Towards Program Risk Management and Perceived Risk Management Barriers

Shahid Rasheed[1],Wang ChangFeng[1] and Faiza Yaqub[2]

[1]*BeijingUniversity of Posts and Telecommunications, China*
[2]*National Transmission Dispatch Company Ltd., Pakistan*
shahidrasheed@outlook.com, wangcf@bupt.edu.cn, faizayaqub@gmail.com

Abstract

This paper seeks to investigate the concepts of risk management and its implications for program management discipline. It highlights the distinctions of programs over projects and discusses why programs are more risky. Further, based on relevant descriptions and findings from respective literatures, we report a number of perceived barriers en route for risk management implementation on ground; we also discuss the reasons and rationales behind such infirmities. Dominant factors causingunderprivileged risk management are classified into four prime categories: resource constraints, contextual restrictions, learning imperfections and human limitations. An empirical survey-based study conducted from Pakistan telecom professionals discovers that monetary constraints, schedule compels, unstable organizational environment, lack of executive's commitment towards risk, and deficit of risk-aware culture are the topmost barriers that impede the implementation of risk management in large-scale telecom programs in the country. The concepts defined in the early parts of this study will enable the practitioners to understand the program risk management subject in enhanced ways, while the findings delineatedlater can equip the relevant stakeholders with better learning of affairs prevalent in Pakistan telecom industry; this may also aid policy makers in instigating corrective actions.

Keywords: Programs, Risk Management, Risk Management Barriers, Pakistan Telecom Industry

1. Introduction

The manifestation of risk and its implications on the business context are frequently conferred, given the rising number of publications on this theme in recent years. Risk management is a topic of concern in financial, health, environment, industry, business and numerous other spheres[1]. Projects and programs are the essential elements inside all organizations; they bear different sizes, and widely vary in complexity [2]. Similar to humans, the projects and programs are also susceptible to numerous risks throughout their lives. That is why risk management has gained the reputation of being an essential knowledge area in professional performs. A lot of organizations such as PMI, OGC, PMAJ, IPMA, PRAM, APM, and ISO are persistently working to enhance knowledge in this domain; many of the allied concepts, processes, and tools are already available.

There has been a tremendous research in project management over several decades and its domains (*e.g.* time, cost, risk, quality *etc.*) are reasonably matured; however, neither program management in itself nor its sub-fields (*e.g.* program risk management) have gained that level of development [3, 4]. Since programs are built on projects and both share many things in common, they are usually perceived to be inseparable [5]; however, despite having many commonalities, the programs differ from the projects in several ways. There is a need to understand, what makes programs more distinguishable over

projects?Why programs are more risk promising?And why program risk management is relatively deprived? In the earlier slice, this study will attempt to answer these questions.

To comprehend the reasons of letdowns in programs, the MIT-PMI-INCOSE Community of Practice conducted a combined study of almost 120 large-scale engineering programs and remarkedthat lack of proactive risk management is one among the top 10 themes of challenges [6]. The large-scale programs are typically linked to strategic drives of the regimes and focused on delivery of policy objectives; they bear manifold stages, manifest higher degrees of complexity, engage multiple projects, involve huge investments, and are usually spanned over more than a few years [6-8]. A comprehensive valuation of risk in programs may certainly help in avoiding costly breakdowns as well as massive reworks in organizational drives. Effective risk management is considered as a bearer of success as well as an ally to the rational use of resources; in short it is proven to have healthy influences on the organizational performance [9]. However, despite all its significances, risk management is unfortunate enough to gain its due focus in realism - as a broader discipline even, let alone the programs. Both governmental and private sectors happen to suffer a lot on account of poor risk management [10]. H. Sanchez [11]highlights that risk management in fact is the least practicing domain among the entire knowledge areas in project management discipline; according to him, the most serious drawback of risk management in the industry is its deprived application.

Risk management is facing more than a few challenges, both from the learning and implementation angles. Dreadfully, many endeavors don't even have risk-pursuing systems, and therefore do not create risk reflectiveness; on the contrary, the ones which accredit such practices, happen to experience many barriers en route for risk management. In case we intend to control the risk management barriers for the wellbeing of projects and programs, we should understand them thoroughly.During the literature review on risk management we happen to know several dilemmas which hinder the risk management practices on ground. While doing a survey of large-scale industries in Hong Kong, Tummala *et. al.*, [12]found several barriers (*e.g.* lack of management support and understanding on risk, organizational resistance to change *etc.*) impeding risk management implementation and operation. A study carried by Choudhry and Iqbal [13]outlines that lack of formal risk management system and absence of joint risk management by stakeholders are major barriers to effective risk management in construction industry inside Pakistan. Similarly Odzaly, Greer and Sage [14]studied several software risk management barriers. All these studies highlight certain facets backing ineffective risk management. The middle part of this work will aim to study why risk management stays underprivileged in real life initiatives; in such respect this paper identifies and deliberates several barriers.

Just like many other fields, telecommunication (development/ construction) programs are also complex disciplines. Rapid developments in technology, presence of a large number of unknowns, and the contextual uncertainties make them more risk promising; such initiatives, therefore, mandate apt risk management for fruitful realizations. In practice, however, the performances of many large-scale telecom endeavors are periled. One of the prime reasons behind this frailness is poor performance of risk administration, which is duly backed by a number of influences and factors. Alike is the situation of certain telecom programs in Pakistan; some are worryingly delayed while some others are facing degraded performances, for one of management's extreme anxieties. After this study recognizes key obstacles in implementing risk management, we undertake a survey from the telecom professionals in Pakistan to discover the topmost barriers impeding risk management in programs. The later part of this study will comprise the details and findings of this empirical survey.

Remainder of this paper is arranged as follows. Section 2 introduces the concept of risk and risk management while Section 3 lays down the key distinctions of programs over

projects. Section 4 tends to maintain that program risk management is a relatively underexplored area. Section 5 discusses the perceived barriers en route for effective risk management implementation, and section 6 details a survey which attempts to rank key risk management barriers in Pakistan telecom domains. Some discussion and findings are available in Section 7 whereas section 8 concludes the overall work.

