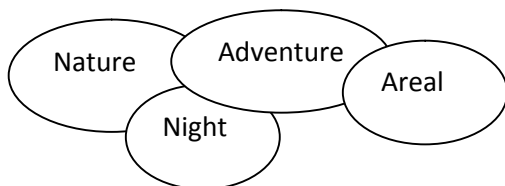


Figure-1: Wild Life Photography

### Eco-Tourism

Eco-tourism is any travel activity within a time frame outside the usual place of living for some purpose without harming or disturbing ecology of the place. It makes the tourism destination sustainable for longer time period.

### Nature Tourism

Nature Tourism is concerned with nature. Tourists travel to a place full of natural activities. He enjoys natural beauty like: rivers, mountains, trees, animals.

### Types of Wildlife Photographs

There are various types of wildlife photographs according to the environmental portraits and the frames. Camera settings play a vital role in documenting the wildlife (refer methodology). Some of the forms are environmental portraits, full body portraits, frame filling portraits, different gestures, capture behavior etc.

#### ❖ Capture behavior, gesture and posture:

It tells more about objects personality and life. Gestural capturing presents different attitude of an object which are captured while the object performing different gestures.

#### ❖ Environment related portrait:

It includes the object to be captured with the natural surroundings, which conveys a message through a photograph or a story.

#### ❖ Full body portrait:

It does not include the surrounding and the prime concern is to focus on the object which is to be captured.

#### ❖ Frame-filling portraits:

It has the prime focus on the face of the object in the frame.

### Information Technology

Information is a vital resource in the development of Tourism. (Dixit, 2012). Information Technology has changed communication through images, videos drastically. It has given new flip to travel wildlife and adventure photography.

### Technical Methodology

- Check the Shutter speed (use a faster shutter speed).
- Check the Aperture.

- Have the knowledge of the surrounding where the pictures being captured and about the animal being documented.
- Click the picture and use suitable software's (for example: Photoshop) for the evaluation.
- Apparatus should be carried which include camera, telescopic lenses, batteries, tripod, gimbal, binocular or a monocular, head lamps, telephoto lenses, camera bags for long lenses, rain covers for lenses, tele convertor, macro lenses for insects, long focal length lenses for birds and underwater camera for marine life etc.
- Check the ISO for daylight should be 200 or less and for moonlight it should be 1600 or more.

#### Dos and don'ts

- Stay inside the sanctuary.
- Do not make noise
- No rush and crush traffic
- Do not spoil the place by throwing garbage
- Do not feed animals
- Don't get too close of the animal, insects. Keep safe distance.
- Don't panic sometimes you need to have patience for a long time.
- Don't get too catch up.
- Avoid using strong perfumes, food with intense smell (like: Oranges) and other smelling substances.
- Don't click nocturnal animals.
- Do not overcrowd. Use a faster shutter speed.
- Know about the 'flora and fauna' of the surrounding and its various important geographic conditions.
- Be patient and silent.
- Be sound at photographic skills.



**Figure-2: Parrot in its natural habitat**

**F/5.6**

**ISO: 100**

**Focal length: 300 mm**

**Max. Aperture: 5**

Source: Mr. Sajal Dixit, Gwalior

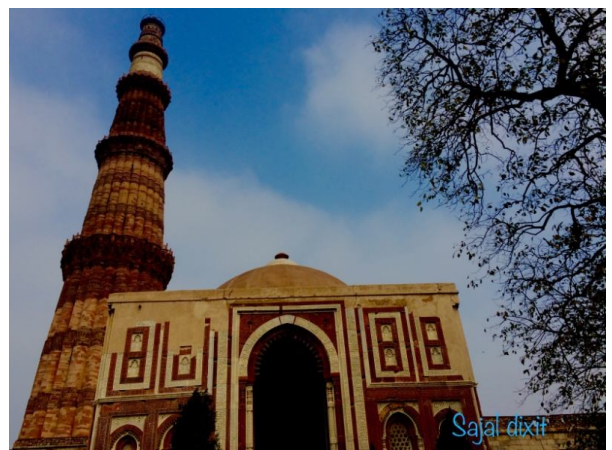


**Figure-3: Lotus Temple**

**f/2.2, ISO: 32,**

**focal length:35mm, max aperture2.5**

Source: Mr. Sajal Dixit, Gwalior



**Figure-4: Qutub Minar**

**f/2.2, ISO: 32,**

**focal length:4 mm, max aperture2.5**

Source: Mr. Sajal Dixit, Gwalior



**Figure-5: Taj Mahal**  
**f/2.2, ISO: 28,**  
**focal length:35 mm, max aperture2.4**  
 Source: Mr. Sajal Dixit, Gwalior

### Effects in wildlife photography

Many good effects can be made in the photographs to give better impression. These effects could be morphing, anti-aliasing, slow motion, and shading. Morphing helps to clarify changes in the posture of object.

### SUMMARY AND CONCLUSION

Wildlife photography can be used for spreading awareness about the endangered species by beautifully documenting and presenting it in the tourism fraternity, society and at various educational institutes, and can be enjoyed as a recreational activity at the various applications of eco-tourism. Domestic and international; inbound and outbound; solo and group; casual and serious tourist can be attracted which may have a positive impact on the industry and create employment, awareness etc.

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## MOBILE HEALTHCARE DELIVERIES IN MATERNAL AND CHILD HEALTH: A CASE STUDY OF LOW AND MIDDLE-INCOME COUNTRIES

Vani Aggarwal<sup>1</sup> Dr. Meenal Sharma Jagtap<sup>2</sup>

### ABSTRACT

Mobile health services are viewed as a convenient way to access high-quality information. New health innovations such as electronic health services, telemedicine, mobile telephony, health wearables, sensors and mobile computing offered a variety of opportunities to monitor, access and transfer vital health information around the world. These technologies can tackle health problems even from remote areas via mobile communication and improve quantity of care specifically in low and middle income countries. However, there are several challenges such as patient related, healthcare professionals related, IT related and applications related challenges that need to be addressed to realize the effectiveness of m-Health interventions. Empirical evidences show favorable dynamics of telecom market, higher internet penetration, health awareness as some of the supporting factors for mobile healthcare deliveries in many developing countries. Also, the total number of studies on mobile health applications increased steadily from 2011 to 2015. A study revealed that 61% of the patients in the emerging markets are aware about mHealth applications/services while only 37% of total patients in the developed countries are aware about mHealth deliveries. The market size of mobile health services is continuously expanding and is likely to reach USD 370 billion by the end of 2017 in annual healthcare cost savings worldwide; the mobile healthcare industry is expected to reach USD 12 billion by 2018 as nearly 50% of physicians are using mHealth applications on daily basis.

Many low and middle income countries implemented various mobile health initiatives to improve maternal and child health. This section of the society is highly vulnerable and need special care to generate healthy growth in any country. This paper extracted information from various studies and government report to analyze the major mobile health initiatives in different developing countries and how effective were these interventions in terms of mortality reduction, increasing communication between health workers and villagers, providing training to community healthcare workers, tracking pregnant women and child immunization status. There is a need to tap the potential mobile health market especially in a lower resource setting areas to incur maximum benefit out of these mobile devices.

**Key words:** Mobile phone, mHealth, Developing countries, Maternal health and Child health.

### Introduction

*“mHealth is not a separate industry, but rather it's the future of a healthcare industry that's evolving to care for patients differently, putting them first to deliver services better, faster and less expensively” (PwC)*

In the world of digitalization, mobile applications are converting phones into medical devices. Mobile health (mHealth) services have been continuously receiving a

huge attention from health professionals, patients, clinicians, service providers, policy makers, and researchers. mHealth applications take the advantage of built-in features of smart phones such as cameras, touch screen, sound system, light, wireless connectivity, and software of the device that processes various functions like interactive questionnaires, algorithms, formulae, calculators, clinical decision support tools, and other parameters (Cortez, 2013). Further, mHealth application could generate treatment recommendations to patients and customize diagnoses by comparing user specific data to vast bodies of clinical research and medical knowledge (Cortez, 2013).

