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QUALITY PAPER

Impact of quality management practices on performance stimulating growth

Empirical evidence from Indian IT enabled service SMEs

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Abstract

Purpose – The purpose of this paper is to explore and identify the contextual quality management practices (QMP) and to empirically examine their underlying dimensions and its direct influence or association with performance in context to Indian IT enabled service small- and mid-size enterprises (SMEs).

Design/methodology/approach – The methodology adopted in this study is sequential exploratory mixed method approach. This study adopts two stage processes of capturing data, first identifying critical QMP/indicators as obtained from review of literature, followed by in-depth interview based on semi-structured questionnaire from sample of 20 select service SMEs. Based on comprehensive compilation of literature as well as through in-depth interview 21 QMP have been identified. Structured instrument has been developed taking measures as identified. The QMP relevant to SMEs have been derived from Kaynak (2003), Samat *et al.* (2006), Salaheldin (2009), Kim *et al.* (2012) and Talib *et al.* (2013b). The research instrument developed was customised and adapted to the background of Indian IT enabled service SMEs. Similarly for measuring quality performance five items have been identified from previous literature. Five-point Likert scale ranging from "5 = strongly agree" to "1 = strongly disagree" is used to show the agreement of the respondents. Exploratory factor analysis has been deployed to identify underlying dimensions of QMP. Thereafter, linear regression modelling has been done to better understand the relationships between QMP and quality performance.

Findings – A three-factor solution has been obtained and the individual practices could be reconfigured into three dimensions, namely, organisational management, capacity management and quality documentation and security management (QDSM). The findings reflect that strength of Indian IT enabled service SMEs pertaining to quality implementation lie with customer focus, training and service-level management (SLM). Regression analysis shows that all three factor dimensions are positively influencing quality performance. The predictor score of three factor dimensions clearly reflects that Indian SMEs in service sectors have been focusing more on organisational culture and QDSM. The overall findings resemble very interesting insights which gives indication of unstructured pattern of approach. Keeping in view the pattern of practices it can be predicted that Indian digital SMEs are not practicing continuous improvement. It could be inferred that Indian IT enabled service SMEs approach is non-continuous in nature.

Research limitations/implications – Further analysis may be needed to measure the construct using confirmatory factor analysis (CFA). The research paper is limited by including only six service sub-sectors which may not be adequate to generalise the results for the entire IT enabled/digital service SMEs within India. The same study can be extended by incorporating more quality management (QM) variables and other contextual factors within the organisation and by involving other service sector SMEs. Future research could be done by incorporating multi-contingency framework and moreover researchers may deploy other sophisticated tools and techniques to investigate how individual QMP are interrelated and its influence on performance by means of linkage research. The conceptual model developed can be validated by incorporating other service sector SMEs by deploying CFA and structural modelling.

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Practical implications – This study could be beneficial to entrepreneurs and managers of start-ups and other service industries towards understanding improvement and changing their implementation approach. The theoretically grounded conceptual framework developed could provide entrepreneurial insights to new service managers and entrepreneurs who can better allocate their scarce resources to build quality and scalability effectively.

Originality/value – This study adds to the literature in identifying and showing importance of QMP in Indian IT enabled service SMEs. This choice is appropriate for this study as no prior research has been found to be conducted on this particular sector from Indian context, especially from service SMEs point of view. This research contributes in identifying new QMP (i.e. service reporting; content management; SLM and information and security management). Overall, the results of this study contribute towards advancing the understanding of the dimensionality of QM. To the best of the authors' knowledge, this study is the first study being undertaken in context to Indian IT enabled service SMEs and is believed that the study provides valuable knowledge from the perspective of QM issues pertaining to Indian service firms.

Keywords Quality, SME, India, Service management, IT, EFA, Implementation

Paper type Research paper

1. Introduction

Today the service sector of Indian economy is expanding rapidly and thus service management has become a top notch concern for many organisations irrespective of any magnitude (Jana, 2007). Outstanding growth of Indian service sector has encouraged entrepreneurs to instigate start-ups and face allied risks (Bitner and Brown, 2008). Growing entrepreneurial activities are undeniably emerging as major absorbers of digitised solutions with adoption of information technology (IT) which contributes to quality delivery by enhancing responsiveness and reduction in errors in service operation system (Sanchez-Rodriguez *et al.*, 2006). Small- and mid-size enterprises (SMEs), in India, contributes 45 per cent to manufacturing and 40 per cent to export sector providing employment to 60 million people, making it to be the largest source of employment. India's economic growth is driven by service sector particularly due to expansion of IT and ITES and also IT sector itself contributes more than 20 per cent of the overall service sector GDP which is rising at a steady rate. Therefore digitalisation is considered to be the next big thing for Indian SMEs. With steady expansion of mobile communication and internet, scope for digital entrepreneurship is becoming significant in India. Thus managing quality has become essential for digital enterprises in service sector domain to gain competitive advantage for long-term business success. Considering the growing prominence of digital SMEs and its contribution towards economic growth, India has targeted these organisations as highest priority area (Talib *et al.*, 2013a, b). The adaptability and ability of IT makes it an ideal platform for small and medium organisations to participate in global market. However, despite the adoption of IT many IT projects have suffered missed deadlines, with unsatisfactory quality outcomes and often the organisations have to go through stages of frustrations which may have serious impact on operations. Studies have shown that implementation of quality management practices (QMP) has failed to achieve any results (Rich, 2008) whereas others have shown mixed results of success which possess questions: what are the critical QMP that could enhance service quality of organisations which would lead towards quality performance. Thus it has become necessary to identify the context-specific quality management (QM) dimensions for IT enabled service industries within the small and medium businesses (Bronte-Stewart, 2005). Considering the pressing need, the purpose of this paper is to explore and identify context-specific QMP practices pertaining to Indian IT enabled digital small and medium service businesses. Further this paper also attempts to empirically identify the underlying

dimensions of QMP and its direct influence or association with quality performance by deploying factor analysis and linear regression modelling. A theoretical-driven conceptual model has been grounded and designed to understand the possible linkage between the identified contextual factors with QM, performance and growth.

