RESULTS AND DISCUSSION

The objectives of this research were to study the following aspects of use of KM in this sector:

(i) the status of the use of KM in the medium sized companies in the IT industry and to find out the success factor for implementing KM
(ii) to study the impact of using KM on firm's performance
(iii) to study the KM systems of two companies where KM is successfully implemented and suggest a proposed model which can be replicated/tailor-made in other similar units

The working hypothesis derived was:

1. There is a positive link between Knowledge Management and Business Performance in Medium sized Information Technology companies in Eastern India
2. The reason medium sized IT companies in Eastern India do not use KM is because of lack of awareness about the impact of knowledge management on business performance

The results of this research study are based on:

- A study of 12 cases of companies based in Kolkata, Bhubaneswar as well as Ranchi which covers most of the IT centers of Eastern India. The following
are the findings from questionnaires given to important officials in these companies.

These results were also reinforced by:

- An interview with industry expert: Mr. Biswajit Panda (Project Lead, KM - Infosys, Bhubaneswar), and academician: Dr. Subhashish Mukhopadhyay (Professor – Calcutta University)
Case 1: Data-Core Systems, Inc.

Data-Core Systems, Inc. is an international professional IT & Business service provider to Fortune 1000 companies and government organizations.

Data-Core Systems, the IT services arm of the group, delivers innovative solutions. We develop custom solutions that allow us to address and resolve requirements that are unique to each client. Leveraging our extensive business and technical capabilities, infrastructure, resources, and quality processes, we work towards creating solutions that provide real returns on our clients' investments. This framework supports us in forging long-term partnerships with our clients. We measure our success through increased customer satisfaction, client retention rates and value delivered.

Data-Core's services are backed by its reputation as a reliable business partner for over 25 years, its guarantees on quality and timelines and by the total commitment of its top management.

The Data-Core Group belongs to a diversified multinational conglomerate – The Kuljian/DC Group – of architecture, engineering, construction management, commercial and engineering software, heavy manufacturing and assembly, chemical, pharmaceutical, healthcare and real estate companies. The conglomerate is an outgrowth of an engineering and construction management firm, The Kuljian Corporation, founded in 1930 and headquartered in Philadelphia, PA.

The Kuljian/DC Group, along with its engineering and construction management affiliates - the major arm in the group – performs annually projects of around $2.5 billion in terms of constructed cost and is one of the major engineering/construction management firms in the world.

Data-Core group’s main activities can be classified into three main groups:

  a. IT Services:
a. Application services including, development, support and maintenance
b. Data Warehousing and Business Intelligence
c. Quality assurance and Software testing
d. Development and Marketing of Application software

b. BPO operations: Biz-Core is the BPO division of Data-Core engaged in Business Process Outsourcing for data-intensive market segments including the financial services, Healthcare, Pharmaceutical, Marketing, Publishing and Litigation Support industries. Its impressive client base is testimony to the quality of services that Biz-Core has provided over the years.

c. Scanning, Digitizing and Backfile conversions: Biz-Core is also a leading provider of Legacy Document Conversion services. They have executed major projects (over 10,000,000 documents – paper, microfiche and microfilm) for several clients. They have included Official Records for two major US State Governments, publication records for the National Library in a major country, and Land Records for a large State of a South American Country.

For these projects Biz-Core typically provides the management, staff, equipment and software to create digital images & index data from paper, microfilm or microfiche documents.

The following is the data gathered about Knowledge Management in Data-Core from a personal interview with Mr. Dipak Bhattacharya (General Manager):

Knowledge process followed:
Every calendar year every employee of Data-Core goes through at least 48 hours of training on the following, so as to make his/her knowledge current

- Quality program
- Job certification
- Communication skills

**Knowledge Management verticals:**
Data-Core uses knowledge management for the following verticals

- Pre-sales
- On-site and Off-site deployment
- Engineering

**Objectives for KM:**
Data-Core is a major user of knowledge management. KM in Data-Core is mainly used for

- Faster Product development
- Modularity
- Portability

**The current challenges/problems the company is facing with the current process:**
Inspite of using knowledge management, Data-Core does face a few business challenges for which Data-Core is trying to find solutions

- Encashing of the product development is not upto the mark
- Attrition
Data-Core’s solution:
From the previously mentioned challenges which Data-Core faced, knowledge management gives the following solutions

- Review and analyze reasons for problems (technical or business)
- Focus on marketing
- Retraining

The benefits of KM in Data-Core:
The practical benefits which Data-Core derived from implementing knowledge management are

- Faster product development
- First to come in the market with a banking software
Case2: Interra Information Technologies (I) Pvt. Limited

Interra Systems offers products and services in the following domains:

- Digital Media Applications
- EDA Solutions

Media product companies across the world use Interra's Vega family of Analyzers to speed the development of their products. These analyzers along with allied products have carved their niche as premier test and measurement tools. Interra also offers front-end technologies to EDA Tool Companies and In-house EDA Tool Developers to rapidly create new solutions. Solutions from Interra Systems have helped them bring products to market at reduced cost. In addition, proven test suites enhance the quality of EDA tools. MC2, Interra's memory development platform has helped embedded memory designers gain productivity along with streamlining their design workflow.

The following is the data gathered about Knowledge Management in Interra Systems, Kolkata from a personal interview with Mr. Suvomoy Bera (Engineering Director):

Knowledge process followed:
Interra Systems has a formal knowledge management process and generally follows a structure which is

- Collection of data by statistic department and passing it to higher levels
- Automatic data collection by MIS department
- Structured decision making by higher authorities

Knowledge Management verticals:
Interra Systems uses knowledge management for the following verticals
- Need based (increases flexibility)
- Production
- Integration of latest technologies

**Objectives for KM:**
Interra Systems is a major user of knowledge management. KM in Glodyne Technoserve is mainly used for
- Faster Product development
- Modularity
- Portability

**The current challenges/problems the company is facing with the current process:**
In spite of using knowledge management, Interra Systems does face a few business challenges for which Interra Systems is trying to find solutions
- Attrition
- Demotivation of employees

**Interra System’s solution:**
From the previously mentioned challenges which Interra System faced, knowledge management gives the following solutions
- Monetary benefits to employees
- Working on latest technologies arrests attrition as lack of projects can be a dampener

**The benefits of KM in Glodyne Technoserve:**
The practical benefits which Interra Systems derived from implementing knowledge management are

- Monetary benefits is high
- Attrition has been arrested
- Absorption of latest technologies by employees
Case3: Mate Consultancies

Mate Consultancies is a Kolkata based IT consultancy firm. They are in the field of offering IT consultancy to almost all major industry verticals. It is based out of Kolkata but has a presence in all major geographies of India.

