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CORRUPTION RISK ASSESSMENT METHODS: A REVIEW AND FUTURE DIRECTION FOR ORGANIZATIONS

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ABSTRACT

Corruption risks are present in varying degrees in different activities in all the organizations involved in government or non government function or business. If corruption risks are proactively identified and addressed, damages caused by them can be minimized to a large extent. However the literature on corruption risk assessment is not adequate and corruption risk assessment is still in evolving stage. This paper provides theoretical foundation of corruption risk, reviews existing corruption risk assessment methods, and integrates earlier research findings into meaningful themes that will provide useful direction in conducting corruption risk assessment leading to a generic corruption risk assessment framework. The study combines existing approaches to present a bidirectional analytical approach for comprehensively identifying corruption risks. In addition, this paper posits a conceptual model for explaining the corruption risk vulnerabilities. The framework aims to integrate empirical knowledge of vulnerability into risk identification process to develop a meaningful corruption risk map. The study offers useful insight for both academician and practitioners. The opportunities identified from this review would provide inputs to researchers to explore future research agenda.

Key Words: Corruption, Corruption Risk, Corruption Risk Assessment, Vulnerability.

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Introduction

Global initiatives, undertaken by international organizations such as Transparency International and World Bank have promulgated a perspective of corruption from the risk management angle (Hansen 2011). Most of the work with risk perspectives has been done at the macro level that has identified and prioritized corruption risks at national or sector level. But country level scan or sector indicators may be misleading at utility or service provider level as corruption involves specific individuals and organizations (Halpern et al 2008). Therefore developing organizational perspective of corruption risks is an important research agenda. This paper systematically reviews academic literature published in research journals and studies published by international organizations like World Bank with an objective to present an overview of corruption risk assessment (CRA). It also attempts to inform and enrich academic research by bringing inputs from the anti-corruption research work of international bodies. Knowledge in the assessment of corruption risk is unstructured and yet to be organized. Williams (2014) stresses the need of pooling existing social scientific knowledge to leverage improved methods and developing a common framework for CRA to improve rigour, validity, and its usefulness. The paper attempts to address this need and develops a generic corruption risk assessment framework. It first provides theoretical foundation of corruption risk and organizes earlier research findings into meaningful themes which provide direction for improving effectiveness of CRA exercise. Existing risk identification methods are then combined into a bidirectional analytical approach for comprehensively identifying corruption risks. The article emphasizes contextual causality of corruption risk and suggests using qualitative analysis for contextualizing corruption risk identification. This review also borrows knowledge from other established disciplines by adopting interdisciplinary approach and integrative perspective to posit a conceptual model for explaining the corruption vulnerabilities. As empirical knowledge of vulnerability helps in developing better understanding of corruption risk, CRA frameworks aims to integrate this knowledge to generate an effectual corruption risk map. The paper is organized in five sections. The first section presents relevant literature, clarifies

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terminological ambiguity and provides theoretical foundations of corruption risk concept. It also describes methods used for corruption risk assessment and related methodological issues. Second section explains the methods used for this study. The discussion section summarises the review findings and integrates the inferences into meaningful themes, conceptualize vulnerability and develops an improved risk identification approach. It also presents gaps in the literature and opportunity for future research. In the fourth section, a generic framework for carrying CRA is presented. The final section highlights some implications and contribution of our findings

1. Literature Review

Why is corruption a risk? Corruption has been widely recognized as detrimental to society, institutions, and organizations. It is regarded as significant contributor in restricting economic growth, inhibiting public service delivery, retarding human development and increasing inequalities in societies. Existing findings (Golden et al 2005; Olken et al 2007) suggest that the cost of public investment and the value of existing capital may differ substantially. Corruption can also threaten the humanitarian endeavor by preventing lifesaving assistance to those who are most in need (Maxwell et al 2012). Apart from financial loss, these risks may affect organization's reputation, productivity, product and service quality in general and public safety in some cases. However, these impacts are kind of avoidable losses which can be prevented to a considerable extent, if organizations have knowledge about these risks.

2.1. What is Corruption Risk?

Risk is generally defined as the possibility that an event will occur and adversely affect the achievement of objectives. However no universally accepted definition of Corruption risk is available in the literature. McDevitt (2011) pointed out that corruption risk generally takes institutional approach and used to identify weakness but its conceptualization varies with various risk assessment tools. Georgiev (2013) refers Corruption risk as the degree of probability that corruption might occur along with a reflection of the potential cost associated with the corruption. Buromensiky et al (2009) describe corruption risk as conditions favouring appearance, development, realization, and spreading of corruption practice in service and professional activity.

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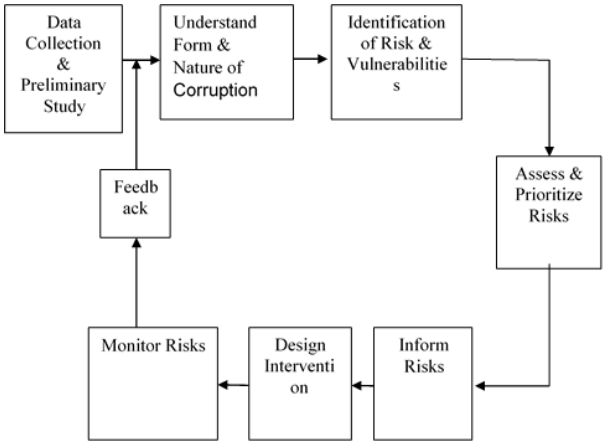
For easy and better understanding, corruption risk may be defined as likelihood of corruption that might occur due to vulnerability or conditions present or practice prevalent in the system with reflection of potential impact associated with corruption. The potential impact would reflect degree of monetary, social, or reputational cost or resource wastage which might occur due to corruption.

2.2. Corruption Risk Assessments

CRAs basically involve identification of issues associated with, contributing to, or otherwise facilitating corruption in a particular setting (Williams 2014). CRA begins with data collection then risks are identified and mapped in the activities or along financial flow in the organization. Next ranking criteria is developed for assessment of risks. Based on ranking criteria, risks are assessed and prioritized. Then responses to risk are determined in terms of policy correction and risk monitoring. CRA exercise is explained in Fig. 1.



Adapted from COSO, Risk Assessment in Practice: Through Leadership in ERM (2012)

Fig. 1. Corruption Risk Assessment Exercise

Hidden nature and complexities of corrupt exchanges and lack of guidance make CRA a difficult exercise. As corruption is a contestable term and perceived differently in different societies, it becomes further difficult to identify corruption risks. Moreover CRAs, if not carried out properly would not be useful. Therefore a review of various CRAs approach is warranted to explore the potential of strengthening the rigour, and validity of CRAs. CRAs methods can be broadly categorized in to surveys and interviews, indicator based methods, value chain analysis, Logic and probabilistic models, Audits, Data mining methods and Case study approach. Each of

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these methodological approaches is presented below:

2.2.1. Surveys and Interviews

Surveys and Interviews have been used in research to identify corruption and fraud risks and find out vulnerable sectors at macro level or vulnerable stages in critical activities like public procurement (Gatti et al 2002, Ameyaw et al 2013, Olusegun et al 2011). However, they cannot give complete information to assemble risk map, especially on soft measures like values and norms, management attitude and integrity awareness (Bager 2011). If people respond on the basis of factors other than actual perception, survey results may give inaccurate results to that extent (DGHL, 2010). Moreover, surveys can't provide information on those concealed acts which do not get revealed and their results may get affected by local understanding of terms. However, Reinikka et al (2006) demonstrate that it is possible to collect quantitative micro data on corruption with appropriate survey methods and interview technique. Review of available literature suggests that targeted focus approach would be quite appropriate for risk assessment survey to obtain institution specific area of concern and prevalent corrupt practices. However surveys need to be coupled with other methods to develop systemic perspective about corruption risks.

