Journal Club Presentations (Academic Year 2019-20)

Sr No.	Date	Topic	Presenter
1	3rd October 2019	Training Need Analysis In Government Regulatory Firms	Dr. Kanchan Akshay
2	24th October 2019	Indian Financial Sector- PMC Bank Collapse	Prof. Dipti Periwal
3	14th November 2019	Traceability in the Supply Chain	Prof. Vibhuti Save
4	21st December 2019	Key Research Dimension- Part 1	Prof. Mahesh Bhanushali
5	27th January 2020	Key Research Dimension- Part 2	Prof. Mahesh Bhanushali

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Meenakshi Malhotra <mmalhotra@vpmthane.org>

Journal Club Schedule for 2019-2020

1 message

Meenakshi Malhotra <mmalhotra@vpmthane.org> Tue, Sep 3, 2019 at 12:13 PM
To: faculty-BRIMS@googlegroups.com
Cc: "Dr. Nitin Joshi" <njoshi@vpmthane.org>, drguru1@rediffmail.com

Dear Team,
The Journal Club met last in June 2019. We shall kick-start the Club meets from this month. Attached is the schedule of the Journal Club from September 2019 to June 2020. Anyone having any issue regarding the date of their journal club presentation can inform by this week so that the changes can be done accordingly.

Looking forward to learning, interactive and informative meets.

Regards,
Dr. Meenakshi Malhotra
Assistant Professor
Dr. V. N. Bedekar Institute of Management Studies, Thane (W).

Journal Club Schedule.docx
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Dr. V.N. Bedekar Institute of Management Studies * VPM's Thane

DR VN BRIMS

Purpose of the Meeting	: Journal Club - Prof. Mahesh B.
Date	: 27/01/2020

Sr. No.	Name	Signature
1.	Kanchan Akerkar	27/01/2020
2	Dr. Meenakshi Malhotra	
3	Ds. Smita Jajoo	27/1/20
4.	Dr. Pallavi Chandwaskar	27/1/2020
5.	Vibhuti Sare	
6.	Dipti Perumal	
7.	Siddhesh Soman	
8.	Sandeep Moghe	
9.	Sekhar V.	
10.	Komal K. Punjani	
11.	Pravin Narang	
12	Asloph John Vieira	
13	Dr. M. Sreedharan	
14	Nitin Joshi	
15	Dr. Guruprasad Murthy	
16	Mahesh Bhanushali	

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Sr. No.	Name	Signature

Purpose of the Meeting	: Journal Club presentation - key Research dimensions
Date	: 21/12/2019

Sr. No.	Name	Signature
01	Mahesh Bhanushali	Bhanushali
2.	Meenakshi Malhotra	Meenakshi
3.	Vibhuti Save	
4	Ds. Smita Jape	21/12/19
5	Dipti Perwal	Dipti
6	Siddhesh Soman	Siddhesh
7.	Krunal K. Punjani	21/12/19
8.	Sandeep Moghe	
9	Pravin Narang	21/12/19
10.	Adolph John Vieira	21/12
11	Dr. Sreedharan	
12.	Nitin Joshi	
13	Dr-Gunaprasad Murthy	

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Sr. No.	Name	Signature

Journal Club Presentation on Key Research Dimensions

By
Mahesh Bhanushali,
Assistant Professor, DR.V.N BRIMS

Under the Guidance of
Dr. Guruprasad Murthy,
Director General, DR.V.N BRIMS
21st December 2019

1

What is research?

- **Research.**
- The systematic investigation into and study of materials, sources, etc, in order to establish facts and reach new conclusions.
- An endeavour to discover new or collate old facts etc by the scientific study of a subject or by a course of critical investigation.
- [Oxford Concise Dictionary]

2

2

What is research? (Cont)

- Research is what we do when we have a question or a problem we want to resolve scientifically
- We may already think we know the answer to our question already-Perception bias
- We may think the answer is obvious, common sense even. Yet research methods need to be deployed
- However until we have subjected our problem to rigorous scientific scrutiny, our 'knowledge' remains little more than guesswork or at best, intuition/perception

3

3

What is research?

- First priority is to formulate the question
- Then identify how the question is to be addressed
  - How have others answered it?
  - How does your proposal fit in with what others have done?
- Then you can present your answer

4

4

Importance of Research

The main purpose of research is to inform action, to prove a theory, and contribute to developing knowledge in a field or study.

- A Tool for Building Knowledge
- Facilitate Learning based on scientific findings
- Resource for consultation and MDPs
- Self development and career opportunities in academics/other platforms
- Means to find and gauge Opportunities of doing and using research

5

5

Metrics used to measure quality of Research

- **Citation**
- **Journal Impact Factor**
- **h-index**
- **i10 index**
- **g-index**
- **Average Number of Citations:**
- **Citation Per Capita (CPC)**
- **International collaboration:**

6

6

Metrics used to measure quality of Research

- **Citation**
- ✓ A citation is when one paper explicitly refers to another paper. There is indication in the text of the paper and full reference is given in the bibliography
- ✓ E.g (Tinker and Tailor, 1973)
- **Journal Impact Factor**
  - Number of citations to a journal in a given year from articles occurring in the past 2 years, divided by the number of scholarly articles published in the journal in the past 2 years

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Example: Journal Impact Factor

- Calculation of 2010 IF of a journal:
- A = the number of times articles published in 2008 and 2009 were cited by indexed journals during 2010.
- B = the total number of "citable items" published in 2008 and 2009.
- A/B = 2010 impact factor
- Source: https://researchguides.uic.edu/if/impact

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Metrics used to measure quality of Research

- **h-index**
  - "A scientist has index *h* if h of his/her Np papers have at least h citations each and the other (Np-h) papers have no more than h citations each" (Hisrch 2005)
  - Eg an h-index of 25 tells us that an author has written 25 papers which have each been cited at least 25 times
  - A h-index of 20 means that an academic has published at least 20 papers that have received at least 20 citations each. The h-index thus combines an assessment of both quantity (number of papers) and an approximation of quality (impact, or citations to these papers).

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9

Example h-index

- In the below example, an author has 8 papers that have been cited 33, 30, 20, 15, 7, 6, 5 and 4 times. This tells us that the author's h-index is 6.

Articles	Citation numbers	
1	33	
2	30	
3	20	
4	15	
5	7	
6	6	= h-index
7	5	
8	4	

What does an h-index of 6 mean?
•An h-index of 6 means that this author has published at least 6 papers that have each received at least 6 citations.

10

10

- **i10 index**
  - i10 index refers to the number of paper with 10 or more citations. It was introduced in July 2011 by Google as part of their work on Google Scholar, a search engine dedicated to academic and related papers
- **g-index**

➢ Given a set of articles ranked in decreasing order of the number of citations that they received, the g-index is the unique largest number such that the top g articles received together at least g2 citations.

➢ A g-index of 20 means that and academic has published at least 20 articles that combined have received at least 400 citations. However, unlike the h-index these citations could be generated by only a small number of articles. For instance an academic with 20 papers, 15 of which have no citations with the remaining five having respectively 350, 35, 10, 3 and 2 citations would have a g-index of 20, but a h-index of 3 (three papers with at least 3 citations each).

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Thank You

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DR V N BRIMS

Purpose of the Meeting	:	Journal Club.
Date	:	14/ NOV./2019

Sr. No.	Name	Signature
1	Dr. Meenakshi Malhotra	
2.	Dipti Perwal	
3.	Kandan Akshay.	
4	Dr. Smita Jagre	14/11/19.
5.	Pravin Narang	
6.	Mahesh Bhanushali	14/11/19
7.	Siddhesh Soman	S.S.soman
8	Sekhar. V.	
9.	Adolph Johnvinia	
10	Mr. M. Sridharan	
11	Dr. Gumpracad Murthy	
12.	Vibhuti Save	

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Traceability in the Supply Chain

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ABSTRACT

Traceability in firms' supply chain operations has become increasingly important today, calling for greater scrutiny and transparency. Firms have responded by increasing and improving product traceability throughout their global supply. Traceability is a significant benefit to firms. Areas affected include quality control and product safety, tracking product recalls, and reverse logistics. Research does exist on the importance and benefits of implementing traceability initiatives but in very targeted areas. In addition, missing from the literature is the important discussion of what factors predicate firms to implement traceability initiatives beyond those prescribed by law and how industries other than very specific categories, create and implement effective traceability initiatives throughout the supply chain. In turn, the purpose of this research is to investigate traceability to gain greater understanding of why firms implement traceability & what actions or initiatives lead to greater traceability effectiveness.

KEYWORDS

Contingency Theory, Supply Chain Effectiveness, Supply Chain Management, Traceability

INTRODUCTION

Global supply chain traceability has become an increasingly important issue in recent years with calls for greater scrutiny and transparency (Steven, 2015; MacCarthy et al., 2016). Government, media, industry groups, suppliers, customers, and firms themselves are all interested in a deeper understanding of how firms manage their global supply chains in terms of information exchange (Silverstro & Lustrato, 2014), quality control (Chen et al., 2014), supplier management (Handfield et al., 2015), disruption avoidance (Kleindorfer & Saad, 2005), and risk management (Grötsch et al., 2013). Recent supply chain safety and security issues in different industries, including restaurant (e.g., Chipotle), pharmaceutical (e.g., Heparin issue 2008), consumer food (e.g., e-coli in hamburger), and energy (e.g., oil rail cars), have further exacerbated demands that firms improve supply chain traceability. As a result, firms have started to increase and improve product traceability throughout their global supply chains in order to have readily available information for internal use and to satisfy stakeholder demands (Shafiq et al., 2014).

IMP

A long history of research exists pertaining to agriculture, food networks, and the food supply chain overall (Fearne, 1998; Mattevi & Jones, 2016). Targeted information systems research has

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studied the traceability abilities of software, which tends to focus on version updates (e.g. Ramesh & Jarke, 2001). In the context of these industries, traceability has been extensively studied from different perspectives, including the importance and benefits of implementing traceability initiatives (Fearne, 1998; Mattevi & Jones, 2016). Also, traceability is a significant benefit to firms in terms of managing quality control and product safety, tracking product recalls, and optimizing reverse logistics processes (Chen et al. 2014; Dai et al., 2015). Recently, there has been more research covering tools to effectively and efficiently manage traceability in the supply chain. Information technologies such as RFID have become important enablers for tracing products/services through the supply chain because they promise improved speed, transparency and security of information sharing (Jakkhupan et al., 2015; SAE, 2015; U.S. House of Representatives, 2007). Serialization is another track-and-trace system adopted by the pharmaceutical supply chain to extend the identification of drugs down to the individual level, so that each unit can be traced from its origin (Mallesh et al., 2015).

Yet, for all its purported benefits, traceability can be difficult to implement both internally and across the supply chain. Implementation is difficult because of the complex and dynamic factors that are inherent in today's global business environment. Firms often struggle to obtain critical, accurate, and up to date logistics information from supply chain partners (Mattevi & Jones, 2016). Also, the breadth of the ways companies receive and utilize information differs from firm to firm and supply chain to supply chain (Mattevi & Jones, 2016). Finally, some firms and industries feel significantly greater pressure than others to implement traceability initiatives in their supply chains because [1] they have high product and supply chain complexity and risk; or [2] they are in the sectors with regulations governing documented traceability processes (e.g. pharmaceuticals and food products). Regattieri et al. (2007) propose that a general traceability framework for food products consists of four pillars of product identification, data to trace, product routing and traceability tools. Based upon Regttieri et al.'s framework, Hu et al. (2013) analyze the implementation of a traceability system in the vegetable supply chain in China.

Practices in the food industry often require traceability be considered an integral part of logistics management including reverse flow and storage of goods, services, and related information (Bosona & Gebresenbet, 2013; Kumar et al., 2015). Yet streamlining reverse logistics process has traditionally been seen as a low priority because collection, reuse and reprocessing of returned materials require integration at various levels of a supply chain. When products are moving against the normal flow, process integration becomes a challenge across organizational boundaries. A traceability system can be an effective mechanism for reverse logistics as it [1] facilitates to establish a standard operating procedure so that a company can act quickly to handle a return with reduced costs in reverse logistics (Kumar et al., 2015); and [2] assures visibility and traceability of information and responsive communication among consumers, employees, suppliers, government agencies, and other affected participants along a supply chain. This is critical to efficiency and effectiveness of reverse logistics, and the reputation and image of a company as well (Bosona & Gebresenbet, 2013).

Although previous studies have demonstrated that traceability system implementation is a complex task, the traceability literature still lacks in important discussion of what factors predicate firms to create and implement effective traceability initiatives throughout the supply chain. This is particularly of initiatives beyond those prescribed by law and in specific industries (e.g., food/agriculture/information systems/electronics). Thus, the purpose of this research two-fold: First, to investigate why firms implement traceability, in addition to regulatory mandates, and second, to better understand which actions or initiatives lead to greater traceability effectiveness in a cross-section of firms in diverse industries. We address this dual purpose by using contingency theory to help explain traceability initiatives in firms via five dimensions of traceability: top management support (TMS), nonconforming process management (NCPM), lot traceability (LT), and internal (ITP) and external traceability processes (ETP).

The next section reviews the relevant literature on traceability and introduces the theoretical background of our research, followed by development of the research hypothesis. Then, we discuss

the research methodology, the study, and the results of data analysis. Finally, implications, limitations and possible future research directions are provided.

THEORY AND HYPOTHESES DEVELOPMENT

Contingency Theory and Traceability

Contingency theory considers the impact of environmental factors on an organizational structure, strategic decision making, and efficiency and effectiveness-driven performance criteria (Donaldson, 2001; Ruekert et al., 1985). The theory further suggests that firms will focus internal resources and competencies in order to develop a strategic contingent response to the changing environmental variables in order to remain competitive (Germain et al., 2011; Luthans & Stewart, 1977). The turbulent and uncertain nature of today's global business environment motivates managers to develop a contingent response in the form of strategies which change supply chain structures in order to "fit" with the external environment to remain, or become, competitive (Germain et al., 2011).

The contingency approach explains that managers consider the interrelationships among environmental, management, and performance variables (Luthans & Stewart, 1977). In the context of traceability, firms implement a contingent response to demands on the firm from the external environment (e.g. stakeholder concerns, competitive environment, industry characteristics), the internal environment (e.g. top management directives), with the overall strategy of improving the competitiveness of the firm (Thompson, 1967; Luthans & Stewart, 1977). In line with this thinking, Barratt et al. (2007) explain that implementation of traceability initiatives can enable firms to create unique resources that others may not be able to imitate and differentiate firms from their competitors.

Traceability is defined as "the ability to identify and verify the components and chronology of events surrounding products at all stages of the supply chain" (Skilton & Robinson, 2009, p. 41). Traceability applies to the tracking of products from their raw materials through transformation into a consumer product, and finally distribution. Effective supply chain traceability helps manufacturers feasibly and accurately track raw materials, WIP, and finished goods and services, wherever they may reside in the supply chain. Traceability can be beneficial to consumers, manufacturers, auditors, and other stakeholders involved in the supply chain process through the measurement of product and service history. This allows for supply chain transparency, improves record accuracy, and gives firms the means to maintain close control over their products. The implementation of traceability measures can also improve firms' competitiveness.