Mate Consultancies has been able to make a mark in the IT consultancy domain with a quality service delivery and customer first approach. The proven combination of onsite-remote delivery model helps the company to synchronize seamless and cost-effective solutions with assured quality to the clients. Mate Consultancies strives constantly to deliver greater tangible business benefits to its clients. Mate Consultancies follows the best business practices that enable companies to operate more efficiently, have better ROI and help them focus on their core business. Mate Consultancies thinks beyond the basic ‘cost arbitrage’ benefit for their clients. Technologists and analysts find solution to the most complex of business logic and help maintain competitive advantage for the clients by transforming concept to reality.

The following is the data gathered about Knowledge Management in Mate Consultancies, Kolkata from a personal interview with Mr.Pradipta Tagore (Director):

Knowledge process followed:
Mate Consultancies has a formal knowledge management process and generally follows a structure which includes

- Formal launch of KM process in 2000
- Malcolm-Baldrige methodologies is implemented

Knowledge Management verticals:
Mate Consultancies uses knowledge management for the following verticals

- Engineering

**Objectives for KM:**
Mate Consultancies is a major user of knowledge management. KM in Mate Consultancies is mainly used for

- Analysis of market demands
- Competitor information
- New developments in the field

**The current challenges/problems the company is facing with the current process:**
Inspite of using knowledge management, Mate Consultancies does face a few business challenges for which Mate Consultancies is trying to find solutions

- Service delivery
- Employee heartburn

**Mate Consultancies’ solution:**
From the previously mentioned challenges which Mate Consultancies faced, knowledge management gives the following solutions

- Faster delivery to customer
- Reduce employee heartburn

**The benefits of KM in Mate Consultancies:**
The practical benefits which Mate Consultancies derived from implementing knowledge management are
- Better technical infrastructure
- Senior management buy-in
- Better absorption of data coming from various sources
Case 4: Gamut Infosystems Limited

In this demanding environment of the 21st century, Gamut is a company committed to principles of quality, continuous improvement and total customer satisfaction. They have a hand-picked and dedicated team of software professionals. This helps to provide a foundation upon which it can build in order to be as good as the best and offer solutions that are world class and cost effective.

At Gamut, human resources remain their greatest asset. Gamut identifies the industry’s best potential talent and carefully nurtures them into well-rounded professionals. They allow their individuality to blossom and provide the right motivation along with a stimulating and challenging work environment.

All these ensure that they have a faster, leaner, nimbler team who are constantly learning, evolving and redefining quality standards daily to be ever ready to react to unique individual requirements. They have the ability to innovate. Adapt. And work into any environment.

Gamut is one of the premier solution providers of India. Gamut’s business interests vary into a wide gamut of activities ranging from ERP Solutions, Embedded Software Solutions, Wired and Wireless Protocols, Simulation Software, Hi-end Graphics, Web Development, Shrink-wrapped packages as well as e-business consulting. Among their regular services they also provide Supply Chain Management, Customer Relation Management for vertical industry sectors like financial services, insurance, retail, telecommunications and fast moving consumer goods (FMCG)
The following is the data gathered about Knowledge Management in Gamut, Kolkata from a personal interview with Mr. Anjan Chatterjee (General Manager, Marketing):

Knowledge process followed:
Gamut does not have a formal knowledge management process and generally follows a structure which is

- Informal
- Pre-sales training
- Lead sharing
- Technical workshops

Knowledge Management verticals:
Gamut uses knowledge management for the following verticals

- Domain knowledge in different verticals like Construction, Steel, Real estate, ERP
- Updating real-time knowledge

Objectives for KM:
Gamut is a major user of knowledge management. KM in Gamut is mainly used for

- Sales leads
- Technical knowledge sharing with partners

The current challenges/problems the company is facing with the current process:
In spite of using knowledge management, Gamut does face a few business challenges for which Gamut is trying to find solutions

- Duplication of knowledge
- Absorption of business practices

**Gamut’s solution:**
From the previously mentioned challenges which Gamut faced, knowledge management gives the following solutions

- Knowledge repository to avoid duplication
- Regular training for new business practices

**The benefits of KM in Gamut:**
The practical benefits which Gamut derived from implementing knowledge management are

- Good monetary returns
- ISO certification achieved
- New applications are found for non-performing products
Case 5: Neveah Technology Pvt Ltd

Nevaeh Technology Pvt. Ltd. is a business consulting, technology and IT services company dedicated to providing differentiated and value added solutions to our clients. Its are a young company promoted by a group of professionals with deep and extensive experience in consulting, industry and IT fields. The vast professional experience of the team at Nevaeh is focused towards providing value added professional services in the areas of BPO and resourcing, business consulting, e-governance, IT infrastructure management, SAP consulting and services and software and IT services. Nevaeh is partner of renowned global product and services companies including being one of the few partners of SAP in enterprise products and services. Nevaeh draws upon deep industry expertise of its leadership team and members in domains of automobiles, banking and financial institutions, chemicals, petroleum and natural gas, e-governance, healthcare, manufacturing, pharmaceuticals, primary metals and mining and retail. Nevaeh has strong technological expertise in areas like SAP, smart card and biometric applications and open system applications. Nevaeh has a world class offshore delivery center operating from Salt Lake City, Kolkata, India and supports secured global connectivity, international standard technology & support facilities, qualified and experienced resources and process driven activities. The company is funded by East India Securities Ltd., a reputed financial services organization of India. The company is ISO 9001:2000 certified. Nevaeh was promoted by a group of professional entrepreneurs with a deep dedication towards creating a venture embodying a set of core values fundamental to our existence.
The following is the data gathered about Knowledge Management in Nevaeh Technology Pvt Ltd, Kolkata from a personal interview with Mr. Prabir Dasgupta (Managing Director):

Knowledge process followed:
Nevaeh Technology has an efficient and formal knowledge management process and generally follows a structure which is
- Automating information flow
- Experience fulfillment

Knowledge Management verticals:
Nevaeh Technology uses knowledge management for the following verticals
- Knowledge base
- Documentation
- Processes
- Training

Objectives for KM:
Nevaeh Technology is a major user of knowledge management. KM in Nevaeh Technology is mainly used for
- Proposal management
- Central archive

The current challenges/problems the company is facing with the current process:
In spite of using knowledge management, Nevaeh Technology does face a few business challenges for which Nevaeh Technology is trying to find solutions

- Obsolescence of software
- Retention of knowledge through library
- Customer’s and user’s requirements not captured
- Quality failure

**Nevaeh Technology’s solution:**

From the previously mentioned challenges which Nevaeh Technology faced, knowledge management gives the following solutions

- Clear time frame and quality management with customer
- Documentation

**The benefits of KM in Nevaeh Technology:**

The practical benefits which Nevaeh Technology derived from implementing knowledge management are

- Marketing
- Measurement of domain competence
- Retention of domain knowledge
Case 6: NetHawk Networks India Pvt Ltd

NetHawk Networks India Pvt Ltd is a Finnish IT solutions company with a presence in nine countries, including Bhubaneswar, India with the purpose of providing expert software services globally, and has rapidly grown over the years. The strategy was to harness local advantages with a global delivery model thereby generating compulsive business benefits for clients, deliver on-the-dot every time and expand rapidly building on delivery strengths.