2.2.2. Indicator based approach

Indicator based approach has gained acceptance because of difficulty in the direct measurement of corruption. They provide an easy method of quantifying the multi-dimensional concepts by combining a variety of statistical data to address. For the purpose of CRA, indicators representing various kinds of risks are identified and risk metrics is prepared to prioritize the identified risk. Indicators based risk approach can be catalogued into two broad groups -- subjective assessment and objective assessment methods. Objective methods are used for assessing risks in public procurement process. Fazekas et al (2014) have proposed a composite corruption risk index for grand corruption by using micro level objective procurement data. They have modeled corruption risk by using multiple regressions linking likely corruption input such as 'tailored eligibility criteria' to two likely corruption outcomes like single bid received or winner share of contracts. Wensink et al (2013) developed econometric model and identified red flags that could explain 55% of whether a case is

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corrupt or not. These models do not help in discovering the vulnerabilities in the system and applicable to procurement where objective data is available. Subjective methods (Blundell et al 2010, TI 21013 a, TI 2013 b, UNGCO 2013) use subjective ranking criteria to parameterize the assessment of risks. These approaches do not optimally use objective data available in the organization and generally deals with economic aspects only. As many of the red flags have appeared in several investigations regardless of Country or sectors (Ware et al 2007), a generic set of indicators or red flag would be of considerable help in conducting CRA as pre-identified external criteria. However review of earlier studies (Kenny et al 2010; Johnson 2010; UN 2010) reveals that there is a need to develop observable indicators at organizational level to capture systemic corruption as most of indicators are either macro level or at contract level and these indicators should be refined to avoid false negative or false positive indications.

2.2.3. Value Chain Analysis

In this methodology, vulnerable points are identified along the value chain of translating inputs to output where situation/ conditions are diagnosed to understand the instance and intensity of corruption. It has been used to identify warning signals in various sectors like water and sanitation sectors (Halpern et al 2008), education sector (Patrion et al 2007) and revenue administration (Zuleta et al 2007). This approach has been used mostly in sector level assessment and would also be useful to generate risk map at organization level. However it needs to be combined with other methods for quantifying corruption risks.

2.2.4. Scenario Logic and Probabilistic Risk Models

Solojentsev (2006) suggests that concepts of probability of bribes and corruption are close to reliability and safety in engineering and they are closed to the notion of risk in economy, business, and banks. He developed probabilistic model by using logic and probabilistic theory with group of incompatible events for the purpose of quantitative estimation, and analysis of bribe probability. However, this model needs past information about events for estimation of bribe probability and require special software. It does not capture all aspects of corruption risks nor provide information for risk mitigation and therefore has limited applicability.

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2.2.5. Data Mining Methods

Several data mining models have been developed to assess the risk of fraudulent transactions. However, their reported utility is generally for fraud detection. Data availability is their main requirement for developing these models and therefore research body has grown in banking, insurance, etc. Risk indicators may be obtained through observations of phenomenon that are assumed to be proxies of corruption such as difference between customs revenue and domestic sales figure of same items (DGHL 2010). Balannik et al (2012) had applied Naïve Bayers (probabilitic) classifiers to support risk assessment in government agencies. They evaluated risk by using classification rules and classified various units/area is in high or low risk area. A review of various corruption risks identified in earlier research indicates that data mining can be helpful in discovering the variations in the price of goods/services or works procured, proportion of Single Sources or No bid contract awarded, data inconsistencies in the manufactured output, material procurement and inventory etc,. This key information would serve as valuable input for CRA by exposing new vulnerable areas.

2.3. Audits

Audit reports and investigations provide valuable inputs about corrupt and fraudulent practices. Bager (2011) reports that audit exercise taken by State Audit Office of Hungary for finding corruption risks in various ministries gave similar results and experience as obtained through self-assessments and surveys. Performance auditing can bring out corruption case indicated by lack of economy, efficiency, and ineffectiveness and participatory audit with user can expose the case of collusion and corruption (Khan et al 2006). Auditing can also contribute in detecting corruption opportunities by examining rules/regulations, procedures and standards. Bager (2011) points out that audit may not give reliable picture on soft measures. However audits may be conducted for detailed analysis of the observed corruption risk to find their nature and causes which will be useful input for CRA.

2.2.6. Case studies

A few research studies have used case study method to find out the corruption risks. For instance, Maxwell et al (2012) have studied corruption in humanitarian assistance through case study along-with desk review and study of humanitarian agencies. They

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found that accurate targeting of those who need assistance pose significant corruption risk. Ekwo (2013) has undertaken case study for finding the corruption risk factors in public procurement in Nigeria. Hartley (2004) points out that the case study approach is useful as a strategy to study a problem in-depth, to understand the interplay of socio-economic forces and processes. Case studies can provide deep understanding of important corruption mechanism and related vulnerabilities through rich details of actual cases. Case studies can involve either single or multiple cases, and numerous levels of analysis (Yin 1984). Multiple cases create more robust theory as the propositions are more deeply grounded in varied empirical evidence (Eisenhardt et al 2007). Darke et al (1998) point out that main criticism of the case study is that no standard approach exists for analyzing huge qualitative data. Graff et al (2008) have pointed out that exploratory multiple case study methodology helps to expand our understanding of the way in which officials become corrupt. Graycar et al (2012) analyzed past corruption cases to identify opportunity and control structure in order to devise preventive mechanism. Analyzing multiple cases analysis would definitely bring out deficiency in control structure and existing opportunities for CRA however developing systematic methods for conducing such analysis need future research attention.

2. Method

The articles were searched electronically by using search term 'corruption risks', risk of corrupt practices, 'corruption vulnerability', 'identifying corruption risks', and 'assessing corruption risks. The articles which were published in the time span of 2005 - 2015 were considered for our study as research on corruption risk from organization perspective is relatively new. As corruption risk literature is fragmented and still in infancy, a general search strategy for our research data set was to maximize the inclusion of all relevant studies. It was therefore considered appropriate to include conference papers and research work and studies published from other crucial sources which are highly engaged in corruption related studies, e.g., World Bank; Transparency International, OECD etc. This approach is supportive of new and innovative research ideas at an early stage of development (Tran field et al., 2003). Further using multiple source types allows the reviewer to combine the information

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from various sources in order to extract adequate meaning (Onwuegbuzie et al., 2007, 2012) and improve legitimation of syntheses (Denzin & Lincoln, 2005). During the review, need was felt to review the articles detailing corruption and fraud scheme and fraud risk assessment methods to better understand the phenomenon. Therefore additional search terms i.e. 'corruption scheme', 'fraud scheme', and 'fraud risk assessment' were added for building extensive review data set to undertake a comprehensive study. Authors excluded studies and articles by following the concept of theoretical relevance as per the exclusion criteria noted in Table 1. A systematic analysis procedure was followed with the application of analytical protocol (detailed in Table 2). **(Refer Table No. 1 or 2)**

3. Discussion

This section summarises and reflects on the findings inferred from the review of literature and assembles them into meaningful themes for improving the CRA. Firstly, a descriptive analysis of the review data set characteristics is presented. Secondly, it presents a broad overview of the theoretical field with several themes emerging from review. Thirdly, it develops an improved risk identification approach by combining existing methods to facilitate comprehensive identification of corruption risks. In addition, it connects to the relevant findings of earlier research to conceptualize vulnerability to. It also brings out opportunities for future research and presents a proposed generic CRA framework.