2. Risk and Risk Management–An Overview

In a common perception, risk is recognized as the impact of uncertainty on the achievement of certain intended goals [5]. International Organization for Standardization (ISO) [15]defines risk as the effect of uncertainty on organization's objectives, where the objectives might relate to a variety of organizational activates including operations, processes, projects, programs, and strategic initiatives. Project Management Institute (PMI) defines risk as an uncertain event or condition that may have a positive or negative effect on the objectives. Similarly, Office of Government of Commerce UK (OGC)[16]describes risk as an uncertain event or group of events that, should it occurs, will have an effect on the achievement of objectives. Piney [17]attempts to present a complete definition of risk quoting that 'risk consists of three parts: an uncertain situation, the likelihood of occurrence of the situation, and the effect (positive or negative) that the occurrence would have on project success'. In the context of program management, risk is explained as an occasion or series of occasions or circumstances that may (positively or negatively) affect the accomplishments of the program in case they happen [7-8], [5]. Risk is usually measured by the combination of probability of a perceived threat or opportunity occurring and the magnitude of its impact on the objectives. Risk is inevitable [18], and eliminating it is not an easy job; however, suitable response plans can always help in minimizing the negative outcomes or exploiting the positive upshots arising from a probable uncertainty [19]. Some contemporaneous developments take a positive notion about risk as well [7], however, for majority of the literatures risk is a negative bearing mainly i.e. they assume that risk has adverse realization and impacts for businesses[20], [21].

Risk management is about getting ready for a potential happening, having a realistic evaluation of possible occurrences, and being able to face the situation with readiness when it arises. A common view observes risk management revolving around three main questions: What is the possible threat (or opportunity)? How to prevent (or exploit) it? What shall we do if it happens? According to the Management of Risk guide by OGC UK[16], risk management refers to the systematic application of principles, approaches, and a processes to the tasks of identifying and assessing risks, and then planning and implementing risk responses accordingly. In the professional perspectives, therefore, risk management is the process of identifying, analyzing, evaluating and controlling the probable risks in an informed way. However, as it is valid for many other subjects too, there is no universally agreed process definition for risk management. ISO [15],[22]describes risk management process to have multi-stage sub-processes, including establishment of the context, risk assessment, risk treatment, risk monitoring and control, and risk communication. Linkage between these sequences of processes in painted in the Figure 1 below.
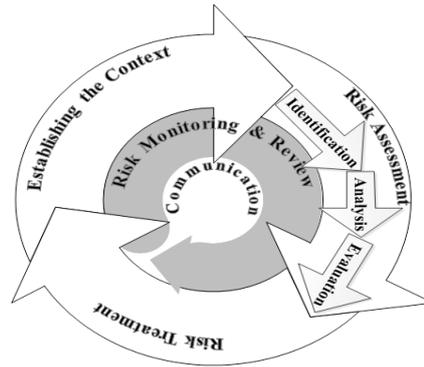
Figure 1. ISO Defined Risk Management Process

According to the Project Management Body of Knowledge by PMI [7], risk management process comprises of the following six stages; Risk Management Planning, Risk Identification, Qualitative Risk Analysis, Quantitative Risk Analysis, Risk Response Planning, Risk Monitoring and Control. Similarly the Management of Risk standard by Office of Government Commerce UK [16] defines management of risk process to embrace four distinct stages as follows; Identify, Assess, Plan, Implement. Likewise the latest revision of risk management standard by Standards New Zealand (AS/NZS ISO 31000:2009) [23]adopts the same process steps as delineated by the ISO.

3. How Programs Differ than Projects and Why are they More Risk Prone?

A project is known as a temporary endeavor (having a specific start and ending) designed to produce a unique product or service, whereas a program has been defined as a group or a set of inter-related projects, sub-programs, or other activities managed in a coordinated way to avail benefits not available from managing them individually [7]. Descriptions given to programs by the Association of Project Management (APM), OGC and other specialized organizations also bear similarities (interested readers may please look into [24] and [25] for reference). Despite there are certain commonalities, the programs are remarkably differentiated from projects. The interested readers are suggested to consult the diverse reviews documented by Pellegrinelli comparing them both [26].

Contrasting projects, for which the success criteria are the deliverables in terms of time, cost and quality [7, 11, 27, 28], the program's success is concerned with delivering benefits and strategies mainly [5, 8, 29, 16]. While some literatures tend to highlight the programs in 'coordinated management of multiple projects' purview, according to certain commentators, a program is a structure organizationally established to give strategic direction to the organizations [30, 11]. The main streams of researchers agree that programs are vehicles to implementing organizational strategies and obtaining benefits through projects and actions (see for example [10, 29, 31, 32]). It is also believed that the programs are typically spanned over multiple years whereas the projects are usually of shorter durations [33]. Though scholars tend to explain the programs with several further angles, it is broadly accepted that the focus on coordination among concurrent projects, having a closer relationship to the organizational strategic aspects, and the element of initiating change inside the organizations, are three prominent characteristics that discriminate the programs over projects [34]. These phenomenon link the programs to 'outcomes' as compared to the projects which are usually believed to have an association with 'outputs' [26].

Because of the very nature of programs being more complex than projects, involving large number of components to manage (*e.g.* projects and stakeholders) and spanning over

longer time periods, their outcomes are relatively more uncertain and unpredictable than projects [8]. Unlike the projects or the strategy domains which either occupy the bottom or the topmost placements in the layered (organizational) pyramid, the program function inhabits a locus that is characterized in between these two extremes. Such a situation makes them more risk prone wherein the risks bear a tendency to emerge from compound directions. This phenomenon is exposed in the Figure2. Risks inside programs is said to arise from three distinct directions, namely up from the component projects (called the escalated risks), down from the strategy level (called the delegated risks), or sideways from within the program layer itself [35].
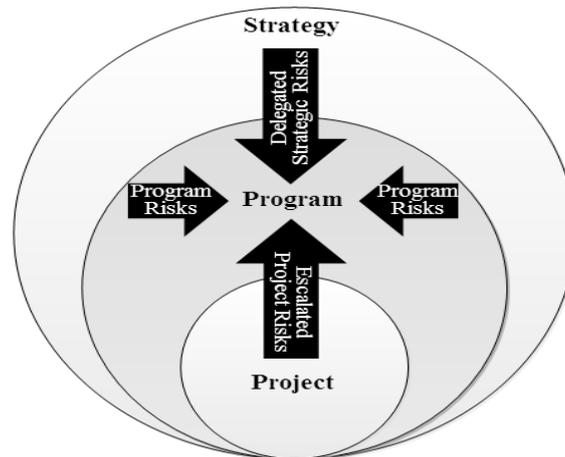

