

Effect of Knowledge Management on Organizational Performance

A Systematic Literature Review

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Abstract

Purpose: This paper aims to identify the state of the art related to the research problem “The effect of Knowledge Management on Organizational Performance”.

Design/Methodology/Approach: The systematic literature review includes 42 papers published between 2010 and 2012. The selected papers were classified according to research approach used, the country and industry of the sample population, research parameters/constructs studied, Data Analysis and software tools used and the research gaps in the inspected studies.

Findings: This paper significantly contributes to the literature. First, the study has identified and gathered if not all, then at least the immense majority of “state of the art” concerning the research problem from January, 2010 to September, 2012. Second, despite the complications generated by the diversity of the research approaches, research constructs,

sample population, the study has been able to aggregate the individual properties, thus leading to a higher level of evidence about the pieces of knowledge about the research problem under investigation.

Originality/Value: *The paper is the first effort towards a systematic literature review of the research problem.*

Keywords: Knowledge Management, Organizational Performance, Systematic literature review

INTRODUCTION

Knowledge Management has become critical in the contemporary business environment that mandates continuous adaptation and change by organizations, and requires employees to strive to improve their company's work processes. It can help organizations to gain competitive advantage and improve organizational performance. It is the reason why knowledge management literature has seen large growth in the last two decades. A variety of knowledge management concepts like knowledge management strategy, knowledge management enablers have been theorized and studied in relation to organizational performance. The present paper aims to review the existing literature on the effect of knowledge management on organizational performance, through a systematic review methodology. The goal of the systematic literature review is to support and direct the future research on the research topic. The review has unique characteristics. The primary goal of the paper is to direct and

support the future research on the effect of knowledge management on organizational performance. For instance, the review focuses on the various research designs used by the researchers all over the world. The review is comprehensive and systematic as the analysis of the literature is based on a systematic search of literature. The literature related to the research topic is classified according to the research designs employed, country/industry in which the study took place and various statistical analyses adopted by the researchers. This is the first of its kind of systematic literature review in relation to the research problem at hand.

RESEARCH METHODOLOGY

A systematic literature review has been used as a research tool in the paper. A systematic review is a methodological process which identifies, evaluates and analyzes research evidence to synthesize and map it. The systematic review is based on a process, which is a defined and methodical way of identifying, assessing, and analyzing published primary studies in order to investigate a specific research question. It is based on a rigorous, transparent and reproducible process allowing developing the most complete view of the literature for researchers undertaking a systematic review is increasingly regarded as a fundamental scientific activity, and the frequency of this kind of review is increasing in management (Kitchenham and Charters, 2007; Staples and Niazi, 2007; Tranfield et al., 2003). By performing a systematic literature review, this research integrates existing information and

provides a theoretically founded framework for understanding various aspects.

The Basic steps of a systematic review process followed in the paper are shown in Figure 1 in form of a flowchart (Tranfield et al., 2003; Kitchenham, 2004; Staples and Niazi, 2007).
Step

Following research questions have been used to analyze the various issues like research approaches used, context of the studies, the constructs evolved, statistical tools used and the research gaps related to the research topic.

Research Question (RQ1)

What is the state of the art related to the research problem “The Effect of knowledge management practices on organizational performance”?

- RQ1a: What is the research approach used by the various researchers to study the above research problem?
- RQ1b: What is the context (country and industry) in which the researchers have studied the above research problem?

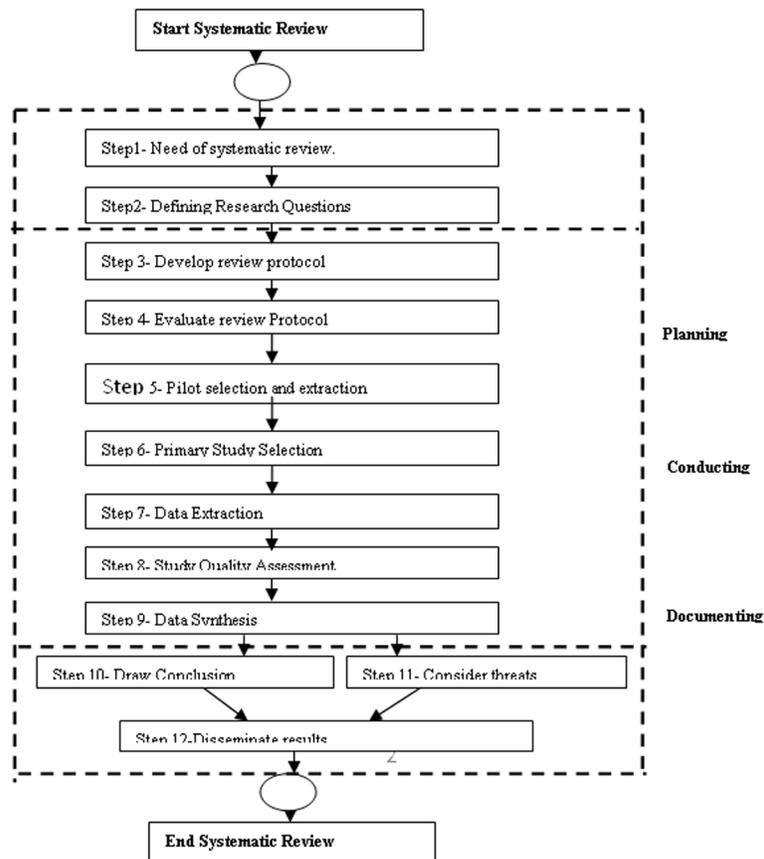


Figure 1: Systematic Review Process (Adapted from Kitchenham and Charters, 2007)

- RQ1c: What are the various parameters that are considered in the previous researches on the above research problem?
- RQ1d: What are the various non-statistical/statistical tools/software tools used by the researchers to study the above research problem (if any)?
- RQ1e: What are the existing research gaps in the area related to the above research problem?

the future. The protocol was evaluated by several researchers. According to the feedback provided by the evaluators and also as per my own experience, the design of the review was improved iteratively. A summary of the final protocol is given in subsequent sections.