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Also, mHealth includes a lot more than healthcare applications on mobile phones. It involves health sensors, wireless networks to monitor various health issues, professional to provide emergency treatment, mobile devices to access health information and numerous healthcare services. Mobile phone is a multi-purpose device capable of performing a multiple functions that are beyond its primary task of communication (PwC, 2017).

*“Smartphone has been the catalyst for the transition of E-health to mobile health (mHealth)”*  
(Perera, 2012)

Engagement of a mobile phone in health sector could result various instant benefits specifically in case of preventable diseases. mHealth could result in major advances in various areas such as; (a) expanding healthcare coverage, (b) improving decision making, (c) managing chronic conditions and (d) providing suitable healthcare in emergencies (Varshney, 2014). Specifically, healthcare workers and families are major users of mHealth services such as monitoring, emergency response, healthcare practitioner support, healthcare surveillance, and healthcare administration etc (PWC, 2012).

Mobile health services are viewed as a convenient way to access high-quality information. New health innovations such as electronic health services, telemedicine, mobile telephony, health wearables, sensors and mobile computing offer a variety of opportunities to monitor, access and transfer vital health information around the world. Key drivers of these technologies are remote monitoring, help conception, manage anxiety and fear, ensure baby care and comfort, provide postpartum support and facilitate economic child care (Research, 2015). These technologies can tackle health problems even from remote areas via mobile communication and improve quantity of care specifically in low and middle income countries. However, there are several challenges such as patient related, healthcare professionals related, IT related and applications related challenges that need to be addressed to realize the

effectiveness of mHealth interventions (Varshney, 2014). The decisions on these challenges will have a significant impact on the decision of “how future mobile health services will be designed, developed, evaluated, and adopted globally” (Varshney, 2014).

India is the second largest producer of mobile phones by volume after China, annual production of handsets increased approximately four times from 3 million units in 2014 to 11 million units in 2017 (TOI, 2018). The ubiquity and mobility function of mobile phones make it approachable and user friendly in healthcare sector. In the world of digitalization, people prefer to use virtual services rather than visiting a brick and mortar building as they look for a more convenient experience.

To facilitate easy, quick and affordable access to healthcare services, healthcare providers are adopting innovative measures/solutions specifically in remote areas of the developing countries. According to a report (Frost & Sullivan, 2018), telehealth<sup>1</sup>, mobile health (mHealth), and artificial intelligence (AI)<sup>2</sup> were identified as top three technologies in the healthcare deliveries.

For effective mHealth interventions, features of smartphones are designed in such a way that these could facilitate six foundational functions in the healthcare sector (Borus M, Tomilson M, et al, 2012):

- i) information about health behaviours, health risks and available resources related to health
- ii) facilitate text messages, calls, videos that helps to provide trainings
- iii) monitoring behaviour in real time, including unobtrusive and automatic monitoring to reduce the burden of self-monitoring

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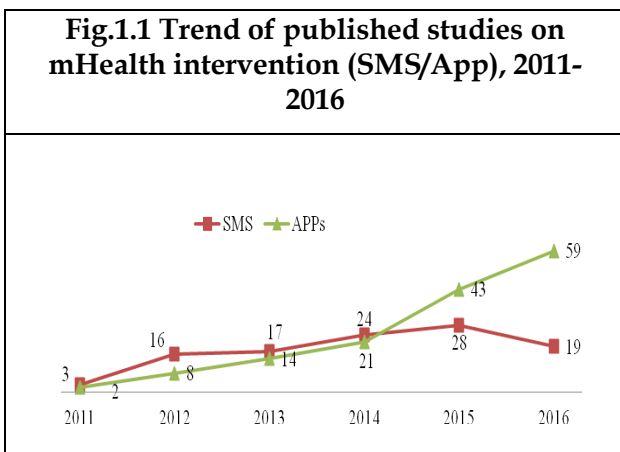
<sup>1</sup> To deliver healthcare via using telecommunications and virtual technology is known as telehealth.

<sup>2</sup> Computer systems able to perform tasks normally requiring human intelligence.

- iv) shape health behaviours through continuous monitoring, feedback, reminders
- v) supporting development and maintenance of healthy behavioural routines by linking to peers, friends, family, or healthcare workers for social support and instrumental support services
- vi) facilitates quick results of diagnostic test and linking to healthcare

After the arrival of mobile connectivity and expansion of networks, new business models have emerged to enable and accelerate low cost access to healthcare deliveries. The GSMA mHealth tracker estimated that there are nearly one thousand mHealth interventions worldwide and most of them are in the developing countries (GHL, 2013).

Empirical evidences indicate that favorable dynamics of telecom market, higher internet penetration, health awareness are some of the supporting factors for mobile health services and deliveries in India. As people become more mobile and travel becomes more accessible, patients are expecting that the healthcare record system to provide essential health information over mobile devices.



Source: (Chen et al, 2018)

Fig.1.1 shows that the total number of publications on mHealth in reproductive maternal and new born child healthcare increased significantly from 2011 to 2016. The total number of studies on mobile health applications increased steadily from 2011 to

2015; while studies on SMS increased slightly from 2011 to 2015 and decreased afterwards.

Indian healthcare sector is experiencing a new wave of opportunities by reinventing in the existing delivery models to enhance healthcare services penetration in India. In effort to provide affordable services to Indian population both public and private sector are working for the advancement of technologies in the healthcare sector. Recently, medical researchers are discussing about new technologies and digitalization of health services such as ICT (Information and Communication Technology), eHealth, mHealth, virtual clinic, robotic operations, remote surgeries etc.

With technological advancement, there are two potential areas where mHealth services could support the government of India's "existing plans to strengthen its corps of community health workers and improve their performance" to contribute in maternal and child health (UNF). Firstly, improve the accuracy, completeness and timeliness of data captured by community health workers to monitor and track pregnant women, mothers and children.

Secondly, accelerate efforts to provide community health workers with refresher training and continuing education by establishing a pan-India platform that delivers accessible, relevant and high-quality mobile content for self-learning. These days home healthcare is the cheaper and more comfortable option for the patients, though in a nascent stage market is served largely by unorganized players, start-ups and recent hospital initiatives (Sharma N. C., 2018).

Health wearables are new solutions developed by many healthcare industries especially in developing countries where resources are constraint and propensity to consume of healthcare products are not so good. Moreover, mHealth services could be visible as more healthcare opportunities such as from wearables to apps. With a passage of time, health wearable are finding place in the healthcare system to improve health facilities. These wearables are connected to

the mobile phone or other electronic devices to track health information of the patients.

Although, empirical evidences on the comparative effectiveness of these applications are not much available and work is going on. But with sufficient financial investment and trainings it is possible to switch from paper based HIS (Health Information System) to mobile HIS database in MNCH (Mother, new-born and child health) (Nguyen et al, 2015).

*“Investments from pregnancy through 3 years of age are the foundation of health and well-being throughout life” (WHO, 2018)*

Every year 2, 89,000 pregnant women and 6.6 million children under age of five die due to lack of healthcare facilities (Maternal and Child health). In a developing country like India, one of the contributing factors to a high child mortality rate is low vaccination rate. It is difficult to create health awareness among rural India and their unwillingness to approach clinics led to lower immunization rate that causes child deaths. Even if some of them have knowledge and willingness for vaccination but they are not aware about the time of the vaccination and immunization programs.

Also, there is a long standing disparity between mortality rates as neonatal mortality rates are not declining as quick as deaths among children aged 1-59 months (WHO, 2018). Therefore, health wearables are the new technology that facilitates storage of health data and transfer health information as these devices are well connected to mobile.

Mobile technologies/devices/solutions can be leveraged to extend the coverage of healthcare delivery to the sections of population those have been performing poor in the maternal and child health indicators like maternal mortality rate, infant mortality rate, under-five mortality rate, neonatal mortality rate, etc. However, poor network coverage is one of the concerns for India. For instance, patient being monitored for a heart attack cannot be left at the mercy of an underdeveloped mobile network (Wipro,

2012). Further there are many challenges in using mHealth services in maternal and child healthcare especially in a developing country like India.