2. Review of literature

Drawing on past literature it is evident that substantial researches have been done on quality and its implementation in context to large organisations (Yusof and Aspinwall, 1999; Beheshti and Lollar, 2003; Thomas and Webb, 2003) with little focus on SMEs (Kuratko *et al.*, 2001). In context to service sector there is a continuing need to address issues related to appropriateness and adaptability of various QMP. It is of no surprise that many service firms are uncertain and investigational in their adoption and application in terms of quality initiatives. There remains scarcity of research pertaining to QMP in SMEs (Petroni, 2002; Seth and Tripathi, 2005) and existing research are mostly theoretical in nature with few empirical findings. Despite the appreciation and continuation of linkages between QM and business performance, there remain very few researches that have examined this issue explicitly, especially in Indian service-oriented SMEs. A systematic review of literature has been done through searches of scholarly electronic databases including: Emerald, World Scientific, Taylor & Francis, Elsevier, Proquest, Springer Link, Google Scholar, IEEE Xplore and some of the conference proceedings that the researchers could access. The search terms used were SME, MSME, quality, service quality, QM, total quality management (TQM), IT and India. Articles included in the study mainly focused on service sector organisations with mix industry types including both service and manufacturing organisations.

2.1 QMP

QM is usually referred to as TQM (Stashevsky and Elizur, 2000). QMP as a whole includes those which are connected to TQM-based approaches. It is important to note that the QMP taken in this study are termed as critical success factors of TQM that can help organisation to attain business excellence (Talib and Rahman, 2010). Moreover, published literatures are available on QMP adopted by different practitioners and academicians in different service industries. Since we are not trying to highlight any major difference between the two terminologies (i.e. QM and TQM) so we have used these terms interchangeably as often has been done by several scholars like Lakhal *et al.* (2006), Fening *et al.* (2008), Kim *et al.* (2012), Ebrahimi and Sadhegi (2013) and Parvadavardini *et al.* (2016). It is also important to note as cited by Ooi *et al.* (2011) in *Journal of Services Marketing* that "the most commonly used method by scholars to research and study on the quality management principles of an organisation is through the use of TQM constructs. Throughout the years, TQM dimensions have been widely used by many well-known scholars, such as Flynn *et al.* (1994), Terziovski and Samson (1999) and Prajogo and McDermott (2005) for the study of quality management and theory". Hence in this paper it will be referred to as QMP which will represent the practices reported under two different nomenclatures, namely. QMP and TQM practices to represent the set comprehensively.

2.2 Identification of QMP in context to developing countries

Brah *et al.* (2000) have identified 11 QMP which include support from top management, customer focus, employee involvement, training of employees, employee empowerment, process improvement, service design, quality improvement, benchmarking, cleanliness

and organisation. Based on the research study it has been revealed and supported the proposition that total QM implementation correlated with quality performance. The identified factors include the behavioural factors like role of top management and leadership, customer focus, human resource focus and quality focus as well as other technique including corporate planning, process focus and information analysis (Brah and Tee, 2002). Researchers analysed 20 critical factors responsible for successful implementation of QM in service sector as leadership and top management commitment, customer focus and satisfaction, policy and strategy-based planning, human resource management, process management and control, product/service design and control, continuous improvement, supplier management, employees satisfaction, employees participation, employee appraisal, reward and recognition, training, quality culture, quality assurance, quality system, impact on society, teamwork, flexibility, zero defect, and benchmarking (Mahapatra and Khan, 2006). Rahman and Siddiqui (2006) described top management support, customer centric advancement, benchmarking, relentless improvement, strengthening employee base as five principal factors considered to be integral part of IT/IS firms.

Al-Marri *et al.* (2007) identifies 16 critical factors of quality orientation practices which were found to be crucial towards implementing TQM in the service sector banking. The identified factors include: top management support, customer focus, strategy, benchmarking, employee involvement, recognition and award, analysis of problem, quality technologies, service design, services capes, service culture, social responsibility, human resource management, continuous improvement, quality department and quality systems. A research study carried out in Greek organisations identified nine QM attributes which found to be critical towards sustainability of organisations. The identified practices include: leadership, strategic quality planning, employee management as well as involvement, customer focus, supplier management, process management, continuous improvement, information and analysis, knowledge and education (Fotopoulos and Psomas, 2009).

On the basis of structural equation modelling Sit *et al.* (2009) investigated the impact of QMP on customer satisfaction in context to Malaysian service organisations. The analysis showed that leadership, information analysis, human resource and customer focus are positively related to customer satisfaction in service organisations. Further analysis in this context strongly supported human resource focus and information analysis as the most crucial practices that influence satisfaction level of the customer (Sit *et al.*, 2009). In context to Indian service sector industries nine set of QMP have been proposed which are commitment from top management, customer focus, focus on training and education, continuous improvement and innovation, supplier management, employee involvement, employee encouragement, benchmarking, quality information and performance. These nine critical factors were found to be predominant as these are frequently used in service area in particular (Talib and Rahman, 2010). Shahin and Dabestani (2011) examined the feasibility of implementing QM based on soft factors which influence the successful implementation of TQM. Accordingly a framework has been developed based on questionnaire survey and case study from Engineering Service Company and findings imply that leadership, closer customer relationship, benchmarking and process improvement have the most correlations among the TQM soft factors.