REVIEW PROTOCOL FOR CONDUCTING SYSTEMATIC LITERATURE REVIEW

Search Strategy

A review protocol was developed and evaluated to reduce potential researcher bias and to permit a replication of review in

order to determine if similar work has been done, the databases were searched. The

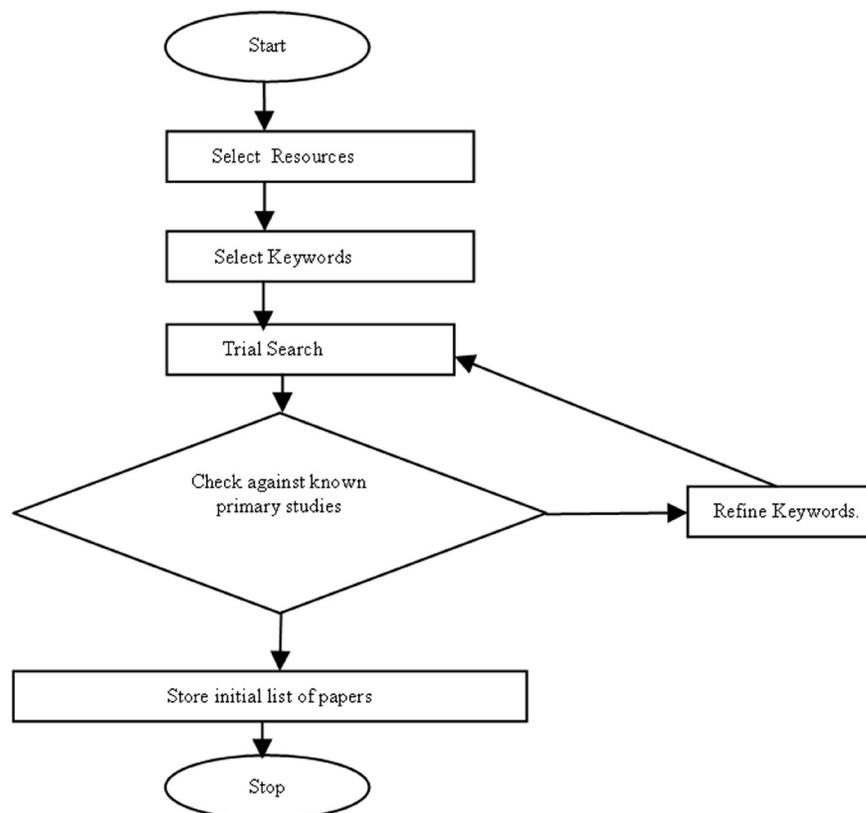


Figure 2: Search Strategy Process (Adapted from Kitchenham and Charters, 2007)

following keywords and strings were used to search within keywords, title and abstract.

(Knowledge Management) AND (Systematic review OR Research Review OR Research synthesis OR Research integration OR Systematic overview OR systematic research synthesis OR integrative research review OR integrative review)

None of the reviewed publications were related to our objectives which are expressed in the research question. For the identification of the research papers, the process depicted as flowchart in Figure 2 is used.

The selected databases and the number of publications that were retrieved from each of them are shown in Table I. The keywords for the search were derived from the research

questions. The search strings are composed by terms representing population AND intervention. The search keywords used for retrieving the relevant studies from the vast literature available on knowledge management are given in Table 2.

In order to verify the quality of the keywords and search string, a trial search was conducted on ABI-Inform and Emerald. Relevant publications were identified from the Journal of Knowledge Management (Emerald) and compared to the result set of the trial search. The search string captured most of the reference publications. Due to a high number of publications, it was decided to use a reference management system. Endnote was also used for the same purpose.

Table 1: Primary Study Selection

	<i>Database</i>	<i>Results</i>	<i>Studies Selected After Scanning 'Title' and 'Abstract'</i>	<i>Studies Selected After Quality Assessment of the article (Quality assessment technique is explained in subsequent section)</i>	<i>Studies Published between 1 January, 2010-31 September, 2012 (excluding Dissertation)</i>
1	Proquest	1106	115	69	18
2	Science Direct	181	13	8	4
3	Emerald	613	71	55	12
4	EBSCO	154	1	0	0
5	IEEE	84	27	13	6
6	IGI Global	5	5	2	0
7	JSTOR	5	5	2	0
8	Sage	3	3	0	0
9	Springer	74	1	1	1
10	TaylorFrancis	1	1	1	1
11	Wiley	25	0	1	0

Study Selection Criteria

Inclusion and exclusion criteria were used as a guide for selecting and assessing the studies for potential inclusion. A theoretical, conceptual or empirical study focusing on the effect of knowledge management on organizational performance was selected for the review process. The keywords 'knowledge management' and 'organizational performance' (or its synonyms as in Table 2) should be in its title or abstract; only full text literature in English language published between 2000 to 2012 was included. However, later the scope of the study was further reduced to include only the papers published from 1 January, 2010 to 31 September, 2012. Also, dissertations were excluded from the review. This was done to limit the scope of the research paper. It is decided to review the remaining literature in the subsequent research paper(s) on systematic literature review on the effect of knowledge management on organizational performance. The Studies focusing on national performance were excluded. Also, the studies which did not discuss organizational performance were excluded.