In the context of traceability, contingency theory posits that managers are more likely to implement initiatives in industries and competitive environments where product and supply chain complexity and risk are higher (Grötsch et al., 2013). This is because complexity and risk create unique situations in which managers must be proactive and manipulate their resources and strategies to fit with this challenging external environment in order to remain or become competitive (Grötsch et al., 2013).

Dimensions of Traceability Effectiveness

This research adapts elements from four key studies on traceability information models and then distills those elements into five key dimensions of traceability effectiveness. The four studies include Bechini et al. (2008), who introduce a data model for traceability, ECR (2004) research that develops a set of best practices for product traceability, research by Jansen-Vullers et al. (2003) that identifies a framework of four elements of traceability based on various traceability definitions, and Kelepouris et al. (2007), who create a complete traceability model. The five dimensions of traceability effectiveness used in this research and their relation to each of the aforementioned studies are detailed next.

Jansen-Vullers et al. (2003) state traceability activities should, at a minimum, include lot traceability, management involvement, and internal and external reporting for traceability data retrieval. Similarly, ECR (2004) posited four key traceability principles in the same theme: traceability capture

and recording procedures, physical lot traceability, internal management/retrieval of traceability data, and external data communication of traceability data. Requirements other than just legal considerations that drive traceability within the supply chain have also been discussed. These include management buy-in as a strategic goal, specific processes for product traceability to maintain safety and quality, unique lot traceability, and systems to store and allow retrieval of data from both internal and external sources (Bechini et al. 2008). Finally, Kelepouris et al. (2007) furthered the work by Jansen-Vullers et al. (2003) and ECR (2004), comparing the two models and combining the elements into a complete traceability model with five elements.

Adapting concepts the previous studies, we propose five key dimensions that are critical to traceability effectiveness: top management support, nonconforming processes/procedures, lot traceability, internal systems management for traceability, and external systems management for traceability. Individual items for each dimension scale were adapted from Speier et al., (2011). To test the items and scales for face validity, short interviews were conducted with supply chain managers from different industries. These interviews were transcribed and analyzed. The participants' responses were consistent with our five identified dimensions and consistent with the literature in the field of product/service traceability.

Top Management Support

Full traceability in the supply chain requires participation and support by internal and external supply chain partners, including top management (Kelepouris, 2007). Strategic guidance from top management is needed to commit financial resources to projects, to provide moral support, and to ensure task delegation (Gunasekaran & Ngai, 2004). Furthermore, the relationship between strategy and traceability is a top-down approach; successful traceability initiatives are often initiated and championed by top management. Contingency theory explains that top management is in a position to recognize the demands coming from stakeholders for traceability initiatives, and move them forward as unsupported initiatives can often be ignored or set aside.

Non-Conforming Processes/Procedures and Lot Traceability

Traceability system must also include formal non-conforming processes/procedures and control mechanisms for lot traceability for success (Bechini, 2007; Merminod & Pache, 2011). Non-Conforming process/procedures and lot traceability represent two similar, but unique constructs. The former focuses on the degree to which a firm has established processes/procedures in place for sharing information in a timely fashion in the case of a traceability issue. The latter, lot traceability, is the specific manifestation of processes/procedures as the mechanism to identify where a quality or abnormal issue originated. Lot traceability allows a firm to understand the origin, routing, and transfer of those products/services in the case of a missed shipment, contamination, etc. (Speier et al., 2011). Together, non-conforming processes/procedures and lot traceability provide a first line of defense by which to prevent, detect, respond, and recover from a product/service traceability issue.

Previous research indicates that elements such as processes/procedures for non-conformance and concrete lot traceability enhance the flow of information between supply chain partners (Blackhurst et al., 2005). In addition, supply chain dynamics can be captured and uncertainty reduced when using these elements for internal and external communication (Merminod & Pache, 2011).

Internal and External Systems Management

Firms employ internal and external systems and relationships to effectively manage information when full traceability is required (Viaene & Verbeke, 1998). Sarpong (2014) also discusses the issues and concerns behind internal as well as external systems for traceability. Furthermore, there must be interaction between internal and external systems management for supply chain traceability, including processes for how buyers and suppliers transfer responsibility (Kelepouris et al., 2007; Merminod & Pasche, 2011).

Internal

Internal systems management for traceability assess the degree to which a firm has integrated methods for product/service traceability within their organization. Firms with integrated methods for product/service traceability are should be able to identify potential problems early and to better respond should an issue occur (Senneset et al., 2007).

Managers tend to develop and adopt internal traceability systems mainly to improve quality; traceability can be seen as a subsystem whose presence is essential to the management of product/service quality (Peri, 2002). Firms typically establish internal systems for traceability through entities such as ISO or through techniques such as failure modes effects and criticality analysis (FMECA) (Bertolini et al., 2006). For example, the ISO 22005 Traceability Standard requires that each company know their immediate supplier and to whom the product is being sent. ISO 22005 also states that food safety is the joint responsibility of all the providers involved (International Organization for Standardization, 2007). FMECA is a technique developed by Ford Motor Company and the United States Military (Mode, 1988; US Military Standard, 1980; US Military Standard, 1983) that identifies and assesses how potential failures can affect the performance of a process or product.

External

External traceability is described as the processes of physically handing over a traceable product from one traceability partner to another (Veronneau & Roy, 2009). Collaboration with external partners has long been cited as critical factor in any program to ensure visibility and traceability of products and services within a supply chain (Rinehart, et al., 2004; Voss et al., 2009). External systems for traceability include procedures to monitor, collaborate, and define consequences from areas such as contamination, quality, and/or non-conformance. Research by Ellis et al. (2010) and Speier et al. (2011) state that as the level of supply complexity and risk increases, the more likely firms are to select suppliers who are better able to trace products/services throughout the supply chain.

When actors in supply chain reach agreement to share information with each other, the next step is to utilize information sharing to improve supply chain performance. By revealing necessary information to all actors, the actors will clearly find out the sequence of operations and activities and therefore be able to coordinate each other activities along the supply chain (Kärkkäinen et al., 2003). In addition, this enables down-stream firms to monitor and control upper-stream production quality (Lyles et al., 2008).

Lyles et al. (2008) posit that using traceability to monitor and/or control upstream suppliers is mainly to control product/service quality from the upstream perspective. However, the implementation of traceability is not the absolute way of solving operational problems. For example, product quality problems can emerge due to buyer inability to create transparency with their suppliers and detect the origins of mistakes (Lee & Özer, 2007). Also, even with traceability initiatives in place all along the supply chain, sources of failure may still emerge if traceability does not cover all crucial points where problems may occur (Bertolini et al., 2006).

Hypothesis Development

Each of the five dimensions of traceability effectiveness were operationalized and measured using items adopted from four studies: Benchini et al. (2008), ECR (2004), Jansen-Vullers et al. (2003), and Kelepouris et al. (2007). The hypotheses attempt to synthesize key factors across these five dimensions in order to contextualize the dimensions into contingent responses as initiatives that address each dimension issue. From a contingency perspective, the response by managers is an attempt to "fit" strategies to external factors by dedicating resources to specific initiatives and operations (Grötsch et al., 2013). The factors are drawn from Clarke (1997), Lyles et al. (2008), Speier et al. (2011), and Perrow et al. (1984) and were adapted to aid in the development of four key factors that impact a firms' product/service traceability in the supply chain. The first two are firm ISO certification and supplier ISO certification and represent the internal environment, as ISO certification processes

are ultimately initiated and controlled by the buying firm. Speier et al. (2011) speak to establishing standardized policies via a common certifying body.

The next two factors are supply chain complexity and product/service risk and represent the external environment. Firms that seek to reduce supply chain disruptions do so by actively managing their supply chain complexity (Perrow et al., 1984; Speier et al. 2011). Furthermore, Clarke (1997), Lyles et al. (2008), and Speier et al. (2011) all speak to how firms with higher risk products/services act more cautiously than firms with lower risk products/services. Each of the four factors are described in the following sections, and then related to the five constructs representing traceability effectiveness.

Firm ISO Certification

Established norms and/or codified requirements for a product or service are often established on technical performance or material standards by governmental agencies (e.g., FDA, U.S. Consumer Products Safety Commission) or industry organizations/associations (e.g., International Standards Organization - ISO) (Marucheck et al., 2011). Many industry standards are voluntary and while compliance is expected and supervised, there is no legal action for non-compliance. The most common public standards are those of the International Standards Organization (ISO). Of the ISO standards the most ubiquitous (industry independent and global in nature) are the ISO 9000(1) series of quality standards and the ISO 22000 standard dedicated to management of safety across supply chains (Trienekens & Zuurbier, 2008). Many guidelines require that manufacturers meet ISO standards for compliance (e.g., the FDA's Good Manufacturing Practice - GMP).

However, realized benefits of standards have been mixed with some debate on whether they promote better product/service quality and signal good management or, if they simply promote a more minimalist management style of only doing what is necessary to meet standards and requirements (Corbett et al., 2005; Sroufe & Curkovic, 2008). Ultimately, research finds that ISO does provide some tangible benefits, including enhancing internal and external product/service traceability, developing better transfer of product/service information to suppliers upstream in the supply chain, consolidating audits across the supply chain, and improving supplier's standards (Trienekens & Zuurbier, 2008). Moreover, Henson and Reardon (2005) posit that in addition to ensuring improved traceability and safety, standards also provide a form of differentiation and a competitive advantage when management supports the certification effort. Therefore, we hypothesize:

Hypothesis One (H1): Firms that are ISO certified have increased/better _____ than those firms, which are not ISO certified.

1. top management support
2. non-conforming processes/procedures
3. lot traceability
4. internal systems management for traceability
5. external systems management for traceability

Supplier ISO Certification

Supply chain managers have an on-going concern about the quality of their suppliers. Supply chain transactions have become increasingly distant as well as global, making it particularly difficult for buyers to observe and manager all of their suppliers' required qualifications. Some firms have begun to look at multinational standards to act as a proxy for unobservable qualifications. Over time, ISO certifications have become part of the criteria for supplier selection (Thaver & Wilcock, 2006). In fact, many firms find that to participate in global markets, ISO certification is a requirement (Terlaak & King, 2006). ISO certifications also can signal to both potential customers and competitors a

favorable operational performance and/or competitiveness as a supplier (Terlaak & King, 2006; Thaver & Wilcock, 2006).

Larger firms with better developed management strategies (e.g., enhanced supplier selection criteria, larger search sets, and more stringent supplier requirements) tend to choose suppliers that are ISO certified (Terlaak & King, 2006). They also argue that meeting ISO certification help ensure compliance with a wide range of quality system requirements (e.g., non-conforming processes/procedures, lot traceability, internal and external systems management). Darnall and Edwards (2006) research affirms that quality-based management systems require an organization-wide commitment to continuous improvement of the firm's products/services. Therefore, we hypothesize:

Hypothesis Two (H2): Firms that require their suppliers to be ISO certified have increased/better _____ than those firms, which do not require supplier ISO certified.

1. top management support
2. non-conforming processes/procedures
3. lot traceability
4. internal systems management for traceability
5. external systems management for traceability

Product/Service Risk

The lack of traceability can hurt supply chain performance and expose firms to myriad of potentially damaging risks. Firms without traceability initiatives in place face supply chain risks including the inability to coordinate activities along a supply chain that lead to failure and error in supply chain operations (Charlier & Valceschini, 2008), problems to fulfill customer demand because of their inability to predict precise item quantity, and accommodating customer order changes (Lee & Özer, 2007; Chryssochoidis et al., 2009). Overall, risk management may be viewed as the enclosure of traceability. Benefits of risk mitigation through traceability include:

- Meeting safety and security requirements for recordkeeping and counterfeit detection
- Verifying process certification (e.g., certified organic or certified non-child labor)
- Preventing damage to brand and corporate reputation caused by taking too long to identify and remove contaminated product from the marketplace
- Achieving the required "one up, one back" traceability required by law
- Complying with environmental and import requirements

Certain products and services carry a higher perceived risk, whether due to the nature of the product/service (hazardous materials or classified digital information), or due to possible disruptions/interruptions during transit (Chopra & Sodhi, 2004). Agricultural products, chemicals, sensitive digital or computer-based information (e.g., credit cards), and pharmaceuticals carry more risk than products such as hand towels.

The lack of monitoring of activities and operations in supply chains can also lead to deviation from a preferred standard and hurt product quality, including the inability of firms to prevent raw materials or components in products that may pose a health hazard to consumers (Lyles et al., 2008). Also, traceability lends quantitative, evidentiary support to firms' operations and products. This empowers the development of a sense of security and awareness that they can display an accurate record of their actions that will provide them a safeguard if non-conformance occurs.

Firms often adopt preventative measures through traceability to reduce the potential issues the come with high risk products and services (Clarke, 1997). For example, enhanced process management (e.g., internal and external processes to prevent, detect, respond and recover from an incident) is usually initiated by governments or agreed upon by senior management (e.g., Hazard Analysis and Critical Control Point - HACCP or the Strategic Approach to International Chemicals Management). Information sharing of high-risk products/services and suspicious incidents helps firms respond to and prevent risk-related issues (e.g. lot traceability. In addition, internal and external information sharing ensure congruent communication within the firm and throughout the supply chain. Therefore, we propose the following hypothesis:

Hypothesis Three (H3): Firms that have higher risk products/services have increased/better _____ than those firms, which have less risky products/services.

1. top management support
2. non-conforming processes/procedures
3. lot traceability
4. internal systems management for traceability
5. external systems management for traceability

Supply Chain Complexity

Supply chain complexity is defined as the level of detail and dynamic nature of an organization's downstream markets (Bozarth et al., 2009). Drivers of complexity include the number of customers in the market, the magnitude of customer relationship tasks, demand management tasks, the average length of the product life cycle, and variability of the demand. These drivers increase as the supply chain with in addition of each supply chain partner, especially downstream. For example, local marketplaces (fewer customers and customer relationships, less variability, etc.) would have low complexity while regional and national marketplaces map to increased complexity and global marketplaces (numerous customers with many customer relationships, and high levels of variability) are considered highly complex.

Firms with more complex supply chains need to have enhanced management oversight, integrate non-conforming processes/procedures more deeply into their product/service traceability requirements, and invest in systems that prevent, detect, respond, and recover from disruptions. Research has established that firms with more complex supply chains are more likely to make investments to manage or even reduce complexity where needed (Perrow, 1984). Furthermore, firms with higher risk supply chains tend to more aggressively manage their supply chain and supply chain partners. Supply chain partners may be held more accountable for their product and service traceability and standardization of operations may be more common so as to reduce complexity and enhance traceability (Speier et al., 2011). Therefore, we hypothesize:

Hypothesis Four (H4): Firms with greater supply chain complexity have increased/better _____ than those firms, which have less supply chain complexity.

1. top management support
2. non-conforming processes/procedures
3. lot traceability
4. internal systems management for traceability
5. external systems management for traceability

METHODOLOGY

Survey Development and Data Collection

An online survey was developed to test the hypotheses. The constructs of traceability effectiveness, top management support, established non-conforming process/procedures, lot traceability, internal system management process for traceability, and external system management process for traceability, were operationalized and measured using items adopted from Speier et al. (2011). The constructs have been shown to satisfy the requirements of reliability and validity in construct measurement (Ketokivi & Schroeder, 2004). The items for all of the constructs in the model utilized a four item, seven-point Likert type scale ranging from 1 (not at all) to 7 (very much).