A strong belief in innovation, creativity, and co-operation prevails at NetHawk Networks. NetHawk Networks have, across nine countries, 450 talented specialists to make the impossible possible when it comes to wireless, Wireline, and VoIP testing. NetHawk tools are based on its unique product concept and ability to do the job a bit differently – or better, as they like to say. NetHawk India is a growing R&D unit of about 150 people located in Bhubaneswar, Orissa. NetHawk India co-operates closely with other NetHawk R&D units in Finland and the USA and supports NetHawk customers world wide.

The following is the data gathered about Knowledge Management in NetHawk Networks, Bhubaneswar from a personal interview with Mr. Sampath (Senior Developer):

Knowledge process followed:
NetHawk Networks has a formal knowledge management process and generally follows a structure which is

- Performance appraisal
- Potential and ability
- Overall development
Knowledge Management verticals:
NetHawk Networks uses knowledge management for the following verticals
- Domain: Healthcare, CRM
- Software: Languages like C#, DotNet
- Communication skills

Objectives for KM:
NetHawk Networks is a major user of knowledge management. KM in NetHawk Networks is mainly used for
- Developing existing domain
- Technical upgradation
- Managerial skills
- Cross-domain training for senior people
- Modularity

The current challenges/problems the company is facing with the current process:
In spite of using knowledge management, NetHawk Networks does face a few business challenges for which NetHawk Networks is trying to find solutions
- Targets fail in some domains because of competition
- Marketing targets are not met
- Lack of experience in KM
- Projects may not add value

NetHawk Networks’ solution:
From the previously mentioned challenges which NetHawk Networks faced, knowledge management gives the following solutions:

- Review and analyze reasons for problems (technical or business)
- Focus on strengths
- Split the goals i.e., instead of one big goal, split the same in several smaller goals
- Retraining

The benefits of KM in NetHawk Networks:

The practical benefits which NetHawk Networks derived from implementing knowledge management are:

- Knowledge transfer
- Knowledge upgradation
- Theory to practical approach
- Training (limited extent)
Case 7: Reddington India Limited

Commencing the Indian operations in 1993, Reddington India Ltd has successfully positioned itself as a focused distribution player with a significant reach across India, Middle East and Africa. Reddington India has demonstrated its capability in these price sensitive / difficult to penetrate geographies by leveraging their risk management capability, effective Supply Chain Infrastructure Management and efficient utilization of the Management Information Systems.

Within a short span of 15 years the Company has successfully transformed itself from a pure IT products distribution firm with traditional cash and carry model to a leading integrated Supply Chain Solution Provider that includes non IT products and involves the management of inventory of greater than 7200 SKU's (stocking units) while transacting business with over 16,000 channel partners.

The consolidated turnover of the company for the financial year 2007-2008 stands at Rs.108700 million (over USD $2.6 billion).

The Company’s higher than industry average growth in the price sensitive Indian market and difficult to penetrate Middle East and African markets showcases its capabilities as a leading distributor in the geographies present

The following is the data gathered about Knowledge Management in Reddington India Limited, Bhubaneswar from a personal interview with Mr. Debabrata Das (Branch Manager):

Knowledge process followed:
Reddington India has a formal knowledge management process and generally follows a structure which is

- Extensive use of Intranet for marketing
- Pre-launch product information
- Special pricing for customers

**Knowledge Management verticals:**
Reddington India uses knowledge management for the following verticals

- Infrastructure
- Logistics management

**Objectives for KM:**
Reddington India is a major user of knowledge management. KM in Reddington India is mainly used for

- Updating of knowledge
- Product development

**The current challenges/problems the company is facing with the current process:**
Inspite of using knowledge management, Reddington India does face a few business challenges for which Reddington India is trying to find solutions

- Infrastructure is not sound, especially internet connection
- Mismatch between product development and market requirements
- Logistics

**Reddington India’s solution:**
From the previously mentioned challenges which Reddington India faced, knowledge management gives the following solutions:

- Improving infrastructure, eg subscribing to two ISPs at a time
- Logistics is strengthened, eg subscribing to multiple courier companies

**The benefits of KM in Reddington India:**
The practical benefits which Reddington India derived from implementing knowledge management are

- Branding
- Competitive pricing
- Quick delivery to clients
Case 8: Ingram Micro India Limited

Ingram Micro Inc. is the world's largest technology distributor, providing sales, marketing and logistics services for the IT industry worldwide. Ranked as No. 67 in the 2009 FORTUNE 500 listing, the company operates in 34 countries with approximately 15,000 associates worldwide, with revenues of more than $35 billion for fiscal year 2007. Ingram Micro's global regions provide the distribution of technology products and services, market development services and supply chain management services to nearly 170,000 technology solution providers and 1,400 manufacturers. Ingram Micro is focused on maximizing shareowner value and achieving customer satisfaction through innovation in the information technology (IT) supply chain. With the dramatic changes driven by technology, companies located throughout the IT supply chain are required to reevaluate their business models to deliver maximum value to businesses and consumers. Distributors, technology solution providers, retailers and IT manufacturers have changed their business models to add value with innovative services and offerings that drive costs out. Distributors that remain successful in this industry have large scale and volume, global coverage, unparalleled standards and accuracy for logistics services, as well as financial strength to support growth and remain competitive. Ingram Micro is committed to transforming the value proposition for technology distribution and is the leading company in this industry. Innovation is the key differentiator between Ingram Micro and other IT distribution companies. The company's management team is focused on leading the industry through change and has a clear understanding of customer expectations. Ingram Micro leads the industry in creating new market opportunities with new and emerging technologies and value-added services. These new opportunities have changed the way that solution providers offer value to their end-user customers, making them more competitive in the marketplace. Ingram Micro continues to demonstrate that
it is the most effective partner to reach the global technology market. Ingram Micro offers more than 280,000 products (as measured by distinct part numbers assigned by manufacturers and other suppliers) with inventory from 1400 technology manufacturers and leading PC suppliers to its 170,000 technology solution provider customers. Ingram Micro is also a service powerhouse delivering logistics and supply chain management services to increase value and drive efficiency for companies at all levels of the IT supply chain. For technology solution providers, Ingram Micro's specialized divisions offer customers technical expertise and a well-informed sales support staff trained to handle the needs of market categories such as enterprise computing, converging technologies, small-to-mid-size businesses (SMB), and the government and education sectors. The company has developed services and solutions designed to address the needs of each technology category and market segment, with expert services to support customers serving vertical and specialty markets.