Figure 2. Materialization of Risks in Programs

The risks learnt at the program level from the component projects are of two kinds: the scaled up project risks which demand engagement of the program for resolution, and the project risks having impact on the program level (even if they do not request program-level response). In addition to such recognitions, a number of similar risks in multiple project domains may sum up to form aggregated risks which are materialized at the program layer. Moreover, the programs may conceive such risks which are founded due to inter-project synergies [35]. Since the programs also embrace elements of related work or activities (as per definitions [7],[25]), in addition to the project components, some risks at program level may also emerge from outside the scope of constituent projects [5].

Compared to projects, the programs are more risk prone for two main reasons [8]. First, the absence of wholly defined scope at initiation makes a program more risk promising. Martinsuo[36] maintains that initial phases of the programs always accompany a high level of uncertainty; this not only launches doubtfulness around the program's opening but also hits its progression and possibly affects the outcomes. Secondly, during the course of program, the scope and content are unceasingly elaborated, elucidated, and tuned so as to guarantee that the program's upshots go in line with the envisioned benefits[8]. Both these regimes make the programs more vulnerable than projects.

In programs, the internal and external uncertainties along with the distinct features of the program compose risk factors that go all along its lifecycle and finally influence the program's capacity of achieving the goals. Figure 3 below provides the association of the contextual risks with the program goals.
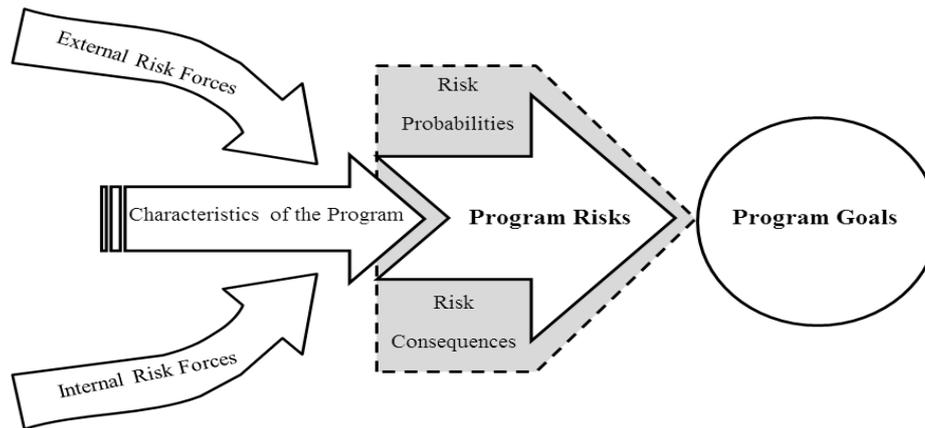
Figure 3. Risk Constructs in Programs

Since the programs comprise of a group of components, their results are heavily influenced by the program contexts and factors surrounding its component projects [10]. The programs are exposed to numerous risks provoking from several sources– both internal and external to the program [37, 15, 38, 16, 8]. Risk management in programs is poised to compete with both these challenges, concurrently.

4. Risk Management in Programs – Why it is Deprived?

There is a consensus that programs are risky undertakings, consequently risk management should be the fundamental part of how programs are accomplished [8, 5, 38]. In a simple judgment, risk management in programs sounds quite similar to the project risk management; however, since the programs differ greatly from projects (in terms of their nature and goals), so does the program risk management [26]. The measurement criteria for projects are relatively simpler involving quantification of metrics like time, cost and quality, whereas in case of programs, it is rather complex; the multiple component projects, their interfaces and the overall objectives make them more multifaceted undertakings [5]. In programs not only the pilot risk plans are indispensible but managing risk in the later phases is even a bigger challenge. As both the strategic intent and the anticipated benefits from the programs are subject to change [31] in view of rising opportunities and emerging threats, risk management happens to be an ongoing activity throughput the program life cycle [15, 16].

Notably, the program management is yet an evolving domain [4] and lacks a clear agreement on its essentials (including even its definitions) and practices. For similar rationale, program risk management is established even slighter [5]. Despite the discrete features of the programs (*e.g.* their standing inside the organizational hierarchy, and their strategic personality *etc.*), not enough has beendone to conceive specialized approaches for this very domain. Some researchers contend that the leading focus of the risk management efforts is still devoted towards the projects whilst the program risk management is still deprived [11]. Majority practitioners still observe the program risk management as an extension of the project risk management, while in the eyes of many researchers a project-based view of programs has been heavily discouraged [26, 10, 39].

5. Perceived Barriers on Way to Risk Management

During our readings targeted on risk management, we have discovered several tangible and intangible factors that impede the application of risk management on ground and deteriorate the initiative's progress. The impediments learnt are classified under four title categories, and discussed hereunderin detail.

5.1. Learning Imperfections

Under this category we consider those factors which either obstruct the risk related understanding or cause defective learning among the practitioners. The first ever confusion about risk starts from its basic definition and concept. Risk is said to have two faces: positive and negative; some describe it as an opportunity while some others tag it as a threat. Some recent developments remark that risk may also be positive (also called positive risk [29, 7, 16]) and can have constructive influences. However, for the vast majority, risk is a destruction bearer and is known for its negative and lethal realization on objectives, alone. Likewise, in use are more than one definitions of risk management too; some individuals designate it to be a decision making process (excluding the identification and assessment part) while some others recognize it as complete process, comprising risk identification, risk assessment and decisions around risk issues [40]. The confusion does not end up here; more than a few people are puzzled if the risk management function is an independent activity inside organizations, or it is fundamental to every process, and the responsibility of each individual within the body, whatever role he or she serves. All these impressions reflect missing understanding of risk among masses; this even hint a lack of consensus on elementary conceptions abuts risk and risk management among professionals.