Talib *et al.* (2013a) developed a reliable and valid instrument necessary for the successful implementation of TQM programme in Indian ICT-based organisations from 84 Indian companies and it was concluded that Indian ICT companies perceives total

management commitment, continuous improvement and innovation, quality culture, training and education, customer focus, teamwork, quality systems, product and service design, process management, communication regarded as the ten most important QMP. While the five QMP such as strategic planning, information and analysis, benchmarking, employee involvement, employee encouragement are being perceived to be the important (moderate) QMP and the remaining two practices include human resource management and supplier management to be the least important practices in Indian ICT industry. Talib *et al.* (2013b) investigated the relationship between TQM practices and quality performances in Indian service industries using a self-administered instrument that was distributed to 600 Indian service organisations which include healthcare, banking, ICT and hospitality industry. Findings of this study revealed that TQM practices were found to be partially correlated with the quality performance. It was also found that quality culture was perceived as the dominant TQM practice in quality performance. Other practices such as quality systems, training and education, teamwork and benchmarking showed a positive relationship with quality performance. Ooi (2015) in his study provided a deeper insight into more detailed view of TQM practices to examine whether the six dimensions of MBNQA model, i.e. HR management, customer focus, leadership, information analysis, process management and strategic planning have the same effect on both manufacturing and service sectors in relation to knowledge management behaviours, whereas it has been found that there is no difference, hence indicating the importance of MBNQA-TQM practices to both industries. Yeh and Lai (2015) evaluated the effectiveness of implementing QMP in medical industry and identified key QMP in order of importance which include: top management involvement, departmental communication and coordination, teamwork, hospital participation, education and training, consultant professionalism, continuous internal auditing, computerised process and incentive compensation.

3. Research methodology

A robust methodology has been deployed in this study following exploratory sequential mixed method approach. This paper adopts two stage processes of capturing data, first by identifying critical QMP/indicators as obtained from review of literature, followed by in-depth interview based on semi-structured questionnaire from sample of 20 select service SMEs. The identified practices as obtained from review as well as from in-depth interview were further subjected to quantitative statistical analysis based on structured questionnaire. The methodology deployed begins with exploratory qualitative endeavour in order to explore and identify QMP which are being adopted in context to Indian IT enabled service SMEs. Based on the comprehensive compilation of previous studies a measurement model has been developed to measure the QMP among SMEs in service sector firms in India. The critical factors/practices are identified from the various literatures available related to QMP as well as TQM with specific relevance to service sector organisations of developing countries perspective. Therefore, literature review has been conducted in a systematic manner. Practices which are relevant to service-based SMEs are taken as measures.

In this study IT enabled service SMEs refer to those organisations "where ways of information exchange is done between computers through a method of interconnection, principally the internet" (Wai *et al.*, 2011). The criteria for selecting these organisations were based on level of IT adoption which are further classified as: Level 1: basic

computerisation (website, e-mail, internet, graphics, etc.); Level 2: computerisation of selective functions but non-cross-functional (financial A/C, payroll in HR, invoicing in sales); and Level 3: computerisation of core business process, process automation and integration (management information systems/enterprise resource planning) or business integration (decision support system, customer relationship management, E-commerce).

3.1 Exploratory qualitative approach

The first phase of capturing qualitative data has been done based on in-depth interview through semi-structured questionnaire to draw rich insights from in-depth analysis of small sample of participants (Bryman, 1999; Jablin and Putnam, 2001). In order to obtain more holistic picture about implementation pattern or structure of QM, interview protocol was designed to capture the QMP that organisations are practicing. The exploratory endeavour has been followed because such approach attempts to identify new knowledge, new insights, new understanding and new meaning in order to explore factors related to topic (Brink and Wood, 1998). In this study the present approach has been found to be suitable for gaining better understanding of the phenomenon in context and to explore some new variables/indicators/practices.

3.1.1 In-depth interview. Initially five service SMEs were selected to carry out the interview process. Thereafter, 15 IT enabled service SMEs were again selected for exploratory qualitative study. Thus unit of analysis for this exploratory qualitative analysis were 20 IT enabled service SMEs. The target respondents for this in-depth interview were entrepreneurs/CEOs, managers and other full time employees of the organisation who are directly or indirectly involved with the implementation of quality or at least perceived the importance of QM/TQM in their enterprises. The objective of in-depth interview is to critically capture the QMP by the firms under investigation and questions were asked accordingly. The interview protocol included questions pertaining to respondent's perception towards adoption of QMP. Questions included about the adoption of information systems in their organisations if any; whether adoption of IT supports daily service operations and how; what could be the other contextual factors that can enhance firm performance. The target organisations include IT embedded digital service SMEs from various sub-sectors like logistics; financial; IT/software services; tourism and healthcare services; consulting firms (HR and facility management services), and others.

In this section some of the verbatim extracts that had been captured during in-depth interview are represented as:

> Our aim is to explore new ideas focusing on the needs of clients in enhancing web development, web design, logo design, e-commerce, flash animation and development of customized web based software development and other IT-enabled services (IT Manager, IT service provider firm).

> We believe that most important factor of our success is the success of our clients. By supplying our customer with top resource and skills, we fulfil our main goal by adding value to their businesses through knowledgeable application of information technologies (Asst. Manager, IT service provider firm).

> We are specialized in web development. Our website designing services covers strategic planning, business intelligence, application development, product/service promotion and solution maintenance. Our focus is given more on graphics design, logo design, SEO service, gallery management system (Web Developer, IT service provider firm).

> We manage business with reliable information suitable to current business requirements. It is being ensured that staff members should comprehend and act on relevant security issues and that firm's information systems is established and operated in a manner appropriate to the importance of information processed.
>
> Our organisation strives to focus more on negotiating and managing Service Level Agreement (SLA). Unmanaged SLA may result an organisation severely exposed to risk without possibility of recourse (Senior manager, IT/software firm).
>
> We consider security and data privacy to be the key risks when outsourcing IT services that may include critical data. These risks have made data privacy and security as the main issues delaying cloud computing adoption (Manager and Admin, HR consulting firm).
>
> Apart from back office and front office software our organisation also focuses on use of variety of multimedia software in order to present time based data such as video, voice and animation, graphics, text image on the web of service provider. Thus application software is the major tool for information generation, processing and delivery. Moreover, constant updation is done for website maintenance to let customer know about our specific services (Operations manager, Tours and Travels).
>
> Basically our business operation is done through e-health service platform. It is a web enabled hospital management system that provides end to end solutions to medical players, where doctors and staff can access the stored data from anywhere through the web. Our web enabled services provides full range of clinical, administrative, and laboratory capabilities which are linked by single data repository. This has reduced our operational expenses (Manager, Healthcare firm).