Section 1.1 comprises an introduction on mHealth in maternal and child health i.e. how mHealth services has been categorized, drivers of mHealth applications and section 1.2 evaluates total market size of mHealth devices. Further, section 1.3 analyzed the different mobile health interventions implemented in low and middle income countries to improve maternal and child health. Section 1.4 concludes the paper and provides food for thought to the policy makers on the effective leveraging of mobile devices in healthcare sector.

### **1.1 mHealth: an Introduction**

*“Mobile health may also decentralize and demystify medicine by shifting the locus of care away from expensive medical facilities and professionals, and towards digitally-empowered patients” (Cortez, 2013)*

Without the invention of the mobile phone, the mobile health industry could not have a beginning. In 1949, mobile telephone services were expanded to 100 towns and 5000 customers under a program introduced by the AT&T (Gruessner, 2015). There were many technological barriers to continue that program across the country. Later, mobile phones became an essential good and companies like Apple, Samsung have developed various complex smartphones with many features. This stimulated the development of mHealth applications worldwide. Mobile health revolution started in the US in 2007 after a release of the first iPhone; an executed connected an iPhone to a blood pressure monitor and to a blood glucose meter. Although, mHealth could trace its roots before 2007 as well to personal digital assistants (PDA), website like WebMD. But “the first iPhone introduced an era of torrential creativity with mobile communications devices” (Cortez, 2013).

With existing traditional methods of healthcare deliveries, it is difficult to cater population of any country specifically developing countries. Mounting pressure on



the healthcare system generated an urgent need to adopt digital initiatives by the government of all the countries. Access to new technologies in emerging and developed nations has leveraged the power of mobile phones to deliver adequate healthcare solutions worldwide.

Mobile health has a capability to connect health facilities seekers to healthcare providers regardless of location. These applications are constantly transforming the entire healthcare system with new value propositions and innovative solutions; from wearables to apps (Frost & Sullivan, 2018). Over 100 countries are using mobile phones to explore/achieve better health and healthcare facilities (WHO, 2014). World Health Organization (WHO) has categorized mHealth services to ensure effective healthcare delivery (Table.1.2) and reported the most frequently used mHealth initiatives globally includes health call centres/health care telephone help lines (59%), emergency toll-free telephone services (55%), emergencies (54%), and mobile telemedicine (49%); while the least frequently reported initiatives are health surveys (26%), surveillance (26%), awareness raising (23%), and decision support systems (19%) (WHO, 2011).

<b>Table.1.1 Categories of mHealth (based on WHO 2009 Survey)</b>
<p><b><i>Communication between individuals and health services</i></b></p> <ul style="list-style-type: none"> <li>• Health call centres/Health care telephone help line</li> <li>• Emergency toll-free telephone services</li> </ul>
<p><b><i>Communication between health services and individuals</i></b></p> <ul style="list-style-type: none"> <li>• Treatment compliance</li> <li>• Appointment reminders</li> <li>• Community mobilization</li> <li>• Awareness raising over health issues</li> </ul>
<p><b><i>Consultation between health care professionals</i></b></p> <ul style="list-style-type: none"> <li>• Mobile telemedicine</li> </ul>

***Intersectoral communication in emergencies***

- Emergencies

***Health monitoring and surveillance***

- Mobile surveys (surveys by mobile phone) and Surveillance
- Patient monitoring

***Access to information for health care professionals at point of care***

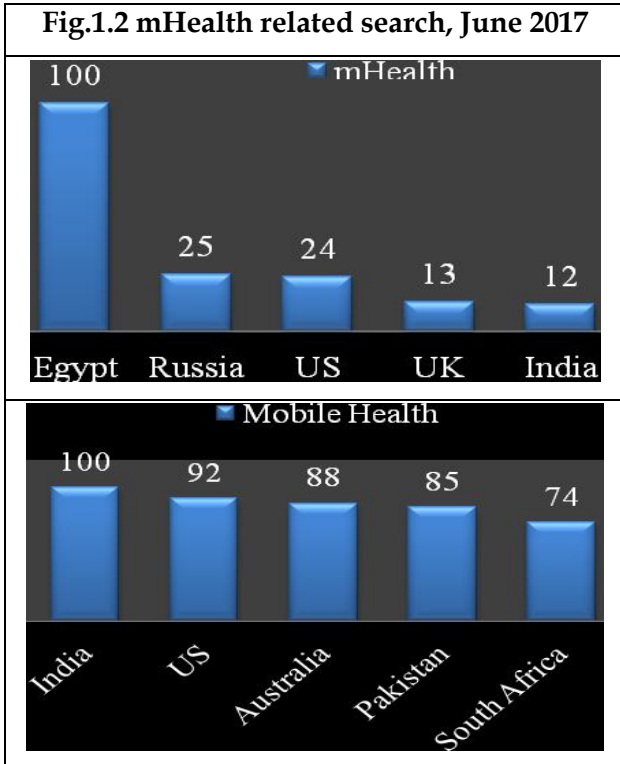
- Information and decision support systems
- Patient records

Source: WHO 2011

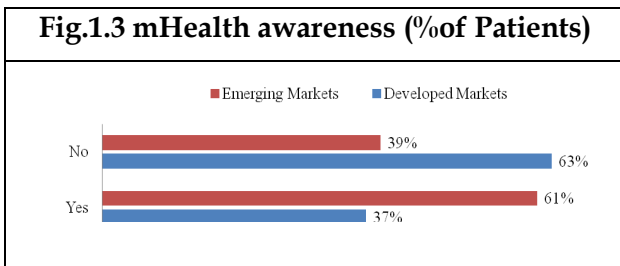
Most frequently used mHealth applications in the healthcare sector are client education and behavior change, sensors and point of care devices, registries and vital event tracking, data collection and reporting, electronic health records, electronic decision support, provider-provider communication, provider work planning and scheduling, provider training and education, human resource management, supply chain management and financial transactions and incentives (Alain B Labriquea, 2013). Mobile health solutions/devices are constantly addressing health problems including growing number of chronic disease related to lifestyle, expensive existing national health facilities, a need to provide equal access to healthcare services regardless of time and place (Silva B, et al, 2015). The scope for leveraging mobile health services as an alternative healthcare delivery channel is substantial in a developing country like India as number of mobile and internet users are increasing continuously.

Globally, mobile traffic is growing very fast; global average for mobile internet traffic as a percentage of the total web traffic is 50% as of January 2017 and it has been estimated that it is likely to grow 7 folds from 2016 to 2021 (PwC, 2017). Further, India ranks second in this parameter with 78% of mobile traffic; indicating increasing role of mobile phones in various sectors including health and it is an important factor for mHealth adoption (PwC, 2017). In the search terms of mHealth including mobile health, health

apps, medical apps, India ranks among the top five countries (Fig.1.2)<sup>3</sup> as of June 2017 (PwC, 2017). With other developed countries, Pakistan and South Africa are under top five category of mobile health search.



Source: (PwC, 2017)



Source: PWC Report, 2012

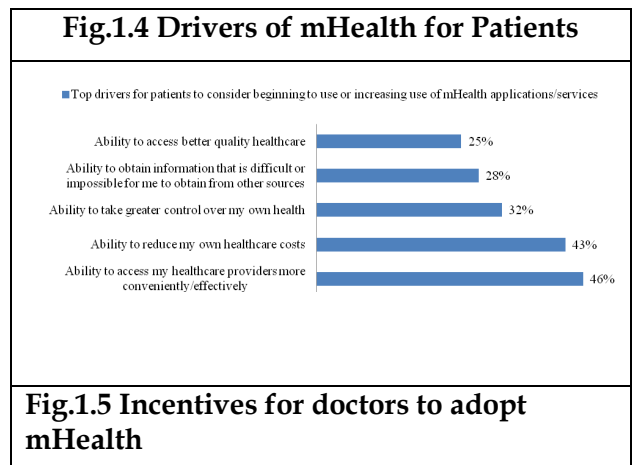
Several studies have mentioned the role of mHealth to efficient and cost effective provision of healthcare deliveries in both developed and developing nations. However, fig.1.3 clarifies that 61% of the patients in the emerging markets are aware about mHealth applications/services while only 37% of total patients in the developed countries are aware about mHealth deliveries. Therefore, it indicates that there is