Unfortunately, the subject of risk management is little found in training calendars of many of the organizations; such neglects hinder risk learning among the teams [16]. Even in batches where a decent understanding of risk management prevails, the practitioners experience deficiency of relevant tools and techniques. Many of the risk management mechanisms (methodologies and processes) found in literatures are quite conceptual, complex, or sometimes even philosophical; resultantly, the practitioners lack credence in terms of compliance. During a study Tummala *et. al.*, [12]noted that the managers lack in knowledge for applying formal risk management techniques, or they find it hard to recruit a solution approach which is logical, easy-going and cost-efficient. They further pointed that inability of interpretingresults of risk processes is another large inherent barrier for risk management. Additionally, some of the tools might not necessarily provide a fair picture of the risks being evaluated; for example, the mainstream of risk management tools being practiced in the industry frequently rely on probability and impact matrices to assess and prioritize the risks, and tailor the risk responses accordingly. Some researchers condemn this approach and maintain that while creating such matrices, the cost and benefit factors associated to each risk's treatments are usually ignored; consequently a severe risk always occupies the top priority, no matter how gigantic its treatment costs and dependencies are, while a moderate risk remains undercover (and waiting until the top ones are addressed) even though its treatment is the easiest one in terms of time or cost [41]. It has been established that such tools inject a gap between the risk's actual standing and its treatments, and therefore convey imperfect learning to the practitioners.

Levin [29]clarifies that inefficient adoption of risk processes is a big reason for poor communication and ultimately results in underprivileged risk management. For example, during risk identification stage, instead of obtaining the opinions of a multidisciplinary expert board, only a few of selected resources assume this function in practical realms. This primarily happens due to lack of education; it is a kind of learning imperfection that may compromise the intended outcomes.

5.2. Human Limitations

The human limitations refer to the human attributes and conduct which consequence a disregard or neglect towards risk on either a deliberate or an unintentional basis. Some studies argue that certain facets of risk management route opposed to human instinct and aptitude. Leaders are always passionate to speak of and pursue for success rather discussing and pondering on the possible losses that could disturb their initiatives; such

thought process limits risk supervision [42, 29]. Some managers believe that their teams should not spend time in finding the negative sides (*i.e.*, risks) because such lengthy lists might never let the teams succeed [5]. Another factor is that human are poor assessors, at times. Researchers have tried to identify a common man's capacity to describe the level of risk employing probabilities. They conclude that human are poor at evaluating risks using objective probability values because such estimates are sometimes intensely influenced by certain factors, for example dread [43]. It is thus believed that people's psychological and social factors widely influence their evaluations about risk [44]. The level to which a risk is perceived by a person may also be dependent on the social and cultural grouping that folk belongs to, and the background context in which a specific threat rises. Among the others, the missing knowledge and the perception of risk controlling being a hypothetical phenomenon are also counted as restrictions in shaping risk awareness among the managers. All such human limitations and personal factors cumulate to entice imperfections in risk judgments and risk responses.

Compared to the unwitting conducts mentioned earlier in this text, a deliberate neglect of professionals towards risk could be an even sheer quandary. One of the biggest risks around risk management is essentially getting members in the organization to engage in the said. The teams protest that the managers are too busy to listen to them. In some cases the subordinate teams fail to buy the engagement of echelons even after they have identified key risks. The Guide to Lean Enablers for Managing Engineering Programs counts insufficient attention in resolving the acknowledged risk as a serious issue [6]. We label such an impediment as lack of commitment or deficit of loyalty. Some literatures relate this predicament to the deficiency of sponsorship of senior management [16]. Raftery [45] mandates 'support from above' for risk management and considers it as a key point in risk practice. The Oracle Corporation [46] also outlines lack of executive's commitment towards risk management as one of the biggest reason behind initiative's failure and relates it to human nature.

Another, and rather important dilemma is that those who take part in risk management undertakings remain deprived of any incentives or rewards [16]; such states of affairs demoralizes them and hamper the consistency of relevant performs. The managers comment that proving the value of risk management is not an easy job, as it is not directly linked to problem-resolving (but to problem-prevention) [14]; for such (misled) evidences (regrettably) the premier echelons incentivize those who 'solve the problems' over those who 'do not let the problems arise'. The executives forget that risk management is far beyond sketching the pilot risk plans; it is about unceasingly managing uncertainties that materialize during the course of execution; so it demands consistency, and any lack in steadiness may turn loss promising.

5.3. Contextual Restrictions

Contextual restrictions may be regarded as a set of internal and external constraints that affect the conducts of risk management. It is a known reality that performance of any organization is largely shaped by the environments it operates in; likewise, risk management function is influenced by the surrounding contexts [5]. In many instances, the absence of risk-aware culture is held accountable for ineffective risk management in endeavors. Such absenteeism puts restrictions towards establishing risk practices and consequences [40]. Sanchez [11] argues that unless the efficaciousness of risk management process is increased, the risk culture inside project based organizations cannot be strengthened. The culture of an organization and stakeholder's outlook undoubtedly plays an imperative role in shaping risk attitudes. The organizational cultures may also echo facets of the physical, human, or organizational aspects paying to risk; for instance trustworthiness or dependability of present or projected risk management. Without an upheld pledge to the uncertainty management procedures, a culture of optimism sustains where historic accomplishments provide shield from future risks and

'champions of past' are misunderstood as 'eternal heroes', evading any possibility of dilemmas in future. Raz *et. al.*, [47] believe that while all agree that risk management is a decent idea, not many managers observe it as part of their job. He notes lack of awareness and over-optimism as slices, backing such cultures.

Heavily significant, though badly neglected is the interfacing of risk management functions with other structural domains. Even in organizations where risk management bears a formal presence, its performance suffers due to disengage with other units. At times, chasing behind or killing a risk might breed a portfolio of other risks that equally impacts a range of other organizational divisions [15]; for such reasons, instead of welcoming the risk guiding divisions, the unit heads resist relevant teams, believing that they interfere in their domains and impede their routines. While doing so, they forget that risk management in fact is everyone's business [40, 29]. One reason for such resistance could be the fact that, due to several factors and constraints, the risk managers might lose to balance between the most crucial risks and the portfolio of smaller risks; such states may verily instigate violations in certain spheres, even though they are unintentional.

