CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies, CENTERIS / ProjMAN / HCist 2017, 8-10 November 2017, Barcelona, Spain

Why is Empowerment Important in Big Data Analytics?

Saradhi Motammarri[a]*, Shahriar Akter[a], Venkata Yanamandram[a], Samuel Fosso Wamba[b]

[a]University of Wollongong, Wollongong NSW 2500, Australia
[b]Toulouse Business School, Toulouse 31068, France

Abstract

Big data analytics with its intricate insights is enabling service providers to better gauge customer needs. It is equally delivering information about the competitive landscape of services to customers. The frontline employees (FLEs) responsible for managing the diversified needs of these 'informed customers' face multiple challenges. The FLEs need not only information about their products/ services but also about markets and customers. A systematic review of the extant literature of big data and FLEs has helped to understand that FLEs need empowerment to adapt their services in high contact big data driven services. Empowerment as a concept is well known in management and psychology literature. The empowerment construct has predominantly remained to consisting of a single, and in a few cases, of multiple items. To facilitate effective service delivery in high contact big data driven services, FLEs need empowerment on multiple levels and there exists a significant gap in the literature about these constituent dimensions. This paper, synthesizing the relevant scholarly work, proposes a conceptual model for the empowerment construct. In doing so, this paper makes an important theoretical and managerial contribution towards the understanding of FLEs' empowerment and its relevance in high contact data driven services.

---

* Corresponding author. Tel.: +61-430-022-130; fax: +61-2-8819-4357.
  E-mail address: saradhi@uow.edu.au

1. Introduction

Empowerment is the 'downward movement of authority and relaxing the boundaries of vertical control'[1-3]. Empowerment of frontlines is critical in high contact data driven services as it demonstrates the provider's preparedness to manage customer expectations in (near) real time. The service delivery is increasingly being challenged with the vast pool of data streams or big data (BD) that are possibly available for both providers and customers alike. The positive impact of frontline employees (FLEs)' empowerment on service quality, customer satisfaction and firm performance has been well established in the extant literature[2,4-9].

The authors did an exploratory search on the challenges to FLEs in big data analytics (BDA) driven services[10]. In the changing landscape of the competitive globalized services market, FLEs job performance may be impacted and become stressful due to inadequate empowerment, information, training, resources, tools, recognition and pressure to exceed targets and perform the jobs meeting or exceeding quality expectations[11-20]. Over the last few years, both practitioners and academics have placed enormous emphasis on BD as one of the avenues to help the frontlines[12,16,21].

BDA is poised to help FLEs with its intricate extraction of insights about market and customer information[22]. Traditionally, leveraging of information is confined to the top of the hierarchy in organisations. Analytically matured organisations are applying similar techniques to selection and deployment of staff at the front desks and service touch points[23,24]. Thus, executives have also started to think that there shall be better information support for frontline staff[12]. To gain fruitful outcomes from the investments on BDA, organisations need to articulate their business drivers and cascade down insights to frontlines to achieve effective service to the customers[25]. While extracting actionable insights from internal and external data is a significant challenge, to effectively utilise those insights for the benefit of serving a customer while he is in the provider's premises is even more complex organisational and behavioural issue.

Our systematic review of literature pointed out that empowerment of FLEs differentiates mature vs. transforming organisations[10,23,26,27]. Despite this valuable knowledge, the impact of FLEs' empowerment on service adaptation in high contact big data driven services environments is poorly understood[12,15,17,19,20,28,29]. Furthermore, empowerment as a construct needs more meticulous examination, considering there is not a standardized empowerment program for organizations that are characterized by the new challenges such as BD[23,27]. An analytical framework based upon a number of key dimensions may well be needed before implementing an empowerment program[30].

While empowerment as such is a well debated concept in the disciplines of psychology and management, its relevance is not well articulated for high contact data driven services[23,24]. Furthermore, empowerment construct is not well explored for high contact services. Thus, this paper explores an essential element, i.e., the role of empowerment for services marketing in the context of BDA.