<sup>3</sup> A higher value means a higher proportion of all queries, not a higher absolute query count

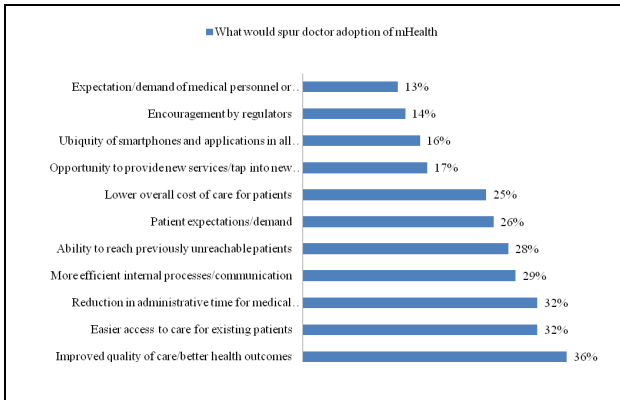
more awareness of mHealth applications in emerging economies as compared to developed nations which leads to a better future of mHealth market in developing nations. PWC published a report on the willingness to use mHealth services (PWC, 2012); patients are likely to adopt mHealth services only if it will improve access to healthcare facilities, lowers cost and increases control in the healthcare sector (Fig.1.4).

Similarly, doctors are likely to adopt mHealth applications if there is an incentive of efficient and improved quality health outcomes (Fig.1.5). It is always difficult to measure the exact parameters that support mobile health or barriers to mobile health. Health seekers are concerned about data security, reliable health information, cost effectiveness etc. Therefore, it is necessary to satisfy the domestic population to adopt mHealth services or applications.

From health providers' perspective, it is vital to focus on quality care, access to all, easy and quick access to healthcare facilities, availability of mobile network, access to mobile phone and internet, digital literacy etc. Adoption of mHealth applications requires support from both the sides; health providers and health seekers. Otherwise, it would not incur benefit to any of them in a society. There were various concerns while using mHealth application in developing region. For instance, cost of mHealth applications and its usage were major concern while using mobile health services.



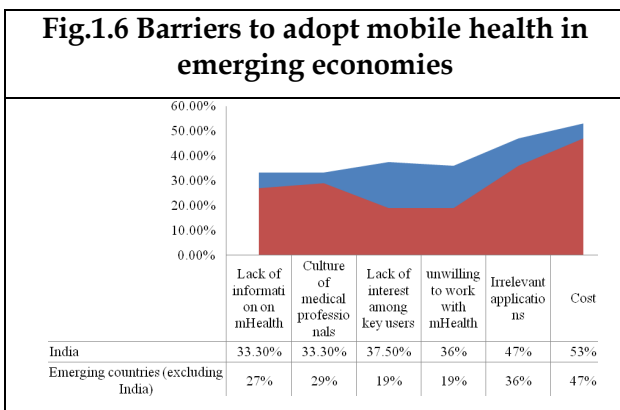
**Fig.1.5 Incentives for doctors to adopt mHealth**



Source: PWC Report, 2012

Similarly, lack of interest among key users, culture of medical professionals and lack of information on mHealth were the top barriers for mobile health providers in emerging economies (Fig.1.6). In using mobile health application, a lot of manual intervention is must; use of SMS, audio/video and other applications. This makes these mobile applications unattractive to consumers and a big deterrent for most of the users.

However, mobile integration with sensor or any other external device could reduce manual intervention and simplify the process by automating these applications (PwC, How mHealth can revolutionize the Indian healthcare industries, 2017).



Source: (PwC, 2017)

## 1.2 mHealth Market

*“mHealth helps to reduce healthcare expenditure by limiting the number of hospital visits and also reduces readmissions”* (Global mHealth Market: Snapshot, 2018)

In the developing countries, public health expenditure accounted about USD 1 trillion per year; if 0.5% of it allocated to digital

health for the next 5 years then cumulative USD 25 billion would be available for digital health companies (GSMA, 2017). In the recent years mobile health market has expanded significantly.

Global mHealth market has been segmented into three sections based on product; connected medical devices<sup>4</sup>, mHealth applications<sup>5</sup> and mHealth services (Global mHealth Market: Snapshot, 2018). It has been expected that the global mHealth market to grow at a CAGR of 36.5% during the time period of 2017-2022 (to reach USD 21.71 billion by 2022) (Market Research Future, 2018).

It has been predicted that mHealth market could reach to USD 370 billion by the end of 2017 in annual healthcare cost savings worldwide (Research S. , 2017). Also, it has been estimated that the mobile healthcare industry to reach USD 12 billion by 2018 as nearly 50% of physicians are using mHealth applications on daily basis (Gruessner, 2015).

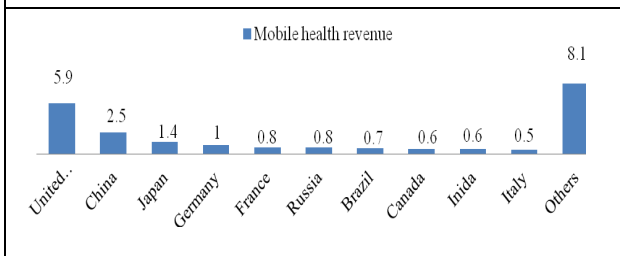
The top two mobile health markets by spending were expected to be the United States and China in 2017 by a PwC study (Fig.1.7). According to a study, India will hold the 8<sup>th</sup> position in terms of mobile health revenue in 2017; with revenue of USD 0.6 billion (PwC, Touching lives through mobile health: Assessment of the global market opportunity, 2012). Mobile health indicators such as mobile penetration, healthcare access, geographical division, per capita income, diseases profile and dependent population are different across various regions. Consequently, adoption rate of mHealth services are expected to vary across countries. For example, share of monitoring services in the total mobile

<sup>4</sup> Heart rate monitors, activity monitors, electrocardiograph, fetal monitoring, neuro monitoring etc.

<sup>5</sup> mHealth applications is further segmented into fitness & wellness, diabetes, cardiovascular diseases, central nervous system disease, respiratory diseases, musculoskeletal diseases, smoking cessation, medication adherence and others.

revenue will typically be greater in high income countries while the contribution of diagnosis services will be higher in low income level group (which have shortage of physicians, hospital beds, etc.) (PWC, 2012). Market driven factors includes patient's involvement in personal healthcare, implementation of smartphones and wearable devices into health sector, portability of health devices (wireless technology), benefits of Cost effectiveness and patients' convenience (Market Research Future, 2018).

**Fig.1.7 Top 10 countries based on Mobile Health Revenue (in USD billion), 2017**



Source: (PWC, 2012)

Mobile health market of the United States (US) is the fastest growing segment of telehealth market and it has been estimated that this market would worth of USD 24.63 billion by 2021 (Frost & Sullivan, 2018). Increased utilization of mHealth devices like smartphones, tablets, wearables and medical grade applications are some of the factor stimulating this expansion (Frost & Sullivan, 2018).

*“mHealth has the potential to dramatically reduce the costs of healthcare operations, while improving the quality of healthcare”* (Research S. , 2017)

North American was the largest mHealth market in 2016 (USD 9.8 billion). Factors contributed to this expansion in North American region were higher healthcare expenditure, various health initiatives by the government, high rate of adoption of new technologies and increased funding by both the private and public organizations (Global mHealth Market: Snapshot, 2018). Further, America is the largest mHealth market share holder with a share of 34% (Market Research Future, 2018). Fig 1.8 shows that the PWC has been estimated in a report that Europe

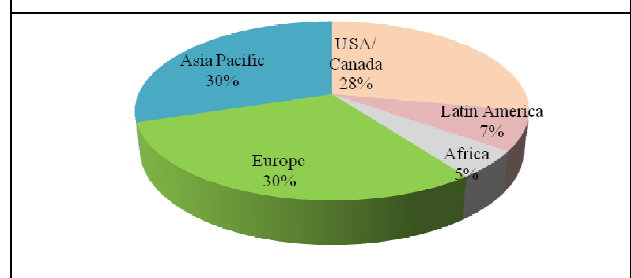
(30%) and Asia pacific (30%) markets are likely to hold largest mHealth share in 2017 (PWC, 2012).