Ineffective and poor communication is perceived another big predicament. Aven [42]underlines that risk staging and communication among the analysts is a lot poor which leads to grave consequences for risk decision-making, for instance by picking the choice or measure that is incorrect. Although the availability of apposite data remains a big question for risk identification and assessments, sometimes even the obtainability might not serve the purpose [15]. While practicing risk analysis, a large number of analysts assume no difference between the historic records and the risks derived from those records. Lack of such extricate while manipulating results from historic records results into delusion where risk probabilities, impacts and the resulting expected values could go quite deceptive [42]. Sometimes historical data does not provide dependable base for the prediction of the futuristic events or their possible consequences. For example, for unique types of risks, historical records may either be missing altogether or if available (in partial), they might bear different interpretations by different stakeholders [22]. Moreover, due to poor risk communications, many of the sources of risk remain unidentified which leads to imperfections in managing risks [40].

Typically, from the physical communications point of view, some individuals or even the teams either hide or do not communicate risks well to the upper (management) levels; though interprets misfortune, it especially happens in organizations with dominance of power [29], or in the cultures which penalize those who highlight or report sick news [6]. Nonexistence of clear guidance (or instructions) on risk from the premiers is another example of bad communication as stated by the Management of Risk Standard UK [16].

Unstable organizational environment, especially in the loosely structured organizations or the turbulent spheres, is another driver backing infirm risk controls. Excessive changes in organizational structures or premature replaces in the relevant administrators induce disorders in risk assignments and do not let them materialize[16].

5.4. Resource Constraints

Resource constraints primarily include the limitations in respect of people, funding and timetables. Having insufficient or inadequate resources is perhaps the biggest risk for risk management itself. Unfortunately, the monetary, schedule and human resource compels occasionally force the endeavors to live with restricted or no risk measures at all. The project managers are always found sticking to project calendars, and worried about dates and deadlines. Some managers complain that formal risk management performs (identification, analysis, and response) are overly (and sometimes unduly) resource consuming, such as cost, human and time resources; they however, undermine the reality that spending on prevention usually costs much lesser than what it does when the problem actually happens [5].

In addition to the factual confines, sometimes the 'we have been through this all; and we already know how to deal with' kind of attitude abstains the managers from allocating due time and monetary resources for risk functions [29]; consequently risk functions suffer for such lacks. Lack of capital and time resources are not the sole concerns, there is but a serious shortage of competent and skilled risk management professionals in the industry. Levin [29]argues that the competency comes with experience and managing comparable programs, and there is no shortcut to it. He endorses that it is hard to find competent risk professionals in the industry.

5.5. Compilingit All

Based on the perspectives offered above, we may conclude a list of significant barriers that perceivably obstruct the implementation of risk management or impede its proficiency in projects and programs. The barrier groups and sub-factors have been shown in Figure 4 below.
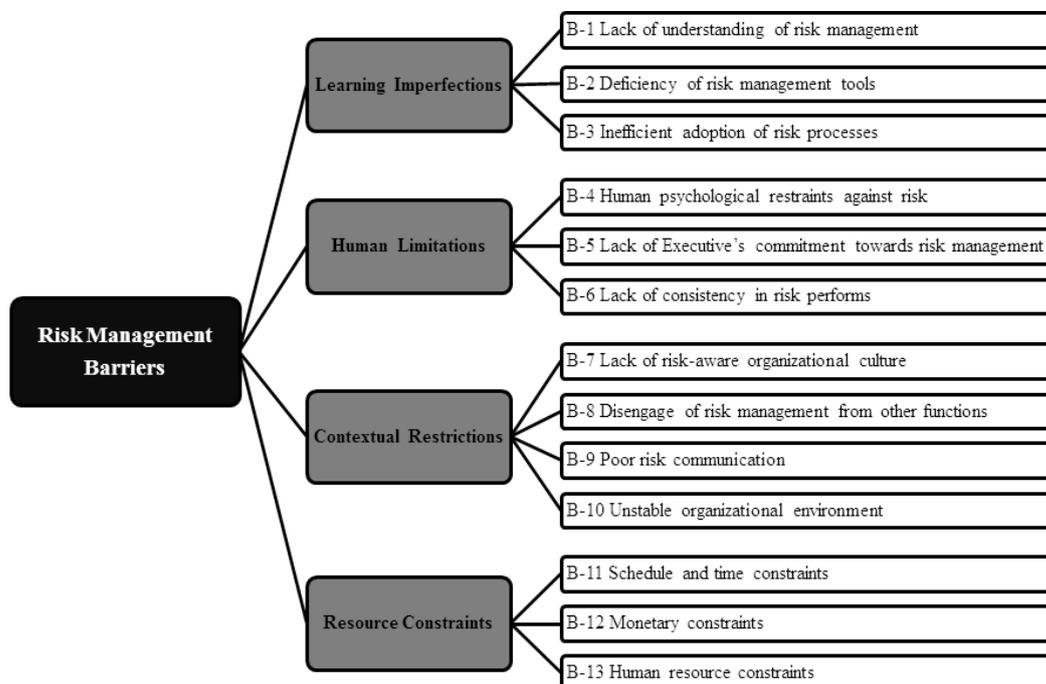

Figure 4. Risk Management Barriers

In the coming section we will evaluate the standing of each factor with regards to its significance towards telecom programs in Pakistan.