Ingram Micro India Ltd is a subsidiary of Ingram Micro Inc., USA. Established in 1989, IMIPL today is the No: 1 IT Distribution company with nationwide presence at 34 locations. We have extensive market expertise in providing a comprehensive product line from a single source. We enjoy an excellent reputation and market credibility as a leading wholesale provider of Computer Systems & Components, Peripherals and Printers, Networking Solutions, Computer Storage Systems, Supplies and Accessories, Application Software and Support Services. As a subsidiary of Ingram Micro worldwide it brings to India the best of business practices and the same state-of-the-art information systems in worldwide distribution. Ingram Micro India Ltd is committed to be the best wholesale provider of IT products and services in India providing real value to the customers and principals.
The following is the data gathered about Knowledge Management in Ingram Micro India Ltd, Bhubaneswar from a personal interview with Mr. Balunkeswar Jena (Area Sales Manager):

**Knowledge process followed:**
Ingram Micro India Ltd has a formal knowledge management process and generally follows a structure which is

- Sharing of information like pricing, promotions etc.
- Pre-launch product information
- Special pricing for customers

**Knowledge Management verticals:**
Ingram Micro India Ltd uses knowledge management for the following verticals

- Infrastructure
- Warehousing

**Objectives for KM:**
Ingram Micro India Ltd is a major user of knowledge management. KM in Ingram Micro India Ltd is mainly used for

- Infrastructure
- Induction training
- Software

**The current challenges/problems the company is facing with the current process:**
Inspite of using knowledge management, Ingram Micro India Ltd does face a few business challenges for which Ingram Micro India Ltd is trying to find solutions

- Infrastructure is not robust, especially internet connection
- Product delivery failures

**Ingram Micro India Ltd’s solution:**

From the previously mentioned challenges which Ingram Micro India Ltd faced, knowledge management gives the following solutions

- Improving infrastructure, eg subscribing to two ISPs at a time
- Logistics is strengthened, eg subscribing to multiple courier companies

**The benefits of KM in Ingram Micro India Ltd:**

The practical benefits which Ingram Micro India Ltd derived from implementing knowledge management are

- Competitive pricing
- Quick delivery to clients
Case9: Kalinga Software Pvt Ltd

Kalinga Software Private Limited (Kalingasoft) an ISO 9001 certified company has been promoted by academicians and education experts with a vision to create a sustained competitive edge for its clients through innovative and need centric solutions to facilitate effective education management.

Kalingasoft is an innovator and thought leader in the area of education management and has delivered world-class products and services to its customers. Kalingasoft's leadership is built on a deep understanding of the education sector, extensive experience and ability to deploy the best of class solutions to solve customer problems individually or through its partners. Kalingasoft has been identified as an ISV partner by IBM for its institute management system solutions-Advanced Level status.

Since its inception 10 years back Kalingasoft has provided end to end education consulting and technology implementation support to the entire spectrum of education domain. Kalingasoft has implemented its best of the breed educational ERP packages – "Greycells" and "e-IMS" in more than 75 educational institutes including universities, colleges and schools

The following is the data gathered about Knowledge Management in Kalinga Software Pvt Ltd, Bhubaneswar from a personal interview with Mr.Srijat Mishra (CEO):

Knowledge process followed:
Kalingasoft does not have a formal knowledge management process and generally follows a structure which is
• Informal
• Sharing of codes, artifacts, sales leads, internal transfer of manuals

**Knowledge Management verticals:**
Kalingasoft uses knowledge management for the following verticals

• Production
• Training
• Lead generation

**Objectives for KM:**
Kalingasoft is a major user of knowledge management. KM in Kalingasoft is mainly used for

• Faster Product development
• Modularity
• Portability

**The current challenges/problems the company is facing with the current process:**
Inspite of using knowledge management, Kalingasoft does face a few business challenges for which Kalingasoft is trying to find solutions

• Lead generation is not very good
• Attrition
• Leakages of critical information

**Kalingasoft’s solution:**
From the previously mentioned challenges which Kalingasoft faced, knowledge management gives the following solutions

- Review and analyze reasons for problems (technical or business)
- Invest in a good firewall
- Training

The benefits of KM in Kalingasoft:
The practical benefits which Kalingasoft derived from implementing knowledge management are

- Knowledge reuse in critical production
- Marketing lead generation
- Behavioral change in workers
- Training of workers
Case 10: Mindfire Solutions

Mindfire Solutions started in October of 1999, with the purpose of providing expert software services globally, and has rapidly grown to its 500-seat facilities at 2 engineering centers. The strategy was simple: marry local advantages with a global delivery model, generate compulsive business benefits for clients, deliver on-the-dot every time and expand rapidly building on delivery strengths. In its heart and soul, Mindfire is a software service provider, with unrelenting focus on optimal software development and delivery. We are clear in our vision of building a software engineering powerhouse, and we do not involve in activities which are not our core competence. The company's vision is "to be a globally respected, professional and innovative software services and technology company".

Mindfire’s services are packaged in different models, and are delivered through their software development process. The delivery model also combines on-site presence and remote development to optimize the time-cost-quality equation. Mindfire’s services cover a wide spectrum of platforms and technologies, from client/server to e-business and handheld development. These are further detailed in this section:

- Product co-development services
- Product realization services
- Porting and migration services
- QA/Testing services
- Product maintenance services
- Sales/reseller services
- Support services
- Co-investment
- Innovation offers
The following is the data gathered about Knowledge Management in Mindfire Solutions, Bhubaneswar from a personal interview with Mr. Arijit Rath (Senior Developer):

**Knowledge process followed:**

Mindfire Solutions has a formal knowledge management process and generally follows a structure which is

- Performance appraisal
- Potential and ability
- Overall development
- Eg Fasttrack - A KM initiative for HR high performers

**Knowledge Management verticals:**

Mindfire Solutions uses knowledge management for the following verticals

- Domain: Healthcare, CRM
- Software: Languages like C#, DotNet
- Communication skills

**Objectives for KM:**

Mindfire Solutions is a major user of knowledge management. KM in Mindfire Solutions is mainly used for

- Developing existing domain
- Technical upgradation
- Managerial skills
- Cross-domain training for senior people
• Modularity

The current challenges/problems the company is facing with the current process:
In spite of using knowledge management, Mindfire Solutions does face a few business challenges for which Mindfire Solutions is trying to find solutions
• Targets fail in some domains because of competition
• Marketing targets are not met
• Lack of experience in KM
• Projects may not add value

Mindfire Solutions' solution:
From the previously mentioned challenges which Mindfire Solutions faced, knowledge management gives the following solutions
• Review and analyze reasons for problems (technical or business)
• Focus on strengths
• Split the goals i.e. instead of one big goal split the same in several smaller goals
• Retraining

The benefits of KM in Mindfire Solutions:
The practical benefits which Mindfire Solutions derived from implementing knowledge management are
• Knowledge transfer
• Knowledge upgradation
• Theory to practical approach
• Training (limited extent)
Case 11: Titan Technologies

Titan Technologies is a medium sized software company operating from Bhubaneswar in Eastern India from past 3 years. It deals in software development, website design and development. It has developed some customized software for their core clients as well as websites to reach world wide for better services.