During in-depth interview the respondents were asked to elucidate the relevant technology-based quality initiatives and practices that are being adopted/implemented in their organisations. The 20 case firms were selected based on its propensity towards adoption of QMP, innovativeness and entrepreneurs/managers knowledge on QM issues. The interviews were further taped, transcribed and summaries of transcripts were subjected to verification by the original interviewee, manager and academician. Accordingly the interview transcripts were read individually to gain the sense of the whole interview (Giorgi, 1989), involving two stage process. In its first phase, there involved identification of general concepts for which key themes was identified. A line by line careful reading of the verbatim of the respondents was analysed. Second the researchers looked for meaningful similarities/differences or relationships among the key themes being identified. Recurring themes were also noted for all transcripts. With specific focus pertaining to IT enabled service SMEs; it is revealed that enactment of Information Technology Service Management with key performance indicators and service-level agreement measurement is critical towards service support and delivery as well as performance. Confidentiality has been maintained throughout the research process. The systematic exploration of the exploratory qualitative approach leads to identification of new QMP/indicators like service reporting, content management, service-level management (SLM) and information and security management.

The respondents were also asked to elucidate the contextual factors that can influence the performance of SMEs towards growth. It is perceived that organisations are looking out for opportunities to integrate cloud computing ERP/IT systems in their business. The established SMEs are slowly moving towards cloud technology and many have already adopted with that. Majority of the organisations believe that to improve the performance in terms of quality and operational efficiency it is imperative

to adopt IT. In this context the verbatim extracts as captured during in-depth interview are represented as follows:

> We believe that Information Technology plays major role in improving the firm's competitiveness. IT provides actionable data for supply chain performance improvement, cost efficiencies, on-time performance and customer satisfaction. With every shipment IT supports better methods and cost effective processes to streamline businesses and manage today's supply chain with better results. With the adoption of IT with electronic bill of lading technology reduces inaccuracies, time, costs, and provides instantaneous online shipment details (Director, Logistics company).

> We use ERP software for our daily operations. The decision to implement ERP allows our organisation to make the daily tasks simpler through correct control of logistic, production and counter sales. But all the modules are not of much help for us. We need more skilled manpower to handle such IT based operations (Sr. Manager, Logistics firm).

> Cloud technology adoption has changed our business processes over time and impacted our business positively. With cloud based infrastructure lot of things have become automated. Social media has been integrated to our systems and this has benefited our business as communication to our client can be done at multilevel and also we are in contact with our clients (Owner, IT firm).

> Creation of attractive investment climate and conducive entrepreneurial environment is paramount for scaling up and rapid growth. We continuously strive to increase access to markets, access to finance, and developing information and supporting skills; delve into firm level R&D. Theses facilitate knowledge and technological spill-overs for enhanced productivity (General Manager, Logistics).

> Creativity and innovation stimulates quality of services at great price. Proactiveness and risk taking attitude helps the firm to attain a new level. However, internal characteristics many a times act as bottleneck which needs to be addressed adequately in-time with long term vision and well planned strategic goals (Manager, Software Firm).

> I feel that there is a need to regularly nurture and foster the culture of entrepreneurship which would contribute to the increased knowledge and wealth. Innovative activities can be propelled by retaining and developing the right kind of talent and capabilities (Manager, Financial Service Firm).

It is analysed further that not only IT is considered to be the contextual factors. It is analysed that organisations tend to be entrepreneurial. Substantial majority of companies are of the opinion that an "entrepreneurial attitude" could have the potential to lead to new ideas which can promote growth. It is observed that due to organic structure of the SMEs, one to one approach between management and employees are common, as a result management also welcome ideas from employees thus fosters culture of innovation. Keeping in view the findings across the organisations, we perceived the sense of "entrepreneurial culture (EC)" as a recurring theme. Thus, two contextual factors identified are "IT" and "EC".

3.1.2 Survey methodology. Based on the comprehensive compilation of literature as well as through in-depth interview 21 QMP/indicators have been identified. Accordingly a survey instrument has been developed taking measures as discussed. The indicators/practices of QM relevant to small and medium businesses have been derived from Kaynak (2003), Samat *et al.* (2006), Salaheldin (2009), Kim *et al.* (2012) and Talib *et al.* (2013b). The research instrument developed was customised and adapted to the background of Indian IT enabled service sector enterprises within

SMEs. The weightage of each QMP is being measured by averaging the corresponding items. Similarly for measuring quality performance five items have been identified from previous literature (Brah and Lim, 2006; Baird *et al.*, 2011; Talib *et al.*, 2013b). The responses of individual items were averaged to represent the performance score as dependent variable. Five-point Likert scale ranging from "5 = strongly agree" to "1 = strongly disagree" is used to show the agreement of the respondents. The selected organisations in this study involves IT enabled SMEs across service sector industries pooled from Centre for Monitoring Indian Economy Pvt Ltd databases, Federation of Small and Medium Industries as well as other sources. In this study logistics, travel and tourism, healthcare, courier services, consulting services, financial services and other service-related organisations within small and medium sectors were targeted. The empirical data were collected using a questionnaire survey. Questionnaires were accordingly sent to 182 firms. Multiple responses were allowed from the organisations. Not all firms responded to the questionnaires, it is, however, 138 firms responded to the questionnaires. Few questionnaires were found to be incomplete. Overall, total sample size obtained is 100. The identified QMP include: management leadership, human resource, education and training, teamwork, customer focus, supplier management, quality data and reporting, strategic planning, quality systems, quality culture, employee management, process management, product/service design, continuous improvement, quality tools and techniques, project management, change management, SLM, content management, information and security management and service reporting.