Nomenclature	
BD	big data
BDA	big data analytics
BDAC	Big Data Analytics Capabilities
EMC	External Marketing Capabilities
FLEs	Frontline employees
IMO	Internal Market Orientation

1.1. Structure

The rest of the paper is organized as follows. Section 2 provides study background, and reviews relevant literature on empowerment and service adaptation. Section 3 provides discussion and proposes dimensions of empowerment based on the extant literature review. Section 4 provides implications for theory and practice. Finally, section 5 presents conclusions of the study and the agenda for future research.

2. Study Background

A systematic review of literature is conducted to understand the impact of big data analytics on frontline employees[10]. This has provided some insights on the relevance of empowerment and service adaptation for FLEs in services marketing. The paper summarizes these insights about empowerment, empowerment constructs and the relationship between empowerment and service adaptation. The review has identified some research gaps about empowerment in the context of BDA services. To bridge this gap, the authors initiated a qualitative study[31] of FLEs and analytics professionals to better understand the structure of the empowerment construct for BDA driven services. The qualitative study and its analysis are in progress.

2.1. Empowerment

"Empowerment [needs to be viewed… as a process of infinite variety"[32 p.3].

In social sciences empowerment has been used in varied contexts such as control over personal acts, feminism, social and racial equality and upliftment of the poor[33]. Empowerment, as a psychological experience of power results in perceived control, perceived competence and goal internalisation for the employee and energise h[im/er] to achieve goals [3]. Structural empowerment advocated by Kanter[34] theorises that organisational structures alone, over individual traits determine empowerment experienced by employees[35,36]. Kanter's theory proposes that there exist two forms of power within organisations namely, formal and informal. While formal power comes from the organisational position, the informal power is a result of network of alliances with other colleagues. Kanter argues that there are six essential ingredients for the success of empowerment: 1) opportunity for advancement; 2) access to information; 3) access to support; 4) access to resources; 5) formal power; and 6) informal power. However, there is also advocacy from certain scholars for non-empowerment for services with the belief that routineness will achieve production line efficiencies[37]. These arguments may not hold in high contact services where there exists complexity in both dimensions of variability of customer needs and task complexity[37].

Synthesizing the customer care success stories of several companies, Zemke and Schaff [8 p.65] succinctly state that empowerment implies "turning the frontline loose" and FLEs are encouraged to take initiative and innovate for solutions for customer's problems[2,5]. Bowen and Lawler[5 p.32] clarify and define empowerment as "sharing with frontline employees four important ingredients: 1) information about the organization's performance, 2) rewards based on the organization's performance, 3) knowledge that enables employees to understand and contribute to organizational performance, and 4) power to make decisions that influence organizational direction and performance."

2.2. Empowerment Constructs

Menon[3] on the premise that psychological experience of power underlies empowerment, developed an integrated approach to empowerment. The empowerment construct has three dimensions namely: a) power as perceived control b) perceived competence and c) goal internalization. To develop the construct, data was collected using a 15-item instrument where the respondents provided their ratings on a six point Likert scale. The study collected 311 responses (88% response) from part-time business students in Quebec, Canada. The scale consisting of the three dimensions was validated with a second sample of 66 employees drawn from financial sector in the same geography. Thus, this research provided the measurement of empowerment along three dimensions than a single measure [38].

Melhem[2] extending the prior theories on empowerment[5], investigated the antecedents to FLE's empowerment. Their conceptual model consisting of the dimensions of knowledge and skill, communication, trust and incentives was empirically tested with a sample of 517 FLEs drawn from 14 retail banks. Trust and knowledge were found to be determinants to FLE empowerment. While incentives were found to have less influence, communication appeared as an important predictor. Considering this study's premise that cascading of information about the firm as well as insights extracted from BD by the upper echelons of management is not only important but also makes a fundamental difference in enabling the FLEs to serve the customers better[12].