Asia pacific mHealth market (worth USD2.3 billion in 2014) projected a remarkable growth rate due to increasing awareness of mHealth devices and services that aid in improve the quality of life for patients stricken with lifestyle diseases (like diabetes, hypertension, obesity etc.) (Malik A, 2016). It has been forecasted that this market is likely to grow with a compound annual growth rate (CAGR) of 35.8% during the period 2015-2020 (Malik A, 2016).

Further, the total global market size of mHealth services has been estimated to reach USD 23 billion in 2017 (Fig.1.9) and in the five developed countries (United Kingdom, Germany, France, Italy and Spain) has been expected to reach USD2.89 billion by 2020 (Frost & Sullivan, 2018). However, mHealth market in a developing country like Brazil is still in a nascent stage. But increasing broadband penetration, availability of mobile networks and devices are stimulating growth of mHealth market.

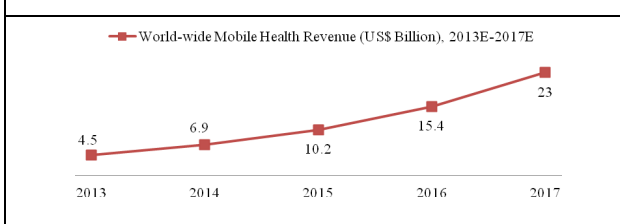
It has been expected that mHealth market in Brazil would reach to USD1.43 billion by 2020 (26.3% CAGR during 2016-2020) (Frost & Sullivan, 2018). Mobile health market of Latin America is a promising market due to “increasing government initiatives and increasing funding by public and private investors and establishment of new companies and new product launches” (Global mHealth Market: Snapshot, 2018).

**Fig.1.8 Estimated Global mobile health market opportunity by regions, 2017**



Source: (PWC, 2012)

**Fig.1.9 Worldwide mobile health revenue**



Source: PWC (PWC, 2012)

From the global perspective, different countries have different needs to adopt mHealth solutions. For example, “the high prevalence of chronic diseases, an ageing population, and the need for improving efficiency and quality of care is driving the adoption of mHealth in Europe” (Frost & Sullivan, 2018). In terms of economic benefits of these interventions in RMNCH, USD 20 dollars benefit could be generated for every dollar. In case of developing nations, rate of increase in GDP per capita of china and India are 1.0% and 0.7% per year respectively; as a result of the effect of lower fertility on age structures (Axelson H, et al, 2013).

### 1.3 mHealth interventions: Case studies of developing countries

*“The adoption of mobile health in emerging markets like India versus developed markets is a paradox. In developed markets, mHealth is perceived as disrupting the status quo, whereas in emerging countries it is seen as creating a new market, full of opportunities and growth potential” (PWC).*

In order to check the mHealth interventions across countries in maternal and child health area, several case studies were identified in the UNICEF report on innovations (mHealth) in maternal and child health sector in different low and middle countries. (Ngabo F, Nguimfack J, Nwaigwe F, et al, 2012) evaluated a mHealth study in Rwanda where mobile phones were used as means to support community health workers in their clinical decisions and to promote provider communication to improve

pregnancy management. (Cole-Ceesay R, Cherian M, onko A, et al, 2010) studied a package of maternal health interventions in the Gambia; where mobile phones were used to link village health worker and traditional birth attendants with health providers and medical facilities like ambulance.

Mobile health applications were also used in Guatemala (Martínez-Fernández A, Lobos-Medina I, et al, 2015) that enabled tele-community facilitators to ask about consultations, to send clinical data and get trainings. Mobile health initiative in Indonesia facilitated communication among midwives and obstetricians; resulted increase in confidence and problem solving attitude of midwives (Chib A, 2010). Table 1.2 demonstrates a detail analysis of mobile health interventions in maternal and child healthcare sector of low and middle income countries.

The m4Change project was implemented in Nigeria to promote mobile health applications improve maternal and child health conditions. Mobile phone application including data collection tool, decision support algorithm was developed to provide quality antenatal care in the primary health centres. (Adanikin AI, et al, 2014) conducted a study where appointment reminders were sent to women to attend the postpartum visit after their deliver in Nigeria.

(Odney TA, Bukusi EA, Cohen CR, et al, 2014) evaluated an impact of SMS reminders on HIV-positive pregnant women in Kenya to check the effectiveness of mobile health services. Similarly, a study conducted by (Kaewkungwal J, Singhasivanon P, et al, 2010) in the Thailand-Myanmar border where smart phones were used for data collection and sending automated text messages to mothers and children when their visits were due and also on child immunization status and ANC visit.

**Table.1.2 Cross Country mHealth interventions in MNCH**

Source	mHealth Intervention	Outcomes
<b>Afghanistan</b>		
(Dimagi, 2012)	Mobile phone to improve antenatal and postnatal care of women; mobile application trainings for men and women	<ul style="list-style-type: none"> <li>i) Skilled deliveries were increased by 22.3%</li> <li>ii) 20% increase in the number of women who received antenatal care</li> </ul>
<b>Bangladesh</b>		
(Nutrition, 2012)	Mobile phone based labour notification system; to improve both maternal and neonatal mortality (ensure the presence of nurses at birth to collect placentas and cord blood)	<ul style="list-style-type: none"> <li>i) Mobile phone was used in 89% of deliveries</li> <li>ii) In 68% of the cases, the team of nurses sent to attend birth arrived prior to placental expulsion</li> </ul>
(Messinger C et al, 2017)	mHealth services for increasing access to menstrual regulation (MR) among low-income women at risk for clandestine abortion	<ul style="list-style-type: none"> <li>i) MR clients expressed positive opinions of mHealth services as a means of improving women's access to affordable and timely MR.</li> <li>ii) Mobile phones had benefits with respect to information dissemination and making appointments,</li> </ul> <p><b>Challenge:</b> emphasized the necessity of in-person consultations for effective sexual and reproductive healthcare.</p>
<b>Cambodia</b>		
(Observatory, 2012)	Cam e-WARN: monitoring disease outbreaks via SMS; Neonatal tetanus, Acute watery diarrhoea/cholera, Dengue, Acute lower respiratory Infection, influenza	<ul style="list-style-type: none"> <li>i) Rapid detection of early stage disease outbreaks.</li> <li>ii) Increased the accuracy of disease outbreak reports compared to the ad-hoc telephone hotline surveillance system</li> </ul>
<b>Ethiopia</b>		
(Little A, Medhanyie A, et al, 2013) and (Medhanyie AA, Little A, et al, 2015)	For data collection, smart phones were given to MWs and HEWs and trained to use health applications on ANC, postnatal care and appointment information on deliveries	<ul style="list-style-type: none"> <li>i) HEWs and MWs were comfortable in using the device and required little technical assistance</li> <li>ii) Unrestricted usage of phones generated confidence, sense of ownership and empowerment among HEWs and MWs</li> <li>iii) 87% of users believed that electronic version of the form were useful for follow-</li> </ul>

		up and reminders <b>Challenge:</b> Problems with username and password settings, smartphones got locked up
(Tesfaye S, Barry D, et al, 2014)	Mobile phone intervention to increase appointment reminders and health education; Health Extension Workers (HEWs) sent text messages to clients	i) Significant increase in postnatal care; from 5% to 51% in the Amhara and from 15% to 47% in the Oromiya region ii) 1.7 times increased in ANC visits of women iii) 4.9 times increased in postnatal care of women who had access to HEWs mobile phone numbers
<b>Gambia</b>		
(Cole-Ceesay R, Cherian M, onko A, et al, 2010)	Mobile phones were linked between CHWs and TBAs to increase communication between Community Healthcare workers (CHWs) and health facilities (providers, ambulance, etc.);	109 patients were transferred from communities to local hospitals <b>Challenge:</b> lack of call credit and short battery life of mobile phones
<b>Ghana</b>		
(Andreatta P, Debpuur D, et al, 2011)	Low literacy level of TBAs; MWs and TBAs were trained to use mobile phones (how to send text messages) to report postpartum haemorrhage (PPH) data such as occurrence, management and outcome	i) Increase in data reporting; 425 births were reported by 9 of 10 birth attendants ii) 13 cases of PPH and one case of neonatal death were also reported
<b>Guatemala</b>		
(Martínez-Fernández A, Lobos-Medina I, et al, 2015)	Mobile phones were given to 125 Community Facilitators (CFs) to provide decision support (consultations), data collection and to receive training	i) Significant reduction in maternal mortality rates ii) 116,275 general consultations, 6783 women were monitored, and 2014 emergency transfers were coordinated by CFs
(Dimagi, 2012)	Commcare mobile application was used in Alta Verapaz to improve maternal care and high rates of malnutrition and malaria	i) Increased monitoring of high-risk pregnancies and upcoming deliveries ii) Data availability simplified the evaluation of productivity and performance of CHWs by monitoring the number and duration of visits completed and the number of patient forms submitted
<b>India</b>		
(Sharma R et	SMS to facilitate oral health	Health information delivered to mothers;