The target population sample was supply chain managers. Contacts were obtained via two sources: members of the Council for Supply chain Management Professionals (CSCMP) and members of the Institute for Supply Management. A total of 2,044 email addresses were obtained from these organizations. Content and face validity of the survey were demonstrated in two steps. First, supply chain professionals reviewed the questionnaire for readability and ambiguity (Dillman, 2000). Second, a pilot study using 40 random contacts from the sample was conducted. Feedback was used to modify the survey. The survey link was then emailed to contact list and after two reminders, a total of 238 usable questionnaires were obtained, for a response rate of 11.6% percent. Non-response bias was assessed by comparing early vs. late respondents and not deemed a threat to data integrity (Armstrong & Overton 1977). The first and fourth quartiles of respondents were tested for differences in mean construct responses. The results of this analysis indicated that there were no significant differences (p-values between 0.072 and 0.301) in the responses obtained from the two groups.

Respondent Demographics

Respondent demographics provide an interesting snapshot into our sample. For example, 50% were working for publically held firms while 43% indicated they worked for privately held firms with 7% considering themselves working for a local/state/federal governmental entity. Respondents fell into four categories of responsibility: procurement/sourcing (52%), Materials Management/Planning/Production/Quality (15%), Inventory/Warehousing (15%), Service/Sales (10%), and Transportation/Logistics (8%) (Table 1). Procurement spend, a proxy for firm size, indicated that most respondents worked in firms with spend greater than $40 million (57%), while those working for small firms ($ spend less than $0.5 million) accounted for less than 4% of respondents.

An equal percentage of the respondents indicated that their firm was ISO certified or currently pursuing ISO certification (43%) as those who were not ISO certified (43%) while 14% indicated they were unsure regarding certification. It must be noted, of those respondents that stated their organizations were ISO certified or pursuing ISO certification, 70% reported to be ISO 9001:2008 and 30% stated another ISO standard. This is important as no respondents identified their firms to be certified under the newest ISO standard, ISO 9001:2015. This point is elaborated on further in the section entitled limitations and future research area.

The survey data revealed that sixty-three percent of respondents identified their products or services as low risk (less perishable, not easily contaminated, non-hazardous), while 37% identified their products or services as high risk (more perishable, easily contaminated, hazardous). Data analysis also showed that 21% of respondents indicated they have low complexity (low reach or more local/regional supply chain reach), 19% indicated medium complexity (national supply chain reach), while 60% indicated high complexity (global supply chain reach). This categorization matches with the procurement spend demographics reported earlier.

Data Analysis

The data was assessed through construct validity using tests to measure reliability, normality, convergent validity, and discriminant validity. Reliability was used to test for internal consistency

Table 1. Respondent demographics

Firm Ownership	
Public	50%
Private	43%
Government	7%
n=203 (some blank responses)	
Procurement/Sourcing	
Materials Management/Planning/Production/Quality	15%
Inventory/Warehousing	15%
Service/Sales	10%
Transportation/Logistics	7%
n=164 (some blank responses)	
ISO Certification	
Yes	43%
ISO 9001:2008	70%
Other ISO Standard	30%
No	43%
Unsure	6%
n=227 (some blank responses)	
Product/Service Risk	
High	0.37
Low	0.63
n=227 (some blank responses)	
Complexity	
High	60%
Medium	19%
Low	21%
n=236 (some blank responses)	

of the research variables and was assessed using Cronbach's alpha on each construct (Table 2). All estimates exceeded the 0.70 cutoff recommended by Nunnally (1979). The full variance-covariance matrix is included in Table 3 in order to address possible instances of covariation between variables (Shah & Goldstein 2006). To assess the responses for normality, tests for skewness and kurtosis were performed on each of the indicators for each construct. Results indicated normality assumptions were met. Common method bias was evaluated by using a three-item marker variable that was not related in any way to the variables in the model (Podsakoff et al., 2003). When paired with the other constructs in the model, none of the correlations were significant at the 0.05 level. Thus, common method bias was not deemed a problem in the data.

Convergent validity was assessed using standard regression loadings from SPSS. Most items were above the desired item loading of 0.70 and were statistically significant; a few items were retained with loadings between 0.60 - 0.70 in order to preserve theoretical integrity. There were no items loading below 0.60 (Garver & Mentzer, 1999). To assess discriminant validity of the

Table 2. Survey scale items and reliability analysis; the survey scales used a seven-point Likert type scale ranging from 1 (not at all) to 7 (very much)

Construct Items	Mean	Std. Dev.
Top management support (Cronbach's alpha = 0.878)	5.02	1.638
• Views traceability within the supply chain as a strategic priority		
• Has a dedicated position focusing on traceability within the supply chain		
• Views traceability within the supply chain as a competitive advantage		
Nonconforming Processes/Procedures (Cronbach's alpha = 0.936)	5.49	1.34
• Prevent a contamination/quality/non-conformance event in our supply chain		
• Detect a contamination/quality/non-conformance event in our supply chain		
• Respond to a contamination/quality/non-conformance event in our supply chain		
• Recover from a contamination/quality/non-conformance event in our supply chain		
Lot Traceability (Cronbach's alpha = 0.84)	5.32	1.32
• Origin and destination points/dates of order, receipt/release/service dates, number within order, description of item/service		
• Routing and transfer points through which a shipment/order/service request moved (e.g., movement from production to distribution to shipping or service initialization to service conclusion)		
• External traceability data (i.e., external to your firm or after the product leaves your firm or service is complete)		
Internal Systems Management (Cronbach's alpha = 0.95)	5.45	1.36
• Provides our supply chain partners with timely data in response to a contamination/ quality/non-conformance incident		
• Provides our supply chain partners with valid data in response to a contamination/quality/ non-conformance incident		
• Communicates with our supply chain partners in a timely manner in response to contamination/quality/non-conformance incidents		
External Systems Management (Cronbach's alpha = 0.93)	5.16	1.43
• Defines consequences for supply chain partners who fail to comply with supply chain contamination/quality/non-conformance procedures		
• Requires our supply chain partners to provide us the actionable information our firm needs to respond to a contamination/quality/non-conformance incident		
• Uses audits to determine if relationships should be maintained with supply chain partners		
• Audits the contamination/quality/non-conformance procedures of our supply chain partners		
• Collaborates with our supply partners to improve their contamination/quality/non-conformance programs		

variables average variance extracted (AVE) was calculated for all constructs (Fornell & Larcker, 1981; Garver & Mentzer, 1999). These results are displayed in Table 4. Values below 0.50 were evaluated; any non-theoretically important items were dropped. Next, the AVE of each construct was compared to the shared variance between all possible pairs of constructs. Any AVE of a single construct that fell below a shared AVE was then tested via nested models to determine significant differences among the constructs in the theoretical model. All constructs met the conditions for discriminant validity.

Table 3. Discriminant validity (Fornell-Larcker criterion)

Correlation Matrix for Constructs					
	1	2	3	4	5
1	**0.825**				
2	0.565	**0.825**			
3	0.562	0.560	**0.785**		
4	0.525	0.628	0.672	**0.788**	
5	0.396	0.519	0.516	0.691	**0.818**

Note: Square root of the AVE on diagonal in bold.

Table 4. Inter-item covariance

Inter-Item Covariance Matrix					
	1	2	3	4	5
1	**2.672**				
2	1.241	**1.807**			
3	1.214	0.995	**1.747**		
4	1.174	1.155	1.214	**1.868**	
5	0.927	0.999	0.977	1.354	**2.053**

Note: Variance on the diagonal in bold

MANOVA Testing

This research studies multiple dependent variables and therefore used MANOVA to analyze the data. MANOVA was used to examine the effect of the four key factors (ISO certification, ISO certification of suppliers, product risk, and supply chain complexity) on the five constructs of traceability. Significant effects were found among the four key factors (ISO Certification: Wilks' $L = 0.949$, $F(5,187) = 2.00$, and a $p < 0.008$); ISO Certification of Suppliers: Wilks' $L = 0.792$, $F(5,187) = 9.80$, $p < 0.000$); Product Risk: Wilks' $L = 0.917$, $F(5,187) = 3.37$, and a $p < 0.006$); Supply Chain Complexity: Wilks' $L=0.927$, $F(10,374) = 2.97$, $p < 0.013$).

MANOVA was then conducted to examine gaps in multiple dependent variables. However, one limitation of this method is its inability to test where the specific differences occurred. Therefore, we followed the initial analysis with the significance test, analysis of variance (ANOVA) to look at individual dependent variables separately. ANOVA is a clear method of capturing the key features of complex and hierarchical data structures or study designs (i.e. the current study has five dependent variables with four independent variables) and presenting key results. The use of ANOVA also avoids the issue with regression of having to specify an over complex model and of carrying multiple pairwise t-tests between the levels of those independent variables with in the model. Given that the MANOVA resulted in significant differences, main effects among the four key factors and the dependent variables (five constructs of traceability) were tested using ANOVA.

ANOVA Testing

The results of the ANOVA testing revealed that the main effects for ISO Certification, ISO Certification of Suppliers, and Supply Chain Complexity were significant across all five constructs of traceability, thereby fully supporting H1, H2, and H4. The main effect for Product Risk were significant for four

of the five constructs of traceability, thereby partially supporting H3. In the case of ISO Certification, ISO Certification of Suppliers, and Supply Chain Complexity the factors are bi-level or contain Yes/No or High/Low designations and the ANOVA can be interpreted directly from the output. However, in the case of Supply Chain Complexity, the factor has three levels. Thus, we deemed that additional post-hoc tests must be performed to interpret the factor's significance. The next sections will discuss the significance of the ANOVA for each the dependent variables with the post-hoc tests included for the Supply Chain Complexity factor.

Implications of ANOVA and Post-Hoc Test Results

ISO certification of a firm is the independent variable for H1. It is hypothesized that firms that are ISO certified will answer with a higher score on each of the five constructs of traceability than those firms, which are not ISO certified. In support of H1, respondents whose firm was ISO certified tended to give higher rating on the five key constructs of traceability. A more detailed analysis revealed that the ratings for ISO certified firms not only were higher than those of non-ISO certified firms, but the difference was statistically significant at the 0.05 level (Table 5).

ISO certification for a firm's suppliers is the independent variable for H2. It is hypothesized that firms that require their suppliers to be ISO certified will answer with a higher rating on each of the five constructs of traceability than those firms, which do not require ISO certified suppliers. In support of H2, respondents whose firm required ISO certified suppliers tended to give higher rating on the five constructs of traceability. Specifically, the ratings for firms requiring ISO certified suppliers were higher than those of non-ISO certified firms and the difference was statistically significant at the 0.05 level (Table 6).

Hypothesis 3 stated that firms with products/services that are higher in risk will answer with higher rating on each of the five constructs of traceability than those firms, which have lower risk products/services. In support of H3, respondents whose firm identified as having higher risk products/

Table 5. Mean ratings for ISO vs non-ISO certified firms

Construct	ISO	
	Yes	No
C1-Top Management Support	5.32	4.78
C2-Non-Conforming Process Management	5.94	5.19
C3-Lot Traceability	5.70	4.91
C4-Internal Traceability Processes	5.91	5.31
C5-External Traceability Processes	5.68	4.75

Table 6. Mean ratings for ISO certified suppliers vs non-ISO certified suppliers

Construct	ISO Certified Suppliers	
	Yes	No
C1-Top Management Support	5.29	4.80
C2-Non-Conforming Process Management	5.77	5.23
C3-Lot Traceability	5.53	4.96
C4-Internal Traceability Processes	5.76	5.41
C5-External Traceability Processes	5.84	4.55

services tended to have higher ratings on four of the five key constructs of traceability. In fact, on those four key constructs the differences between firms with higher risk compared to lower risk products/ services were statistically significant at the 0.05 level (Table 7).

Firms with more complex supply chains were hypothesized to have higher rating on the five constructs of traceability than firms with less complex supply chains. Supply chain complexity was representing on a tri-part scale of more complex, medium complex, or low complex. H4 was supported with respondents whose firm identified as having more complex supply chains tended to have higher ratings on the five constructs of traceability. In fact, on those key dimensions the differences between firms with different levels of supply chain complexity were statistically significant at the 0.05 level (Table 8).

Post hoc tests revealed that three constructs (Top Management Support, Non-Conforming Process Management, and Internal Traceability Processes) revealed differences between organizations with more complex supply chains and organizations with less complex supply chains. For these three constructs organizations with more complex supply chains responded with higher ratings and those rating were statistically different from organizations with less complex supply chains.

In the case of Lot Traceability and External Traceability Processes, post hoc tests revealed statistically significant differences between all three levels of supply chain complexity. Specifically, in both constructs the post hoc tests revealed that the pair-wise comparisons of the ratings differences between organizations with more complex supply chains, medium, and less complex supply chains all were statistically significant at the 0.05 level.

Table 7. Mean ratings for firms with high product/service risk vs low product/service risk

Construct	Product/Service Risk	
	High	Low
C1-Top Management Support*	5.20	4.94
C2-Non-Conforming Process Management	5.86	5.33
C3-Lot Traceability	5.66	5.01
C4-Internal Traceability Processes	5.94	5.31
C5-External Traceability Processes	5.57	4.91

* not statistically significant at the 0.05 level

Table 8. Mean ratings for firms with more complex supply chains vs less complex supply chains

Construct	Supply Chain Complexity		
	More Complex	Medium Complex	Less Complex
C1-Top Management Support	5.25	5.09	4.31
C2-Non-Conforming Process Management	5.73	5.24	5.04
C3-Lot Traceability	5.53	5.15	4.42
C4-Internal Traceability Processes	5.80	5.53	4.96
C5- External Traceability Processes	5.50	4.83	4.45

Note: using a LSD test for individual means the means in bold differ from one another at the 0.05 level

CONCLUSION

Organizations today face significant visibility and supply-chain issues due to the length and complexity of global supply chains. These issues can be exacerbated by poorly managed, or non-existent traceability systems within firms and throughout their supply chains. The purpose of this paper was to investigate the path to greater traceability effectiveness vis-à-vis the interaction of a theoretical model of five dimensions of traceability and four key factors that represent potential considerations that may impact a firm's product/service traceability. The behavior of the model was explained using the tenets of contingency theory.

Our primary contribution is that the research finds empirical support for contingency theory in the context of supply chain traceability. The research indicated that the dimensions of top management support, non-conforming processes/procedures, lot traceability, internal systems management, and external systems management all were statistically significant differentiators with regards to firm ISO certification, supplier ISO certification, and supply chain complexity. For the factor defined as product/service risk, four of the five dimensions were statistically significant with top management support as the lone dimension not significant. A summary of each hypothesis and the statistical significance of each dimension is displayed in Table 9. While Table 9 illustrates the overall results of the four hypotheses and the contribution therein, more detail must be provided on each individual hypothesis to add weight to the results of this research.