Through their empirical research, Wilder et, al.[20] validated that while empathy and anticipation helped in customization opportunity, FLEs' creativity demonstrated their actual ability to adapt a service. This argument was

also supported by Bowen and Lawler[5]. While discussing empowerment of FLEs, they address the basic questions of empowerment, like: what, why, how and when. Bowen and Lawler and Wilder et al.[5,20] found that a firm's service climate and empowerment were found to be positively related to the FLEs ability to adapt a service to the needs of the customers. FLEs may differ on the degree to which they leverage the empowerment bestowed on them[39-41] due to their personality traits[29,42].

2.3. The Impact of Empowerment in Big Data Environment

The literature search identified a few studies in which either FLEs' empowerment or service adaptation were examined. The extant literature of both management and psychology significantly emphasized employee empowerment's positive impact on customer satisfaction[1,3,6,9]. Empowerment as a right strategy to enhance service quality is well established in the literature[7]. Scholars have argued that for FLEs to engage in service adaptation, organizational and managerial supports are essential[3,6,20].

Wilder et al.[20] investigated the approaches to promote adaptive behavior in FLEs to address customer needs through empathy and innovation. Previous studies investigated personality or intrinsic characteristics[6,15,43,44]. Wilder at al.[20] examined perceived service climate, structural empowerment, empathy, anticipation and creativity to explain adaptive service offering. For validating their measurement scales, for a pre-test, data was collected through an online survey of 245 FLEs. For the main study, a sample of 498 responses were obtained. The respondents were FLEs from a variety of sectors, like counselling and education, restaurant, financial consulting, medical and customer service. Most of the respondents (42%) belonged to high contact service and 33% of them from low contact services. Wilder at al.[20] found support to their hypothesis that perceived service climate and structural empowerment predict the service adaptation by FLEs.

Spiro and Weitz[43 p.62] defined adaptive selling as "the altering of sales behaviors during customer interactions based on perceived information about the nature of the selling situation." The research setting was diagnostic equipment and supplies manufacturer and respondents were drawn from 10 of its divisions. The response rate for their survey was 54% with 268 usable responses from salespeople. The study contributed a 16-item ADAPTS scale to assess the adaptive ability of salespeople in customizing their presentation as they interact with customers during service encounters. Thus, adaptive selling was about the behavioral changes of salespeople to meet the perceived customer needs and characteristics.

Chebat and Kollias[6] analyzed the impact of FLEs empowerment on employee adaptability towards role-prescribed and extra-role behaviors. Their hierarchical model consisted of other variables, role conflict, role ambiguity, self-efficacy, job satisfaction and adaptability. The study was confined to a single industry, banking services and limited to a single bank. Their respondents consisted of 41 financial service managers in retail banking drawn from six branches of the bank. The respondents were indirectly reached through a regional manager for completion of a 56-item questionnaire. In terms of customer interaction, the service managers had a regular contact with their customers.

Gwinner et al.[15] advanced service customization research by formulating service adaptation constructs. They took an integral view of service adaptation consisting of two dimensions: interpersonal adaptive behavior and service offering adaptive behavior. Their model consisted of customer knowledge, predisposition to adapt and motivation to adapt as the predictors for customized service behaviors. Data was collected via self-administered phone interviews of service representatives belonging to a telecommunications provider. With a response rate of 47.8%, they captured 239 usable responses. These service representatives on the average spend five minutes for each encounter with their customers.

Klidas et al.[45] investigated antecedents to empowered behavior in the context of European luxury hotels. Empowered behavior is defined as "the demonstration, by employees, of independent decision making, initiative and creativity, to enhance customer satisfaction"[45 p.72]. Klidas et al.[45] studied the role of training, reward practices, organizational culture perceptions and management style on FLE's empowered behavior. The data is sourced from 16 American-owned hotels in seven European countries, Italy, England, Belgium, The Netherlands, Portugal, Sweden and Greece. With approximately 50% return of questionnaires, 533 responses were received. After excluding managerial staff and incomplete ones, a usable sample of 356 was obtained. Training and reward practices were not found to be important predictors of empowered behavior. However, customer-oriented culture and empowering management style were found to be effective in inculcating empowered behavior among frontline staff[45].