Table 2: Search Keywords

<i>Population</i>	<i>Intervention</i>
Knowledge Management	Organizational Performance OR Business Performance OR Corporate Performance OR Organizational Results OR Organisational Benefits OR Organisational Survival OR Firm Performance OR Sustainable Competitiveness OR Competitive Advantage OR Financial Performance OR Business Impact

Study Selection Procedure

Primary Study Selection was done in three steps. In the first phase, a computerized search was carried out by using multiple keywords and their strings in the following eleven databases: ABI Inform ProQuest, Elsevier Science Direct, Emerald, Academic Search Elite (EBSCO), IEEE, IGI Global, JSTOR, SAGE, Springer, Taylor Francis and Wiley. In second phase, the studies were scanned in 'Title' and 'Abstract' for selection. In the third phase, the studies were selected after quality assessment (Quality assessment technique is explained in subsequent section.)

Study Quality Assessment

The study quality assessment (Step 8) of systematic review process can be used to guide the interpretation of the synthesis findings and to determine the strength of the elaborated inferences (Kitchenham, 2007). However, as also experienced by Staples and Niazi, 2007, it was found that it is difficult to assess to which extent the authors of the studies had actually addressed validity threats. Indeed, the quality assessment performed is a judgment of reporting rather than study quality. The questions given in Table III were answered for each publication during the data extraction process. With QA1, it was assessed if the authors of the study clearly state the aims and objectives of the carried out research. QA2 assessed if the study provides enough information (either directly or by referencing to the relevant literature) to give the presented research the appropriate

context and background. QA3 was checked with “Yes” if validity threats were explicitly discussed. If the study just mentioned validity threats without properly explaining how they are identified or addressed, the question was answered with “Partially.” QA4 was answered with “Yes” if the data in the context property of the data extraction form could be compiled to a major degree. With QA5, it was assessed if the outcome of the research was properly documented. The quality assessment criteria are summarized in Table 3.

Table 3: Quality Assessment

<i>ID</i>	<i>Quality Assessment Question</i>
QA1	Is the aim of the research sufficiently explained?
QA2	Is the presented research approach clearly explained?
QA3	Is it clear in which context the research is carried out?
QA4	Are the threats to validity taken into consideration?
QA5	Are the findings of the research clearly stated?

Data Extraction

The data extraction was performed in an iterative manner. An initial extraction form with the properties listed in Table 4, which shows also the mapping to the respective research questions answered by the property, was prepared. All properties namely research design (P1), country and industry of research (P2), various parameters studied in the studies (P3), statistical tools used for analysis (P4) and research gaps (P5) should be extracted from the studies. Before starting

the second iteration, the compiled extraction forms were reviewed and the extracted data was consolidated. In second data extraction iteration, the established categorization was confirmed and used for data synthesis (Step 9) and drawing conclusions (Step 10).

Table 4: Data Extraction Properties

<i>ID</i>	<i>Property</i>	<i>Research Question</i>
P1	Research Design (Empirical or conceptual)	RQ1a
P2	Country/Industry (Manufacturing/Service)	RQ1b
P3	Parameters	RQ1c
P4	Statistical Tools	RQ1d
P5	Research Gaps	RQ1e

RESULTS AND ANALYSIS

Due to the heterogeneity of the studies reviewed in terms of the date of publication, methodology and theoretical framework, a meta-analysis i.e. employing statistical and econometric procedures for synthesizing findings and analyzing data (Transfield et al. 2003), was not appropriate for this review. The analysis conducted was descriptive by nature.

Research Approach (RQ1a)

The inspected studies were categorized according to the applied research method. Our initial strategy for the categorization was simple and straightforward: extract the mentioned research method without interpreting the content of the study.

However, we discovered two issues with this approach. First, the mentioned research methods were inconsistent, i.e., one study fulfilled our understanding of a “Case study” while another did not. Second, the research method was not mentioned at all in the paper. Therefore, we defined the following categories and criteria to classify the studies consistently:

1. Conceptual Research
2. Empirical Research

Conceptual research focuses on developing a theory to explain specific phenomena or behaviors. Empirical research is defined as research based on observed and measured phenomena. It reports research based on actual observations or experiments using quantitative research methods and it may generate numerical data between two or more variables. It was found that empirical studies (84%) constitute a clear majority of the studies with only 16% of the studies being conceptual studies.

Table 5: Research Design (RQ1a)

<i>Research Design</i>	<i>Studies</i>	<i>Frequency</i>
Conceptual	[1], [2], [14], [30], [42]	5
Empirical	[3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41]	37

Study Context (RQ1b)

The study settings were categorized on the basis of the country of the target sample population and the type of the industry from which the sample was taken. It was found that highest numbers of studies (26%) were based on sample population from Taiwan. Second

Table 6a: Study Context (RQ1b)

<i>Country based on Target Sample Population</i>	<i>Studies</i>	<i>Frequency</i>
Taiwan	[7], [9], [13], [20], [21], [22], [23], [25], [36], [38], [39]	11
India	[17], [30], [34]	3
Brazil	[16], [40]	2
Greece	[32], [37]	2
Jordon	[3], [28]	2
South Korea/ Korea	[12], [35]	2
China	[15]	1
Hong Kong	[8]	1
Jamaica	[29]	1
Iraq	[2]	1
Italy	[6]	1
Malaysia	[41]	1
Pakistan	[19]	1
Spain	[27]	1
Slovenia/ Croatia	[33]	1
Uganda	[4]	1
US	[31]	1
South Africa	[24]	1
Diverse Sample	[13], [26]	2
Not stated	[1], [5], [10], [11], [14], [18], [26], [42]	8

highest numbers of studies (7%) were based on sample from India. There were two studies each that had sample population from Brazil, Greece, Jordon and Korea. Sample population from China, Hong Kong, Jamaica, Iraq, Italy, Malaysia, Pakistan, Spain, Slovenia/Croatia, Uganda, US and South Africa each had one study. Studies ([13], [26]) had diversified sample population. Study [13] has sample from Sweden, Taiwan, Italy, France, UK, Belgium, Finland, Germany, and USA. Study [26] had research sample from four advanced countries the USA, Japan, Germany and the UK. Country of the sample was not stated for 18% studies out of which 37% studies were conceptual studies.