First and foremost, the results indicate that managers believe firms that are ISO certified and require their suppliers to be ISO certified are more likely to possess the five dimensions of traceability, providing support for H1 and H2. This outcome reinforces the findings from Trienekens and Zuurbier (2008) in that ISO certification, whether it be at the firm level or within a firm's suppliers, does provide tangible benefits. In addition, with H1 and H2 being supported, this research supports Henson and Reardon's (2005) notion that along with ensuring improved traceability and safety, private standards also provide a form of differentiation and a competitive advantage when management supports the certification effort. From a contingency perspective, this finding suggests that managers understand the relationship between macro-level certifications and traceability dimensions and more specifically, how the former influences management decisions to create the latter.

The findings also found support for H3. Excluding the non-statistical result for top management support this research agrees with Clark's (1997) research. Clark's (1997) work establishes that to reduce the potential issues that more risky products/services bring with them, many firms adopt preventative measures such as non-conforming processes/procedure, lot traceability, and internal

Table 9. Summary of Hypotheses Outcome and Statistical Significance

Traceability Dimensions	H1 – Firm ISO Certification	H2 – Supplier ISO Certification	H3 – Product /Service Risk	H4 – Supply Chain Complexity
Top Management Support	0.01	0.02	0.24*	0.00
Non-Conforming Processes/Procedures	0.00	0.00	0.00	0.00
Lot Traceability	0.00	0.00	0.00	0.00
Internal Systems Management	0.00	0.05	0.00	0.00
External Systems Management	0.00	0.00	0.00	0.00

(NOTE: All dimensions are significant for all hypotheses except for Top Management Support in the case of H3 – this hypothesis is denoted with an asterisk)

as well as external systems management. For this study's sample, it appears that top management support is not a differentiator in regard to product/service risk magnitude (low risk vs. high risk).

One possible explanation may lie with variables such as firm size and industry. This study did not control for firm size or industry due to low sample size and the subsequent loss of power within the statistical tests. However, future research should include a control for firm size since larger organizations may have more hierarchical control in their management structure which in turn could lead to differences in top management support. Also, industry type may play a larger role in top management support since some industries like food products (e.g., HACCP) or healthcare products/services (e.g., CDRH) are mandated by certain government/agency policies that may predispose top management to adopt traceability standards therefore innately requiring top management support.

In addition, supply chain traceability originally attracted the attention of public authorities and private companies in high risk industries (i.e., food, food service, pharmaceutical, and health) due to the potential hazards of unsafe products and services. As a result, the U.S. Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA) regulations have great impact on a firm's supply chain in terms of traceability.

Thus, more and more companies view traceability as part of competitive strategy in the supply chain (Canavari et al.,2010). In turn, top management is willing to support the development of traceability beyond legal requirements and baseline expectations in high risk products/services although establishment of traceability systems is not mandatory. In recent years, public safety is garnering more attention and is being extended to less risky products/services. This is evidenced by the increased number of recalls across a variety of industries such as home appliances, children's products, furniture, mobile devices etc. (Szal, 2016).

Two factors contribute to the increased number of recalls. First, in business today, companies operate in the environment that many of them have interwoven supply chains, resulting in more widespread and complicated recalls. Second, tighter regulation and better detection technologies are applied even in less risky products/services businesses in response to increasing consumer demand on product quality and safety (Szal, 2016). Realizing the increasing scope, complexity and costs of recalls and a poorly executed recall can be devastating to a company's reputation, senior management tends to view supply chain traceability as a strategic priority in order to have a system in place to address procedures and communication along the end-to-end supply chain in case a recall does occur. This non-supported hypothesis reflects the trend that supply chain traceability is in general viewed as a competitive advantage by business executives.

All of the five key dimensions of traceability were supported in H4. This agrees with Perrow's (1984) assertion that firms with more complex supply chains are more likely to make investments to manage or even reduce complexity where needed. The support of H4 also is in agreement with Speier et al. (2011) that supply chain partners may be held more accountable for their product/process traceability and standardization of operations so as to reduce complexity and enhance traceability. The results also suggest that managers believe complexity drives firms to create a contingent response to that complexity in the form of more effective traceability initiatives. Complexity often instills uncertainty in managers, who treat uncertainty with the same strategies as dynamism. Supply chain complexity and product complexity have been recognized as critical contingent factors in supply chain management research (Blome, Schoenherr, & Eckstein, 2014). Prior studies suggest that the complexity of product/process and supply chain complexity complicate decision making, decrease operations performance, and cause disruption (Narasimhan & Talluri, 2009; Hu et al., 2008). Contingent strategies in the form of traceability processes is therefore a reaction to complexity.

Effective traceability can be a valuable strategy to firms, increasing organizations' competitive advantage (Barney, 1991). These competitive skill differences can improve organizations' profits and demonstrate governance value (Ghosh & John, 1999). Furthermore, organizations must not only possess such resources, managers must deploy resources in ways that most effectively fit the given context.

Limitations and Future Research

Our study has some limitations to be addressed in future research. First, our survey data called for the subjective perceptions of managers in relation to traceability. Although an approach well established in prior studies was used, future research should consider more objective measures including cost, secondary data from customer satisfaction surveys, and other relevant firm metrics. Second, due to the time frame of data collection and the updating of ISO standards (i.e., data collection occurred during late 2016 while the ISO 9001:2015 standard was in its infancy), our data does not include a sampling of organizations using the newer ISO 9001:2015 standard. Future research would need to address traceability through the lens of the ISO 9001:2015 standard and compare to the conclusions obtained using the older ISO 9001:2008 standard. Controls for firm size and industry must also be included in this research area.

Another area of future research is the impact of contracts and contracting on traceability. There has been limited work on insurance and contracting with suppliers especially for forward traceability. Bulut and Lawrence (2008) both found a negative association with the use of contracting and the adoption of traceability practices. However, their studies only applied to the food supply chain. Ramesch and Jarke (2001) studied the information technology supply chain and found that subcontracting brings difficulties with tracing which entity provided which parts and whose parts affects which other parts of the subcontracted project. Future research is needed to address other industries and industry wide standards for how contracting effects traceability in the supply chain.

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Traceability in the Supply Chain

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1

Traceability

It is defined as "the ability to identify and verify the components and chronology of events surrounding products at all stages of the supply chain"

-Skilton, P. F., & Robinson, J. L. (2009). Traceability and normal accident theory: How does supply network complexity influence the traceability of adverse events. *The Journal of Supply Chain Management, 45(3), 40–53.* doi:10.1111/j.1745-493X.2009.03170.x

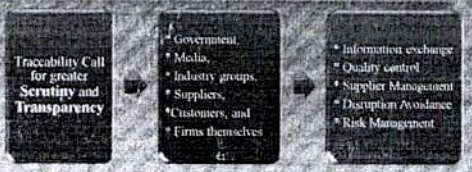
2

Abstract

- Traceability: greater scrutiny and transparency
- Area affected: Quality control and product safety, tracking product recalls, and reverse logistics.
- Research Need:
  - what *factors predicate* firms to implement traceability initiatives beyond those prescribed by law
  - how industries *create and implement* effective traceability initiatives throughout the supply chain.

3

Introduction



- Enablers of Traceability:
  - RFID(Radio-Frequency Identification) -improved speed, transparency and security of information sharing
  - Serialization (used in pharmaceutical supply chain)-identification of drugs down to the individual level and traced from its origin

4

Challenges for implementing traceability

- *Difficult to implement* both internally and across the supply chain.
- High product, *supply chain complexity* and risk
- They are in the sectors with *regulations governing* documented traceability processes
- Reverse logistics-collection, reuse and reprocessing of returned materials require *integration at various levels* of a supply chain.

5

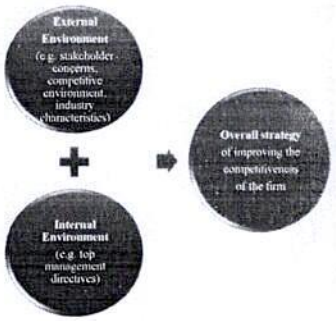
Purpose of the research

- To investigate why firms implement traceability, in addition to regulatory mandates (Importance of traceability)
- To better understand which actions or initiatives lead to greater traceability effectiveness in a cross-section of firms in diverse industries. (which dimension is effective w. r. t. factors identified in Literature Review)

6

THEORY

- **Contingency Theory-** impact of environmental factors on an organizational structure, strategic decision making, and efficiency and effectiveness-driven performance criteria
- Traceability, firms implement a contingent response to demands on the firm from



7

Literature review

(Dimensions of Traceability Effectiveness)

Sr. No.	Author Name	Year	Paper Title	Elaborated on
1	Bechini, A., Cimino, M. G., Marcelloni, F., & Tomasi, A.	2008	Patterns and technologies for enabling supply chain traceability through collaborative e-business.	Introduced data model for traceability- i. Management buy-in as a strategic goal ii. specific processes for product traceability to maintain safety and quality iii. unique lot traceability iv. systems to store and allow retrieval of data from both internal and external sources
2	ECR	2004	*ECR tracing traceability in the supply chain to meet consumer safety expectations*	Developed a set of best practices for product traceability- i. Traceability capture and recording procedures ii. Physical lot traceability iii. Internal management retrieval of traceability data iv. External data communication of traceability data
3	Jansen-Vullers, M. H., van Dorp, C. A., & Beulens, A. J.	2003	Managing traceability information in manufacture. *International Journal of Information Management*	Identified a framework of four elements of traceability based on various traceability definitions- i. Lot Traceability, ii. Management involvement, iii. Internal and iv. External reporting for traceability data retrieval.
4	Kelepouris, T., Pramatari, K., & Doukidis, G.	2007	*RFID-enabled traceability in the food supply chain. Industrial Management & Data Systems*	comparing the two models by Jansen-Vullers et al. (2003) and ECR (2004) created a complete traceability model with five elements

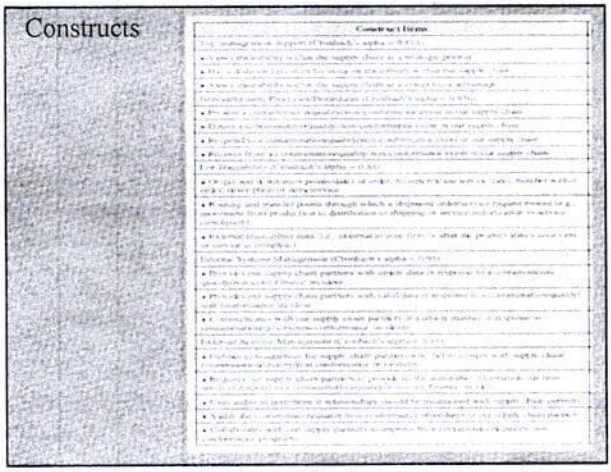
8

Dimensions of Traceability Effectiveness

Top Management Support	• To commit financial resources to projects • To provide moral support • To ensure task delegation • To recognize the demands coming from stakeholders for traceability initiatives
Non-Conforming Processes/Procedures	• Focuses on the degree to which a firm has established processes/procedures in place for sharing information in a timely fashion
Lot Traceability	• To identify where a quality or abnormal issue originated • To understand the origin, routing, and transfer of those products/services in the case of a missed shipment, contamination, etc.
Internal Systems Management	• Establish internal systems for traceability through entities such as ISO or • Through techniques such as failure modes effects and criticality analysis (FMECA)
External Systems Management	• Collaboration with external partners has long been cited as critical factor in any program to ensure visibility and traceability of products and services within a supply chain

9

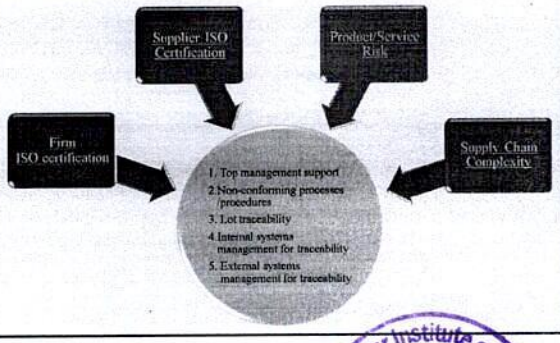
Constructs



10

Hypothesis development

The five dimensions of traceability effectiveness were operationalized and measured using items (firm ISO certification, supplier ISO certification, supply chain complexity & product/service risk adopted from four studies



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Methodology

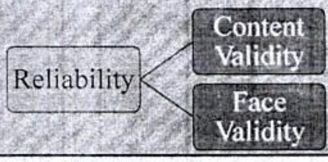
- **Hypothesis testing-** Online Survey
- **Constructs-** 5 Dimensions
  - ✓Top management support
  - ✓Non-conforming processes/procedures
  - ✓Lot traceability
  - ✓Internal systems management for traceability
  - ✓External systems management for traceability

  DEPENDENT VARIABLES
- **Items** [adopted from Speier et al. (2011)]-
  - ✓Firm ISO Certification
  - ✓Supplier ISO Certification
  - ✓Product/Service Risk
  - ✓Supply Chain Complexity

  INDEPENDENT VARIABLES
- **Scale**-seven-point Likert type scale ranging from 1 (not at all) to 7 (very much)
- **Response Rate** = 11.6%
- **Non-response bias:** comparing early vs. late respondents-no significant differences (p-values between 0.072 and 0.301) in the responses obtained from the two groups

12

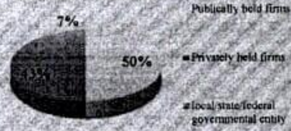
Sampling



13

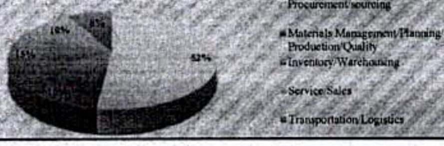
Respondent Demographics

Respondent Firm Types



ISO Certified Firm

Four categories of responsibility



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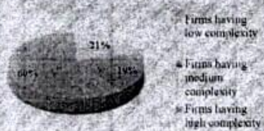
Respondent Demographics

Risk Identified by firms

Complexity of firm's Supply Chain



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Data Analysis

- **Construct Validity-**
  - Reliability-Cronbach's alpha on each construct exceeded the0.70 cut off
  - Discriminant validity -

Correlation Matrix for Constructs

	1	2	3	4	5
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

  - Normality-tests for skewness and kurtosis
  - Common method bias
  - Convergent validity-standard regression loadings from SPSS(most of the item>0.70

16

MANOVA Testing
(To examine gaps in multiple dependent variables)

1	ISO Certification of firm	p<0.008
2	ISO Certification of Suppliers	p<0.000
3	Product Risk	p<0.006
4	Supply Chain Complexity	p<0.013

- Limitation-Inability to test where the specific differences occurred

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Mean Ratings
(To look at individual dependent variables separately)

Table 3. Mean ratings for ISO vs non-ISO certified firms

Construct	ISO Yes	ISO No
C1 Top Management Support	[illegible]	[illegible]
C2 Non-Conforming Process Management	[illegible]	[illegible]
C3 Lot Traceability	[illegible]	[illegible]
C4 Internal Traceability Processes	[illegible]	[illegible]
C5 External Traceability Processes	[illegible]	[illegible]

Table 4. Mean ratings for ISO certified suppliers vs non-ISO certified suppliers

Construct	ISO Certified Suppliers Yes	ISO Certified Suppliers No
C1 Top Management Support	[illegible]	[illegible]
C2 Non-Conforming Process Management	[illegible]	[illegible]
C3 Lot Traceability	[illegible]	[illegible]
C4 Internal Traceability Processes	[illegible]	[illegible]
C5 External Traceability Processes	[illegible]	[illegible]

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Mean Rating

Table 7. Mean ratings for firms with high product/service risk vs low product/service risk

	Product/Service Risk	
Construct	High	Low
C1 Top Management Support*	5.20	4.94
C2 Non-Conforming Process Management	5.86	5.33
C3 Lot Traceability	[illegible]	5.01
C4 Internal Traceability Processes	5.94	[illegible]
C5 External Traceability Processes	5.57	4.94

* not statistically significant at the 0.05 level

Table 8. Mean ratings for firms with more complex supply chains vs less complex supply chains

	Supply Chain Complexity		
Construct	More Complex	Medium Complex	Less Complex
C1 Top Management Support	[illegible]	[illegible]	[illegible]
C2 Non-Conforming Process Management	[illegible]	5.24	[illegible]
C3 Lot Traceability	5.51	[illegible]	4.42
C4 Internal Traceability Processes	5.80	5.53	4.96
C5 External Traceability Processes	[illegible]	[illegible]	[illegible]

Note: using a LSD test for individual means the means in bold differ from one another at the 0.05 level

19

Conclusion-Post Hoc ANOVA

- The research indicated all Dependent variables were statistically significant differentiators with regards to Independent variables.