The following is the data gathered about Knowledge Management in Titan Technologies, Bhubaneswar from a personal interview with Mr. Panda (Consultant):

Knowledge process followed:
Titan Technologies does not have a formal knowledge management process and generally follows a structure which is
- Performance appraisal
- Potential and ability
- Overall development

Knowledge Management verticals:
Titan Technologies uses knowledge management for the following verticals
- Domain: Healthcare, CRM
- Software: Languages like C#, DotNet
- Communication skills

Objectives for KM:
Titan Technologies is a major user of knowledge management. KM in Titan Technologies is mainly used for
Developing existing domain
• Technical upgradation
• Managerial skills
• Cross-domain training for senior people
• Modularity

The current challenges/problems the company is facing with the current process:
Inspite of using knowledge management, Titan Technologies does face a few business challenges for which Titan Technologies is trying to find solutions
• Targets fail in some domains because of competition
• Marketing targets are not met
• Lack of experience in KM
• Projects may not add value

Titan Technologies’ solution:
From the previously mentioned challenges which Titan Technologies faced, knowledge management gives the following solutions
• Review and analyze reasons for problems (technical or business)
• Focus on strengths
• Split the goals ie instead of one big goal split the same in several smaller goals
• Retraining

The benefits of KM in Titan Technologies:
The practical benefits which Titan Technologies derived from implementing knowledge management are

- Knowledge transfer
- Knowledge upgradation
- Theory to practical approach
- Training (limited extent)
Case 12: Glodyne Technoserve Limited

Glodyne Technoserve is a leading IT Services company, headquartered in Mumbai, India with presence across India and US. Glodyne offers technology led business solutions across two SBU’s i.e. Technology Infrastructure Management Services (Technology IMS) and Application Software Services. Glodyne Technoserve has been able to make a mark in the IT Services domain with a quality service delivery and customer first approach. The proven combination of onsite-remote delivery model helps the company to synchronize seamless and cost-effective solutions with assured quality to the clients. Glodyne strives constantly to deliver greater tangible business benefits to its clients. Glodyne follows the best business practices that enable companies to operate more efficiently, have better ROI and help them focus on their core business. Glodyne Technoserve thinks beyond the basic ‘cost arbitrage’ benefit for their clients. Technologists and analysts find solution to the most complex of business logic and help maintain competitive advantage for the clients by transforming concept to reality. The company has a highly experienced leadership team which is steering the organization to newer heights. The company has ISO 9001:2000, ISO 27001 and CMMi certification. Glodyne believes in fostering strategic alliances and the synergies they bring to business. Glodyne has a strong alliance program with technology market leaders in IT Products and Services who complement their expertise in Technology IMS outsourcing and projects business. Technology IMS (Technology Infrastructure Management Services)

IT operations are moving center-stage and in many organizations the transition is already complete. Dependency of businesses on technology to
become competitive has made it a necessary investment rather than a cost to keep clean back offices. The key assets of well managed Information Technology operations lend significantly to the innovation-enabling capabilities of any organization. A strong technology focus for last three decades has led to increasingly complex IT systems with host of business applications that if not maintained can lead to operational bottlenecks. Complex IT systems demand more resources to maintain existing service levels and thus become less responsive to the business. And given the focus on cost optimization to stay ahead of competition in globalized markets, it is not prudent to continually hire, retain and train in-house maintenance staff to meet the needs of technology maintenance. Glodyne enables companies to focus on their core competencies, while their team infuses innovation through IMS Services. Glodyne’s Technology IMS services enables organizations to align their IT portfolios, run their businesses more cost effectively and free resources for business growth.

Glodyne’s Technology IMS include:

- Remote Management Services
- Networks Management Services
- Disaster Recovery Management Services
- Maintenance Services
- Database Management Services
- Desktop Management Services
- Server Management Services
- Security Management Services
- Storage Management Services
- Application Development & Management Services
Human Resource Management Services

The following is the data gathered about Knowledge Management in Glodyne Technoserve, Ranchi from a personal interview with Mr. Sameer Phadnis (Regional Manager):

Knowledge process followed:
Glodyne Technoserve does not have a formal knowledge management process but generally follows a structure which is

- Nothing formal, but geared up for
- Critical knowledge reuse

Knowledge Management verticals:
Glodyne Technoserve uses knowledge management for the following verticals

- Production
- Marketing lead generation

Objectives for KM:
Glodyne Technoserve is not a major user of knowledge management. KM in Glodyne Technoserve is mainly used for

- Sharing of codes and artifacts
- Sales leads
- Internal transfer of manuals

The current challenges/problems the company is facing with the current process:
Inspite of using knowledge management, Glodyne Technoserve does face a few business challenges for which Glodyne Technoserve is trying to find solutions

- Attrition
- Lead generation
- Obsolescence of products

**Glodyne Technoserve’s solution:**

From the previously mentioned challenges which Glodyne Technoserve faced, knowledge management gives the following solutions

- Training of people (India and Abroad)
- Use of independent consultants for lead generation and pushing the obsolete products

**The benefits of KM in Glodyne Technoserve:**

The practical benefits which Glodyne Technoserve derived from implementing knowledge management are

- Increased lead generation
- Better networking with professionals (helps in lead generation)
Abstract of personal interviews with Mr.BiswaJit Panda (Project Lead, KM Process - Infosys, Bhubaneswar) and Dr.Subhashish Mukhopadhyay (Professor, Calcutta University)

Mr.BiswaJit Panda: Knowledge management at Infosys is embedded in the corporate culture. KM has been a major contributor to corporate growth and profitability. Infosys has been recognized with the MAKE (Most Admired Knowledge Enterprise) award

The heart of the KM system is the KM repository known as ‘Infoscion’ which has entire knowledge of the Infosys system which is open to most employees. This repository has 4 verticals: (a)Business (Open to business development employees), (b)Technical (Open to technical team), (c)Project Management (Open to project team, both domestic as well as onsite), and (d)Consulting (Open to the consulting team, both domestic as well as onsite)

The KM effort at Infosys is popularized by: (a)Monthly meetings, (b)Seminars, and (c)Debates. These efforts are meant to be utilized for encouraging employees to contribute by: (a)Number of documents accessed, and (b)Number of documents added to the repository

The drivers for this programs are: (a)Performance measure (Transparent appraisal process), (b)Proper review mechanism (Transparent review mechanism), (c)KCU points (Knowledge Contribution Units), and (d)Award & Recognition (KM contributions are incentivized)
Dr. Subhashish Mukhopadhyaya: The spread of KM in Kolkata region has not kept pace with other parts of the country. One reason can be that the IT industry in Kolkata is still in a nascent stage. Secondly, other industries, especially manufacturing and industries employing large labor force, in the eastern region have been through a series of labor disputes and hence a climate of knowledge development has not been created. This said, there are a few instances where knowledge management has been researched by faculties of Calcutta University and Jadavpur University by organizing and participating in national seminars on this subject.