6. Dominant Barriers as Perceived by Pakistan Telecom Industry

In a bid to understand what the major obstructers are that do not let risk management realize its objectives in large-scale programs, we chose to study the standpoint of telecom sector in Pakistan. During the 2005-2008 tenure, Pakistan telecom sector was on the boom witnessing promising growth [48]. In the recent past, however, many telecom programs in Pakistan have experienced compromises and even failure in achieving the intended objectives. Some examples include the Next Generation Wireless Mobile Services (3/4G) Program (NGWMS) which was badly delayed by almost a decade [49-51]; the Wireless Local Loop (WLL) initiative which could not deliver its promises [52]; and some of the Universal Service Fund (USF) (sponsored) programs which are suffering from substantial delays [53-54] *etc.*

In order to conduct survey, twenty seven (27) telecom experts (chiefly from PMO sections; having 5-18 years of experience) in Pakistan were handpicked. The major population comprised of managers from telecom development and operations companies (including the fixed line operators, cellular mobile operators, wireless local loop operators, solution development vendors *etc.*), while a few relevant stakeholders from the public domains (such as policy makers, regulator, funding bodies *etc.*) and subject advisers (like market consultants, technical specialist *etc.*), were also consulted. A small group (consisting of two academic researcher and one telecom professional) assumed the survey to target the perceptions of experienced program managers on risk management barriers. In order to expedite the responses and to enhance the accuracy of results, the experts were mainly approached through personal contacts. Each respondent was given a short briefing before filing the survey instrument. Overall response remained rich (85%); just two (2) surveys were rejected being incomplete or inaccurate. Twenty one (21) successful responses were finally processed to conclude the picture. Response stats are sketched in Figure5.
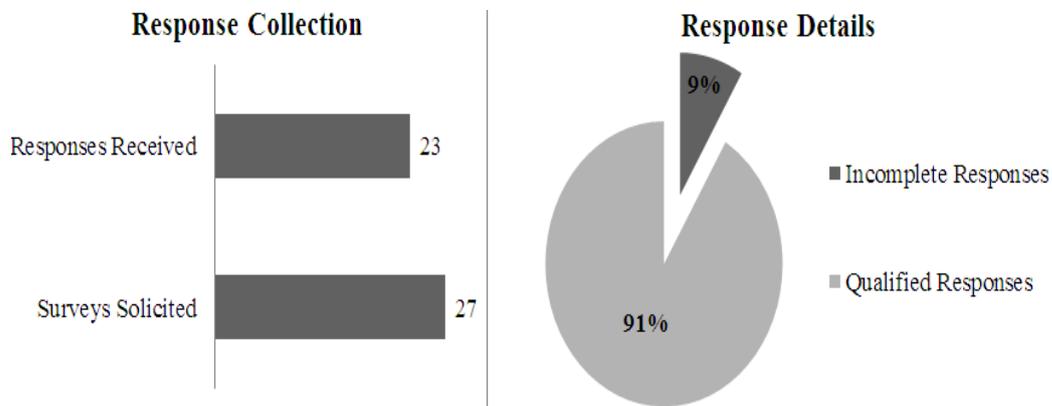

Figure 5. Survey Response Stats

To prioritize the risk management barriers, the experts were requested to rank each element (listed in Figure4) on a scale from 1 (Most Agreed) to 9 (Least Agreed) by asking questions like 'To what extent do you agree that the listed barriers are responsible for underprivileged risk management in the telecom programs in Pakistan'. The final percentage score against each barrier was calculated using the formula $(100 / t) \Sigma s_i$, where s_i is the score from each expert (s_i= 9–rank+1), and t is the sum total of all scores. The results are captured in Figure 6 below.
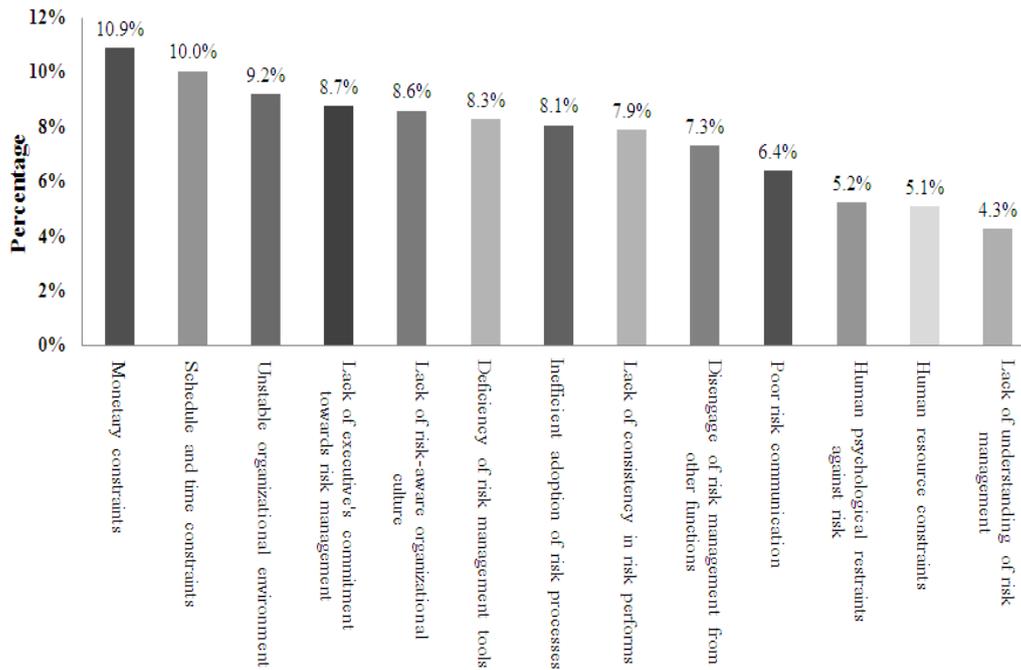
Figure 6. Ranking of Risk Management Barriers

7. Discussion and Findings

Although response rate is reasonably good, the sample size is relatively smaller and relates to a single geographical region (Islamabad; the capital of Pakistan), so the possibility of a cultural bias may not be overruled. We therefore infer that the study is indicative rather conclusive. However, since the majority respondents were well conversed with the program management (having belongings to the program management offices in corporate headquarters), we assume that the rankings filed were faithful and broadly indicate the prevalent situation. Another prospect is that the study sample comprised of the professionals from foreign owned as well as indigenous concerns (having stakes in large-scale programs with nationwide presence), thus accommodating diverse beliefs. In order to bring the respondents on same page, each one of them was briefed on the terminology and the purpose of survey; this ensured that the professionals comprehended the terms used in the survey.