4. Data analysis and exploratory factor analysis

Before conducting factor analysis two tests were performed to check the suitability of factor analysis. In order to verify whether the data set was suitable for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy value has to be equal to, or greater than, 0.6 and Bartlett's test of sphericity value need to be significant and equal to or smaller than 0.05 (Meyers *et al.*, 2006; Pallant, 2007; Leech *et al.*, 2008). However, for this study, KMO value found to be 0.922 and also Bartlett's test found to be significant, where $p = 0.000$. Therefore it is found appropriate to conduct factor analysis (Tabachnick and Fidell, 2001; Meyers *et al.*, 2006). The next stage was to analyse elements of QMP. The identified QM indicators have been measured and analysed by using exploratory factor analysis via principal component analysis (PCA). Initially factor analysis has been performed with varimax rotation technique on 21 identified QMP/indicators leading to the extraction of three components. Harman's one factor test has been performed to detect common method variance which accounted for 64.78 per cent of variance which shows that good factor analysis has been done. In this study Kaiser Criterion was followed (Kaiser, 1960), which suggests selection of those indicators whose Eigenvalues are greater than 1, factor loadings greater than 0.3 are considered to meet minimum level, loadings of 0.4 are considered good in statistical terms, and loadings of 0.5 or more are considered to be highly significant (Rollins, 1992; Tabachnick and Fidell, 2001; Hair *et al.*, 2006). In this study, factor loading of more than 0.5 have been taken as cut-off value. The goal of PCA is to reduce the measured variables to a lesser set of components that capture variables with as much information as possible in the measured variables with as few components as possible (Park *et al.*, 2002). The research model

as presented in this study is subjected to PCA using IBM SPSS Statistics Version 22. The exploratory factor analysis of indicators of QMP reveals the presence of three components that accounted for 64.78 per cent of total variance. Varimax rotation technique has been conducted to identify the dimensionality of QMP. Four indicators were dropped due to cross-loadings, namely, quality culture, quality assurance, project management and change management. Before combining individual QMP into the underlying factor dimensions, reliability test has been done to measure the internal consistency. Accordingly Cronbach's α has been calculated and found to be 0.956, which is well above the minimum required level as suggested by Hair *et al.* (1998), and this validates the reliability of our study. A three-factor solution has been obtained, and the 17 practices could be reconfigured into three dimensions, namely, organisational management (OM), capacity management (CM) and service technology management. The factor loading matrix is shown in Table I. Variables like V5, V9, V10, V11, V12, V18 and V19 were clustered to define the first factor, which has been labelled as "OM" factor. Variables like V1, V2, V3, V4 and V21 were combined to define the second factor which is labelled as "CM". Variables like V13, V14, V15, V16 and V17 has been configured to form dimension named "quality documentation and security". Variables with low loadings and cross-loadings have been eliminated from Table I. In order to examine the reliability of the data at dimension level we calculated Cronbach's α. Cronbach's αs were also computed to assess the reliability of the three dimensions (OM, CM and quality documentation and security). At the dimension level Cronbach's α for Factor 1 – OM is 0.888; Factor 2 – CM is 0.898; Factor 3 – quality documentation and security management (QDSM) is 0.901, thus validates the reliability of the study.

Descriptions	Factors 1	2	3
Eigen values	11.320	1.214	1.070
Percentage of variance explained	22.396	21.627	20.759
Cumulative percentage of variance explained	22.396	44.023	64.782
Reliabilities (Cronbach's α)	0.888	0.898	0.901
Rotated component matrix			
Education and training (V1)	0.168	0.850	0.216
Process management (V2)	0.246	0.803	0.282
Product/service design (V3)	0.359	0.721	0.339
Continuous improvement (V4)	0.251	0.622	0.392
Human resource (V5)	0.543	0.425	0.326
Management leadership (V9)	0.617	0.443	−0.055
Strategic planning (V10)	0.626	0.349	0.243
Teamwork (V11)	0.690	0.302	0.404
Supplier management (V12)	0.677	0.120	0.377
Service reporting (V13)	0.395	0.317	0.611
Content management (V14)	0.379	0.317	0.696
Quality data and reporting (V15)	0.153	0.332	0.758
Service-level management (V16)	0.209	0.218	0.799
Information and security management (V17)	0.477	0.296	0.679
Customer focus (V18)	0.721	0.258	0.310
Employee motivation and encouragement (V19)	0.657	0.115	0.415
Quality tools and techniques (V21)	0.361	0.578	0.363

Table I.
Rotated component matrix

5. Hypotheses development

As observed from Table II, we developed hypotheses taking three QM construct, i.e. OM, CM and QDSM as independent variables and quality performance as dependent variables. Considering the review of literature on QMP and performance (Brah and Lim, 2006; Alonso-Almeida *et al.*, 2015; Baird *et al.*, 2011; Talib *et al.*, 2013b), three hypotheses have been formulated:

H1. There is a positive relationship between OM and quality performance.

H2. There is a positive relationship between CM and quality performance.

H3. There is a positive relationship between QDSM with quality performance.

5.1 Regression analysis

In order to test the hypotheses we applied automatic regression modelling. This analysis has been undertaken to better understand the relationships between the three QM dimensions and quality performance. The details of overall model summary has been shown in Table II. From Table II, the Durbin-Watson index is at 2.036, which lies within range of 1.50-2.50, which suggests that there is no autocorrelation problem in data (Durbin and Watson, 1951). From Table III it is found that each of the identified QM dimensions has tolerance value of more than 0.10 and variance inflation factor of less than 10, which indicates that model had no serious multicollinearity problem (Hair *et al.*, 1998).