With respect to the study sample it was found that most of the studies (40%) had sample both from manufacturing and service industry. Equal number of studies (14%) had sample from manufacturing and service industry each. For some studies (30%) the industry to which the sample belonged was not mentioned.

Table 6b: Study Settings (RQ1b)

<i>Context/ Industry</i>	<i>Studies</i>	<i>Frequency</i>
Service	[2], [4], [8], [28], [29], [36]	6
Manufacturing	[3], [5], [17], [25], [37], [39]	6
Both	[7], [10], [13], [15], [16], [22], [23], [24], [26], [27], [31], [32], [33], [34], [38], [40], [41]	17
Not Stated	[1], [6], [9], [11], [12], [14], [18], [19], [20], [21], [30], [35], [42]	13

Research Parameters (RQ1c)

The data extraction from the inspected studies found that a large number of Knowledge Management(KM) and Organizational performance constructs/indicators have been used by the researchers to study the effect of knowledge management on organizational performance.

KM constructs employed by the researchers in studies studying the effect of KM on organizational performance are critical success factors of KM, KM strategies, KM Processes, Marketing Knowledge Management, applied channel logistics knowledge, KM infrastructure, KM capability, Knowledge Stock, Knowledge Ambiguity, Knowledge resources, Knowledge Sharing, Knowledge capacity, KM Maturity, Dynamic Capability, KM enablers, KM Orientation, KM evolution, Knowledge Management Technologies and Customer Knowledge Management. It is found that the inspected studies have used both the subjective and objective measures of organizational performance. Most of the studies have relied on subjective measures of organizational performance. Only few studies have used objective measures for organizational performance. A large number of studies have adopted the balanced scorecard (BSC) as a measurement framework for the organizational performance (OP) construct. The various indicators used by the inspected studies for measuring Knowledge Management and organizational performance can be referred to in Table 7.

Table 7: Research Parameters (RQ1c)