From the above two sources of data ie primary data from Kolkata, Bhubaneswar and Ranchi, we can now analyze the objectives of this research.
Analysis of Objective 1a: The status of the use of KM in the medium sized IT companies in Eastern India

The use of KM by the companies is in the knowledge process as well as KM verticals. The following is the status of use of KM by medium sized IT companies in Eastern India:

1. DCL, Kolkata

- Knowledge process:
  - Quality program – DCL uses KM for improving the product quality as well as for faster time-to-market of their products
  - Job certification: DCL uses a continuous certification program for their employees so as to make them current with their skill set which will act as an selling proposition when pitching to customers for new business
  - Communication skills: Many customers need the employees of their suppliers to have a good communication skills so that they can communicate clearly their need and preferences, hence employees with good communication skills make them attractive to the customers

- KM Verticals:
  - Pre-sales: KM helps in developing a techno-commercial knowledge repository which be used for reference whenever companies’ need to present a techno-commercial bid
  - On-site, Off-site deployment: The KM repository is a techno-commercial repository and hence even during off-site deployment,
important data can be interchanged so as to make the deployment seamless

➢ Engineering: KM helps the engineering department by making available the required data from the repository

2. Gamut, Kolkata

- Knowledge process:

  ➢ Pre-sales: KM helps in developing a techno-commercial knowledge repository which be used for reference whenever companies’ need to present a techno-commercial bid. This helps especially the marketing team especially when the team is travelling to customers’ place

  ➢ Lead sharing: KM helps Gamut which is a multi-branch company share customer leads among branches. This can help as many customers have an unique buying pattern which can be shared between marketing people across branches to leverage the marketing

  ➢ Technical workshops: Technical workshops are a regular feature of Gamut and inputs gathered by one set of participants can be shared for profit between branches

- KM Verticals:

  ➢ Domain knowledge in different verticals like Construction, Steel, Real estate, ERP: KM helps in developing a techno-commercial knowledge repository on verticals like construction, steel, real estate and ERP, which be used for reference whenever marketing people need to present a techno-commercial bid

  ➢ Updating real-time knowledge: The KM repository is updated in real-time so as to provide current data to employees. This can act as an USP for the company
3. Interra, Kolkata

- Knowledge process:
  - Collection of data by statistics department and passing it to higher levels: KM helps in seamless integration of data collection and data assimilation
  - Automatic data collection by MIS department: KM goes to the second stage of data collection and assimilation ie data processing by the MIS department
  - Structured decision making by higher authorities: After the data is processed, the last stage is the decision-making by the top management depending on the data gathered and processed

- KM Verticals:
  - Production: KM helps in the continuous production process by seamlessly integrating the flow of information
  - Integration of latest technologies: All IT companies should always be up-to-date with operating technologies. KM helps in identifying as well as integrating latest technologies globally

4. Neveah, Kolkata

- Knowledge process:
  - Automating information flow: KM helps in information collection and assimilation
  - Experience fulfillment: KM helps in data analysis as well as storage which includes case studies of all business transactions for future use

- KM Verticals:
Knowledge base: KM helps in building a knowledge base which makes the work of retrieving and using data faster

Documentation: KM helps in documenting important data and also storing them

Processes: KM helps in processing data which including using only relevant data and filtering unwanted data

Training: KM helps in identifying needs of employees. IT being a field where obsolescence is high it is imperative that employees, especially those involved in programming are exposed to the current technologies

5. Mate, Kolkata

- Knowledge process:
  - Malcolm-Baldrige methodologies is implemented: The KM process was formally launched in Mate in year 2000. The use of KM was in implementing the Malcolm Balridge model of organizational change and the best practices of leadership development

- KM Verticals:
  - Engineering: KM helps in engineering development and also in technical consulting

6. Ingram, Bhubaneswar

- Knowledge process:
  - Sharing of information like pricing, promotions etc.: KM helps in database management which in turn helps to share details of
information like pricing, promotions, special schemes etc. with both dealers as well as with other branch offices

➢ Pre-launch product information: Ingram’s business process depends heavily on the channel reach. KM helps in maintaining a repository which the channel can tap into for information regarding pre-launch offers so as to be ready for the customers when the offers are advertised by Ingram

➢ Special pricing for customers: KM helps with database repository which helps in understanding the value of each customer and this can lead to a better pricing for those specific customers, often across geographies

• KM Verticals:
  ➢ Infrastructure: Since Ingram is a channel driven organization, it is imperative that communication infrastructure has to be robust
  ➢ Warehousing: The essentials of channel management are a robust warehousing facility. KM helps in identifying as well as in implementing a robust and reliable infrastructure as well as warehousing backbone

7. Redington, Bhubaneswar

• Knowledge process:
  ➢ Extensive use of intranet for marketing: Redington is also a channel driven company and hence KM provides with a robust intranet backbone for implementing knowledge flow within the company
  ➢ Pre-launch product information: Redington’s business process depends heavily on the channel reach. KM helps in maintaining a repository which the channel can tap into for information regarding
pre-launch offers so as to be ready for the customers when the offers are advertised by Ingram

➢ Special pricing for customers: KM helps with database repository which helps in understanding the value of each customer and this can lead to a better pricing for those specific customers, often across geographies

• KM Verticals:
  ➢ Infrastructure: Since Ingram is a channel driven organization, it is imperative that communication infrastructure has to be robust
  ➢ Logistics management: The essentials of channel management are a robust logistics. KM helps in identifying as well as in implementing a robust and reliable logistics management system

8. Kalingasoft, Bhubaneswar

• Knowledge process:
  ➢ Sharing of codes, artifacts, sales leads, internal transfer of manuals: KM helps in building and maintaining a knowledge repository which helps the company to share with the company codes, artifacts, sales leads, internal transfer of manuals etc.

• KM Verticals:
  ➢ Production: KM helps in uninterrupted production by making data available on time because of the repository
  ➢ Training: KM helps in identifying as well as in fulfilling the training need requirements of the company
  ➢ Lead generation: KM helps in lead generation for the marketing department by mining data of potential as well as existing customers whose requirements can be fulfilled by the company
9. Mindfire, Bhubaneswar

- Knowledge process:

  - Performance appraisal: KM helps the HR department in identifying the best methods for performance appraisal.
  - Potential and ability: The KM for HR department also helps in identifying employees with potential and ability who are then sent for further training as well as for an in-house employee promotion known as Fasttrack.
  - Fasttrack - A KM initiative for HR high performers: KM helps in identifying the exact training required for each fasttrack employee which helps the company realize the full potential of the employee and reward them accordingly.
  - Overall development: The KM intervention is not limited to HR only and also helps in the overall achievement of business goals of the company.