Table 1. Summary of Hypothesis Outcome and Statistical Significance

Traceability Dimensions	H1 – Firm ISO Certification	H2 – Supplier ISO Certification	H3 – Product Service Risk	H4 – Supply Chain Complexity
Top Management Support	[illegible]	[illegible]	0.24*	[illegible]
Non Conforming Processes/Procedures	[illegible]	[illegible]	[illegible]	[illegible]
Lot Traceability	[illegible]	[illegible]	[illegible]	[illegible]
Internal Systems Management	[illegible]	[illegible]	[illegible]	[illegible]
External Systems Management	[illegible]	[illegible]	[illegible]	[illegible]

NOTE: All dimensions are significant for all hypotheses except for Top Management support in the case of H3 – this hypothesis is denoted with an asterisk

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Limitation and Future Research

- This study did not control for firm size or industry due to low sample size.
- Survey data called for the subjective perceptions of managers in relation to traceability.
- It should consider objective measures including cost, Secondary data from customer satisfaction surveys, and other relevant firm metrics.
- Data does not include a sampling of organizations using the newer ISO 9001:2015 standard.
- Controls for industry must also be included in this research area.
- Future research could be on the impact of contracts and contracting on traceability.

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Purpose of the Meeting : Journal Club

Date : 24th ~~th~~ Oct, 2019

Sr.No.	Name	Signature
1.	Dr. Meenakshi Malhotra	Meenakshi
2	Dr. Smita Jape	Sjape
3.	Vibhuti Sare	
4.	Sandeep Meghe	
5.	Dr. Pallavi Chandwaskar	Pallavi
6.	Siddhesh Soman	S.S.Soman
7.	Krunal K. Punjani	
8	Sekhar. V.	
9	Dr. Guruprasad Murthy	
10	Dipti Persad	Dipti

Dr. V.N. Bedekar Institute of Management Studies * VPM's * Thane

Indian Financial Sector

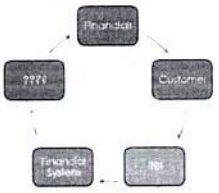
History Rhymes-Will it repeat ?

PMC Collapse – Case

Journal Club – By Dipti Periwal
24/10/2019

1

Case Perspective



2

History

2001- A sharp asset deflation (2001) stock market crash had led to collapse of Madhavpura Mercantile Co-operative Bank . 90% of exposure was in capital Markets. RBI restricted the bank's operations and came up with a scheme of reconstruction but further with no improvement , RBI cancelled its License in 2012

2004- Global Trust Bank put under moratorium as it disclosed capital market exposure at 13% and NPA rose from 1.5% to 25%. Its loan growth and Tier 1 turned negative leading it to be nationalized and finally merged with Oriental Bank of Commerce

2019 PMC with 117bn of deposits was placed under restriction by RBI as it disclosed 70% of loan to a single group HDIL (a real estate company)

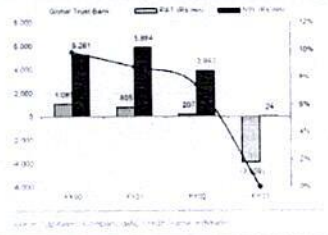
3

Focus table and charts (Source – Company Data,credit Suisse Estimate)

	Madhavpura (CO)	GTB(Pvt)	PMC(CO)
Year of Default	2001	2004	2019
Advances (bn)	14bn	33bn	84bn
Deposits(bn)	12bn	69bn	116bn
Loan market share		0.4%	0.1%
NPA Stressed Loan	88%	26%	76%
Single Exposure	87%	13%	73%

4

Global trust bank Saw erosion of net worth in one year



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Madhavpura Mercantile Cooperative bank

- Oct -2018 -Close to 45,000 depositors of scam-ridden erstwhile Madhavpura got their deposits back
- In the latest round of returning money to the depositors, those who had deposits up to Rs two lakh will get their deposits back. 17 years after Rs1,200 crore scam hit depositors and bankers alike
- Till now individual depositors have got back about 52 per cent of their money, while other HUFs have got 28 per cent of their deposits back

6

PMC Bank Case

- Three weeks ago, Punjab & Maharashtra Cooperative Bank (PMC Bank) suddenly collapsed. It has Rs 11,500 crore in deposits from more than 3,00,000 people
- And had lent more than Rs 6,500 crore to bankrupt real estate group HDIL Ltd, which was controlling the bank through common directorships and shareholding (As per Business Standards)
- According to HDIL's latest annual report, unpaid interest and principal amount to banks and financial institutions are Rs 1,780.97 crore
- Accounts belonging to HDIL group were replaced with dummy accounts to match the outstanding balances in the balance sheet
- As loans against depositors and were of lower amounts, they were not checked by the RBI

7

Billion dollar question !

How will PMC be able to recover its dues from a company whose cash flows are lower than its outstanding debt on books?

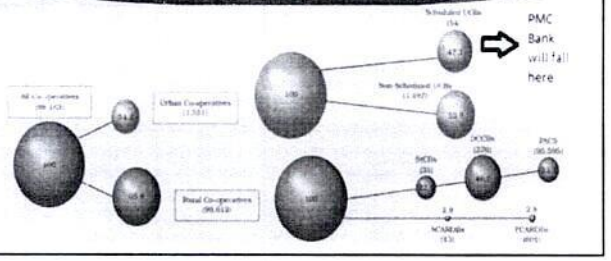
8

Failure of monitoring at so many levels

- As the loan outstandings were huge and if these were classified as NPA, it would have affected the profitability of the bank, we continued to report all the accounts as standard account
- Statutory auditors, due to their time constraints, were checking only the incremental advances and scrutinized accounts shown by the management
- Prior to 2015, the RBI inspectors checked only the top accounts. Loans to HDIL, which were across multiple entities, did not figure in these inspections
- When RBI inspectors started looking into the "advances master", "legacy accounts belonging to this Group were replaced with dummy accounts to match the outstanding balances in the balance sheet

9

The structure of co-operative banks and their Assets size



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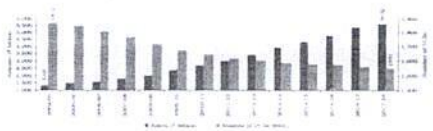
Effect of consolidation on ucb's count and growth in assets size



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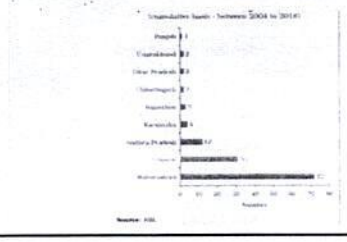
Regulation of Co-Operative Banks

Co-operative Banks (98,163)

Urban Cooperative Banks (UCB) (1,551)	Rural Cooperative Banks (RCB) (96,612)
UCBs are jointly regulated and supervised by State Registrars of Co-operative Societies and by RBI while Multi-State UCBs are jointly regulated by Central Registrar of Co-operative Societies and by RBI	Powers have been delegated to NABARD to conduct inspection of State and Central Rural Cooperative Banks (RCBs)

12

No of merger in UCB's



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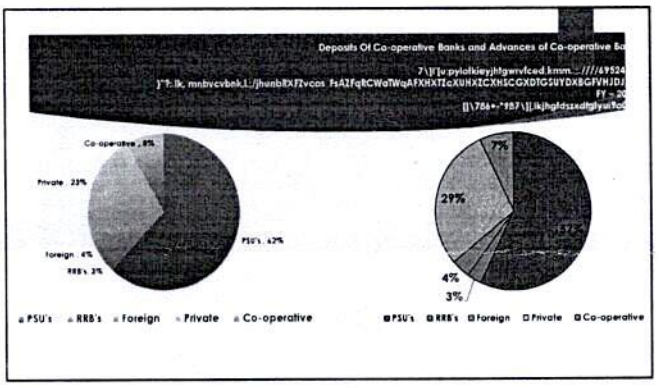
To start a co-operative bank

- You need only 25 lakhs vis-à-vis 100 crs to start other public sector banks
- You need license fro RBI

14



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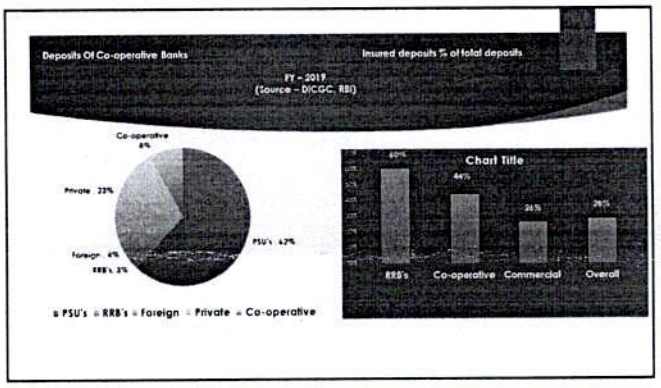

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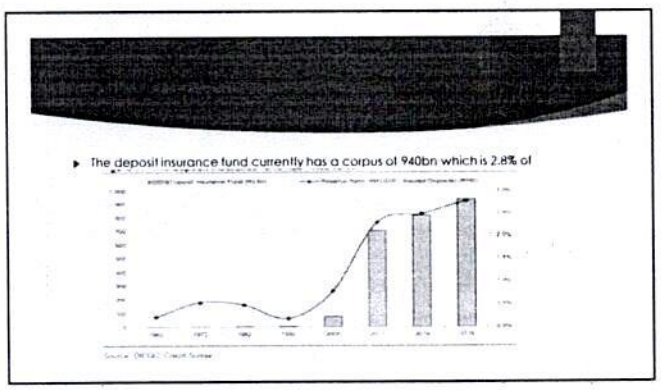

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Key financial parameters of Urban Cooperative banks

Amount (bn)	March -16	March -17	March -18
Capital	110	121	130
Reserves	296	335	353
Net worth	**406**	**456**	**483**
Borrowings	26	34	49
Borrowings/Net worth	6.4%	7.5%	10.1%
Deposits	3922	4435	4565
Advances	2449	2612	2805
CD Ratio (%)	62%	59%	61%

18

Capital Adequacy Ration (CAR)

Capital Adequacy Ratio is also known as Capital to Risk Assets Ratio, is the **ratio of a bank's capital to its risk.**

CAR = Total Capital/ Risk Weighted assets

Total Capital = Tier 1 and Tier 2 Capital

Tier 1 or core capital, consists of equity capital, ordinary share capital, intangible assets and audited revenue reserves

Tier 2 comprises unaudited retained earnings, unaudited reserves and general loss reserves

19

Improvement in Share of UCBs which meet the Basel III capital requirement of 9%

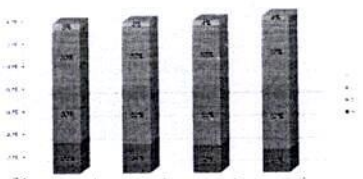
20

CAMEL Rating

- The RBI scores each of the UCBs based on parameters of the CAMELS framework – Capital Adequacy, Asset Quality, Management Quality, Earnings Quality, Liquidity and Sensitivity to Market Risk. Over the years, the share of A rated UCBs have come down
- While the share of B rated UCBs has increased. The share of C and D rated UCBs has remained range- bound

21

CAMELS grade rating share of the UCBs



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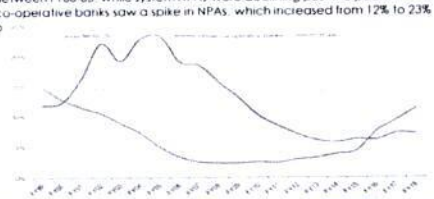
NPA's

- Between FY00-05, while system NPAs were declining post the peak in FY97, co-operative banks saw a spike in NPAs, which increased from 12% to 23%



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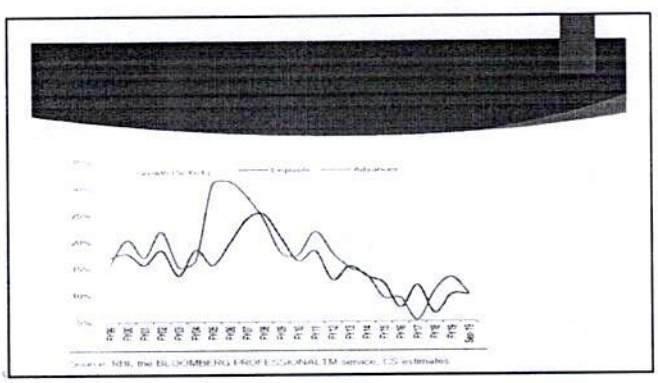

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Is PMC issue – **a systemic problem?**

- As per RBI's stability report the entire financial system is connected
- It clarifies that though Scheduled urban co-operative bank are small part of the system but it will have huge impact
- If some co-operative bank goes bankrupt, it will have a cascading impact on the entire system
- E.g - If cooperative banks withdraw some loan or stop lending to an entity, the withdrawal of credit can push the financially viable entity into fresh set of liquidity problems and any NBFC/Bank which has exposure to that entity will suffer

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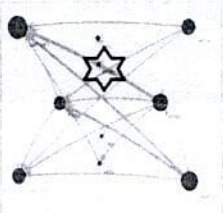
- Obviously the size of cooperative banks is smaller than NBFCs/HFCs but the difference is that in case of NBFC/HFCs there are some good ones which remained immune to the crisis, but its difficult to say that about co-operative banks
- Banks' bilateral exposure to financial system at 46.5% RBI –Dec 2018
- Financial institutions establish links with other financial institutions for efficiency gains and risk diversification, but these same links lead to risk transmission in case of a crisis

26

Network plot for financial system 2019



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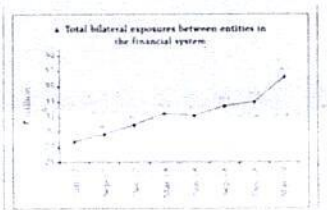

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Cooperative bank or a cooperative credit society?