al, 2011)	education (mothers and children)	increased mothers' knowledge and practice of child's oral health
(Dimagi, 2012)	Mobile application (MOTTECH Suite) was introduced to improve delivery of family health interventions and quality of health services in rural India	Over 50% increased (from 6.7% to 59.5% in the total number of women visited by a Frontline Workers (FLW) within 24 hours after delivery in less than one year
<b>Indonesia</b>		
(Chib A, 2010) and (Lee S, Chib A, et al, 2011)	Mobile phones provided to midwives, midwives coordinators and obstetrician gynaecologist at the provincial hospital; Simple voice communication between MWs and OB-GYNs to do data transfer	<ul style="list-style-type: none"> <li>i) Significant increase in confidence to store patient's data and solve difficult problems</li> <li>ii) Improvement in searching for numbers in phone lists and getting the phone to do what they wanted it to do</li> <li>iii) Increase in patients visit to health centres for medical information instead of home treatment.</li> <li>iv) Access to mobile phones had a direct positive effect on health knowledge of MWs</li> </ul>
<b>Kenya</b>		
(Odney TA, Bukusi EA, Cohen CR, etal, 2014)	Appointment reminder sent to HIV-positive pregnant women; SMS sent on weekly basis during first 6 weeks postpartum and on every 2 <sup>nd</sup> week starting on week 28 of pregnancy	<ul style="list-style-type: none"> <li>i) 19.6% of intervention women attended a maternal postpartum clinic as compared on 11.8% women in control group</li> <li>ii) 92% of intervention group infants received HIV testing v/s 85% of control group</li> </ul>
(Sellen D et al, 2014)	Mobile Phone based approach to increase breast feeding	The study stated that cell phone based counselling approaches were effective in supporting exclusive breastfeeding of infants.
<b>Liberia</b>		
(Lori JR, Murno ML, Boyd CJ, Andreatta P, 2012) and (Munro ML, Lori JR, Boyd CJ, Andreatta p, 2014)	TBAs were trained to send real-time SMS for data collection on pregnant women; provided mobile phones, call credit and solar chargers to TBAs	TBAs knowledge on mobile phone was increased; turn on mobile phones, make calls, identify mobile coverage, battery knowledge, send SMS



<b>Mali</b>		
(Simonyan D et al, 2013)	Mobile Phones were used for diagnosis collection and transfer of healthcare data vis JAVA applet to a central server	<ul style="list-style-type: none"> <li>i) Families reported 206 episodes of disease in the intervention group and 168 in the control group.</li> <li>ii) Intervention group children had 85 medical consultations compared to 28 in the control group</li> <li>iii) Reduced child morbidity (episodes of cold, cough, diarrhoea, teething, infection, vomiting, etc.)</li> </ul>
<b>Niger</b>		
(Dimagi, 2014)	A mobile application (RComs) was introduced to prescribe medicine, facilitate counselling, provide treatment and refer children to health clinics	<ul style="list-style-type: none"> <li>i) This application screened acutely malnourished children on their visits</li> <li>ii) Helped to guide health workers through clinical examination of the child</li> </ul>
<b>Nigeria</b>		
(McNabb M ,Chukwu E, Ojo O, Shekhar N, et al, 2015)	Mobile phones were provided to CHWs and trained on health applications; ANC decision support algorithms and health counselling messages during visit	<ul style="list-style-type: none"> <li>i) Measuring blood pressure increased from 87% to 97%</li> <li>ii) Performance in provision of HIV increased from 67.5% to 82.2%</li> <li>iii) Health education increased</li> <li>iv) 83% patients were satisfied with the ANC services</li> </ul>
(Adanikin AI, et al, 2014)	Appointment reminders were sent twice to women; at 2 weeks and 5 days before scheduled postnatal care appointment	<ul style="list-style-type: none"> <li>i) 98% women received SMS reminder; 50% were more likely to attend their postnatal appointment than who did not received SMS</li> <li>ii) Total cost of sending 2,252 SMS reminder was USD 21.12</li> </ul>
(Oyeyemi SO and Wynn R, 2014)	Mobile phones were given to pregnant women to increase primary health facility utilization	<ul style="list-style-type: none"> <li>i) The total facility utilization rate of pregnant women increased significantly</li> <li>ii) The total facility utilization rate of the primary health care centres increased significantly</li> </ul>

<b>Pakistan</b>		
	Introduced mobile application to address high maternal and neonatal mortality and morbidity in flood-affected areas;	<ul style="list-style-type: none"> <li>i) Upgraded BEmONC services by implementing a comprehensive package</li> <li>ii) Facilitated 24/7 service delivery, incentives and performance-based financing</li> <li>iii) eHealth monitoring and communication for development (C4D)<sup>6</sup></li> </ul>
<b>Rwanda</b>		
(Ngabo F, Nguimfack J, Nwaigwe F, et al, 2012)	Rapid SMS system was introduced to increase communication between Community Healthcare workers (CHWs) and health facilities (providers, ambulance, etc.); 432 CHWs were trained and 500 mobile phones were distributed among them	<ul style="list-style-type: none"> <li>i) 100% of CHWs were compiled with reporting</li> <li>ii) Facility based deliveries were increased by 27%</li> <li>iii) 3 maternal deaths and 137 child deaths were registered in the system</li> <li>iv) 163 SMS were sent associated with danger signs</li> <li>v) 11,502 pregnancies were registered (81% of total estimated)</li> </ul>
<b>Senegal</b>		
(Observatory, 2012)	EpiSurveyor: to collect public health and other data on mobile phones; Maternal Health data collection	Use of Partograms to assist labour increased on average by 28% among all ten regions involved in the project, compared to a 1% increase in the use of partograms in areas outside the EpiSurveyor pilot study.
	During delivery, use of donated prepaid mobile phones to allow mothers to contact hospitals	
<b>South Africa</b>		
(Rotheram-Borus MJ et al, 2011)	Mobile phones were used to collect routine information, complete questionnaires and to upload numeric, voice, and text-based data on women and their babies during	Mobile phones were innovative in data collection; effective in low-resource settings

<sup>6</sup> Communication for development (C4D) is an approach promoted by UNICEF that uses a two-way process for sharing ideas and knowledge using a range of communication tools and approaches that empower individuals and communities to take actions to improve their lives.