- KM Verticals:

  - Domain-Healthcare, CRM: KM helps in improving the quality of domain expertise by providing knowledge repository of required domain knowledge, be it Healthcare or CRM or any other.
  - Software-Languages like C#, Dotnet: KM helps in upgrading employee skills in critical areas like C#, Dotnet by providing self-learning as well as by video-conference learning of the same.
  - Communication skills: Many customers need the employees of their suppliers to have a good communication skills so that they can communicate clearly their need and preferences, hence employees
with good communication skills make them attractive to the customers

10. NetHawk, Bhubaneswar

- Knowledge process:
  - Production: KM helps in uninterrupted production by making data available on time because of the repository
  - Training: KM helps in identifying as well as in fulfilling the technical training need requirements of the company

- KM Verticals:
  - Engineering: KM helps in engineering development and also in technical consulting
  - Communication skills: Many customers need the employees of their suppliers to have a good communication skills so that they can communicate clearly their need and preferences, hence employees with good communication skills make them attractive to the customers

11. Titan, Bhubaneswar

- Knowledge process:
  - Performance appraisal: KM helps the HR department in identifying the best methods for performance appraisal
  - Potential and ability: The KM for HR department also helps in identifying employees with potential and ability who are then sent for further training as well as for an in-house employee promotion known as Fasttrack
Overall development: The KM intervention is not limited to HR only and also helps in the overall achievement of business goals of the company

- KM Verticals:
  - Domain-Finance: KM helps in improving the quality of domain expertise by providing knowledge repository of required domain knowledge like Finance
  - Communication skills: Many customers need the employees of their suppliers to have a good communication skills so that they can communicate clearly their need and preferences, hence employees with good communication skills make them attractive to the customers

12. Glodyne, Ranchi

- Knowledge process:
  - Critical knowledge reuse: KM helps in modularizing the knowledge repository thereby making knowledge available as per requirements

- KM Verticals:
  - Marketing lead generation: KM helps in lead generation for the marketing department by mining data of potential as well as existing customers whose requirements can be fulfilled by the company
  - Production: KM helps in uninterrupted production by making data available on time because of the repository

From the above data we can surmise that the broad areas of KM use in medium sized IT companies in Eastern India can be classified into the following:
2. **HR**: 7 out of 12 (DCL, Gamut, Neveah, Mindfire, Nethawk, Titan, Kalinga)

3. **Marketing and Communication**: 7 out of 12 (DCL, Gamut, Glodyne, Mindfire, Nethawk, Titan, Kalinga)

4. **Operations**: 7 out of 12 (DCL, Glodyne, Interra, Ingram, Reddington, Kalinga, Mate)

5. **Information sharing**: 6 out of 12 (Glodyne, Ingram, Interra, Kalinga, Neveah, Reddington)

6. **Strategy Development**: 3 out of 12 (Ingram, Interra, Reddington)

7. **Infrastructure development**: 2 out of 12 (Ingram, Reddington)

**Confidence interval test**: The confidence interval tests for this data, using the following formula gives the following results

Confidence interval \( C = \hat{p} \pm [(1.96) \ ( \hat{p} \times \hat{q} ) /n] \)
where, $\hat{p}$ - accuracy of the sample to be tested; $\hat{q}$ - a function of the test’s level of confidence; $n$ – sample size

2. **Quality initiative** - $33.33 \pm 26.67$: This calculation shows that 33.33% of companies use KM for *quality initiative* with confidence interval being ± 26.67%

3. **HR** - $58.33 \pm 27.89$: This calculation shows that 58.33% of companies use KM for *HR* with confidence interval being ± 27.89%

4. **Marketing and Communication** - $58.33 \pm 27.89$: This calculation shows that 58.33% of companies use KM for *marketing and communication* with confidence interval being ± 27.89%

5. **Operations** - $58.33 \pm 27.89$: This calculation shows that 58.33% of companies use KM for *operations* with confidence interval being ± 27.89%

6. **Information sharing** - $50.00 \pm 28.29$: This calculation shows that 50.00% of companies use KM for *information sharing* with confidence interval being ± 28.29%

7. **Strategic development** - $25.00 \pm 24.50$: This calculation shows that 25.00% of companies use KM for *strategic development* with confidence interval being ± 24.50%
8. **Infrastructure development** – 16.7 ± 21.00: This calculation shows that 16.70% of companies use KM for *infrastructure development* with confidence interval being ± 21.00%
Analysis of Objective 1b: To find the success factors in implementing KM in the medium sized IT companies in Eastern India

The detailed analysis of this research study found that the following are the factors behind any successful implementation of knowledge management in medium sized IT companies in Eastern India:

- **Top management commitment**: The term top manager usually refers to the chief executive and those reporting to him or her. Top management commitment (Keramati and Azadeh, 2007) includes activities such as communicating company’s quality value, reinforcing quality messages meeting with the work force and the customers giving formal and informal recognition, receiving training and training others. Top managers develop and facilitate the achievement of the mission and vision, develop values required for long term success and implement these via appropriate action and behaviors, and are personally involved in ensuring that the organizations management system is developed and implemented. Another important responsibility of top management is establishment of an environment in with performance is rewarded. The commitment can be in the following ways:
  
  - *Economics and Strategic Planning*: Top management provides strategic long-term planning and the funding for the KM effort
  - *Training*: The focus is placed on developing people who are capable of tapping internal and external information and turning it into useful organizational knowledge
➢ *Compensation and reward:* Domain experts must be recognized and rewarded in ways that makes them feel it is worth their time to cooperate

➢ *Performance appraisal:* The performance appraisal apart from providing the input to KM activities, also aims at bringing organizational improvement through effective directing of the employee’s behavior

- **Encourage knowledge gathering:** It is assumed that human knowledge-building depends on a discrete sequential decision-making process subjected to a stochastic information transmitting environment (Murphy, 2006). This environment randomly transmits Shannon type information-packets to the decision-maker, who examines each of them for relevancy and then determines his optimal choices. Using this set of relevant information-packets, the decision-maker adapts, over time, to the stochastic nature of his environment, and optimizes the subjective expected rate-of-growth of knowledge. This knowledge gathering is expected to improve human behavior for decision making. The sources of knowledge gathering are:

  ➢ *Internal and external sources of knowledge:* Internal sources of knowledge include corporate databases, MIS, KM repositories etc. The external sources of knowledge can be both primary as well as secondary

  ➢ *Attending conferences and training programs:* Attending national and international conferences help companies in networking with like minded professionals in India as well as abroad resulting in mutual benefits to both like getting outsourcing orders as well as getting technical inputs
• **Dedicated KM initiatives:** This study has concluded that companies invest in dedicated KM initiatives in the following areas:

  ➢ **Hard initiatives (Hardware, networking, infrastructure and software):** The building blocks of KM starts with investments in the basic hardware required to build knowledge repositories, databases and the means to connect the same using technology and software

  ➢ **Soft initiatives (Encouraging interaction with peers):** Peer driven knowledge is encouraged by a majority of companies. This helps in keeping the employees abreast of the latest technologies as well to understand the road ahead

  ➢ **Sharing knowledge through structured meetings:** Most companies leverage the tacit knowledge in their employees through regular staff meetings where employees are encouraged to share their latest findings both within the company as well as from the outside world

  ➢ **Encouraging in-company socializing through parties, de-stressing etc.:** Most of KM workers are exposed to constant pressures, especially customer delivery deadlines, installation deadlines to name a few. It is imperative that companies take this into account and encourage in-house socializing through parties (Mindfire, Bhubaneswar has a dedicated party officer), de-stressing by regular yoga, exercises etc.