The survey findings reveal that the resource constraints (including the monetary constraints and the schedule compels) and the contextual factors (including the unstable organizational environment and the deficit of risk-aware culture inside organizations) are perceived as the dominant forces behind poor risk management performs in Pakistan telecom programs. Yet another impediment is the lack of executive's commitment towards risk management functions. Since Pakistan is a developing nation where the routine initiatives in general and the large-scale programs in particular, are exceedingly tightened up by financial resources, the spotting of monetary constraints (as conceived by the respondents) is somewhat comprehendible. However, the higher rating of time and schedule compels reflect that the spirit of risk management is largely misunderstood even among the experts; or, perhaps the telecom initiatives are overly squeezed by time compels in view of unparalleled technological advancements. Moreover, the contextual factors also portray an alarming picture, demanding the need of improvement in the overall organizational philosophy. The lack of executive's commitment is irrefutably another serious sign which calls for a mind-set change in the premier echelons. It is rather good to know that HR constraints and lack of understanding of risk management stays at

the bottom; which reflects that a sufficient number of program professionals bear fair insights in risk discipline; this lets us tie up decent hopes with the future.

8. Conclusions

In this paper we attempted to highlight what risk and risk management in fact is, why is there a stringent need to manage risk in the large-scale programs, and why these endeavors remain deprived. The concepts and reviews on program management and program risk management delineated in this study may well orient the managers and practitioners to understand and manage the (large-scale) programs.Moreover, we have reviewed the writings of several scholars and professional bodies to list up a number of barriers that obstruct the execution of risk management on ground. The major barrier heads obtained are: resource constraints, contextual restrictions, learning imperfection, and human limitations. After discussing the obstacles and the associated dilemmas in detail, we turned towards the telecom sector in Pakistan where certain programs are facing serious challenges, and one of the obvious reasons backing this ailment is poor risk management. With an aim to learn the top of the line downsides behind underprivileged risk management in Pakistan telecom domains, we conducted a survey, which revealed certain facts about this domain. Monetary constraints, schedule compels and unstable organizational environments have been exposed to be three topmost issues behind this infirmity in Pakistan telecom projects and programs. Although the ranking results typically apply to the telecom industry, the enlisted barriers are generic in nature and may hold true – in some form or the other –for other similar segments, as well. The presented records may offer help to the potential investors and prospective stakeholders in learning the trends in Pakistan telecom market. Additionally, the findings may be helpful for the regime holders and policy makers for initiating corrective measures. Such studies can be followed to understand the perceptions of a variety of other markets too.

References

[1] C. L. Pritchard, "Risk Management: Concepts and Guidance 4th edition", ESI international, (2010).
[2] R. D. Archibald, 'Managing high-technology programs and projects", John Wiley & Sons, (2003).
[3] S. Pellegrinelli, D. Partington, and J. Geraldi, "Programme management: An emerging opportunity for research and scholarship," Oxford Univ Pr, (2011).
[4] P. W. G. Morris, J. K. Pinto, and J. Söderlund, "The Oxford handbook of project management", Oxford University Press, (2011).
[5] D. Hillson and P. Simon, "Practical project risk management: The ATOM methodology", Management Concepts Press, (2012).
[6] J. Oehman, "The Guide to Lean Enablers for Managing Engineering Programs", Version 1.0, Cambridge, MA, Vasa. Joint MIT-PMI-INCOSE Community of Practice on Lean in Program Management, (2012).
[7] PMI, "A Guide to the Project Management Body of Knowledge", PMBOK 5th Edition. (2013).
[8] PMI, "The Standards for Program Management", Third Edition. (2013), p. 176.
[9] S. Saleem and Z. U. Abideen, "Do effective risk management affect organizational performance," European Journal of Business and Management, vol. 3, no. 3, pp. 258–267, (2011).
[10] S. Pellegrinelli, D. Partington, C. Hemingway, Z. Mohdzain, and M. Shah, "The importance of context in programme management: An empirical review of programme practices," International Journal of Project Management, vol. 25, no. 1, pp. 41–55, (2007).
[11] H. Sanchez, B. Robert, M. Bourgault, and R. Pellerin, "Risk management applied to projects, programs, and portfolios," International Journal of Managing Projects in Business, vol. 2, no. 1, pp. 14–35, (2009).
[12] V. M. Rao Tummala, H. M. Leung, C. K. Mok, J. F. Burchett, and Y. H. Leung, "Practices, barriers and benefits of using risk management approaches in selected Hong Kong industries," International journal of project management, vol. 15, no. 5, pp. 297–312, (1997).
[13] R. M. Choudhry and K. Iqbal, "Identification of risk management system in construction industry in Pakistan," Journal of Management in Engineering, vol. 29, no. 1, pp. 42-49, (2012).
[14] E. E. Odzaly, D. Greer, and P. Sage, "Software risk management barriers: An empirical study," in Empirical Software Engineering and Measurement, 2009. ESEM 2009. 3rd International Symposium on, (2009), pp. 418–421.
[15] ISO, "Risk management - Principles and guidelines", (ISO 31000 : 2009). (2009).

[16] OGC, "Management of Risk", (M_O_R®), Guidance For Practitioners 3rd Edition - Office of Government Commerce UK. TSO (THE STATIONERY OFFICE), **(2010)**.

[17] K. Piney and B. Sc, "Three Essential Elements of Risk," no. April, p. 2014, **(2014)**.

[18] A. Jordan, "Risk Management for Project Driven Organizations", A Strategic Guide to Portfolio, Program and PMO Success. J. Ross Publishing, **(2013)**.

[19] E. Dafikpaku, M. B. A. B. Eng, and M. Mcmi, "The Strategic Implications of Enterprise Risk Management : A Framework," in ERM Symposium, **(2011)**, p. 48.

[20] A. J. McNeil, R. Frey, and P. Embrechts, "Quantitative risk management: concepts, techniques, and tools", Princeton university press, **(2010)**.

[21] T. Williams, "A classified bibliography of recent research relating to project risk management," European Journal of Operational Research, vol. 85, no. 1, pp. 18–38, **(1995)**.

[22] IEC/ISO, "DRAFT INTERNATIONAL STANDARD IEC / FDIS: Risk Management-Risk Assessment Techniques," vol. 2009, **(2009)**.

[23] Standards New Zealand, "Risk Management Standard AS/NZS ISO 31000:2009." [Online]. Available: http://www.standards.co.nz/.

[24] A. for P. Management, Apm body of knowledge 6th Edition. **(2012)**.