4.1. Descriptive analysis

A total of 48 articles from journals and 34 publications of International Bodies pertaining to corruption risk studies were found to be relevant for corruption risk study. A wide range of methods have been employed by researchers as evident from review. The frequency details of various methods used in academic research and work of International Bodies is furnished in Table 3. Author- wise distribution of research methods is mapped in Table 4.**(Refer Table No. 3 or4)**

The data set given in Table 4 reveals that surveys, interviews and indicators are the most commonly used research methods. About 15 % of research articles were found to employ a variety of different methods such as case study, data mining, business game simulation, value chain, logic probabilistic models, and qualitative meta-

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analysis. It was further found that sixteen articles have used more than one method and survey was found to be one of the methods in these researches. However none of the methods have proposed methodological framework integrating variety of methods used in risk identification and assessment. A sizeable number of articles (about 36%) are found to be of theoretical in nature but these articles had not elaborated the concept of risk and vulnerability. This article therefore posits a conceptual model for explaining the corruption vulnerability. The theoretical nature of the majority of articles support the suggestion of Ashforth et al (2008) that there is much need for conceptual work that is integrative, interactionist, and processual in nature. This need is further confirmed by the fact that only 19 articles out of 48 have discussed about corruption risks. However though most of articles published in top journals do bring out various factors affecting likelihood of corruption in the organization, guidance on CRA is lacking. Several important issues pertaining to CRA are found to have remained unaddressed. First issue is how to integrate various approaches to conduct comprehensive risk identification. Second issue concerns finding a suitable method for conduction systematic analysis of a variety of data gathered from multiple data. Third issue pertains to quantification of risk in CRA. The present article attempts to address this gap in remaining sub- sections.

4.2. Summing up theoretical field

Corruption has been studied by placing emphasis on the individual's traits and behaviours, organizational parameters and process approach (Frost et al, 2014). Our review finds that recent research on organizational corruption has also taken in to account the factors governing interaction among different actors inside the organization and external factors in explaining corruption. There are five major themes emerging from coded data of our consideration set which are mapped in Fig. 2. First major theme representing individual's traits and behaviours include unethical attitude and strive to gain benefit (Mackevicious et al, 2009), disconnect between ethics and business in minds (Gopinath, 2008), level of moral meta-cognitive ability and information processing capacity (Hannah et al., 2011) and ethical decision frames (Tenbrunsel et al, 2008). Their main focus is on individual predispositions for understanding corrupt

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behaviour and therefore omits more systemic causes. In the second theme, factors represent organizational parameters like weak procurement and control structure (Bowen et al., 2012), entrepreneurial orientation (Karmann et al., 2014) and ambiguous rules (Martin, 2013). There remains empirical inconsistency in research body examining why some organizations are more prone to corruption (Frost et al 2014). It might be due to variety of factors including lack of systemic research perspective and contextual difference in corruption genesis in different organizations. There also exists number of studies (Moore, 2007; Nieuwenboer & Kaptien, 2008; Pinto et al., 2008; Zyglidopoulos et al., 2008; Frost & Tischer, 2014) that have explained the prevalence of corruption through processes of institutionalization, rationalization and socialization as a result **(Refer Fig. 2)** of interaction among different members within the organization. Here the focus is on group processes that lead to the normalization of corrupt behaviours due to the incentives and tolerance of corrupt acts. There emerges fourth theme which includes environmental factors like high taxes, convoluted licensing requirement and inefficient government service delivery (Wu, 2009), quasi monopoly over supply of public goods (Evernsel, 2010), social identity (Misangyi, 2008). This set of studies has highlighted the role of socio-political and economical factors embedded in external environment in explaining the corruption but these factors alone cannot explain organizational corruption. Fifth theme focuses on web of relations between internal and external actors. It includes social ties with the government officers (Collins, 2009), deployment of middleman (Biswas, 2014), family and friend relationship (Bowen, 2012) and relations and mechanisms favouring specific interests (Economakis et al, 2010). These themes can be analyzed further from their theoretical perspectives. Misangayi (2008) notes that the research and practice have been dominated by two alternatives frameworks. The first perspective is based on an economic perspective and focuses on the roles of rational personal cost/benefit analysis, opportunities to exploit discretion for gain. Second one emphasizes on normative and cognitive aspects of corrupt behaviour and stresses the importance of the ways in which organizational settings can generate amoral reasoning and behaviour. In addition, this data set reveals third

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perspective which examines illegal activities by focusing on interpersonal connections between public and private actors who profit from these associations. Jancsics (2012) has categorized these studies as relational model and explain that various advantages such as acquiring certificates, licenses, and contracts can be obtained through these connections. Some researchers (Mackevicius, 2009; Bowen et al, 2011, Agueilera et al ,2011) have employed Cresey's fraud triangle based model consisting of motivation, opportunity, and rationalization factors in their analysis. However present studies have not yet catalogued various opportunities and motivations in the context of organizational corruption. Further, there is lack of studies that systematically analyzes the simultaneous interaction of the three factors. Graycar (2012) had adopted situational crime framework which is close to Kiltgaard's (1988) approach for analyzing past cases to inventory control and opportunity structure by finding conditions having monopoly, discretion and insufficient accountability. However it delimits the form of data to cases and does no pay much attention individual motives. These theoretical models and frameworks are effective conceptual model for explaining corrupt behaviour. However they alone may not fully capture the complexities of corrupt acts from preventive perspective because opportunity does not capture capability factor and collusive behaviours especially concealment scheme which involve external elements and auditors. In sum, above themes highlight the need to adopt systemic perspective to develop CRA framework and to allow more comprehensive means to capture the various aspects of corruption risk. These themes also illustrate that it would be necessary to obtain rich descriptions of 'real world' corrupt transactions and undertake qualitative analysis to find situational factors presenting opportunity and incentives within organization and understand web of corrupt relationships for generating contextual information about corruption risk during CRA.

4.3. Identifying Risks comprehensively

Risk identification is most important part of CRA exercise therefore methods used for identifying risk conditions and vulnerability warrant discussion. Bager (2011), UNGCO (2013) and TI (2013 a) categorize risk factors on the basis of motivation, opportunity, and rationalization/culture, incentives and opportunity. Blundell (2013)

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uses a generic heuristic to describe corruption scheme in assessing corruption risk in forestry sector. Cover et al (2014) suggest developing sector specific corruption typologies to conceptualize corruption. TI (2013 a) recommends to consider external risk by correlating business proportion and CPI score of country while assessing bribery risk for commercial organization. It is appropriate to consider external environment during CRA. In fact, organizations are embedded within a social context and wide spread corrupt practices within society are likely to be diffused to the organizations (Veliotis, 2011). DGHL (2010) recommends that CRAs should find the factors that cause corruption by identifying specific practices within the institution that compromise the institutions capacity to perform its function in fair and impartial manner. Klitgaard et al (2000) recommended identifying conditions conducive to corruption and listing the indicators of potentially corrupt activity on the basis of formula:

Corruption = Monopoly + Discretion - Accountability

Graycar et al (2012) use case analysis to identify opportunity and control structure. ACLEI (2013) corruption risk framework identifies risks through various questions asked from multiple perspectives. Despite multiplicity of approaches and growing awareness about alternative theoretical explanations, risk identification exercise remains a complex issue and needs further clarity. With a view to provide a useful practical tool both for scholars and practitioners, above approaches were meaningfully organized and it's deduced that risk identification can be operationalized in two ways. First, it can begin by identifying risk events through surveys, workshops, desktop research and expert feedback and analyze backwards to pinpoint intermediate and root causes. Alternatively, risk identification may begin with discovering vulnerable areas and undertaking control reviews in these areas or analyzing qualitative data like corruption case, audit reports to uncover unanticipated vulnerabilities. It involves analysis in forward direction to proactively identify situations conducive to corruption. First approach may not discover all potential corruption risks therefore risk identification exercise should embrace bidirectional analysis i.e. backward analysis and forward analysis. As risk identification exercise should essentially identify potential risk

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scenarios – that is to find out what adverse could happen, how it can happen and where it would happen in the organization, it needs multiple level of analysis by using a variety of data to generate contextual information for assembling a meaningful corruption risk map. Vulnerability concept can facilitate multiple levels of analysis in the broader context embracing individual, organizations and environment. Therefore this article develops conceptual understanding of vulnerability in the following section so that understanding of vulnerability concepts can guide practitioners in carrying out bi-directional analysis with systemic perspective to comprehensively identify corruption risks.

4.4. Conceptualizing Vulnerability

Recent findings (Bager, 2011; Vian etal, 2011; Johnston, 2012, Maxwell 2011) highlight the need to identify current vulnerabilities which may be sustaining corruption. Vulnerability analysis gives us an idea of where corruption may be occurring (Vian et al., 2012) and help in clarifying the concept of risk and identifying the areas of concern in the organization. Such an assessment can point to appropriate controls and incentives needed to reduce corrupt dealings (Johnston, 2010). Bager (2008) states that vulnerabilities are defined on a higher level of abstraction, indicating areas where risks are more likely to occur. Johnston (2010) suggests the strategy of assessing the vulnerability by comparing government performance indicators to benchmark for example time, steps, fees needed to obtain permits and register a business. Vulnerability in the earlier research is being referred to as susceptible activities or certain characteristics assessed by abnormal value of indicators. Vulnerability usually occupies chief focus in risk assessment in fields like safety, disaster and security etc. Ernest and Young (2010) also suggests that corruption risk should be viewed in a way similar to health and safety risk because it has similar effect. It was therefore considered appropriate to grasp the understanding of vulnerability concept by borrowing and integrating knowledge from these disciplines. In the field of disaster and safety risk, vulnerability is considered a result of ‘lack of capacity’ or ‘susceptibility to harm’ (Brooks et al., 2005; Gallopin, 2006; Gaillard, 2010; Cardona et al., 2012). Similar definitional approach seems to be useful in conceptualizing vulnerability in the field of corruption risk. However it needs to be refined by taking review finding into

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account. The thematic analysis underscores the need of integrative approaches focusing on the relations between individual dispositions, organizational settings, collective actions and exchange with external environment. Ashforth et al.(2008) also suggested that measuring individual dispositions or organizational characteristics 'in snapshot fashion are unlikely to tell us much about the trajectory of systemic corruption. Authors therefore were guided by Turner's vulnerability framework (2003) which provides a template suitable for reduced – form analysis and yet inclusive of larger system character of the problem. Drawing on the theoretical explanations offered by existing research and learning of thematic analysis, an attempt is made to synthesise vulnerability model with an empirical focus to find how different corrupt incidences can occur in the organizations and a theoretical focus on gaining a deeper understanding of the corruption. The model is depicted in Fig. 3 and presents the broad category of components which impact organization's vulnerability to corruption. It shows that vulnerabilities are rooted in actions and factors embedded in organization and environment thus vulnerability is to be thought as a multidimensional concept. **(Refer Fig.3)** It also illustrates that vulnerabilities will not always lead to corruption unless they are exploited through corrupt actions (UNGCO 2013). It would be therefore useful to identify corrupt practice during CRA to understand how vulnerabilities are exploited. If corrupt exchanges are separated in time and the transfer and counter-transfer have different forms, actors can easily blur the corrupt nature of their transaction (Hipp et al 2010). Leaders can perfectly conform to the established legal norms and yet abuse their traditional authority for personal benefit (Aguilera et al 2008). These findings indicate that detection and prosecution is inherently difficult as corruption is secret and often consensual. Vulnerability therefore also reflects 'unusual difficulties' in detecting and preventing corruption. A sub-set of organizational theme includes factors like absence of effective sanction, absence of code of ethics, weak financial control, unregulated discretion etc., reflects lack of internal control. Internal control failures may result in opportunity for corruption and facilitate rationalization of corrupt practices (Pfizer, 2009). Review of literature on internal controls (Merchant et al 2007, Hared et al

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2013, Berry et al 2009, Nisiyama et al 2016, COSO 2012, Pfizer 2009) shows that these failures may arise due to weakness in the organizational structure, governance system, policy, procedure, processes and boundary systems. Thus vulnerability can arise due to lack of control in the organization. Changes in the internal control will reduce or increase the vulnerability hence vulnerability is to be considered as dynamic and can be described as a set of conditions arising out of interaction of various factors that increases the likelihood of corrupt practices and unethical behaviour. As genesis and evolution of an emergent phenomenon like corruption will vary from organization to organization (Ashforth et al., 2008), an organization can be vulnerable to certain type of corrupt practices and not to others. Even within an organization not all activities and functions will be vulnerable to corruption. Vulnerable activities and functions need to be identified as control over them would reflect the 'characteristics' of vulnerability and reflect corruption risk exposure. The model recognizes importance of externalities in the corrupt exchanges and hypothesizes that individual, organization and external environment affect each other and should form an integral system for carrying out vulnerability analysis. It explains that vulnerability to corruption arises due to factors or conditions which are conducive to corruption that are being viewed as opportunity for organizational corruption and may facilitate rationalization of corrupt practices. It is to be noted that above model is descriptive one and does not explain the strength of impact of vulnerabilities nor does it show the interrelationship between various vulnerabilities. However it can improve risk identification in the organization by facilitating systemic perspective about problem of corruption.

4.5. Understanding vulnerability linkages and role of governance mechanism

Very often corruption schemes are inter related and used in complementary manner that reinforces the effectiveness of each scheme and make them more difficult to combat (Ware et al 2007). However most of the studies on the subject have tended to focus on the antecedents of organizational misbehavior on non-compliances of procurement procedures (Tukuamuhabwa, 2012). Zimelis (2012) pointed up the observation that research on corruption should go beyond simplistic general

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conditions and need to better operationalize the elements of analysis and interconnectedness between various determining factors. This observation is significant in the light of fact highlighted by OECD (2009) that corrupt acts that will occur later can be planned at the stage of need identification and tenders' design and detection probabilities vary considerably according to procurement stages. Further economic, political and personal factors would affect corruption (Bazyar, 2015). For instance, some time insufficient regulation may be put in place to further the corrupt goals. It is therefore necessary to understand vulnerability linkages by covering entire value chain under CRA. Moreover, risk factor in broader governance area may also facilitate corruption schemes in other activities. For example, Trepte et al (2005) pointed out that informal market where price of position is derived from potential corrupt returns may exist and 'the purchase of position' for District Engineers, internal auditors and external auditors that would allow them to participate in corrupt deals. Similarly, corruption can skew incentives that may result in distorted decision making in respect of Budget and Project Prioritization. Earlier findings (Schliefer and Vishny 1993, OECD 2014, Kenny 2006) indicate that funds may be diverted to areas where corrupt actors can better extract bribes from new investment. This review also indicates that only a few studies have been undertaken for identifying risks arising from these broader governance areas. It is therefore necessary that broader governance mechanism linked with personnel management, budgeting and project prioritizations need to be covered during CRA.