• **Top management conviction of bottom-line improvements through KM:** It is studied that no KM initiative will succeed unless the top-management is convinced that KM can improve bottom-lines by directly helping in getting more business or indirectly by reducing costs by identifying and eliminating waste
Analysis of Objective 2: Study of impact of KM on medium sized IT companies in Eastern India

There were six impact cluster areas which were identified from the research study. They are:

1. **New product development**: This cluster area is impacted in the following ways
   - Faster product development – KM helps in faster product development by eliminating duplication in the production process as well as by ensuring that the right tools are available for the employees at the right time
   - New applications are found for non-performing products: KM helps in refurbishing the products whose life span is over or products which remain unsold for a long period of time
   - Absorption of the latest technologies by employees: KM helps in easing the understanding of latest technologies for the employees thereby helping in the absorption of the latest technologies by the employees of companies

2. **Sales**: This cluster area is impacted in the following ways
   - Good monitory returns: KM helps in finding out the best customers with the help of knowledge repository as well as in filtering that knowledge for profit

Gamut Infosystems, Kolkata
Monetary benefits are high: KM helps in identifying and eliminating unnecessary costs for the sales department. Thus KM delivers high monetary benefits to companies

3. **Quality:** This cluster area is impacted in the following ways

- ISO certification achieved: KM helps in smoothening the production process as well as in documenting the same. This helps medium sized IT companies in Eastern India achieve the quality certification of ISO 9000
- Better technical infrastructure: KM helps in designing a suitable infrastructure for faster flow on information between channels
- Better absorption of data coming from various sources: KM helps in developing a database for the companies. This central database helps in better absorption of data coming from various sources

4. **Marketing process:** This cluster area is impacted in the following ways

- Increased lead generation: KM helps in identifying new clients based on market offerings of the company as well as current requirements of the market and secondly, to mine information about current and past customers who can be tapped for current offerings as well as a replacement/upgradation of the current product
- Better networking with professionals (helps in lead generation): KM helps companies to identify key professionals in the
industry and who can be tapped on for knowledge sharing as well as for future business requirements

5. **Strategy formulations:** This cluster area is impacted in the following ways

- Competitive pricing: KM helps in creating a repository of information of not only the company’s own offerings but also the competitor’s offerings and their pricing policies. This helps the company to price their products competitively.

- Quick delivery to clients: KM helps in understanding the future requirements of customers based on their past buying behavior by use of the customer knowledge repository. This can help companies to anticipate the demand and accordingly start manufacturing the same. This helps in cutting down the customer delivery time.

- Branding: KM also helps in brand building by ensuring customer satisfaction as well as creating a positive impact in customer’s minds, both current as well as prospective. This increases the brand equity of company

6. **HR policies:** This cluster area is impacted in the following ways

- Attrition has been arrested: KM helps HR department by building up a repository where a database of reasons people leave the organization can be created. This information can be got from exit interviews, peer and manager interviews etc.

- Knowledge reuse in critical production: KM repository helps in knowledge reuse by making available critical HR data which
can identify suitable replacements in production lineup so that even if some people are absent on any day, production is not affected

- Behavioral change in workers: KM measures behavioral changes induced by any stimulus by tracking the changes in behavior of workers over a period of time by recording the same with the help of KM repository
- Training of workers: KM helps in identifying training needs of workers as well as the best place to procure the training, either inhouse or outsourced
- Knowledge transfer: KM helps in transfer of relevant data from one user to another within the office, city or outside ie across boundaries by the help of knowledge repositories which can be accessed by all relevant people
- Knowledge upgradation: KM helps in identifying and making available the latest technologies which are relevant to the organization
- Theory to practical approach: KM helps organizations by creating and distributing case studies of important activities like HR activities or marketing activities eg a case can be prepared on a breakthrough in an important account and the complete approach by the marketing executive, which can then be duplicated by another marketing executive in another account
- Measurement of domain competence: KM helps in measurement of domain competence of the workers by continuously testing and evaluating the workers by using the KM repository
Retention of domain knowledge: The biggest challenge for any organization is to retain knowledge. It is easier to retain explicit knowledge like sales reports, case papers, marketing activities report etc., but it is very challenging to gather tacit knowledge i.e. knowledge which resides within the heads of workers. KM helps in building up a repository of explicit as well as tacit knowledge by using tools like compulsory recording of daily activities, recording group discussions as well as their recommendations, recording case studies prepared of their activities including customer behavior so that when the marketing executive leaves, his accounts can be handled almost seamlessly by his successor.
Research Findings emerging using Triangulation

Triangulation was done with a. Literature review; b. Primary data; c. Researcher’s own experience

Finding 1: Use of knowledge management principles and tools in medium-sized IT companies improve their new product development process

Finding 2: Use of knowledge management principles and tools in medium-sized IT companies increase their sales revenue

Finding 3: Use of knowledge management principles and tools in medium-sized IT companies improve the quality of product developed

Finding 4: Use of knowledge management principles and tools in medium-sized IT companies improve their marketing processes

Finding 5: Use of knowledge management principles and tools in medium-sized IT companies aid in their strategy formulation

Finding 6: Use of knowledge management principles and tools in medium-sized IT companies improve the effectiveness of their HR functions
Testing of Hypothesis

Working Hypothesis of this research:

From the literature review as well as the initial pilot study, we had drawn the working hypotheses for this research:

1. There is a positive link between Knowledge Management and Business Performance in Medium sized Information Technology companies in Eastern India
2. The reason medium sized IT companies in Eastern India do not use KM is because of lack of awareness about the impact of knowledge management on business performance

We have used 12 case studies involving all the studied companies and using the Pattern Matching approach we have tested the hypotheses. The pattern matching throws up 6 patterns:

1. KM helps medium sized IT companies in Eastern India in new product development process
2. KM helps medium sized IT companies in Eastern India in increase their sales revenue
3. KM helps medium sized IT companies in Eastern India in improve the quality of product developed
4. KM helps medium sized IT companies in Eastern India in *improve their marketing processes*

5. KM helps medium sized IT companies in Eastern India in *aiding their strategy formulation*

6. KM helps medium sized IT companies in Eastern India in *improve the effectiveness of their HR functions*

Hence from these above we find that the pattern matching approach *validates these working hypothesis* that were framed

Also from the interviews of the industry professionals in the targeted companies we also come to the second conclusion in the hypothesis ie *Lack of awareness about KM* leads to diminished support from the top management which eventually leads to abandoning several KM projects. The most glaring example is the Banking Software developed by Data Core Limited, Kolkata for Bharat Bank, Kolkata which was later abandoned and the space was filled by competitors

Finally from the research study we find that data from all 12 companies are giving similar results, we derive the following *KM model* using data of two companies ie Neveah Technology Pvt. Ltd., Kolkata and Mindfire Solutions, Bhubaneswar from which emerges which the impact of knowledge management on medium sized information technology companies in Eastern India
Knowledge Management model showing impact of KM on medium sized information technology companies in Eastern India