- Customers should also be sure as to which institution they are dealing with cooperative bank or cooperative credit society
- The former are regulated by the Reserve Bank of India while the latter are regulated by state governments
- The insurance is just for the co-operative bank and not for co-operative credit societies.

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What should RBI do

- RBI or ministry of finance must immediately constitute a panel with a short finite life
- This panel should have powers to put the assets of PMC bank and personal assets of HDIL in an escrow account and ring-fence it from the ad hoc action from revenue department and creditors like it was done for IL FS
- All institutions collecting deposits and calling themselves bank should be completely under RBI

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Few banks for reference

- Hutat Mahila Cooperative Bank from Karnataka, Sri Anand Co-operative Bank from Pune, Kolkata Mahila Co-operative Bank from Kolkata and Hindu Cooperative Bank from Punjab

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Learning from – PMC Collapse

How to keep your money safe?

1. Several customers tend to hold one bank account throughout their life. In cases like PMC, such savings of a lifetime can get stuck even if for a short period
2. Financial advisors thus say that savers should hold multiple bank accounts – about 2-3 – from a mix of co-operative banks, private banks and public sector undertaking (PSU)
3. No more than 10% of your financial assets should be parked with a co-operative banks
4. Customers should also be sure as to which institution they are dealing with: cooperative bank or cooperative credit society.

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- One should check the name of the bank you are dealing with on the RBI website to make sure you are dealing with an RBI-regulated entity and not some local body running a financial institution with a similar sounding name
- In case of PMC, the bank has 19 per cent statutory liquidity ratio – deposits that are invested in government securities, and 3-4 per cent cash reserve ratio – share of deposits that are maintained in cash so that is the only security during the crisis which is insufficient

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Decision Makers

- Large depositor reportedly got a whiff of the whistleblower but not the entire system. And which should not be ignored
- Importance of bilateral exposure.

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Thank You

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DR V N BRIMS

Purpose of the Meeting : Journal Club (TOPIC)

Date : 3rd Oct, 2019

Sr.No.	Name	Signature
1	Meenakshi Malhotra	Meenakshi
2	Dr. Smita Jape	[signature]
3.	Dr. Pallavi Chandwaskar	Pallavi 03/10/19.
4.	Vibhuti Save	[signature]
5.	Krunal K. Punjani	[signature] 03/10/19
6.	Pravin Narang	[signature]
7.	Siddhesh Soman	S.S.Soman
8	Mahesh Bhanushali	Bhanushali
9	Dipti Periwal	Dipti Dipti
10	Nitin Joshi	Joshi. 03/10/19
11	Dr. Guruprasad Murthy	[signature]
12.	Haarika. A.	[signature] 03/10/19.

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TOP: 3

Case

Training Needs Analysis in a Government Regulatory Firm (B)

Asian Journal of Management Cases
15(1) 34–49

SAGE Publications
sagepub.in/home.nav
DOI: 10.1177/0972820117744687
http://journals.sagepub.com/home/ajc
SAGE

Shailaja Karve[1]
Meenakshi Aggarwal-Gupta[2]

Abstract

Western State Electricity Regulatory Commission (WSERC) a Government Regulatory Firm in India needed to enhance its human resource capabilities. It was grappling with employees who were either on contract or deputation, and were essentially temporary in nature. The younger staff was lacking in both technical and managerial skills and could not contribute to the organization's functioning. The senior staff appeared unwilling to transfer their knowledge to the junior staff. In addition, there were various people-related challenges in terms of differences in working styles, hierarchical culture of the firm, conflict across levels and functions and preference to operate in silos. It was decided to address the people related challenges through training to create a climate of trust and sharing before initiating a mentoring intervention. It was decided to undertake customized training to address the unique context and challenges being faced by the firm; therefore, a training needs analysis (TNA) was carried out. Various tools such as the TNA questionnaire, visioning exercise, personal interviews and focused group discussions (FGD) were used to gather data to identify specific training needs of the firm. The case focuses on the process of initiating a TNA in a small firm and some of the associated challenges.

Keywords

Training Needs Analysis, visioning exercise, interviews, focused group discussions, managerial skills, competencies

Discussion Questions

1. Discuss the use of the TNA. What are the different methods of conducting the TNA? Evaluate the TNA approach used by the ISBAR consultants. If you were a consultant, would you have done it the same way or would you have used some other approach?
2. On what basis should an organization choose internal or external consultants for conducting any HR or OD intervention?

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[2] Associate Professor, Indian institute of Management Indore, Madhya Pradesh, India.

Note: This case is based on a real organization. As requested, the name of the organization and the characters have been disguised to protect the organization's identity.

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Arun Nalwade, chairman of Western State Electricity Regulatory Commission (WSERC), had been grappling with the issue of untrained manpower in the firm.[1] He recognized that the employees of the firm, whether contractual or permanent, were not equipped in terms of both technical and managerial skills. He had invited a few consultants to discuss the design and implementation of a mentoring initiative so that the senior people in the firm could train the new employees. This discussion brought out some of the other people-related challenges faced by the organization. Arun talked about differences in working styles, hierarchical culture of the firm, conflict across levels and functions, etc. Since many of the employees were on deputation, they brought with them the culture of their parent organization. Arun visualized a collegial atmosphere with seamless functioning to carry out the work of the commission effectively. However, these differences resulted in a lack of cohesiveness that worked at odds with the vision of the Chairman. The consultants raised questions regarding the readiness of the organization and individuals for a mentoring initiative. It became clear that these issues would need to be addressed before any developmental intervention could happen.

The consultants recommended conducting training in various areas such as self-awareness, leadership, conflict management, team building, etc. to create a climate of trust and sharing amongst the employees. Such training would also ensure that people developed a holistic perspective of the role of a regulator. Since this was a firm with a unique structure and characteristics such as the temporary nature of most of the managerial staff,[2] judicial rulings as the firm's output, expertise driven organization, etc., it was felt that off-the-shelf training programmes may not address the challenges faced by this firm. There was a need to identify the exact training requirements of the firm before conducting any training. Hence, it was decided to carry out a training needs analysis (TNA).

Need for Trained Manpower in the Power Sector

(Facts about industry)

The total workforce in India's power sector at the end of the Tenth Five Year Plan was approximately 0.95 million (Planning Commission, n.d.). The power sector was a technically intensive sector, primarily dependent upon an engineering workforce. It was estimated that over 0.5 million technical and 0.15 million non-technical individuals needed to be inducted and trained (Ministry of Power, 2002) to meet the requirements of this sector.

The challenge for the sector was not only to attract fresh talent but also to upgrade the skill sets of existing employees (IEMR, n.d.). To improve education and availability of skilled employees, the power sector had taken some important initiatives. One of them was introducing educational courses related to energy capacity addition, production, operations and maintenance. In addition to technical skills, the National Training Policy (NTP) 2012 provided a competency framework to ensure that the requisite knowledge, skills and attitudes amongst employees (Department of Personnel and Training, 2012) were enhanced to operate in a competitive market environment. One of the key hindrances in this process was the lack of training infrastructure. Existing infrastructure for refresher training to update skills and knowledge and managerial training met only 3 per cent and 4 per cent of the requirements, respectively. This had a significant impact on decision-making capabilities and effectiveness of various organizations.

Need for Trained Manpower at WSERC

(Facts about Organization)

Having gone through various reports and forecasts for manpower capability requirements in this sector, Arun decided to discuss the development interventions with the commission members and senior members in WSERC. After deliberations amongst the core group (a group of decision-makers

comprising the chairman, commission members, secretary and directors), WSERC decided to appoint an external consultant to conduct a TNA of its employees to understand current levels of competencies and challenges faced by them. A thorough search for capable experts led WSERC to the International School of Business Administration and Research (ISBAR), who were appointed as consultants for the project. Terms and conditions of the contract were made explicit in the work order given in August 2011. The expected expense for the TNA and trainings was well within the range of WSERC's past expenditure on trainings and workshops.

Training Needs Analysis

On receiving the signed contract, Anand Nair (Undersecretary) shared WSERC's objectives, philosophy, organizational structure and employee profile details regarding their qualifications, tenure and designation with the ISBAR consultants. The consultants gathered information about the power sector, regulatory firms and best practices with reference to people management in such organizations worldwide. In parallel, Arun briefed the consultants about his vision for the organization within the ambit of the Electricity Act 2003. As the discussion continued, it became clear that while the organization had recruited people as per a manpower plan, the deployment of people did not strictly follow this plan. The actual work that the people on contract, that is, advisors, regulatory staff (RS) and junior regulatory staff (JRS) were doing differed from the roles that had been assigned to them. Also, while they all had been recruited as consultants, both the RS and JRS were expected to act as regular employees of WSERC and were being groomed as internal experts in the organization.

To get greater clarity on the structure and functioning of the organization, the consultants conducted an employee profiling survey to understand the work currently being done by all people (see Exhibit 1 for the way the TNA unfolded at WSERC). As had been agreed, the TNA of all employees was to be conducted and independent consultants (advisors, RS and JRS) hired by WSERC. The survey included understanding whether they were permanent or contractual employees, if they were working independently or within teams, and their reporting relationships. This survey also sought information on the trainings taken by these employees in the past. This information gave the consultants critical insights into the functioning of WSERC and its employees, for example, while many employees had the designation of RS and had employees reporting to them as per the organization chart, in practice, they were operating almost independently. There were no well-defined team tasks. Many advisors had multiple RSs and JRSs reporting to them while some advisors had no direct subordinates.

As part of the profiling study, employees had been asked to list down skills and competencies they felt were required to carry out their tasks (see Exhibit 2 for their responses). The respondents tended to use jargons such as personality development, interpersonal skills, legal and technical skills, etc. as skills required to do their jobs. Very few respondents were able to describe specific skills that were required. It thus became important that the TNA identified the required training and provided descriptions that could be used to design the training content.

Training Needs Analysis Plan

The consulting team had planned a two-pronged approach to conduct the TNA, that is, using a questionnaire and interviews and group discussions. Based on the feedback received from WSERC, discussions with the commission members and directors, and perusal of various policy documents and reports on employee training needs in the power sector, the consultants came up with a list of 10 managerial

competencies (Exhibit 3) that they felt were required by employees to carry out their tasks. This list was validated through subsequent discussion with the commission and used to prepare a TNA questionnaire.

Survey: The areas of attitude and behaviour were to be appraised through the competency of individual effectiveness. Similarly, managerial skills would be through analytical skills, task achievement, planning and organizing, etc. The same questionnaire would be administered to individual employees and his/her 1–2 supervisors (L1 and L2). L1 supervisors were immediate bosses, and L2 supervisors were the supervisor's supervisor.

Qualitative Data: Visioning exercises, interviews and focus group discussions (FGDs) to get an in-depth understanding of the organizational and individual requirement were planned. FGDs would be conducted with groups of the following:

- Experts/advisors (with respect to roles of RS and JRS)
- RS (with respect to roles of JRS and their own role)
- Section officers (with respect to roles of administrative staff)

It was decided that data collection for the TNA exercise would be spread over three working days in WSERC. Data entry and analysis would start simultaneously and take about a week to complete. The consultants expected to share the preliminary findings with the core team within 10 days and submit the TNA report to WSERC within fifteen days from beginning the work on the assignment. A mail was sent to Anand to organize a three-day visit for the consultants to WSERC. The mail contained the detailed plan of intervention to enable the organization and its people to plan their time (Exhibit 4).

On receiving a detailed TNA process plan, Anand began working on different activities such as venue and other infrastructure arrangements, coordinating with the secretary and directors for releasing all the employees for questionnaire administration, FGDs and interviews in a manner so that the work of WSERC was not unduly disturbed.

Data Collection

On 10 September 2011, the consultant team comprising three members from ISBAR reached WSERC. The employees of WSERC were curious, and there was a buzz in the organization about what was going to happen. On reaching the office of WSERC, the consultants realized that while some appointments had been fixed, others were still tentative and would be scheduled dynamically.

The consultant team began the TNA process as per the plan. They found that while some groups of people were eager to participate in the process, other groups were not interested. When the FGD of advisors and consultants began, one of the advisors raised a strong objection to being called to participate in the FGD. They had apparently not been asked to keep themselves free and resented being subjected to an exercise that would not benefit them. The ISBAR consultants explained the purpose of the exercise and apologized if Anand had missed out the communication to the advisors. However, the advisors were not convinced. As one of them commented:

> We have not been informed about any exercise. We were just now told to come to this room for two hours. As an external consultant, I come to the office for only three days in a week. If I spend two hours here, how will I get my work done?

The ISBAR consultants tried to explain the purpose of the meeting but finally asked the advisor to take up any issues related to inadequate communication directly with the organization since they themselves

were consultants, external to WSERC. After that, the advisors withheld their objections, but it was clear that they were not interested in participating in the FGD. They reluctantly began answering the questions posed to them. Fortunately, as the discussion progressed, they started contributing. Soon, their interest was caught and everyone began participating. Everyone had a view and wanted to make it heard. As one of them stated, 'Every person cannot have legal, financial, and technical knowledge. There needs to be greater interdepartmental interaction for effectiveness in work. We need to be given more freedom to work.' Another advisor narrated an incident:

> I did not know that a brief had to be sent to the commission before a hearing. I was asked for the brief at the time of the hearing, but I was not ready with it. The processes are streamlined but not documented, due to which a person may run around without knowing how to do the work. There has to be standardization of the processes.

At the end of the discussion, the consultants thanked the group for contributing and asked them to fill the self and supervisory feedback questionnaires for the TNA. Similar exercises were conducted with the other groups as planned. The FGD for administrative staff was conducted in the local language (Marathi) to elicit maximum responses from the participants.

The FGDs were interspersed with interviews of all senior people in the organization. Sample questions that were used for the FGD, interviews and visioning exercises are given in Exhibit 5. On the advice of the Chairman, a couple of interviews that were not part of the original plan were also conducted. These interviewees included the registrar and a representative of an external consulting firm that had been working with WSERC from the beginning. These interviews provided additional insights into the challenges being faced by the organization. For instance, Sanjay Patil, the registrar mentioned:

> Any training has to begin with basic communication skills. All employees should possess order drafting skills in terms of quality, appropriate language, and uniformity of language. Everyone should know the meaning of words such as respondent, petition, etc. JRS are all technically trained as engineers, but they do not know how to draft legal orders.

The responses of employees who were not available on these three days were collected later through email. At the end of this time period, the consultants were relieved because much of the data collection of the TNA intervention was conducted smoothly and was well received by the employees. A few scheduling hiccups had occurred since this type of an exercise was being carried out for the first time in WSERC. The employees had not been sure of the kind of planning that would be required for this exercise. In all, most of the organization had been covered by the TNA. Table 1 provides the details of people covered through each intervention and number of interventions conducted.

Analysis and Outcomes

The series of visioning exercises (with the commission), interviews (directors, secretary, undersecretary, registrar) and FGD (experts/advisors, RS, JRS, section officers) backed by the needs identification questionnaire brought out employee needs at various levels in WSERC. All the employees (100%) were considered for the TNA (except Commission and Class IV who were out of the scope of the mandate given to the consultants) because this was the first attempt of WSERC to conduct a TNA, and the questionnaire helped create awareness of individual needs.