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Customer KM (Team Learning, Sharing Intellectual capital, Collaborating innovation, Creating Customer value)	motivation models, leadership, organizational culture & environment, work design, human resource management policy	Moderating variable-Learning Organization (Personal mastery, improving mental models, building shared vision, Communication and cooperation.)	Shieh CJ (2011).
Knowledge Management Configuration	Profit variation, sales variation, variation in the number of employees	Strategy typologies	Carlo B., Marco V. (2012).
KM Organizational factors (Collaborative experience, Culture for change, Mutual trust, Size, naturalness in ICT use) Knowledge Management Technologies (Focus on the use of those electronic tools that support a) the development of electronic knowledge bases and, b) that guarantee standard procedures for knowledge transfer.)	Financial Performance (profitability, return on investment (ROI), return on sales (ROS), and overall financial performance), Speed to market, New product performance		Vaccaro, A., Parente, R., & Veloso, F.M. (2010).
KM strategy (Codification & Personalisation)	Financial performance, process performance, internal performance	Mediating variable-Innovation	Lopez-Nicolas, C.; Merono-Cerdan, A.L. (2011)
Knowledge Evolution Strategy-Mutation(internal-driven), Crossover(external driven)	BSC(Financial performance, customer performance, internal process performance, learning & growth)	Moderating variable-environmental variation (EV), knowledge density (KD), IT capabilities (IT), Sharing culture (SC)	Chen, D.N., & Liang, T. P. (2011).
KM strategy-System, Human, critical success factor (leadership & top management, culture, technology, people, structure, performance mgt.)	Business Performance (Growth, Profitability)	ITM strategy- IT environment Scanning, strategic use of IT. HRM strategy- HR flow (recruitment, selection, training and development), work system (control, team work, job specificity), reward system (wages and performance assessments).	Chen, Yue-Yang & Huang, Hui-Ling (2012).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
KM strategy (human oriented, system, internal, external) KM Process- Acquisition & creation, collection & storage, sharing, use)	BSC (Financial, Customer, Internal business, innovation & learning))		Akhavan, A., Owlia, M. S., Jafari, M., & Zare, Y. (2011, December).
Knowledge management Orientation (organizational memory, knowledge sharing, knowledge absorption, and knowledge receptivity)	Firm performance- Subjective, Objective (profit)	Mediating variable (MO)– intelligence generation, intelligence dissemination, and responsiveness. Control variable for market orientation – age, size, industry classification, and strategic type	Du, P. (2011, August)
Knowledge Enhancement Capability (knowledge acquisition, knowledge conversion processes), Knowledge Utilization Capabilities: (knowledge application processes).	Firm Performance: return on asset and earnings per share	Mediating variable Innovation-(firm's pursuit of product and service innovations to differentiate the firm from its competitors).	Hsu, I. C., & Sabherwal, R. (2011).
Chief Information Officer's Education	Organizational Performance EPSDiluted = Diluted earnings per share1; EPSBasic = Basic earnings per share2; ROA = Returns on assets	Control variables include: NI/REV = Net income ratio measured by net income over total revenues; RESTR = 1 if firm had restructuring, 0 otherwise; LEV = Percentage of total debts over total assets; SQSEG = Square root of the number of business segments reported on Compustat; GROWTH = Sales growth (percent change in sales from prior year); PHD = 1 if the new CIO has a PHD degree, else 0; RD/REV = Ratio of research and development expense to total revenues; PHD*RD/REV = Interaction of research and development activities and CIO's education.	Chen, Y. T., Yan, Y. C., Huang, H. W., & Huang, H. W. (2011, June).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Knowledge Management System KM process-creation[SECI], organization [storage, codification, retrieval, maintenance], transfer[absorption, diffusion], Application[Integration, leverage]),	Organizational performance (Indicator not stated)	Moderating variable- CIO's education(PHD degree) Mediating variable- KM capability, KMS	Han, W., & Wang, Y. (2012, May).
KM infrastructure KM innovation.	Competitive advantage (not stated)		Mundra, N., Gulati, K. & Vashisth, R. (2011).
KM strategy (Human, system),	OP (Indicator not stated)		Roy M., Chatterjee T. & Linnane L. (2012).
Knowledge management effectiveness (Ratio of R &D expenses to total revenues.) KM enablers(leadership, culture, KM strategy, IT, People) ,	Firm performance(market share, profitability)		Theriou N., Maditinos D., Theriou G. (2011).
Market Knowledge Management (acquisition of market knowledge, conversion of market knowledge, application of market knowledge, and protection of market knowledge) dynamic capabilities- sensing capability, absorptive capability and learning capability	Business performance -financial and non-financial indicators (market performance- market shares, sales growth rates, customer satisfaction, and the success rate of new product. Financial performance- return on investment and profitability)		Hou, J. J., & Chien, Y. T. (2010).
KM Maturity ((1) information technology (the ability of technology to capture knowledge and usage of information systems), (2) organisation (people, organisational climate and processes) and (3) knowledge (knowledge accumulation, utilisation, sharing practices and knowledge ownership identification)	Organizational Performance Financial perspective Supplier perspective Innovation and learning perspective Customer perspective Internal processes perspective Reputation		Rasul J., Bosilj Vuksic V., Indihar Štemberger M.(2012).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
(Knowledge sharing, Knowledge absorption, Knowledge storage, Knowledge conversion),	OP(Sales growth, EPS)		Huang, C.L. (2011)
knowledge acquisition, knowledge dissemination ,responsiveness to knowledge.	Objective organizational high performance Perceived high organizational performance (perceived organizational performance, perceived market performance) Competitive Advantage		Bagorogoza, J. & Waal, Andre de (2011).
KM Process-K Acquisition, K creation, K dissemination, K accumulation	Organizational Performance, Competitive advantage	Influencing Variable HRM- Work design, Recruit selection, Training Development, Performance evaluation, salary & Rewards.	Wang, Keh-Luh, Chiang, Chi & Tung, Chiu-Mei. (2012).
Top management support for KM and technical infrastructure for KM	Organizational performance (quick response of market demand and changing environment, predict the new prospect for products and services, strong position of firm in the industry, competitive edge over competitors and substantial market share in term of its major rivals)	Mediating variable- Knowledge application (experience and mistakes, utilize in new product development, long term plans and growth of the organizations and quickly response to the critical competitive needs).	Hague, A. & Anwar, S. (2012).
KM activities (responsiveness to knowledge(response to market knowledge, response to client needs), Knowledge acquisition (Market, financial), Knowledge dissemination (tacit, explicit), Knowledge utilization)	Balanced scorecard (BSC) Financial performance • Performance from customer perspective • Performance from process perspective • Performance from learning and growth perspective	The internal business environment – Organizational environment (organizational culture (value and principles), organizational climate (rules, policies, procedures, structure, incentive systems, etc.) Technical environment (technological infrastructure and its ability to respond to the increasingly dynamic work environment)	Chen, L., & Mohamed, S. (2010).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
KM maturity- ICT Management, Information management, KM issues (principle, policy, strategy), KM implementation, Ubiquities knowledge, assessment of KM growth.	Performance Assessment tool(Profitability, Liquidity, Leverage, Shareholder satisfaction, Growth, Intangible value, Customer satisfaction, Employee satisfaction)		Kruger, C. J. N., & Johnson, R. D. (2011).
KM Infrastructure <ul style="list-style-type: none"> • Identify and appoint domain leaders • Identify and appoint affinity groups at each plant • Seek and Assimilate knowledge in the respective domains • Submit knowledge capture documents to affinity groups in their respective • Electronically submit captured knowledge to domain leaders KM Imperatives • Capture knowledge from all locations • Classify knowledge, create categories • Approves documents uploaded in the KM portal • Facilitates and assists domain Leaders • Users download knowledge documents at all locations 	Sustainable Competitive Advantage		Goel, A., Rana, G. & Rastogi, R.(2010),