4.6. Future Research Direction

Earlier corruption risk research has mostly focused on procurement process and even entire cycle of procurement has not been covered. The contract management phase of public procurement cycle is under-researched and the problem is more severe in case of procurement of infrastructure (CSD 2013). Mixed form of ownership like joint venture or PPP and activities like Sponsorships, Concession provide different type of corruption opportunity and incentive structure which is required to be understood. In fact, conventional activities like manufacturing, selection, and recruitment etc. have also not yet got research attention. CRA exercise relies on multiple data sources for effective risk assessment. At national

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level, macro indicators provide some idea about broader picture. Other sources are survey, interview, workshops corruption and audit reports, etc. At present, no standard analysis approach exists for qualitative analysis of this data. Review reveals that Grounded theory (GT) method has been used recently successfully in corruption study (Kihl et al 2008, Jancsics 2014) for qualitative analysis. Pfiester (2009) had effectively applied GT to discover five broad categories of control failures and finding principles and practices that address these failures. Charmaz (2006) point out that GT is very diverse in its application and can be modified and applied to suit the nature of the research problem. It seems that GT methods can help in conducting systemic analysis of data collected from diverse sources to develop rich and comprehensive understanding of corruption risks by grounding CRA in organizational reality however future research is necessary on the issue. Further, the issue of quantifying the corruption risks remains unaddressed in CRA. In this context, it is pertinent to note that risks faced by organizations may vary from simple to complex ones. The complex risk situations may necessitate interaction with experts and key informants, review of codes and specification and analysis of historical data, studies from other similar systems. Further, comprehensive risk assessment would not limit to identification of technical causes or individual failures but suggest mitigation measures (Manuele, 2008). Therefore qualitative judgment would invariably play important role in CRA. In fact, most of assessment criteria used for corruption risk prioritization are found to be subjective where feedback of experts and key informants usually serves as the basis in most of the cases and deals with economic impacts. These techniques can be improved by including multiple attributes like severity, occurrence and detectability. Another solution may be using quantitative scores backed by qualitative justification for risk quantification as being used in developing Government Defence Anti Corruption Index by TI (2013b). Additional potential alternatives for future research may be found by studying how the similar issue was addressed in fraud risk assessment? Comunale et al (2005) had combined fuzzy logic application with indicator based approach to develop an expert system to assist the auditors in fraud risk assessment. Deshmukh et al (1999) demonstrated use of Analytical hierarchy process to drive a

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single measure of risk of management fraud. Chang (2008) used Grounded theory and Delphi method to select critical risk factors and applied fuzzy theory to calculate risks. Buoni et al (2011) combined think maps, attacks trees, fuzzy numbers and Delphi method to help auditors to better understand and manage fraud scheme. Earlier studies (Savage, 2007; COSO , 2012) recommended using Fault tree, Event tree etc to break a complex risk occurrence which can be qualitative and serve as basis for quantitative models. However a very few studies (Conforti et al 2013; Buoni et al 2011) formalizing such techniques could be found for fraud risk analysis. Fuzzy theory, Delphi, Fault tree and Multi criteria decision technique etc can be explored for assisting in carrying out iterative risk assessment however further research is needed for developing standard assessment technique. Fraud risk literature and various reports from Pricewater Coopers, Association of Certified Fraud Examiner stress the importance of internal control system and audits in uncovering fraud incidences. This review also suggests that internal control play a significant role in preventing corruption that emphasize examination of corruption scheme specific controls and developing their proxy for predictive value in future research and evaluate the associated risk for the "rationalization" factor of various corrupt practices. Another area of research is building an inventory of corruption opportunity and motivational factors. This review could not find any meta study in the research field of organizational corruption. As single research cannot capture all aspects of corruption vulnerability, existing knowledge about leading drivers of organizational corruption risk needs to be organized by aggregating earlier findings through techniques like Meta-analysis as being done in other fields.

4. Proposed CRA Framework

The necessity of a generic framework of CRA analysis for the organizations has been long felt. Although an organizational road map from data collection to process analysis to policy correction would depend, to some extent, on particular features of an organization and specificities of its process or activities or business model. However, it is possible to draw up a generalized framework for CRA. The graphical abstract of proposed CRA frame work is presented in Fig. 4. It has three main phases; (i) data collection and analysis, (ii) risk

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identification and measurement, and (iii) policy correction and risk monitoring.

The framework starts with a general research by studying the governance chain of organization and reviewing the literature about past fraud and corruption issues. This literature survey helps researchers to identify the relevant concepts and their enhance theoretical sensitivity. The data is collected from multiple data sources like audit findings, annual reports, past corruption cases and expert feedback/interviews. Data gathering is driven by theoretical relevance i.e. understanding corruption scheme and finding corruption vulnerabilities. **(Refer Fig.4)**. Risk identification is to be undertaken by using bidirectional analysis to find risk event and identify their causal risk factors. It also involves finding vulnerable areas and proactively identifying situations conducive to corruption from control reviews for discovering risks. With the help of vulnerability conceptual model presented in Fgure- 3, this framework incorporates empirical knowledge of vulnerabilities embedded in different vulnerable areas of the organization and finding how they are being exploited by prevalent corrupt practices or can be abused in alternative corruption scheme. For instance, it can bring out the interrelation and dependence between specific deficiencies of control systems, opportunities of private gain and various actors involved in the corrupt exchanges. In addition it can facilitate relevant information about weak structure, instance of urgency abuse, complexity and presence of divergent norms in the organization. This empirical knowledge will enrich the bidirectional analysis in developing systemic perspective of corruption risk for generating a fruitful corruption risk map. The framework concurrently uses data from IT-enabled processes for comprehensive risk identification. The purpose of using this data is to get all relevant information captured in data that helps in better understanding of processes, outcomes, patterns of procedure non-conformances and relation with private actors. Data on events, inputs, process and outputs can also be used to compare measures and results among different units through benchmarking or comparing the key performance indicators or process characteristics like substantial variation in procurement price, proportion of contract awarded without open bidding, etc. This can be used to discover potential risks and assess

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likelihood and impact of potential adverse events. In the next step, findings inferred from the above analysis are combined to prepare a risk map. It can be assembled by connecting vulnerable position in the various process stages or along the financial flow adopting value chain approach.