From Table II, it can be observed that coefficient of determination (R^2) was 0.580, representing that 58 per cent of quality performance can be explained by three independent predictor variables (QM dimensions). This expresses that the identified QM dimensions can significantly account for 58 per cent in quality performance. The proposed model was adequate as the F statistics ($F(3, 96) = 44.248$) has been significant at 1 per cent level ($p < 0.01$). This indicated that the overall model is statistically significant and there is a positive relationship between three QM dimensions and quality

Table II. Overall model summary

Model	R	R^2	Adj. R^2	SE of Estimate	Change statistics R^2 change	F change	df1	df2	Sig. F change	Durbin-Watson index
1	0.762	0.580	0.567	0.632	0.580	44.248	3	96	0.000	2.036

Table III. Multiple regression analysis

Model	Independent variables	Unstandardised coefficients B	SE	Standardised coefficients β	Quality performance t	Sig.	Collinearity statistics Tolerance	VIF	Results
1	(Constant)	3.870	0.063		61.253	0.000			
	Organisational management	0.567	0.063	0.590	8.924	0.000	1.000	1.000	Accept (*H1*)
	Capacity management	0.187	0.063	0.195	2.947	0.004	1.000	1.000	Accept (*H2*)
	Quality documentation and security	0.423	0.063	0.441	6.665	0.000	1.000	1.000	Accept (*H3*)

performance. The results of multiple regression analysis include standardised β coefficients, t-value and its significant level, are tabulated in Table III. The results indicate that three quality dimensions are positively associated with quality performance.

6. Discussions

6.1 Discussions as per results of exploratory factor analysis

The first factor dimension "OM" accounted for the largest proportion, i.e. 22.39 per cent of total explained variance. This factor is defined by seven QM indicators which are related to organisational-based activities. To manage the organisational-based activities and its process, it is advantageous to the firms which are struggling to create radical and incremental innovation. It is likely that the significance of organisational climate in small and medium service firms is conducive to the implementation of TQM practices. From the underlying dimension of Factor 1 it is observed that customer focus resembles higher loading and thus can be considered as major critical determinants of QMP. This finding reflects that Indian service SMEs is more customer centric, as customer focus positively influences service quality (Samat *et al.*, 2006). Several authors reported the importance of strategic planning for integrating internal process with external suppliers and customers in unique supply chains (Frohlich and Westbrook, 2001; Van Donk and Van der Vaart, 2005). It is also acknowledged in the literature that improving supplier relations enhances performance of both suppliers and buyers (Tari *et al.*, 2007). The targeted organisations in this study might be incorporating quality into OM practices with clear customer focus (Ahire *et al.*, 1996). It is, however, interesting to observe the role of human resource factor which has relatively obtained low factor loading with respect to other QMP under Factor 1, whereas it is reported in the literature the importance of human aspects in TQM context (Bowen and Lawler, 1992; Schonberger, 1994). Inference can be draw upon the fact that Indian IT enabled service SMEs are not systematic while practicing and managing their human resource and such non-systematic approach reflects Factor 2.

The second factor dimension "CM" explained 21.62 per cent of variance which has been constructed by five indicators, and are related to building capacity that transform knowledge into effective decision making and solving the problems in order to enhance the performance of both short and long term (Slack and Lewis, 2002). From the underlying dimension of Factor 2, it is observed that education and training resembling high loading score among the several other practices. Therefore, it is likely that Indian IT-oriented small and medium service sector firms are aware on such practice of educating their employees within the organisation. Now a day SMEs have considered IT as powerful tool for digital option generator, and thus it is likely that introduction of IT involves cross-training of all employees in all aspects (Brah and Lim, 2006). Software services and other IT enabled auxiliary services are focusing on imparting knowledge of programming languages as well as understanding of communication protocol (Mata *et al.*, 1995). Proper and effective training could establish IT managerial capabilities in identifying and planning IT projects correctly by allocating scarce resources. It is also observed that from Factor 2, among the other QMP quality tools and techniques obtained low loading score, thus can be inferred that Indian service-based SMEs lacks proper implementation of quality tools and techniques may be due to lack of proper training to employees.

The third factor dimension "QDSM" explained 20.75 per cent of variance which has been defined by five indicators and is related in context to technological and documentation aspects of organisations. With "quality documentation and security"

it is expected that organisations can manage their process more efficiently which could enhance their performance. As our focus is on IT-oriented service sector SMEs it is obvious that role of human participation is critical in service operations. Therefore the preference and perception of consumers play vital role to achieve sustainable competitive advantage of the firm. SLM covers the functions of "defining, negotiating, monitoring, reporting and controlling service agreements that have been signed with customers" (Riedl *et al.*, 2009). Now a day as most of the communication between service provider and consumer is done through web-enabled channel, so content management is considered to be important practice which is being practiced in IT enabled service SMEs. It is a blend of technology and business processes to effectively manage and deliver large amount of information (Forsyth, 2004).

6.2 Significance of predictor importance

The findings reflect the present level of QMP and its implementation in context to Indian IT embedded digital service SMEs. From the above computational analysis it can be seen that OM, CM and QDSM positively influence the quality performance. From the Figure 1, it is observed that OM resembles highest priority, QDSM resembling middle priority and CM as least priority. Figure 1 shows the predictor importance for each identified dimensions. The score for predictor importance of Factor 1 (OM), Factor 3 (QDSM) and Factor 2 (CM) are 0.64, 0.30 and 0.06, respectively, which clearly reflects that Indian digital SMEs in service sectors have been focusing more on organisational culture and QDSM. It is, however, observed that CM has been given least importance. But regression analysis shows that all the three dimensions of QM have influence on quality performance. In view of findings it is also require focusing on capacity enhancement.

6.3 Some more findings and recommendations

As the implementation practices of CM is rather low in comparison to other two dimensions, it is imperative for the SMEs to focus on that particular dimension. Table I denotes that CM is measured by important indicators which cannot be ignored. Training and education is considered to have positive influence on service industries employees rather than manufacturing industries employees (Zhang, 2000). Proper training and education is vital and therefore management of SMEs should understand that such activities could lead to long-term commitment, as the outcome of TQM implementation cannot be realised immediately. Literature emphasised that education and training have positive influence on performance (Karia and Asaari, 2006; Talib *et al.*, 2013b).