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Knowledge management capability (Knowledge learning and acquiring, sharing, creating and improving)	Product or service quality; product or service innovation; employee attraction; employee retention; customer satisfaction; management and employee relation; employee relations	Human resource management (personnel staffing , performance appraisal , reward and compensation, training and development , employee participation) Organizational learning (information-sharing patterns ,inquiry climate, learning practices, achievement mindset) Organizational innovation (Technological Innovation[product, process and services innovation], Administrative innovation [organizational strategy, structure, system, cultural innovation])	Kuo, Tsung-Hsien (2011).
KM capability- Knowledge Infrastructure capability (Technology, Organizational culture, Organizational Structure) Knowledge process Capability (Knowledge acquisition, Knowledge conversion, Knowledge application, Knowledge protection)	Organizational Performance		Mills, Annette M. & Smith, Trevor A.(2011).
Knowledge capacity(acquisition, sharing and application)	Organizational and community improvement (Building shared values, improving female and youth employment, promoting social participation, enabling people to have a sense that they are engaged in a common enterprise, facing shared challenges and having equal opportunities to be included in the process of capacity building.)	Strategic Human resource management practices (Staffing, Training, Participation, Performance Appraisal and Rewards) Employee improvement (employees' talents and skills, motivation, the structure and the design of their work, employees' job satisfaction, Their behavior and performance.)	Pekka-Economou, V. & Hadjidema, S.(2011).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Knowledge sharing(information technology (IT) Infrastructure and systems, open communication, organizational learning and sharing)	Business Performance (business competitiveness[level of profitability, sales growth and total quality cost, as well as the ability of the company to gain or retain new business], Manufacturing performance [Engineering change rates, production cycle times, operational cost, and internal and/or external customer satisfaction.]and process efficiency [Firm's overall reputation] Process efficiency [Increased internal production rate, Improved customer response time, Reduced products defect rate])	Control Variables (CV), namely firm size and nature of business New product Development (Employee involvement, Design simplification and modular design) Integrated supplier management (supplier evaluation and selection, supplier involvement,)	Tsu-Te Andrew Huang, L. C., & Stewart, R. A. (2010).
Knowledge Based Resources Knowledge management Capability(activities and technologies related to acquisition and utilization of knowledge within the firm)	Resource utilization (Return on investment, Equipment utilization, Energy usage/ cost, Total cost of resources used, Distribution costs including transportation and handling, Manufacturing including labor, maintenance, and re-work. Inventory Other Output measures related to supply chain	Supply chain Technology Investments	Collins, J. D., Worthington, W. J., Reyes, P. M., & Romero, M. (2010).
Knowledge sharing	Competitive advantage	Agile capability (Responsiveness, competency, Quickness, Flexibility)	Almahamid, S., Awwad, A., & McAdams, A. C. (2010).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
knowledge management capacity (acquisition and dissemination)	profitability and sales growth, cash turnover, financial goal achievement, and risk management with respect to competitors.	Moderating/Interacting Variable- Social Interaction(Coordination, Communication) Control variable- firm size (number of employees), Industry type (manufacturing, service)	Hsiao, Y. C., Chen, C. J., & Chang, S. C. (2011).
Dynamic capabilities(absorbing, creating, storing and applying knowledge resources) Knowledge resources (customer-related and competitor-related knowledge resources.) Customer-related knowledge resources (customer perceptions of the firm's products, promotion, and market Segments toward the firm.) Competitor-related knowledge resources (competitors' promotions, market segments and customers) Learning mechanisms (experience accumulation, knowledge articulation, and knowledge codification)	Performance (subjective assessment of store's quality of service, level of sales, current profitability, sales growth rate, and overall store performance.)		Chien, S. Y., & Tsai, C. H. (2012).
Knowledge Ambiguity (Knowledge tacitness of innovations , knowledge complexity of innovations, knowledge specificity of innovations)	Innovation - related performance (Market, coordination, efficiency, R&D.)	Control variable- type of innovation (process, administrative), its degree of novelty, and whether or not the innovation is tailor-made., Subsidiary age, and subsidiary size.	Ciabuschi, F., & Martín, O. M. (2012).
Effective Knowledge management (knowledge acquisition, knowledge conversion, use)	Percentage of new product sales to total sales, market share, and return on investment (ROI), agility of internal processes and reduction in response time to market changes	Innovativeness (Open to innovation in terms of culture values and beliefs.) Strategic orientation (customer orientation, competitor orientation and inter-functional coordination)	Ferraresi, A. A., Quandt, C. O., dos Santos, S. A., & Frega, J. R. (2012).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Knowledge Stock(Number of recent patents)	Firm performance(ROA)	Moderator variable-Firm Size (total number of employees), Ambidextrous learning (exploratory proportion of previously unused citations by a firm in a focal year, as determined by the list of patents and citations in the previous five years. and exploitative learning-average number of times a firm used the same citation in the patents it applied for) Control variable-country, technology opportunity, prior performance (ROAt-1), slack (debt ratio, current ratio), firm size(logarithm of total annual sales at the end of the year), firm age(numbers of years a firm has been in existence).	Lee, C. Y., & Huang, Y. C. (2012).
KM Capability (Infrastructure [technological, structural, cultural], process [acquisition, conversion, application and protection of knowledge])	Firm Performance (return on investment (ROI), market share, profit margin on sales, growth of ROI, growth of sales, and growth of market share)	SCM practices (information sharing, integration, on-time delivery, response time and communication of strategic needs)	Wai Peng Wong, Kuan Yew Wong, (2011).
Knowledge Conversion Socialization Externalization Combination Internalization	Corporate Performance Financial performance Market/customer Process People development Future	Organizational Cultures Clan culture Hierarchy culture Adhocracy culture	Tseng, S. M. (2010).