As CRA should generate detailed actionable and contextual information on corruption risk for designing appropriate intervention to mitigate risks, it is necessary to undertake qualitative analysis of huge and diverse data. There exists number of qualitative analysis methods which can be used for the purpose. GT is one such method that may be applied to analyze diverse data as it's a general method of analysis that accepts qualitative, quantitative and hybrid data from survey, experiments and case studies (Glaser, 1978). Here, the data is analyzed through iterative process of coding and constant comparison. Coding involves "naming segments of data with a label that simultaneously categorizes, summarizes, and accounts for each piece of data (Charmaz, 2006). Coding leads to making analytic interpretations which help in developing interconnection between factors, mediating strategies and consequences of corrupt exchanges in a systematic manner. It is recommended that process maps may be created for all important activities to develop understanding about them which would improve the process of coding. In fact, ICAC (2011) suggests use of process mapping to understand the procurement process and the vulnerabilities of the procurement process in most of the organizations. Thereafter feedback either through Delphi method or through a specially designed questionnaire or from historical data (if available) is required to be obtained on the likely frequency and impact of the identified risks which along with earlier analysis findings will be used to categorize major and minor risks. Identified major risks should be considered for detailed audit analysis for finding policy correction or change in rules or improving the internal controls. These risks should be informed to functional executives involved in important decision making and need to be monitored through their proxy indicators which in turn may also help in further detection of new risks. CRA findings can also be used to develop self assessment tool for conducting periodic audit of identified major corruption risks. As framework relies on qualitative analysis, it's findings may be evaluated against the criteria adopted from Lincoln et

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al (1985). Table 5 explains these criteria and relate them to quantitative research criteria and mention the measures taken to improve the quality of findings**. (Refer Table No.5)**

5. Conclusion

Systemic and persistent corruption affects developing and developed economies alike (Misangyi et al 2008). It is our place as scholars to suggest useful way of thinking about and acting corruption so that 'no to corruption' becomes an institutional part of the fabric of organizational practice (Asforth et al 2008). However effective and sustainable measures to reduce corruption have proved elusive (Graycar et al 2008). A corollary consequence of the above observations is that there is an urgent need to devise an appropriate system for identifying corruption risks and addressing them. This article is framed to address this need. Literature review also reveals that CRA is useful to public authorities, government organizations and corporate in finding systemic vulnerabilities and arresting opportunities leading to leakage and corruption, however a wider section of traditional activities and new forms of inter-organizational relationships like joint ventures; public private partnerships are required to be covered in future CRA research. With a view to improve understanding of corruption risk perspective, this study provides theoretical foundations of corruption risk and overview of methods used in CRA. Inferences from the earlier findings have been assembled into meaningful themes which would provide useful directions for conducting CRA. Existing methods have been combined to present a bidirectional analytical approach that is expected to be useful to scholars and practitioners as it facilitate comprehensive identification of corruption risks in the organization. Building on review, this paper develops and presents a generic framework for CRA. This framework contributes in several ways. Firstly, it will help in developing systemic perspective of corruption risks in the organization. It consolidates data from separate organization-wide sources and transforms it through systematic analysis into a rich source of useful information which will provide an evidence base for executives for risk mitigation. Thirdly, it attempts to harness the existing technical capabilities of IT in the IT enabled processes to find out new corruption risks in the organizations and monitor the identified risks. Fourthly, it would provide useful insights by making

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linkage between various vulnerabilities clear by incorporating empirical knowledge of vulnerability and uncovering the prevalent corruption schemes. It also suggests methodology for undertaking systematic qualitative analysis of diverse data with a focus to improve validity of CRA output by contextualizing risk identification. Fifthly this framework would also help organizations in establishing self assessment tool that can be integrated with periodic audits to proactively monitor emergence of any new corruption risk. Another major theoretical contribution is the synthesis of a conceptual model for developing the understanding of the concept of vulnerabilities. Vulnerability concept presented in this article helps in clarifying the concepts of risk and generating an effectual corruption risk map for organizations. This review also suggests future research agenda. When future research examines these suggestions, it can provide significant value to the organization. It is pertinent to state that this research work is also having some limitations which are related with methodology used. First, literature search may have failed to capture certain relevant articles despite extensive efforts. Secondly authors recognize their subjectivity about classifying the papers in various thematic spheres.

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Fig.2 Themes Emerging Form Research Data Set.

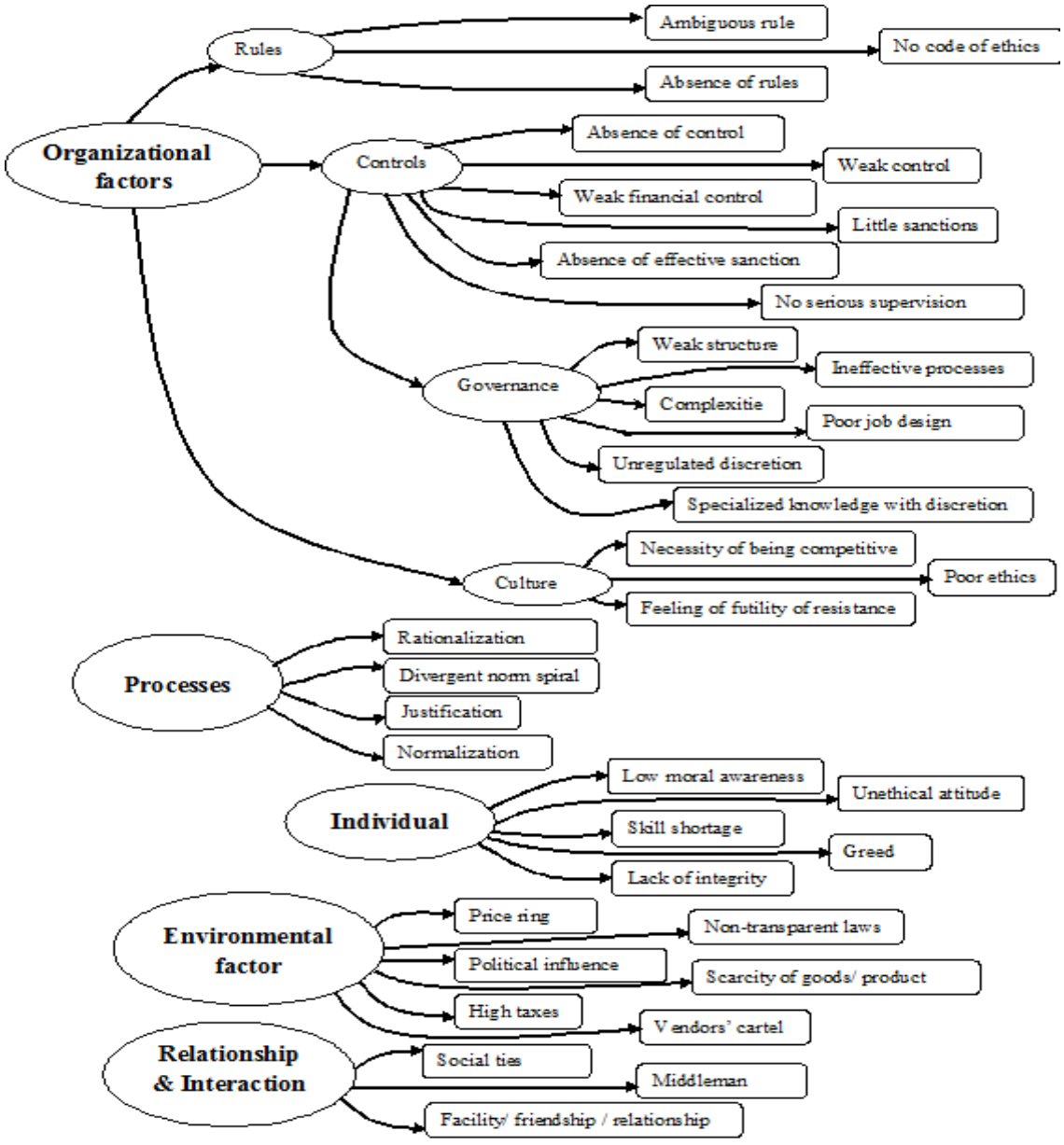

Fig. 2 Themes emerging from Research Data Set

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Fig. 3. Details of Vulnerability Analysis Components