	pregnancy and at one week, six months, and twelve months post-birth	
<b>Tanzania</b>		
(Lund S, Nielsen BB, Hemed M, et al, 2014), (Lund S, Hemed M, Nielsen BB, et al, 2012) and (Lund S, Rasch V, Hemed M, et al, 2014)	Automated SMS system was introduced to facilitate appointment reminders and health education to mothers; women received unidirectional test messages and a mobile phone voucher to enable bidirectional contact with healthcare providers	<ul style="list-style-type: none"> <li>i) 44% of total women received more than 4 ANC visits compared to 31%; 59% women believed that text messages influenced their decision to attend ANC</li> <li>ii) 30% women contacted health providers via mobile phones</li> <li>iii) 71% women asserted that educational message helped to understand danger sign during pregnancy</li> <li>iv) skilled birth attendance were increased by 60% compared to 47%</li> </ul>
<b>Thailand</b>		
(Kaewkungwal J, Singhasivanon P, et al, 2010)	Smart phones to capture remote data and send SMS; automatically generated lists and message reminders to mothers and children when their visits were due, data collection on child immunization and ANC visit	<ul style="list-style-type: none"> <li>i) 280 pregnant women attended 900 ANC visits; 59% women were on time as compared to 44% before intervention</li> <li>ii) 45% of child immunization status were recorded and updated on mobile phones</li> <li>iii) 44.2% children were received vaccination on time compared with 34.4% before intervention</li> <li>iv) 17% of parents received SMS reminder on their phones</li> <li>v) 10% of women received SMS reminder on their phones</li> </ul>
<b>Vietnam</b>		
(Ngoc NT1, Bracken H, Blum J, Nga NT, et al, 2014)	Phone follow-up of pregnant women; completed a semi quantitative pregnancy test at their initial visit to determine baseline Human Chorionic gonadotropin (HCG) and again after 2 weeks later at their homes	<ul style="list-style-type: none"> <li>i) 85% intervention women did not require an additional clinic visit</li> <li>ii) Phone follow-up and home pregnancy test were effective in screening ongoing pregnancies</li> </ul>

Zambia		
(Seidenberg P et al, 2012)	Automated notification system based on mobile phone texting to diagnosis of infant infection with (HIV)	This texting significantly shortened the time between sample collection and results notification to the relevant health providers and facilities; time of result notification to a health facility fell from 44.2 days to 26.7 days and mean time to notification of a caregiver also fell significantly (from 66.8 days to 35.0 days)

#### 1.4 Conclusion

Despite high economic growth and technology advancement, many developing countries have a higher burden of diseases with the greatest burden of maternal, new born and child death (WHO Report 2011). Ensuring a healthy development of the child ought to be the primary concern of any country and in order to achieve success in this vision, it is necessary for developing countries like to introduce better health monitoring solutions (eHealth, mHealth, etc.) in the healthcare sector. If mobile devices could be effectively leveraged then it could help to address healthcare issues like accessibility and affordability worldwide. In healthcare deliveries, health determinants such as public health spending, sanitation facilities, health awareness, female education, access to mobile phones, digital literacy are correlated with better health outcomes such as higher life expectancy, lower mortality rates and good life style. Hence, mobile devices have a significant role in healthcare delivery and there is a need to tap the potential mobile health market to improve health system in low and middle income countries.

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## Sustained Firm's Performance through Knowledge Management & Dynamic Capabilities

Sunali Bindra<sup>1</sup> and Dr. Saurabh<sup>2</sup>

### Abstract

*Two primary areas that have attracted the attention of the researchers and academicians in competitive strategy area are: one, the significance and role of dynamic capabilities and two, the firm's ability to handle its knowledge resource base. The knowledge based dynamic capabilities are potentially more viable to generate superior performance by a firm rather than employing knowledge process capabilities or dynamic capabilities separately. Thus, the purpose of this paper is to unbundle the dynamic capability concept and to help elucidate the nature of the processes that foster organizational learning and to define its linkage with knowledge management. A conceptual paper, proposes a framework and discusses the possibilities of superior firm's performance by defining dynamic capabilities through knowledge management.*

**Keywords:** *Dynamic capability, Knowledge management, Organisational learning, Sustained firm performance*

### Introduction

The approach of dynamic capability has emerged as the touchstone in the domain of strategic management (Nair, 2004). In the current scenario of changing and sporadic business environments, the approach of dynamic capability, in defining the strategy of a business, seeks to explain the reasons behind the discrepancies arising between the success factors of different firms in building competitive edge in dynamic market (Martin, 2000; Teece, 1997). Complementing the dynamic capability, there has been implicit discussion over the knowledge and its management within the organisation for creating differential advantage. Knowledge management has also been treated as the most momentous factor and an essential strategic initiative of sustainable competitive advantage for firms (Grant, 1996).

The theory discussing dynamic capability stresses upon the revitalization of organisational resources by adapting and reconfiguring them into fresh skills, competencies and capabilities (Teece, 1997) and enable firms to spontaneously respond to the new and recessionary situations

(Karimi, J., 2015) whereas at the same time, the concept of knowledge management enables to managers to find solutions to generate, preserve, mediate and utilize firm's explicit and tacit knowledge (Cepeda and Vera, 2005). Owing to the complex, uncertain and ever changing environment as faced by the firms, the significance of developing knowledge competences that ensure the organisational success have been acknowledged by researchers (Sorensen and Stuart, 2000). Resultantly, the knowledge competencies thus acquired, has been acknowledged fairly for leading to competitive edge through building capabilities instead by merely having access to the resources (Agbim, Zever and Oriarewo, 2014).

To a certain extent, these two aspects of dynamic capabilities and knowledge management have recognized each other's significance. While emphasising on the theoretical constructs of dynamic capabilities, researchers have realised that their nature and origin can be correlated to knowledge (Eisenhardt and Martin, 2000). According to David J. Teece, "the firm's ability to sense, seize, integrate, mediate and use knowledge on a regular basis embraces the key to firm's abilities and competitive advantage." On the other hand, the scholars who are primarily concerned with

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knowledge processes have started to examine conceptual relations to dynamic capabilities (Sambamurthy and Subramani, 2005; He and Wong, 2004). It is also being investigated as to how dynamic capabilities can guide knowledge management (Haas and Hansen, 2005; Cepeda and Vera, 2005; Gold Malhotra and Segars, 2001; Sher and Lee, 2004).

The paper tries to comprehend the potential relationship between knowledge management and dynamic capability and also to establish a theoretical link between their collective impacts on the firm's performance. It proposes a framework that unequivocally integrates the two concepts and discusses their potential linkage with firm's performance. The paper is conceptual in nature and shall be helpful in defining a path for a useful research. The research in this direction shall be defining in terms of contributing to the existing literature as well as providing insight to the corporate and business practitioners in defining a structure for improved business performance. The proposed paper is structured in four sections.

The section one is introduction which provides the insight towards the requirement of the discussion. Section two discusses the theoretical contributions with respect to dynamic capabilities and knowledge management and the literature discussing the relationship between the two. Section three provides for a conceptual framework along with detailed discussions and the last fourth section provides for an informative conclusion.

## **Theoretical background**

### **Dynamic Capability**

The term dynamic capability was encapsulated by Teece, Pisano and Shuen (1997) in their classic paper. This concept is generally considered as an extension of the resource based view (RBV). The RBV informs that each firm carries a unique profile of tangible and intangible resource which leads to firms' competence and affects its performance (Barney, 1991; Penrose, 1959;

Amit and Schoemaker, 1993). The RBV basically suggested that the resources and capabilities are the main sources of competitive advantage (Barney, 1991; Wernerfelt, 1984).

Teece, Pisano and Shuen, (1997) propose the concept of dynamic capability which emphasises that in tumultuous and changing environmental dynamism, a firm must possess the ability to sense, seize and reconfigure its resources to ensure its competitive advantage.

The emphasis of Teece, Pisano and Shuen (1997) is mostly on the factors that impact and lead to sustainable competitive advantage in the conditions of turbulent environments. Dynamic capabilities are the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments and stress on the significance of a firm's existing asset position, path dependencies and the organisational routines which lead to organisational learning and enable the firms to perform tasks better and quicker (Teece, 1997).

Dynamic capabilities have undoubtedly been important in attaining competitive advantage from quite some time. However, its significance has escalated because in the current era of globalisation, the global economy has become more open to the sources of invention and innovation, both geographically and organisationally.

(Teece, 2000). Ref. to the Fig1, sensing refers to an organisation's capacity to sense and shape forthcoming opportunities and threats; seizing implies the capacity of a firm to seize the desired opportunities as and when they arise & reconfiguring is the

firm's capacity to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring its assets, both tangible and intangible, including difficult-to-replicate capabilities required to adapt to changing customer and technological opportunities.