[25] O. of G. of Commerce, Managing Successful Programmes. Program Management Group, **(2011)**.

[26] S. Pellegrinelli, "What's in a name: Project or programme?," International Journal of Project Management, vol. 29, no. 2, pp. 232–240, **(2011)** February.

[27] R. Olsson, "In search of opportunity management: is the risk management process enough?," International Journal of Project Management, vol. 25, no. 8, pp. 745–752, **(2007)**.

[28] O. Perminova, M. Gustafsson, and K. Wikström, "Defining uncertainty in projects--a new perspective," International Journal of Project Management, vol. 26, no. 1, pp. 73–79, **(2008)**.

[29] G. Levin, "Program Management: A Life Cycle Approach", CRC Press, **(2012)**.

[30] J. R. Turner and R. Müller, "On the nature of the project as a temporary organization," International Journal of Project Management, vol. 21, no. 1, pp. 1–8, **(2003)**.

[31] M. Thiry, "Combining value and project management into an effective programme management model," vol. 20, pp. 221–227, **(2002)**.

[32] M. Lycett, A. Rassau, and J. Danson, "Programme management: a critical review," International Journal of Project Management, vol. 22, no. 4, pp. 289–299, **(2004)**.

[33] G. Reiss and A. Van Der Merwe, "Program management demystified," International Journal of Project Management, vol. 16, no. 1, p. 65, **(1998)**.

[34] P. Morris and J. K. Pinto, "The Wiley guide to project, program, and portfolio management", vol. 10. John Wiley & Sons, **(2010)**.

[35] D. Hillson, "Towards programme risk management," in 2008 PMI Global Congress Proceedings, Denver, Colorado, USA. Saatavilla www. risk-doctor. com. Luettu, 2008, vol. 12, p. **(2011)**.

[36] M. Martinsuo and P. Lehtonen, "Program and its initiation in practice: Development program initiation in a public consortium," International Journal of Project Management, vol. 25, no. 4, pp. 337–345, **(2007)**.

[37] D. Hillson, "Using a risk breakdown structure in project management," Journal of Facilities Management, vol. 2, no. 1, pp. 85–97, **(2003)**.

[38] PMCC, P2M: "A Guidebook of Project and Program Management for Enterprise Innovation", Tokyo, Japan. **(2008)**.

[39] S. Pellegrinelli and D. Partington, "Pitfalls in taking a project-based view of programmes," in Proceedings of PMI Global Congress EMEA, **(2006)**.

[40] H. P. Berg, "Risk management: Procedures, methods and experiences," Risk Management, vol. 1, **(2010)**.

[41] L. Anthony and T. Cox, "What's wrong with risk matrices?," Risk analysis, vol. 28, no. 2, pp. 497–512, **(2008)**.

[42] T. Aven, "Perspectives on risk in a decision-making context--Review and discussion," Safety science, vol. 47, no. 6, pp. 798–806, **(2009)**.

[43] N. F. Pidgeon and J. Beattie, "The psychology of risk and uncertainty", Blackwell Science, London, **(1998)**.

[44] P. P. Calow, "Handbook of environmental risk assessment and management", John Wiley & Sons, **(2009)**.

[45] J. Raftery," Risk analysis in project management", Routledge, **(2003)**.

[46] Oracle Corporation, "Risk Management : Protect and Maximize Stakeholder Value," **(2009)**.

[47] T. Raz, A. J. Shenhar, and D. Dvir, "Risk management, project success, and technological uncertainty," R&D Management, vol. 32, no. 2, pp. 101–109, **(2002)**.

[48] S. Y. Imtiaz, M. A. Khan, and M. Shakir, "Telecom sector of Pakistan: Potential, challenges and business opportunities," Telematics and Informatics, **(2014)**.

[49] S. Rasheed, W. Changfeng, F. Yaqub, K. Rafique, and Z. Di, "Risk Balancing in the Programmes – An Application in the Telecom Domain," International Journal of u- and e- Service, Science and Technology, vol. 7, no. 6, pp. 175–194, **(2014)**.

[50] G. MoIT, Policy Directive under Section 8, no. 2 of the Pakistan Telecommunication (Re-Organization) Act 1996 for Spectrum Auction for Next Generation Mobile Services in Pakistan. MoIT, Government of Pakistan, **(2013)**.

[51] D. News, "Delays hang over Pakistan 3G lifeline," **(2013)**. [Online]. Available: http://www.dawn.com/news/1034716.

[52] ProPakistani, "Will CDMA Ever be Able to Compete With GSM in Pakistan?," **(2012)**. [Online]. Available: http://propakistani.pk/2012/11/08/will-cdma-ever-be-able-to-compete-with-gsm-in-pakistan/.

[53] L. Corporation, "Survey of Universal Service Fund - Key Findings," **(2013)**.

[54] Business Monitor International, "Asia Pacific Telecommunications Insight May 2013," **(2013)**.

Authors

Shahid Rasheed, Mr. Shahid Rasheed is a Ph.D. researcher at Beijing University of Posts and Telecommunications, China. He has been affiliated to the telecommunications, defence and other engineering sectors since 1998. Before commencing his doctoral research, he worked as Senior Manager at Pakistan Telecommunication Company Ltd. (Etisalat), mainly in the projects and strategic management functions. He holds post-graduation qualifications in Business Administration as well as Telecom Engineering fields. His areas of interest include Program and Strategy Management, ICT developments and allied disciplines.

Wang ChangFeng, Prof. Dr. Wang ChangFeng is the director of the International Project Management Institute in Beijing University of Posts and Telecommunications, professor and Ph.D. supervisor. He is an expert in guiding the PMI GAC project management accreditation, assessment expert for PMI GAC CRC project management accreditation. His main research areas include the enterprise project management of safety risk early warning and emergency response, and the complex system integration and control of major projects and programs.

Faiza Yaqub, Mrs. Faiza Yaqub is serving as Deputy Director in National Transmission Dispatch Company Ltd. Pakistan. She is a post-graduate in Elect. Engineering from University of Engineering and Technology Lahore, Pakistan. Her research interests include engineering developments, corporate management, entrepreneurial business opportunities and advances in power and telecom integration domains.