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
<p>KM infrastructure-culture(collaboration, trust, learning culture), structure (Decentralization), management(Top management support, promotion), technology (IT support)</p> <p>Knowledge process Capability (Acquisition, conversion, application, protection)</p>	<p>Subjective Organizational Performance-The capability to develop new products/ services, the capability to predict business or risks, the improvement of capability to cope with new information of markets</p>		<p>Sangjae Lee, Byung Gon Kim & Hoyal Kim (2012).</p>
<p>Applied channel logistics knowledge: warehouse staging systems proximate to customers; information from customers on future production plans, information from customers that improves delivery and inventory management; suppliers' warehouse staging systems proximate to buyer's firm; suppliers' application of buyer's production plans; and information from suppliers that improves delivery and inventory management</p>	<p>Financial Performance</p> <p>(1) average return on investment over the past three years;</p> <p>(2) average profit over the past three years; and</p> <p>(3) Profit growth over the past three years.</p>	<p>Control variable- size (the natural logarithm of the number of employees) and demand uncertainty (tapping sales predictability, sales forecast accuracy, and ease of monitoring market trends)</p>	<p>Birou, L., Germain, R. N., & Christensen, W. J. (2011).</p>
<p>Marketing Knowledge Management (Built-in marketing assets, Invested-in marketing assets, Internal marketing capabilities, External marketing capabilities)</p>	<p>Organizational performance –market performance (contribution to organization's non-financial assets, organization's ability to develop new services, and organization's image), customer performance (customer satisfaction, loyalty, and ability to attract new customers), financial performance (return on investments, profitability, Market share and contribution to organization's financial assets).</p>		<p>Mamoun, N. Akroush & Samer, M. Al-Mohammad (2010).</p>

<i>Construct & Indicator</i>			
<i>KM Construct</i>	<i>Organizational Performance Constructs</i>	<i>Other variable</i>	<i>Studies</i>
Organizational Culture that affects Knowledge Processes (1)credibility; (2) respect; (3) fairness; (4) pride; and (5) camaraderie	Organizational Performance- firm value(Price/earnings ratio, Tobin's q ratio), Operating performance (Operating margins, operating income per employee, and return on assets (ROA))and growth rate)		Nold III, H. A. (2012).
Knowledge Sourcing Strategy(System oriented, person oriented, external oriented, internal oriented)	Firm performance (Degree of overall success, market share, growth rate, profitability, and innovativeness in comparison with major competitors)	Control variable- Size (Logarithm of the number of employees), Age (The number of years a firm has existed), R&D investment (Averaged R&D expenditures during the past three years), Industry Type	Choi, B. & Lee, Jae-Nam(2012).
Critical Success Factor of KM (human resource management, information technology, leadership, organizational learning, organizational strategy, organizational structure, and organizational culture) KM strategies (codification and personalization) KM processes (knowledge creation, knowledge org, knowledge storage, knowledge sharing, and knowledge utilization.)	Organizational Performance (Financial perspective, Customer perspective, internal process perspective, learning and growth)	Middle Manager's Role (Analyst, Intuitive, Pragmatic)	Al-Hakim, Laith Ali Yousif & Hassan, S. (2011).

Statistical/Non-statistical Tools (RQ1d)

On data extraction from the inspected studies, it is found that a large number of the studies used EFA (35% studies) and CFA (40% Studies) to determine the validity and

reliability of the measures used in the research. Also, structural equation modeling was used by a large number of the studies (30% studies) for hypothesis testing. Second most popular methods used for path testing were

correlation (16.6% studies) and regression analysis (16.6% studies). Other tests used in the studies to assess the effect of KM on organizational Performance were t-test, z-test, chi-square test, Wald test, Wilcoxon Signed

Table 8a: Statistical Tools Used (RQ1d)

<i>Tool Used</i>	<i>Studies</i>	<i>Frequency</i>
t-test	[3], [40]	2
z-test	[30]	1
Chi-Square test	[6]	1
Wilcoxon Signed Ranks Test	[31]	1
Wald test	[12]	1
ANOVA	[6], [38]	2
EFA	[4], [6], [8], [12], [16], [19], [20], [21], [28], [29], [33], [34], [36], [37], [39]	15
CFA	[8], [10], [11], [15], [16], [18], [19], [22], [23], [25], [27], [28], [29], [33], [37], [40], [41]	17
SEM	[9], [11], [15], [16], [19], [22], [23], [27], [28], [29], [33], [40], [41]	13
Correlation Analysis	[8], [19], [26], [32], [36], [38], [39]	7
Regression Analysis	[3], [13], [21], [26], [35], [38], [39], [41]	8
Cluster Analysis	[6], [34]	2
Profile Deviation Analysis	[11]	1
Percentage Analysis	[30]	1
Interview Analysis	[17]	1
Not stated	[1], [2], [5], [7], [14], [24], [42], [43]	8

Ranks Test, cluster analysis, profile deviation analysis, percentage analysis and interview analysis.

Most popular software tool used for the data analysis was SPSS (23.8% Studies). Lisrel was the second most used software tool (16.6% studies). Other software tools used for analysis were AMOS (9.5% studies), SAS (1 study), EQS (4.7% studies) and PLA Graph (2.3% studies).

Table 8b: Software Used (RQ1d)

<i>Software Used</i>	<i>Studies</i>	<i>Frequency</i>
SPSS	[6], [7], [16], [18], [28], [29], [33], [36], [38], [39]	10
LISREL	[5], [15], [25], [27], [33], [37], [41]	7
EQS	[10], [28]	2
SAS	[24]	1
AMOS	[8], [16], [18], [22]	4
PLS Graph	[29]	1
Not stated	[1], [2], [3], [4], [9], [11], [12], [13], [14], [17], [19], [20], [21], [23], [26], [30], [31], [32], [34], [35], [40], [42]	22

Research Gaps Identified (RQ1e)