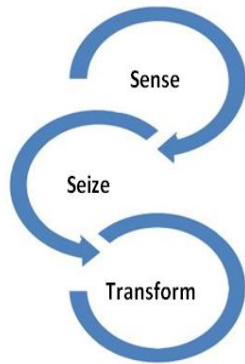


Fig 1 Teece's Dynamic Capability Model: Based upon "Explicating Dynamic Capabilities: The nature and micro-foundations of sustainable enterprise performance," by Teece, (2007)

Further, the dynamic capabilities of the firm are defined by managing the organisational learning by capturing creating and absorbing the knowledge and using its for improving the performance. In the current business scenario where the rate of change of business environment is high and the organisations are exploring the new ideas for addressing the dynamic situations, the challenge is to capture, create, align, integrate and reconfigure knowledge in a systemic manner. Hence an exhaustive literature support is explored for defining the knowledge management and its possible relation with dynamic capability.

## Knowledge Management

The paper explores knowledge management as a significant interdisciplinary business practice which has attracted eyeballs owing to the increasing consciousness about the significance of knowledge for firm's survival and longevity. Continued existence of the firm entirely depends on the firms' ability to adapt and adjust to the changing market dynamism (Elias M Awad, 2007). Knowledge management focuses on knowledge within the context of the organisation, thereby contributing to learning and innovation. It is primarily concerned with identifying and enhancing an organisation's knowledge to enable the organisations to compete in the dynamic environment (Alavi and Leidner, 2001). Knowledge management literature has an exigency side that specifically focuses

upon firm's internal characteristics including knowledge forms and the type of activities affecting the suitability of the knowledge management initiative (Spender, 1996; Sabherwal, and Becerra-Fernandez, 2001).

The knowledge management unequivocally discusses as to whether knowledge is an asset (possession) or if it is nested in tradition by emphasizing on the difference between knowing and knowledge (Orlikowski, 2002). Henceforth, knowledge can be understood both as an essence that individuals, groups and firms 'have' (an intangible asset) and also as something that is 'done' (as practice) by individuals, groups and firms.

Mutually both such types of knowledge have an impact on firms' performance, depending on the types of knowledge and the errands that are involved. Hence, knowledge management initiatives should be carefully and consciously disseminated and applied with the processes of seizing, mediating, sharing and using knowledge to generate expertise.

Knowledge management provides for enabling the introduction of new products. New products originate from new ideas that embody knowledge (Dougherty, 2004; Iansiti and Clark, 1994). Many studies highlight knowledge related processes that lead to continuous innovation which requires the corresponding presence of three basic processes at the firm level. In terms of managing for consistent innovation a minor framework is proposed of aligning knowledge management system for continuous innovation. The knowledge management consists of knowledge creation, absorption and integration.

Many studies suggest the knowledge related processes lead to continued innovation. Knowledge creation, absorption and integration are the driving force behind the creation of new products that revitalize the company through continued innovation (Verona, 2003; Dougherty, 1992; Henderson, 1994). Simultaneous presence of these three fundamental processes namely knowledge creation, absorption and integration

channelizes the firms towards continued innovation.

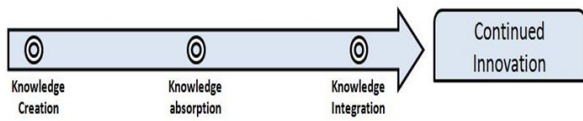


Fig: 2 Proposed by authors

- Knowledge creation involves adding to the existing stocks of knowledge and .is defines as the firm’s ability to learn, assimilate and utilize information captured in-house or from outside the firm.
- Knowledge absorption involves filtering the extracted information and choosing the relevant information which may prove to be worthwhile for the organisation.
- Knowledge integration means incorporating the newly acquired knowledge into its processes to create value for the firm.

The knowledge automation environment is a process of filtering ideas and transforming them into valid knowledge, having the ability to guide decision making. The unifying concept of learning is the specific mechanism that held companies determine the kind of knowledge required for decision making.

### Towards an Integrative Framework

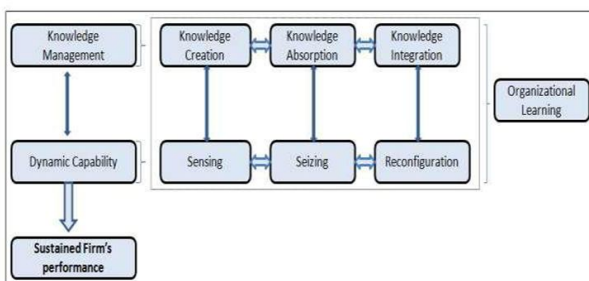


Figure 3: Proposed framework by authors

The literature on dynamic capability highlights the key roles of both knowledge resources and learning mechanisms. In order to obtain competitive advantage, knowledge can act as a critical strategic resource (Grant,

1996). However, it is often indicated in the past researches that knowledge resources lead to the development of dynamic capabilities (Griffith et al., 2001), and that learning incorporates using such knowledge resources (Heijden, 2004). Learning mechanisms boost dynamic capabilities and offer an insight into the foundation of the concept of dynamic capabilities (Zott, 2003; Zollo and Winter, 2002). The above discussion indicates that dynamic capabilities, knowledge resources and learning mechanisms are interconnected to each other. However, there seems to be a gap in empirical research analyzing the interrelationships between these three concepts.

In an attempt to narrow this gap, it must be investigated as to how dynamic capabilities are influenced by the knowledge resources and learning mechanisms. Knowledge resources might not be effectively transformed into dynamic capabilities without an effective learning mechanism. The learning mechanisms provide an insight into the process perspective of dynamic capabilities. The present research contributes to the existing knowledge by proposing a framework that integrates the dynamic capability view, knowledge management and the organizational learning theory all leading to sustained firms performance.

### Discussion

In this section, the paper attempts to delineate the interrelationship between knowledge management and organisational learning in a dynamic capacity structure prompting sustained firm’s performance, which is characterized as the organisation's success or failure in accomplishing its objectives by sensing, seizing and reconfiguring the knowledge resources. The framework is clarified in stages beginning with the more obvious relationship between knowledge management and dynamic capability leading to organisational learning, trailed by clarifying the interrelationship between all the factors and finishing up with

an exchange of their potential connects to increase sustained firm's performance.

The above conceptual framework suggests that the three aspects namely, knowledge management, dynamic capabilities and sustained firm's performance are interrelated to each other in such a way that one positively impacts the other. The framework proposes that organisational learning is facilitated by knowledge management by the creation, absorption, integration and adaptation of the knowledge resources by sensing, seizing and reconfiguring according to the changed dynamics. Organisational learning mainly focuses on the exploration of new knowledge resources and incorporating employees experience into the organisations (Tsai, 2012). It underlines on the consistent generation of new learning to add to the current stocks.

Learning organisation is essentially focused around the definition, stockpiling, transmitting, dispersion and coordination of existing knowledge resources within the organisation, thereby developing and exploiting core competencies channelizing towards sustained firm's performance. An unavoidable segment of both is the sharing of contemplations to make and become new learning, updated by incredible organisational structures and situations, reinforced by practical knowledge management frameworks. Effective knowledge organisations create such circumstances that connect knowledge management with dynamic capability.

Also, the concept of dynamic capabilities provides a much needed theoretical base which enables us to understand the process of competition in the global era (Krzakiewicz, 2013). The dynamic notion of knowledge, the related issues of its management and creation particularly revolve around organisational learning and knowledge management. The primary purpose of organisational learning is the consistent generation of new knowledge, and also the more proficient and compelling

administration of the resulting organisational assets.

## Conclusion

The paper explores the relationship between the knowledge management and dynamic capabilities in sustaining the performance of the firm. Based upon the literature and study of sample cases, the paper is able to signify that the three components of dynamic capability of the firm i.e. sensing, seizing and reconfiguration are enabled and strengthened and fostered with knowledge creation, knowledge absorption and knowledge integration respectively. The integration with knowledge management and system for dynamic capability in the organisation provides for the organisational learning. The paper concludes that knowledge management enabled dynamic capabilities underpins detailed operational/functional competencies which can constitute organisational learning, and provide for sustained performance of the firms. The paper would provide for the linkages for knowledge management and dynamic capabilities and shall also be able to help practitioners for exploring new system for defining their dynamic capabilities.

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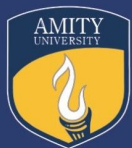
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