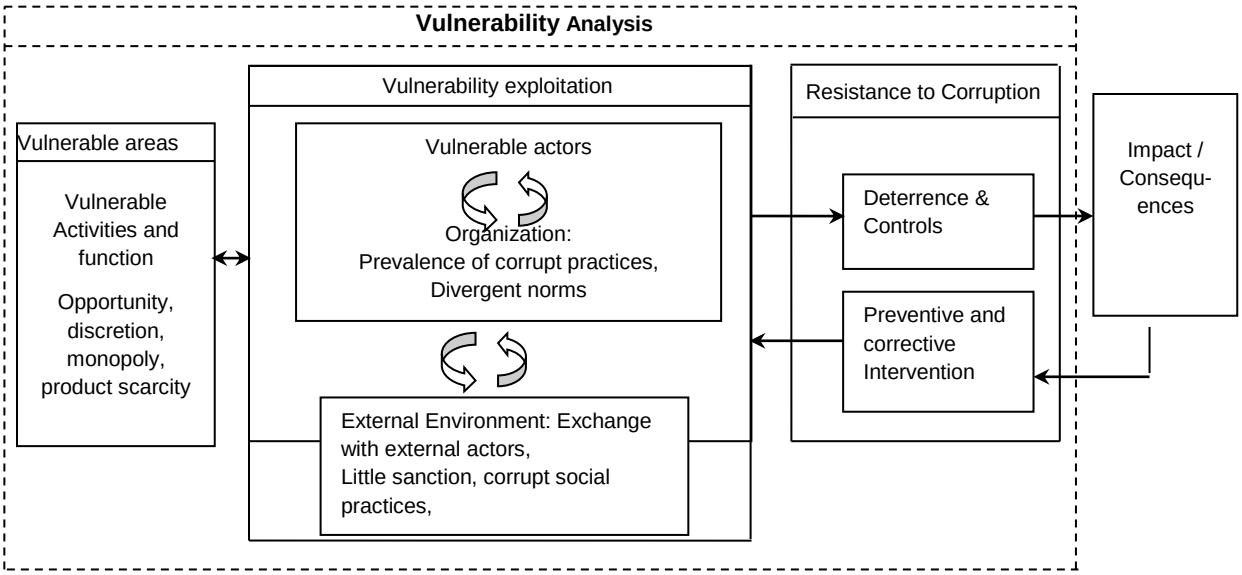

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Fig.4 Corruption Risk Assessment Framework

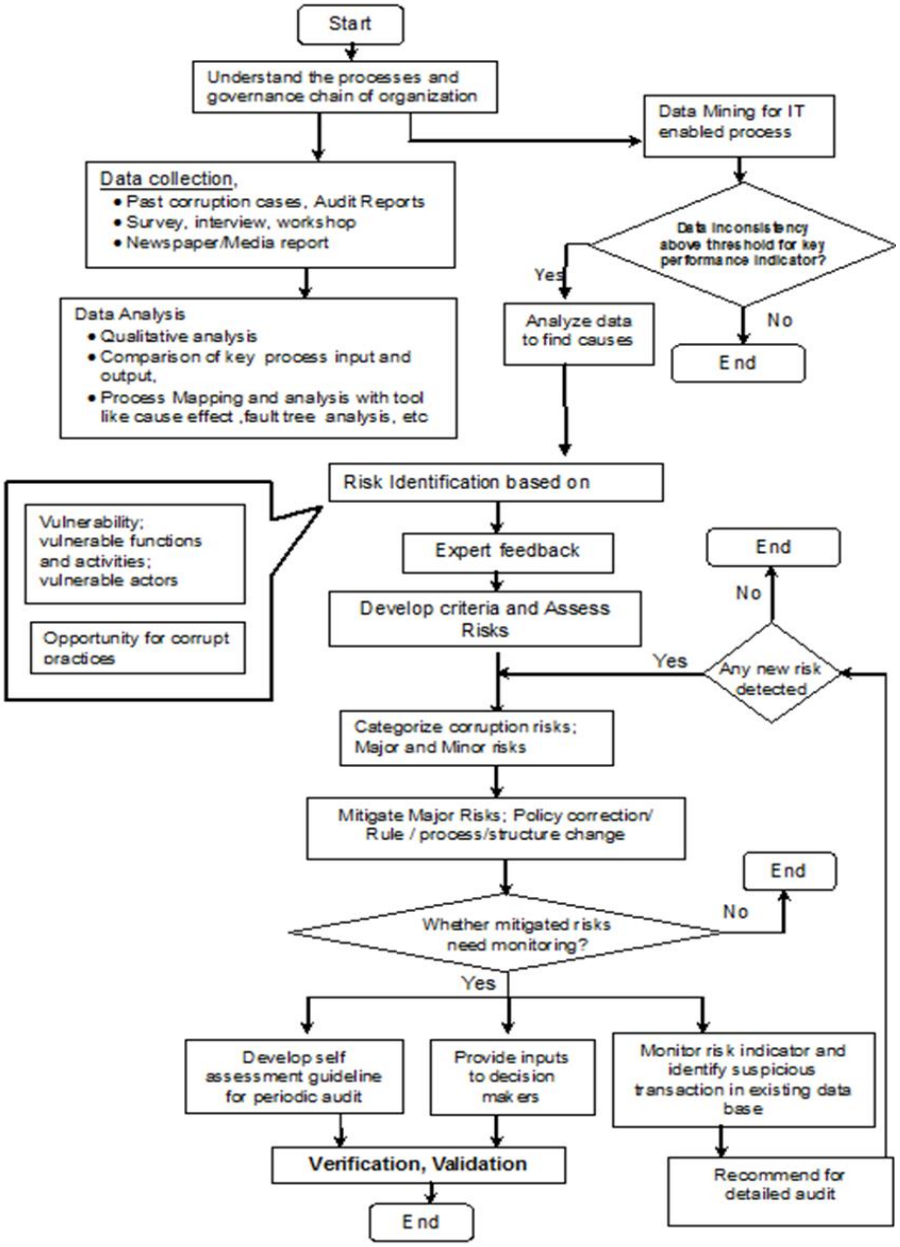

Fig. 4. Corruption Risk Assessment Framework

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LIST OF TABLES:

Table 1- Criteria for Selection and Exclusion

A. Selection Criteria: 1. Time period between 2005-2015 2. Conceptual review 3. Article dealing corruption with Micro perspective 4. Journal articles, Conference papers and work of International bodies engaged in anticorruption work searched electronically by following search terms : i. corruption risks, ii. risk of corrupt practices, iii. corruption vulnerability, iv. identifying corruption risks, v. assessing corruption risks, vi. corruption scheme vii. fraud scheme viii. fraud risk assessment
B. Exclusion criteria by theoretical relevance: 1. Studies in which the primary focus is not micro-perspective. However exceptions were made for certain "foundation" articles. 2. Articles unavailable electronically or by other reasonable means. 3. Book reviews. 4. Non-English language articles with no suitable translation available.