The research gaps were identified from the limitations and the future research prospects related to the research problem provided by the various researchers in their respective studies. It was found that a large number of studies (64% studies) indicated that generalisability of the results of the studies was not feasible. The reasons cited were

the small sample size of the studies and concentration of sample population on single/few companies/industry/country. Different companies/industries may have different macro and micro factors influencing them which might lead to significant difference in the results of the same study in different settings. Similarly, different countries have different cultures, economic levels and internal/external environment working on them which might lead to significant difference in the results of the same study in different countries. It is recommended that to increase the generalisability of the studies, same studies must be replicated in different environments. About 54.7% studies felt that the sample size used by them in the research was inadequate to generalize the results of the study. A large number of the studies (54.7% studies) focused on the fact that there is a need to make the research models more comprehensive. This can be done by adding more constructs to the research models. This is in light of those studies that have used single or few aspects of knowledge management or organizational performance for investigation. About 9 studies indicated that a longitudinal study is required to study the dynamic aspects of the effect of knowledge management on organizational performance. Other research gaps identified from the studies were use of quantitative secondary data (7.1% studies), use of single key informant for data collection (11.9% studies), use of self reported measures or perceptual data (23.8% studies), use of single data source (4.7% studies) and requirement of a case study (7.1% studies).

The researchers of the inspected studies emphasize that that perceptual data/self reported measure that is collected from respondents is more likely to be subjective. Because perceptual data is mostly based on the respondents' expectations for the future rather than on the reality of the present, the data validity in this case is questionable and open to criticism. Also, the researchers point towards the shortcoming of single data sources that prevents data-triangulation which might lessen the researchers' abilities to understand and analyze underlying pillars of the research constructs correctly. The researchers find that due to single data source they are not able to get much information about 'why' the respondents had chosen their responses. It is recommended by the researchers to use multi-method of data collection (e.g. Survey, Interview, archive, etc.) in future researches. An important research gap found in the study was the need of empirical studies on the effect of knowledge management on organizational performance in developing countries like India. Only 7.1% studies had sample population from India. Out of those studies, one was case study [17], one was case study supported by perceptual data [30] and one was a cluster analysis study [34]. The studies are significant in terms of the research problem being undertaken in a developing country like India. However, it is felt that empirical research needs to be conducted in Indian context with a high level focus on research constructs, research approaches and sample population.

Table 9: Research Gaps (RQ1e)

<i>Research Gaps</i>	<i>Studies</i>	<i>Frequency</i>
Size of the sample is limited.	[3], [4], [6], [7], [8], [11], [12], [16], [19], [21], [23], [24], [25], [27], [28], [29], [30], [31], [33], [35], [39], [40], [41]	23
Generalizability of results is limited.	[3], [4], [6], [7], [8], [11], [12], [13], [16], [19], [20], [21], [23], [24], [25], [26], [27], [28], [29], [30], [31], [33], [35], [38], [39], [40], [41]	27
A longitudinal study is required	[3], [6], [9], [13], [21], [27], [35], [40], [41]	9
Need of empirical studies on the subject particularly in the context of vast and developing economies like India, Africa.	[16], [17], [24], [34]	4
Self reported measure.	[16], [12], [19], [21],	4
Other variables/constructs can be added to the research study to make it more integrative.	[3], [4], [7], [9], [11], [12], [13], [15], [16], [18],[20], [21], [26], [27], [28], [29], [31], [32], [35], [39], [40], [41]	22
Quantitative secondary data	[23], [24], [26]	3
Single Key informant	[12], [15], [16], [25], [29]	5
Perceptual data	[3], [9], [13], [16], [21], [27]	6
Single Data Source	[3], [35]	2
A case study is required	[3], [4], [16], [39]	4
Not Stated	[1], [2], [5], [10], [14], [17], [22], [36], [37], [42]	10

CONCLUSION

The systematic literature review conducted in this study is the first of its kind in relation to the research problem under study, i.e. “Effect of Knowledge Management on Organizational Performance”. This paper significantly contributes to the literature. First, the study has identified and gathered if not all, then at least the immense majority of “state of the art” concerning the research problem from January, 2010 to September, 2012. Second, despite the complications generated by the diversity of the research approaches, research constructs, sample population, the study has been able to aggregate the individual properties, thus leading to a higher level of

evidence about the pieces of knowledge about the research problem under investigation. The study tried to make the review as comprehensive as possible. Both journals and conference proceedings were included in the review.

The results of this review encourage further research on the effect of knowledge management on organizational performance. From the analysis of the existing literature, it can be indicated that relationship between Knowledge management and organizational performance is a suitable subject for empirical study. There are diverse knowledge management constructs that can affect the organizational performance positively.

For example, knowledge management enabler, knowledge management process and knowledge management strategy. An important research gap in the literature on the topic is the need of empirical studies on the effect of knowledge management on organizational performance in developing countries like India [34]. Only few studies with sample population from India have studied the relationship empirically. Those few studies too have not conceptualized the relationship between KM and organizational performance holistically. Relationship between Knowledge Management and organizational performance can be tested. Validated tools are available for studying the relationship between Knowledge Management and organizational performance.

Like other research studies, this study also has its own limitations. First, only the literature published from January, 2010 to September, 2012 was included in the review. Also the dissertations were not included in the review. This was done to keep the scope of the research paper within control of the researcher. In future researches, the systematic literature review on the problem can be made more comprehensive by adding more research studies, if not all. Second, the study tried to keep the search process as systematic as possible; however there may be some literature that may not have got included in the study. Third, the properties extracted from the studies were totally based on the claims made by the respective studies. This may lessen the robustness of the results of the study. In the future researches, data must be extracted from the existing studies

with a more robust data extraction strategy in place. These limitations notwithstanding, it is believed that the findings offer some noteworthy insights.

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