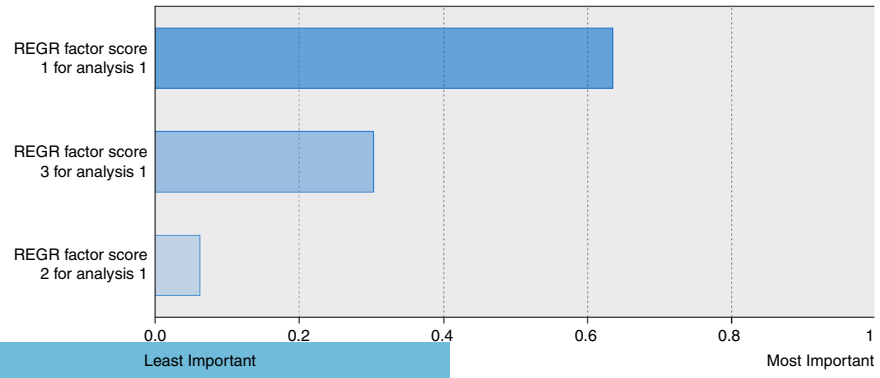

Figure 1.
Predictor importance

The findings as observed from Tables II and III is very interesting which reflects that Indian digital SMEs in service sectors are aware of the importance of such practice but SMEs due to their inherent resource constraints cannot implement such practice in rigorous and structured fashion. It is likely that Indian service SMEs are not much aware of quality tools and techniques as such specialised training are not being imparted. Another possible reason for lowest importance of CM could be explained from the perspective of process management, so it is likely that investments in quality systems have not resulted in process management. More precisely, organisations may not be concerned about their business process on a daily basis. In the context of quality systems, it could be concluded that firms are not concerned about developing better organisational and management practices, i.e. process management; rather they are concerned about satisfying their external requirements in order to stay in business. The overall findings reflect the unstructured approach towards capacity enhancement. Keeping in view the patterns or structure of the indicators constituting CM it can be predicted that Indian digital SMEs are not practicing continuous improvement. Rather the improvement approach is likely to be non-continuous and intermittent which is surprising.

In connection to CM Indian service SMEs should focus on imparting proper education and training to employees including training on quality tools and techniques. It is thus recommended that firms must emphasise on documenting its processes and also must establish process management (product and service design) in order to ensure continuous development and control. Furthermore, firms should also focus on implementing strategic human resource management in order to ensure agility.

7. Development of conceptual model framework

7.1 Effects of IT and EC on QM – performance relationships

It is commonly accepted that QM alone is not able to generate a sustainable competitive advantage and it can only achieve this advantage through complementarity with other resources or organisational practices. According to resource-based view (RBV), complementarity of two resources occurs when value of one resource increases in presence of other (Cagliano and Spina, 2000). As reported in literature (Zhang *et al.*, 2012; *Journal of Operations Management*) "Contextual factors can have moderating effect on the relationship between QM practices and performance. A moderating effect occurs when a third variable changes the relationship between two related variables. From this perspective the effect of QM practices on performance depends on the level of certain contextual factors (third variable)". From in-depth interview as discussed earlier, we take IT and EC as organisational resource capability to be the two contextual factors (Basu and Bhola, 2015). Research has shown that QM plays an important role in improving firm's competitive positions and that application of IT influence this relationship (Willcocks *et al.*, 2007). It is acknowledged that "the perspective of knowledge based view (KBV) of the firm is consistent with the approach to organisations as culture" (Balogun and Jenkins, 2003). Drawing on RBV and contingency theory, as well as based on findings from in-depth interview we take IT and EC as two contextual factors that influence the relationships between QM and performance.

7.2 Hypotheses development

Numerous studies have been conducted to identify the performance impact of IT on organisations. Researchers have used various theoretical, conceptual, analytical as well as empirical approaches to draw insights as the extent to which IT within the

organisations delivers improved performance. In this paper, IT construct is taken as "resource capability which has been considered to be an essential ability of organisation by which information can be managed for better firm performance" (Pebrianto, 2013). Brah and Lim (2006) reported that IT capability serves as an enabler to quality performance. Studies conducted by Zhang (2007) and Nakata *et al.* (2008) suggested a positive relationships between IT and organisations performance.

Thus we make hypothesis as:

H1a. There is a positive significant influence of IT on performance.

Arguments for the value of IT in order to support QM capabilities find a basis in RBV of firm (Barney, 1986, 1991), which argues that, "to bestow competitive advantage, an organisation should acquire or develop resources or capabilities that could contribute positively to performance, are not possessed by all competing firms, and are difficult to imitate or duplicate" (Barney, 1986). Literature has given much importance to the relationship between IT and QM and also issues relate to as how specific IT applications impact various aspects of QM (Kock and McQueen, 1997), moreover IT as resource portfolio, may not meet the RBV criteria when acting alone. Based on definition of resource complementarity, it can be argued that "QM and IT are complementary resources and previous research supports the notion. It is reported that firms implementing both information systems and TQM would achieve better success in terms of performance" (Schniederjans and Kim, 2003). Laframboise and Reyes (2005) found that "ERP implementation positively affects firm performance when enterprise information system implementation interacts directly with quality improvement systems". Mjema *et al.* (2005) showed that "introduction of IT on QM contributed greatly to the enhancement of quality awareness in improvement of product quality and quality cost reduction". Thus we make hypothesis as:

H2a. There is a positive and significant influence of IT on QM.

Several studies provide empirical support for the notion that entrepreneurial orientation (EO) has positive influence on performance (Covin *et al.*, 2006; Lee *et al.*, 2001; Wiklund and Shepherd, 2005). On basis of meta-analysis it is reported by Rauch *et al.* (2009) that "effects of EO on performance can be regarded as moderately large". Amado *et al.* (2010) showed that EC is a valuable capability that leads to performance, which indicates that such capability positively influence firm performance. Thus, we propose the hypothesis:

H1b. There is a positive and significant influence of EC on performance.