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Table 2- Analysis Protocol

A. Data organization: 1. Arrange papers in chronological order from 2005 to 2015. 2. Prepare Excel workbook for recording and comparing coding the information.
B. Data Analysis: 1. Literature was searched using selection criteria to select the articles and papers were excluded by using exclusion criteria. 2. Full content of each paper was reviewed to develop theoretical sensitivity of researchers. 3. Papers are selected from 'theoretical relevance' perspective for further analysis. 4. Information from selected papers was coded for extracting information, taking into account the author(s)' focus in application domain, research design used to determine the phenomena(on), key findings. Inferences from review learning are combined for capturing risk causality and risk consequence. 5. Factors that make organizations vulnerable to corrupt practices were identified and organized into groups on the basis of thematic similarity. The thematic structure of the reviewed field is mapped in (Fig. 2) to present overview of theoretical field. 6. Existing risk identification methods were meaningfully organized to develop bidirectional analytical approach. 7. Risk assessment literature was reviewed from other established disciplines to borrow and integrate the concepts for vulnerability conceptualization.

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Table 3 - Frequency of use of research methods in Academic research articles and International Agencies' research publication

Methods	Method Frequency in (International Agencies' research publication)	Method Frequency in (Academic research)	Total Frequency
Indicator	7	1	8
Survey/Interview	4	10	14
Case Study/ Analysis	0	2	2
Data Mining	0	1	1
Co-relation study	1	1	2
Audit	1	0	1
Logic and probabilistic model	0	1	1
Theoretical	13	19	30
Business game	0	2	2
Value chain analysis	2	0	2
Qualitative meta analysis	0	1	1
Mixed	6	10	16
Total	34	48	82

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Table 4- Authors by type of Research Methods

Methods	Name of the Authors/Publication
Indicator	Savona, E. U. and Martocchia, S., (2006). Fazekas, M., Toth, I. J. and Peter, l., (2014), Kenny, C., (2007), Stanley, K. D., Loredo, E. N., Burger, N., Miles, J. N. V. and Saloga, C. W., (2014), TI (2013b), Ware, G. T., Moss, S., Campos, J. E. and Noone, G. P., (2007), World Bank (2010), Wensink, W. and Jan, M., (2013).
Survey/Interview	Collins J. D., Uhlenbruck K. and Rodriguez P. (2009), Frost, J. and Tischer, S., (2014), Gbadamosi, G. and Joubert, P., (2005), Gopinath C. (2008), Heywood, P. and Meyer-Sahling, J., (2013), Karmann T., Mauer R., Flatten T. C. And Brettel M. (2014), Lindgreen A. (2004), Rama M., (2012), Schultz, J. and Søreide, T., (2008), Wu X., (2009). Buromensiky M, Serdiuk O, Osyka I, Syrotenkos, Shekhovtzov T, Volianska O, Kalchenko S and Company MAConsulting (2009), Ewins, P., Harvey, P., Savage, K. and Jacobs, A. (2006), ICAC (2011), Pashov, K., Valev, N. and Pasheva, (2010).
Case Study/ Analysis	Ojha, A. And Palvia, S., (2012), Zyglidopoulos, S. C., Fleming, P. J. and Rothenberg, S., (2009), Zyglidopoulos, S. C., Fleming, P. J. and Rothenberg, S., (2009).
Data Mining	Balannik, R., Besciere, P., Mazer, E. and Cobbe, P., (2012).
Co-relation study	Lopez, J. A. P. and Santos, J. M. S., (2014). Mulcahy S., (2012).
Audit	Khan, M. A., (2006)
Logic and probabilistic model	Solojentsev, E. D., (2006).
Theoretical	Arjoon S., (2006), Ashforth, B. E., Gioia, D. A., Robinson, S. L. and Treviño, L. K., (2008), Aguilera R.V. and Vadera A. K., (2008), Bager, G., Korbuly, A., Pulay, G., Benner, H., Haan, I. , Vos-Schellekens, J., Van E. D., (2008), Bishara N. D. and Schipani C. A. (2009), Chhralkovska, J., Jansky, P., and Mejstrik, M., (2012), Galang, R. M. N., (2012), Georgiev, V., (2013), Hess D., (2009), Hannah S. T., Avolio B.J. and May D. R., (2011), Hansen, H.K., (2011), Moore, C., (2007), Misangyi, V. F., Weaver, G. R. and Elms, H., (2008), Mackevicius, J. and Kazlauskiene, L., (2009), Martin, A. W., S. H. Lopez, V. J. Roscigno and R. Hodson, (2013), Nieuwenboer, N. A. and Kaptien, M., (2008), Pinto, J., Leana, C. R. and Pil, F. K., (2008), Petkoski D., Warren D. E. and Laufer W. S.,(2010), Vian, T., Brinkerhoff, D. W., Feeley, F. G., Salomon, M. and Vien, N. T. K., (2012). ADB (2011), Cohen, J. C., (2006), DGHL (2010), Halpern, J., Kenny, C., Dickson, E., Ehrhardt, D., and Oliver, C., (2008), Kenny, C., (2006), McDevitt A., (2011), Savage, A. (2007), TI (2013a), UNGCO (2013), World Bank (2009), Williams, A. (2014), World Customs Organization (2015), Willems and Theodorakis (2016).
Business game	Rabl, T. and Ku¨hlmann, T. M., (2008), Rabl, T., (2011)
Value chain analysis	Patrion, H. A., and Kagia, R., (2007), Plummer, J. and Cross, P., (2007).
Qualitative meta analysis	Tenbrunsel A. E. And Smith-Crowe K., (2008)
Mixed	Bager G. (2011), Bowen, P. A., Edwards, P.J. and Cattell, K., (2012), Biswas M., (2015), Cover, O. and Mustafa, S., (2014), Geetanee, N., (2006), Maxwell, D., Bailey, S., Harvey, P., Walker, P., Sharbatke-Church, C. and and Savage, K., (2012), SÖÖt, M., (2012), Smith-Crowe, K., Tenbrunsel, A. E., Chan-Serafin, S., Brief, A. P., Umphress E. E. and Joseph, J., (2014), Voliotis, S., (2011), Zou, P. X. W., (2006) Blundell, A. G. and Marwell E. E., (2010), Døssing, H., Mokeki, L. and Weideman, M., (2011), Trivunovic, M., Johnsøn, J., Mathisen, H., (2011), AFP (2013), World Bank (2007), Zuleta, J. C., Leyton, A. and Ivanivic, E. F., (2007).

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Table 5 - Evaluation Criteria for Measuring Quality and Measures to Improve Quality of CRA

Quantitative Research	Qualitative Research	Criteria Explanation	Measures taken to improve quality
Internal Validity	Credibility	It represents congruence of findings with reality.	The proposed framework uses multiple data sources that facilitate convergence and corroboration of information from different sources. The triangulation of data source will help in enhancing findings' credibility.
External validity	Transferability	It refers to applicability of findings to other contexts.	Analysis of past data used in this framework from key/similar organizations would instantiate common corrupt practices and provide general pattern of corruption risk which improves the transferability of findings to other contexts.
Reliability	Dependability	It refers to the stability of data over time and under different conditions.	Provision of iterative risk assessment along with feedback about intervention effect and generation of contextual information are expected to lend the conformability to the CRA output.
objectivity	Conformability	It refers to objectivity and implies that the data accurately represent the information.	Learning from the review has been used to strengthen conceptual understanding and then combined with knowledge from other established disciplines to define various stages and assembled into CRA framework in a systematic manner to improve the dependability.