Table 1. Participants Covered Through Various TNA Interventions

Name of Intervention	Number of Interventions/Participants Covered
Visioning Exercise	1
Interviews	5
Focus Group Discussions	3
Self-Analysis Questionnaire	52 participants
Advisors & Secretary*	11
RS & JRS	26
Administrative & Clerical staff	15
Supervisor's Questionnaire (L1 & L2)	37 responses

Source: Company records.
Note: *Based on the advice of the chairman, legal and non-technical consultants were not covered through the TNA.

Survey Outcomes

Data were compiled and integrated as per the levels (advisors, JRS, RS and administrative staff, section officers, secretary, undersecretary, directors, registrar) and as individual scores of employees. Mean scores were mapped against the 10 competencies (broad categories) used in the questionnaire. Spider charts (Exhibit 6) were used to graphically depict differences in perceptions for each individual and his or her supervisor(s) and demonstrate the competency gap.

Median scores and forced distribution were used to compare people within their peer group and identify where they stood vis-à-vis their peer group. This helped identify people who were perceived as low on the managerial competencies and people who were perceived as relatively high on these competencies. Exhibit 7 depicts the analysis for a group of respondents (RSs). Since there was a significant perceptual gap between self and supervisor ratings, the organization recommended using the more stringent criteria for identifying people who required training in certain competencies.

Based on the results, the consultants concluded that the majority of employees were on the average level of proficiency on most competencies, and therefore the knowledge, skill building and attitudinal training should be pegged at enhancing the proficiency level. For the top performers, it could be a refresher training to leverage their competencies for future performance. The low scorers would have to attend the training and be additionally supported by continuous Management by Objectives (MBO) initiatives in a phased manner through varied assignments, projects, mentoring, etc.

Qualitative Analysis Outcomes

Information received from interviews and FGDs was transcribed and compiled. Based on the content extracted, various points emerged—many of them repeatedly, as needs for training. Emerging points were categorized in terms of competencies that had been identified earlier. The points that were not part of the competency framework were added as additional training requirement (Exhibit 8).

Based on the feedback received, various trainings (attitudinal/behavioural, commercial and functional) were identified for each level (Exhibit 9). In the final report submitted to WSERC, the consultants recommended certain interventions (Exhibit 10) along with the areas of training for optimal effectiveness of the change process.

Presentation of Findings

Gurdeep Singh (Secretary of WSERC) requested the team of consultants to share their findings in the form of a presentation to the organization. He shared a copy of the report with the commission and directors prior to the consultants' presentation.

The consultants presented four emerging areas of training intervention and mentioned organizational level interventions that WSERC could consider for it to become a seamless and agile organization as envisioned by the commission. These interventions would make the organization ready to work with different demands arising out of government policies, utilities (public and private), public interest litigations (PIL), public hearings, concerns of consumers, equitable and fair distribution of power (electricity) in urban and rural areas in the state, power traffic rationalization, power theft, etc. Additionally, they recommended the use of appropriate evaluation of all the training programmes delivered to understand training effectiveness.

The following four areas of training interventions were recommended:

- Attitudinal/behavioural training—communication, team building, time management, goal setting, etc.
- Managerial training—analytical thinking, leadership, coaching and mentoring.
- Functional/technical training—Electricity Act and its application, regulation of tariffs, writing proposals, etc.
- Commercial training—understanding requirements of various power utilities, dealing with a dynamic market, understanding the economic environment of the country, etc.

Systemic interventions recommended for the organization included the following:

- Role clarity
- Change management
- Competency based interventions
- Cultural change
- Knowledge management systems

Way Forward

After scrutinizing the TNA report and the presentation by the consultant team, the decision-makers in WSERC decided to embark on the journey of capability building for their employees. Since they felt that ISBAR had developed deep insights into the functioning of WSERC, they appointed ISBAR for the design, delivery and evaluation of attitudinal, behaviour training programmes and mentoring intervention. The technical/functional trainings would be conducted through internal experts or other trainers that had been employed in the past. Commercial training was already underway and would continue with the same trainers. The core group also decided not to take any immediate decision on the systemic interventions recommended by the consultants.

While a decision was taken to implement the recommendations of the TNA, it would be challenging to conduct formal training programmes, given the small number of people in the firm. Arun pondered if there could be alternative approaches to competency development where formal training would not be required. The number of identified trainings appeared too many to be delivered within a year. He wondered if he should prioritize the programmes and suggest which could be focused on for the current year.

A critical question facing him was if he should send his people to well-known management institutes for training or have in-house training programmes such as the one being planned with ISBAR trainers. He would also need to identify ways to address the systemic challenges that had been identified by the consultants. Organization of various training programmes had to include their design, delivery and evaluation.

Exhibit 1. Timelines for Training Need Analysis

April 2011	Arun Nalwade met consultants to discuss the mentoring initiative. The decision was taken to first conduct TNA and training before mentoring.
May 2011	Proposals invited for TNA by WSERC
June–July 2011	Evaluation of proposals and discussion with firms that had submitted TNA proposal
August 2011	Work order issue to ISBAR to conduct TNA
Mid-August 2011	Briefing to ISBAR consultants and employee profiling conducted by them
End-August 2011	Detailed TNA plan mailed to WSERC
September 2011	Three day TNA process commences, comprising survey, focus group discussions and interviews
End-September 2011	Data tabulation, analysis and results
October 2011	Preliminary TNA report presented to WSERC
End-October 2011	Final TNA report submitted to WSERC

Source: Company documents.

Exhibit 2. Skills Required as Identified by the Respondents

- Interpersonal skills
- Analytical skills (5)
- Problem-solving (2)
- Personality development
- HRD skills
- Willingness to work
- Readiness to learn new ideas
- Learning ability
- Good drafting skills (5)
- Legal drafting (2)
- Writing skills (2)
- Technical skills/knowledge (7)
- Financial knowledge (3)
- Written and verbal communication (5)
- Planning and organizing
- Teamwork (2)
- Interpersonal sensitivity
- Change orientation
- Time management (2)

- People management
- Legal skills, interpretation and proper knowledge of law (7)
- Knowledge in power sector
- Detailed knowledge of other subjects
- Language skills
- Deep knowledge of law and economics
- Legal aspects of regulatory framework (2)
- Conceptual skills
- Reasoning
- Long work experience in a power plant
- Working knowledge on true-ups, APR (annual performance review) and ARR (annual rate of return) being submitted by utilities for review
- Understanding basics of ROPs (record of proceedings) of court (technical/functional skills)
- Reading
- Commercial skills
- Logical skills
- Negotiation skills
- Management skills
- Data analysis
- Knowledge, accuracy, and speed for dealing with administrative and employee matters
- Good understanding of power system operations, financial and economic aspects, other regulatory bodies, professional interaction with utilities operational/field staff for effective monitoring of regulatory issues and its timely input to the commission

Source: Company documents.
Note: Numbers in brackets represent the frequency of responses.

Exhibit 3. List of Competencies

1. Individual effectiveness
2. Analytical skills
3. Task achievement
4. Planning and organizing
5. Adaptability
6. Creativity
7. Communication
8. Teamwork
9. Developing people skills
10. Leadership skills

Source: Company documents.

Exhibit 4. Mail for Scheduling the TNA Exercise

The Undersecretary, 28/8/2011

WSERC

We have received employee profile details and philosophy, objectives and mandate of WSERC. We propose to have a TNA process wherein information would be collected through quantitative and qualitative methods. I take this opportunity to familiarize you with the TNA process plan and schedule that we envisage. This process will include

1. Questionnaire to understand perceptions of employees for self-assessment of training needs
2. Questionnaire to understand perceptions of superiors about training needs of the people reporting to them
3. Focused Group Discussions (FGD) with varied groups to understand common needs and constraints faced in work roles and functioning
4. Interviews with Directors
5. Visionary exercise in the form of a discussion with the commission

Our consultant team will comprise three members. TNA process will be spread over three days (10th, 11th & 12th September 2011) from morning 10 am to 5 pm. We need your assistance in plotting a schedule for the same. As per the details provided by you, there are 16 regular staff and 48 consultants. Our data collection plan will be as follows:

- Interview with the Directors and Secretary (3 people) – one hour of interview per person
- Visioning exercise with the Commission chairman and member – 1.5 to 2 hours for the exercise
- Three focus group discussions (FGDs). Each FGD will be followed by administration of TNA questionnaire to the group. Please plan 1.5–2 hours per FGD. The three FGD groups will be
  - Individual consultants and advisors
  - RS
  - Undersecretary, section officers, and other administrative staff
- All the JRSs will be required to fill the TNA questionnaire. Please schedule a group appointment of 45 minutes so that the questionnaire can be explained and administered to all the JRS's together.

As per the plan, the training needs will be identified by self, immediate supervisor (L1) and supervisor's supervisor (L2) or two key supervisors in case the reporting is to multiple people. Thus, in addition to self-evaluation, people who are in the supervisory category will also fill the TNA questionnaire for their subordinates.

Kindly help us in setting the appointments and ensuring the presence of the identified group/persons for the TNA activity.

Infrastructure Requirement:

For infrastructure arrangements, we will require a large room for the administration of need identification questionnaire and FGD (seating capacity of 20/25 individuals). Interviews with directors can be conducted in their cabins, and visioning exercise with the commission can be arranged in a conference room (5 individuals). We will also need a room for the consultants to sit and work for the three days. All participating employees need to be given pens and notepads.

We will bring the required number of questionnaires and if required, will use your facilities for Internet and photocopy requirement. Ms Smita Naik from International School of Business Administration and Research will be the contact person. You can communicate with her for any suggestions and clarifications.

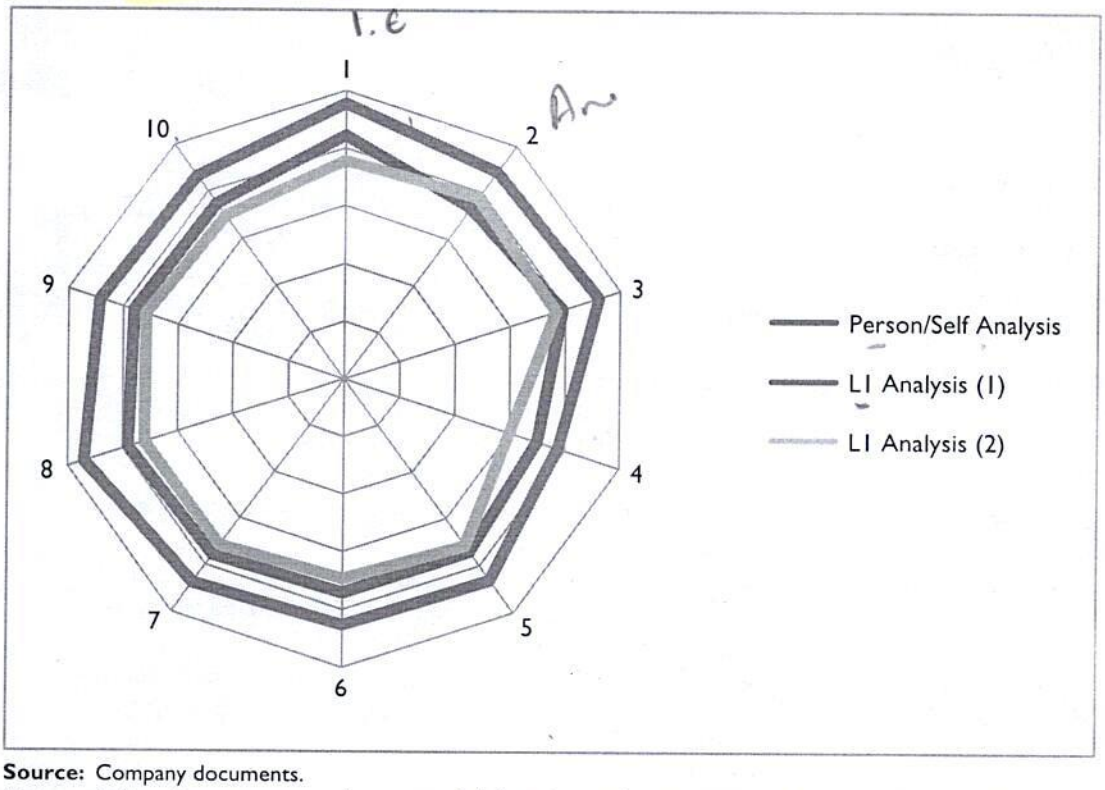
Source: Company documents.

Exhibit 5. Sample Questions for Focused Group Discussion and Interviews

1. How do you see WSERC's role in the power sector five years from now?
2. How do you see the internal organizational structure emerging over the next 2–3 years?
3. Do you foresee any change in the way people will work due to the above changes?
4. According to you, what skills and competencies will be required to perform well for each of the aforementioned questions?
5. If you have to look for new employees in the next 2–3 years, what qualities/competencies would you look for?
6. How can you ensure transfer of knowledge or knowledge dissemination within the organization? What have you done so far?
7. As an advisor/consultant, do you foresee any change in the way you would approach/deal with clients in the next 3–5 years?
8. When will you say that a person is a good performer? Are there times when you may evaluate a person low on performance even if the person is technically sound?

Source: Company documents.

Exhibit 6. Spider Chart



Source: Company documents.

Note: Spider charts represent the person & LI evaluation for a respondent coded as JRS2. The numbers 1–10 on the periphery represent the 10 competencies on which the individual was evaluated through self and two supervisors' evaluations. The outer chart shows self-evaluation that is significantly higher than the assessment of the supervisors.

Exhibit 7. Comparative Analysis for Regulatory Staff

Median Analysis for Sample Competencies for RSs

Competency	Median Scores	People Below Median
Individual Effectiveness	**4.06**	RS 3, 8, 10, 12
Analytical Skills	**3.89**	1, 2, 5, 8, 9
Task Achievement	**4.00**	2, 3, 8
Planning and Organizing	**3.81**	1, 3, 5, 6, 8, 9
Adaptability	**3.84**	2, 3, 5, 8, 9

Forced Distribution for RSs

Competency	Top 20%	Average 70%	Low 10%
Individual Effectiveness	RS 4, 5	1, 6, 9, 7, 2, 12, 3, 10	8, 11
Analytical Skills	4, 10	6, 7, 3, 12, 1, 9, 5, 8	2, 11
Task Achievement	1, 2	3, 4, 5, 6, 12, 7, 8, 9	10, 11
Planning and Organizing	10, 2	7, 12, 4, 1, 6, 9, 5, 8	3, 11
Adaptability	1, 2	3, 4, 12, 5, 6, 7, 8, 9	10, 11

Source: Company documents.
Note: The numbers represent respondent employee codes.