It is reported that TQM programmes are more likely to succeed if the prevailing culture of organisation is compatible with the values and basic assumptions proposed by TQM (Kujala and Lillrank, 2004). The values of such culture can be captured through entrepreneurial management, innovation and decision making which has been captured during in-depth interview. Change in culture is the most effective way to manage TQM in organisation. It is mentioned that "cultural change can be used to bring about change in systems, implement corrective and preventive actions or influence management for business improvement". With reference to the context of research, culture is referred to as "EC". It can be said that techno entrepreneurial management capability with its entrepreneurial zeal could help in implementing QM programmes. Thus the following hypothesis is being proposed:

H2b. There is a positive significant influence of EC on QM.

It is well recognised that QMP influence the performance of organisation (Brah *et al.*, 2000; Talib *et al.*, 2011a, b, 2013a, b). Considerable bodies of empirical evidence substantiate that implementation of QMP improves the quality performance of organisations (Brah and Lim, 2006). It has been measured in various ways and found that model pertaining to QMP can best predict performance that varies across the world (Prajogo and Sohal, 2004; Arumugam *et al.*, 2008). Literature on QMP further suggests that it is positively related to performance (Brah *et al.*, 2000; Yusuf *et al.*, 2007; Salaheldin, 2009). Thus an optimal path exists between QM construct and performance. Sousa and Voss (2002) reported that relationships between QMP and quality performance which is treated and inveterate meticulously in the literature and therefore QM should not be the sole object of analysis. Thus we propose the following hypothesis:

H1c. There is a positive significant influence of QM on performance.

Growth is an organisational outcome that results from amalgamation of specific resources, capabilities and routines (Nelson and Winter, 1982). Path dependency is considered to be an important theme for firm growth (Coad, 2009). It is a common notion which prevails that if performance of an organisation can be improved then it would also lead to firm growth. Thus we can say that an optimal path may exist from better implementation of QMP to performance setting firm on growth trajectory. We propose the following hypothesis:

H2c. There is a positive and significant influence of performance on growth.

Based on exploratory qualitative approach and review of literature supported by classic organisational theories like RBV and contingency theory, an integrated conceptual model has been theoretically grounded. The integrated conceptual model has been depicted in Figure 2.

8. Conclusion

From the above analysis it is alarming to note that some of the important management practices like education and training, HR management, process management are not gaining much importance. It seems that service SMEs need to be more stringent on practices like human resource and use of quality tools and techniques. Proper practicing of human resource-related activities would guide the employees to solve

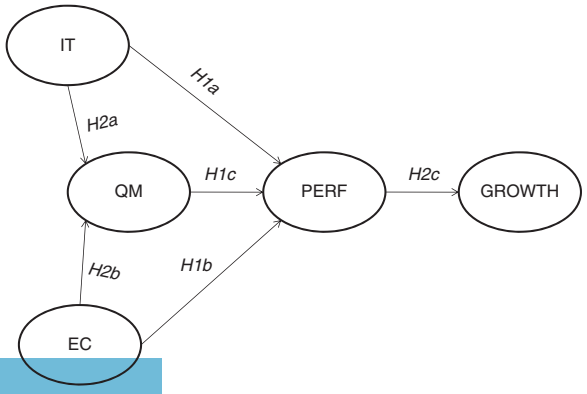

Figure 2.
A proposed conceptual model

problems as well as to take responsibility of quality. It can also be concluded that systematic way of problem solving approach through proper HR practices would lead the organisations towards path of continuous improvement. The exploration of identifying dimensions of QM dimensions in context to IT enabled service SMEs in India thus fills the disparity and consequent gap in knowledge.

To the best of our knowledge, this is the first study undertaken within Indian IT enabled service SMEs to examine the relationship between QM dimensions and quality performance. Although studies exists showing the relationships between individual QMP indicators with quality performance (Talib *et al.*, 2013b) in context to Indian service industry, however, studies focusing on association between individual practices at dimension level with that of quality performance has not been empirically investigated earlier from Indian context. Thus the findings of this study provide valuable knowledge from the perspective of QM issues in context to Indian service firms with specific relevance to IT embedded SMEs. Overall, the results of this study contribute therefore in advancing our understanding of the dimensionality of QM and may inform future attempts to measure effects of QM. From theoretical point of view, based on proposed conceptual model, this study adds to literature related to contingency factors in the relationship between QM and performance, by identifying IT and EC as organisational resource factor. Therefore, emphasis on quality alone cannot singularly ensure high performance but it is the fusion of other organisational resources (i.e. IT and EC) producing significant distinctive advantage.

With regard to managerial and entrepreneurial contributions, the findings prescribe potential implications for entrepreneurs and management of micro, small and mid size organisations to review their quality implementation practices and focus on organisations capacity enhancement. The authors believe that the outcome of this study could be beneficial for the SME managers and entrepreneurs for framing policy as a tool for evaluating the effectiveness of their current quality implementation. The entrepreneurial implications in this study would help the entrepreneurs to prioritise the allocation of resources in identifying the factors on which emphasis should be put which can be controlled to make the new venture model a success. With exposure to global economies, customer preferences are changing drastically and accordingly SMEs need to augment their product/services. Internally, these organisations need to take concern of risks due to employee churn, data security against competition, copyright protection, duplication of data, silos of application and data, etc. This study could be extended with more number of respondents to evaluate the relationship between QMP and service performance. Future study may be carried out by doing a comparative study between high technology and low technology firms within service sector SMEs to ascertain the level of quality implementation at firm level. Further research may also be carried out by deploying other sophisticated statistical analysis to capture the linkage orientated pattern of TQM practices and to investigate empirically its direct and indirect influence, with other contextual factors as mediating variables, on overall business performance. The conceptual model indicates that IT and EC can be taken as two organisational resource capability that may contribute to sustainability of firm in its business environment with its influence on firm growth. It can also be said that IT, quality as well as EC are antecedents to firm growth. The model recommends partially the importance of organisational capabilities which researchers and managers/entrepreneurs can take as input. The model can be deemed to be a new conceptual base which has not been earlier reported in the literature. However, in terms of limitations this model is theoretically driven

and thus to validate this model quantitative analysis is needed. Pertaining to the conceptual model, future research can be designed by forming more comprehensive and integrative model with some other variables which would be critical to QM and performance towards firm growth.

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