Exhibit 8. Competency Descriptions for Training

Sr. No	List of Competencies	Descriptors/Indicators
1	Individual effectiveness	Knows how to push ideas; takes responsibility and ownership; increases commitment to work; is assertive, proactive and takes the initiative; has a positive attitude and professional approach to work and networking
2	Analytical skills	Logical thinking, critical thinking and decision-making capabilities; identifies important points in any document; analyses tasks, does in-depth research and executes tasks well and within the timelines; evaluate a proposal; precision in a job
3	Task achievement	Role and goal clarity among employees; works aggressively and completes tasks in time
4	Planning and organizing	Links roles to organizational goals; management training; tracks and manages events through appropriate documentation; plans tasks better, prioritization and execution
5	Adaptability	Politically savvy; know-how to work in an organization and with colleagues; deals with periodic changes, manages transition from student life to professional life

Sr. No	List of Competencies	Descriptors/Indicators
6	Creativity	Ability to think and apply mind; identifies what can be done professionally rather than only through traditional ways of working; identifies different ways of working within the legal framework
7	Communication	Training in workplace etiquettes
8	Teamwork	Managing conflict, teamwork, coordination among people and interpersonal relations
9	Developing people skills	Training in motivating employees, better people management, getting work done from limited staff and encouraging more ownership of work
10	Leadership skills	Empowerment, mentoring
11	Technical skills	Domain knowledge; exposure to the working of regulators; understands Electricity Act 2003; orders drafting skills in terms of quality, language and uniformity of language and understanding of legal terminology; writing skills; can evaluate a proposal; precision in a job; knows which law to apply; accuracy
12	Other trainings	Use of relevant IT tools; basic knowledge of law, economics to provide a holistic perspective; finance for non-finance

Source: Company documents.

Exhibit 9. Training Needs Identification at Various Levels of Employees

Level of Employee	Type of Training	Utility	Reasons
Directors and Secretary	a. Leadership—managing and developing people b. Mentoring c. Training on strategy and business processes	Need for junior employees to have a leader who can guide and direct them. Junior employees lacked ownership of work, and conflicts were hampering the flow of work.	This cadre of individuals is well versed in technical aspects and government functioning. Leadership training would help them understand their own leadership styles and effectively manage other people in the organization.
		Using power, developing managerial skills, business communication also emerged during discussions and interviews.	Additionally, they also needed to develop the internal capability in the organization and therefore mentor their subordinates through a formal process of mentoring and not leave it to chance learning.
Advisors/ Consultants	d. Coaching and mentoring e. Leading a team	Advisors/consultants were having a rich experience as they had worked in various utilities so they could mentor, coach and even lead a team.	One of the key objectives was a transfer of technical and functional knowledge. It was expected that coaching and mentoring of newer employees would lead to the transfer of this tacit knowledge. Also, they would help the junior employees hone their managerial skills.
Regulatory Staff (RS)	f. Enhancing individual effectiveness, adaptability and task achievement g. Analytical ability h. Planning and organizing i. Creativity j. Communication k. Teamwork l. Developing people skills and becoming a leader	Need for skill building (attitude/ behaviour) emerged during FGD with experts/advisors, in terms of planning, time management, working with others, collaboration in work, etc.	These individuals had some experience and were ready to be team leads of small groups of 2–3 individuals. They needed to coordinate with utilities and plan own performance in accordance with the needs of the organization.

(Exhibit 9 continued)

(Exhibit 9 continued)

Level of Employee	Type of Training	Utility	Reasons
Junior Regulatory Staff (JRS)	m. Enhancing individual effectiveness, adaptability and task achievement n. Analytical ability o. Planning and organizing p. Creativity q. Communication r. Teamwork	Need for skill (attitude/behaviour) building emerged during FGD with experts/advisors and regulatory staff, in terms of planning, time management, working with others, collaboration in work, dealing with conflicts, etc.	This group was embarking on a career in the regulatory and power sector and had to become familiar with the workings of both of them. As freshers, they had to build their skill sets and competency levels. They also had to understand the unique demands of being in the regulatory setup through working with others.
Administrative Staff	s. Enhancing individual effectiveness and adaptability t. Planning and organizing u. Communication v. Teamwork	Need for skill (attitude/behaviour) building emerged during FGD with regulatory staff, in terms of planning, time management, working with others, collaboration in work, dealing with conflicts, etc.	This group had come through the varied government departments and had to adjust to the culture and set-up of WSERC, and adapt to working with regular employees and consultants.

Source: Company documents.

Exhibit 10. Proposed Interventions

To establish a culture of continuous learning amongst WSERC employees and make WSERC meet the dynamic changes and demands of the business environment, following were certain interventions proposed by consultants to WSERC:

1. Role clarity among WSERC employees (job analysis and role effectiveness)
2. Change management (preparing for internal and external changes)
3. Competency based (people competency, human resource development initiatives)
4. Cultural change (organization wide)
5. Knowledge management and systems (processes and standardization)
6. Mentoring (developing leaders and leaders mentoring junior level employees)

Source: Company documents.

Notes

1. Readers interested in a detailed background to this issue can look at the case, 'Capability Building in a Government Regulatory Firm (A)'.
2. Most of the managerial staff were either hired as consultants on an annual contract basis or were deputed from other government organizations for 2–3 year periods.

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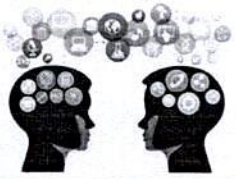
Journal Club presentation on
"Training Need Analysis in a Government Regulatory Firm"



1

Abstract

- Case is about Western State Electricity Regulatory Commission (WSERC), a Govt regulatory firm
- Arun Nalwande, Chairman of WSERC, had been grappling with the issue of untrained manpower in his firm
- Lack of technical and managerial skills among employees who were either permanent or on contract
- Senior staff members were not willing to share knowledge with juniors and employees preferred to work in silos
- Consultants suggested mentoring and coaching in the areas of leadership, conflict management, team building , but Mr. Arun suggested to conduct a TNA before any such training is imparted

2

Need for Trained Manpower in Power Sector

- Total workforce in power sector in India: 0.95 million
- Expected manpower: 0.5 million with technical and non technical skills needed
- Challenge: to attract the fresh talent and upgrade the skills of existing employees
- Solution: Introducing educational courses related to energy capacity addition, production, operations and maintenance
- Existing infrastructure and refresher training could met only 3 to 4 % of the requirements due to which the industry faces the problem of skilled employees

3

Need for Trained Manpower at WSERC

- Considering the issues company was facing, Arun discussed the development interventions with the commission and senior members and decided to appoint an external consultant, ISBAR (International School of Business Administration and Research) to conduct a TNA for his employees

4

Training Need Analysis

- ISBAR collected information about company's objectives, philosophy, structure and employee profile from Mr. Anand Nair, (Undersecretary)
- They also gathered information about the power sector and the best practices worldwide
- People were recruited as per manpower plan but deployment was not followed
- Regulatory Staff (RS) and Junior Regulatory Staff (JRS) hired on contract, were expected to act as regular employees and there was no role clarity about their work
- Employee profiling survey was done to understand if people were working independently or in teams and their reporting relationships
- It was found that despite having teams, people were working independently and there were no well-defined team tasks
- Employees were asked to list down the skills and competencies they feel would be required to efficiently carry out tasks

5

Exhibit 2. Skills Required as Identified by the Respondents

- Interpersonal skills
- Analytical skills (5)
- Problem-solving (2)
- Personality development
- HRD skills
- Willingness to work
- Readiness to learn new ideas
- Learning ability
- Good drafting skills (5)
- Legal drafting (2)
- Writing skills (2)
- Technical skills/knowledge (7)
- Financial knowledge (3)
- Written and verbal communication (5)
- Planning and organizing
- Teamwork (2)
- Interpersonal sensitivity
- Change orientation
- Time management (2)

People management
- Legal skills, interpretation and proper knowledge of law (7)
- Knowledge in power sector
- Detailed knowledge of other subjects
- Language skills
- Deep knowledge of law and economics
- Legal aspects of regulatory framework (2)
- Conceptual skills
- Reasoning
- Long work experience in a power plant
- Working knowledge on true-ups, APR (annual performance review) and ARR (annual rate of return) being submitted by utilities for review
- Understanding basics of ROPs (record of proceedings) of court (technical/functional skills)
- Reading
- Commercial skills
- Logical skills
- Negotiation skills
- Management skills
- Data analysis
- Knowledge, accuracy, and speed for dealing with administrative

6

TNA Plan

- Questionnaire, Interviews and Focused group discussions methods were used to collect data
- Areas of Attitude and behaviour were appraised through individual competency and managerial skills through analytical, planning and organizing
- Consultants prepared a list of 10 competencies which they felt were required to carry tasks and this helped them to prepare questionnaire

7

Exhibit 3. List of Competencies

1. Individual effectiveness
2. Analytical skills
3. Task achievement
4. Planning and organizing
5. Adaptability
6. Creativity
7. Communication
8. Teamwork
9. Developing people skills
10. Leadership skills

Source: Company documents.

8

Sample Questions: Exhibit 5

1. How do you see WSERC's role in the power sector five years from now?
2. How do you see the internal organizational structure emerging over the next 2–3 years?
3. Do you foresee any change in the way people will work due to the above changes?
4. According to you, what skills and competencies will be required to perform well for each of the aforementioned questions?
5. If you have to look for new employees in the next 2–3 years, what qualities/competencies would you look for?
6. How can you ensure transfer of knowledge or knowledge dissemination within the organization? What have you done so far?
7. As an advisor/consultant, do you foresee any change in the way you would approach/deal with clients in the next 3–5 years?
8. When will you say that a person is a good performer? Are there times when you may evaluate a person low on performance even if the person is technically sound?

9

Data Collection

- TNA process began as per plan, few employees were interested and few were not.

  "We have not been informed about any exercise. We were just now told to come to this room for two hours. As an external consultant, I come to the office for only three days in a week. If I spend two hours here, how will I get my work done?"

  "I did not know that a brief had to be sent to the commission before a hearing. I was asked for the brief at the time of the hearing, but I was not ready with it. The processes are streamlined but not documented, due to which a person may run around without knowing how to do the work. There has to be standardization of the processes."

10

Analysis and Outcome

Exhibit 7. Comparative Analysis for Regulatory Staff
Median Analysis for Sample Competencies for RSs

Competency	Median Scores
Individual Effectiveness	**4.06**
Analytical Skills	**3.89**
Task Achievement	**4.00**
Planning and Organizing	**3.81**
Adaptability	**3.84**

11

Analysis and Outcome

- Majority of employees were on the average level of proficiency on most competencies and hence knowledge, skill building and attitudinal training should be pegged at enhancing the level
- For top performers, refresher course could be an option to meet future requirements
- The following four areas of training interventions were recommended:
  - Attitudinal/behavioural training—communication, team building, time management, goal setting, etc.
  - Managerial training—analytical thinking, leadership, coaching and mentoring
  - Functional/technical training—Electricity Act and its application, regulation of tariffs, writing proposals, etc.
  - Commercial training—understanding requirements of various power utilities, dealing with a dynamic market, understanding the economic environment of the country, etc.

12

Recommendation

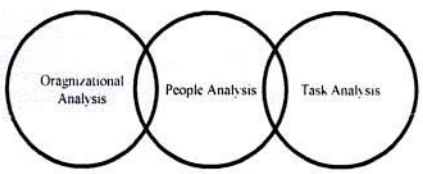
- Systemic interventions recommended for the organization included the following
  - Role clarity
  - Change management
  - Competency based interventions
  - Cultural change
  - Knowledge management systems

13

Training Need Identification at BRIMS

14

McGhee And Thayer's Three-level Analysis Model



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15

Introduction to BRIMS

- Founded: 1972
- Location: Thane
- Courses: MMS/ PGDM/ Certification Courses
- Achievements: NAAC Accreditation B++, Approved by AICTE
- Publication: Srujan and Research Publication
- Facilities: Library, Canteen, Hospital and Medical Facilities, Wi-Fi Campus, Auditorium, IT Lab, Sports Complex

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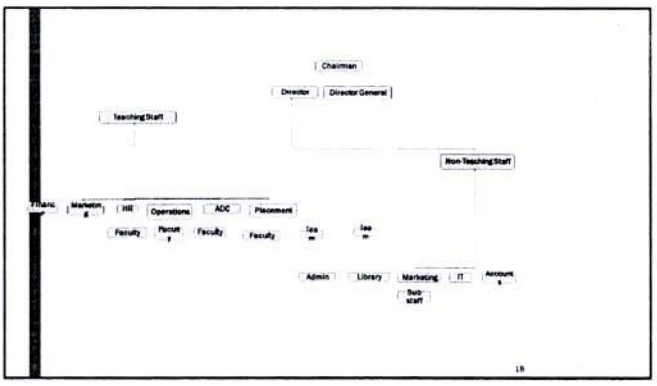
Quality Policy

- We at Dr. V.N. Bedekar Institute of Management Studies, Thane are committed to achieve a high level of satisfaction amongst our students interested parties by
  - Consistently imparting knowledge using the latest techniques based on the prescribed and designed syllabi
  - Close interaction with students throughout their stay
  - Practicing one on one interaction with every student to the extent possible
  - Increasing awareness and competence of all our employees
  - Complying on all applicable statutory and regulatory requirements
  - Continually improving the effectiveness of our quality management system based on ISO 9001:2015

17



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Training Need Analysis at BRIMS

- Training Need Identification was done for the non teaching section of BRIMS
- HR students formed groups and collected data
- Prior appointments were been taken so that the work was not disturbed
- Secondary data was collected from various websites and journals about the job analysis of various departments in an educational institution
- Primary data was collected through questionnaire: 360 degree feedback, interviews with the supervisors and focused group discussions
- It was found that employees were willing to share the information and were open to suggestions and learnings

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Training Need Identification

Based on the data collected, following gaps have been identified in various departments

- Library Department
  - *Consist of 4 members- Library head, Library assistant, Junior clerk and Peon*
  - *Dept needs improvement in following areas:*
    - Communication skills
    - Interpersonal skills
    - Conflict handling
    - Team Management
    - Leadership
    - Technical skills (Research)

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Training Need Identification

- IT Department
  - *Consist of 4 members- IT Head, IT Assistants and Peon*
  - *Dept needs improvement in following areas*
    - Analytical skills
    - Behavioural skills (Communication)
    - Planning and Organizing
    - Team work and coordination

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Training Need Identification

- Administration Dept.
  - *Consist of 3 members- Admin head, 1 clerk and peon*
  - *Dept needs improvement in following areas*
    - Technical Skills (Software)
    - Communication skills
    - People skills

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Training Need Identification

- Accounts Dept
  - *Consist of 2 members- Account head and Account clerk*
  - *Dept needs improvement in following areas*
    - Software and Technical Knowledge
    - Development on latest laws and acts in Finance (Seminars)
    - Communication skills
    - Analytical skills

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Training Need Identification

- Marketing Dept
  - *Consist of 7 members- 2 heads, 3 counsellors and 2 tele callers*
  - *Dept needs improvement in following areas*
    - Team work and Coordination
    - People skills
    - Technical skills (Software)
    - Communication skills
    - Creativity

24

Training Need Identification

- Sub-staff (Peons)
  - *Consist of 6 members*
  - *Dept needs improvement in following areas*
    - Hospitality
    - Communication
    - Behavioural
    - Basic computer knowledge
    - Team work and coordination
    - Planning

25

Competencies Identified

- Based on the qualitative data collected following competencies have been identified as most important
  - *People skills (Communication)*
  - *Planning and Organizing*
  - *Analytical skills*

26

Plan Ahead

- Step 1: Raw and qualitative data collected
- Step 2: Inputs from the house (Journal Club)
- Step 3: 360 degree feedback from the stakeholders about the departments (Quantified data)
- Step 4: Data to be statistically analysed and gaps to be identified
- Step 5: Training as a Solution'

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Thank YOU

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