Auh et al.[46] basing their research on empowerment theory[38,47,48], investigated the effects of empowering leadership on frontline employee's service-oriented behaviors. Two distinct views existed on empowerment: macro perspective (delegation) and micro perspective (enabling). Auh et al.[46] integrated those perspectives and used a multi-level approach to examine the effects of group-focused and FLEs perceived empowering leadership on service-oriented citizenship behaviors, and tested it in an automobile dealership setting. Auh et al.[46] concluded that customer learning enhances empowerment and service oriented behaviors.

2.4. Big Data Analytics Capabilities

Data savvy corporations (analytical innovators) recognize that sourcing, retaining and managing talent is a major barrier to derive value from analytics as technology is no longer a barrier[23,27]. Companies are able to merge and correlate 'digital trails' of employees from both in-house as well as social media[23]. Davenport et al.[23] classify talent analytics into six levels of maturity based on the organizational abilities in leveraging insights to manage their staff. They observe that some organizations are able to directly link their frontline staff engagement to increase in annual sales per staff. Both Davenport et al.[23] and Ransbotham et al[27] advocate that in the coming years, organizational performance rests on the motivation and capability development of their staff.

Akter et al.[49] have analyzed the impact of BDA on firm performance from the perspectives of Resource Based View (RBV), IS success, business value of IT and socio-materialism and have put forward a BDA Capability Model to predict firm performance. Sieving through the BD extant literature they have proposed a typology of BDA Capabilities (BDAC). They derive three key building blocks of BDAC as follows: "organizational (i.e., BDA management), physical (i.e., IT infrastructure), and human (e.g., analytics skill or knowledge)"[49 p.117]. Akter et al.[49] [p.118-119] further elaborate BDA management capability (BDAMC), BDA technology capability (BDATEC) and BDA talent capability as follows:

- "BDAMC is an important aspect of BDAC ensuring that solid business decisions are made apply proper management framework."
- "BDATEC refers to the flexibility of the BDA platform (e.g., connectivity of cross-functional data, compatibility of multiple platforms, modularity in model building etc."
- "BDATLC refers to the ability of an analytics professional (e.g., someone with analytics skills or knowledge) to perform assigned tasks in the big data environment."

2.5. Gaps in Extant Literature

The service marketing literature glorifies the role of FLEs[32,38-40]. However, there exists a major gap in understanding the challenges being faced by FLEs and the means to augment their capacities to manage the increasingly demanding customers in the BD driven services environment while accounting for service heterogeneity (i.e., high contact vs. low contact; customers well defined vs. ill-defined) and FLEs typology[41]. Services researchers foresee the re-emergence of service adaptation to the individual needs of the customers as the new wave of services revolution is impacting the services sector[3,26,33,42]. While Akter et al.[49] made significant progress in tying BDAC to firm performance, how these capabilities themselves enable the FLEs who actually deliver services to the end customers is not apparent. Furthermore, the role of FLEs' empowerment on service adaptation in high contact BD driven services environment has not been explored and understood[20,50-52].

In specific, this literature review helped the authors to identify a few important knowledge gaps with respect to empowerment, internal marketing orientation, external marketing capabilities, and service adaptation in high contact big data driven services environment. For example: 1) What are the components of FLEs' empowerment in high contact BD driven services environment? 2) Is empowerment a hierarchical construct? 3) How do empowerment and internal marketing orientation of the firms enhance the customer linking, seizing and market sensing capabilities of the FLEs? How do these capabilities enable FLEs towards service adaptation in high contact BD driven services? The response to these questions yields valuable new knowledge. It also helps in the strategic orientation of both firms and FLEs to enhance services marketing. Probably, for these reasons Ostrom et al.[28] might have emphasized BD as one of top 12 priorities for services marketing.

3. Discussion

The positive effects of empowerment on FLEs roles, discretion abilities, firm performance and service adaptability are established in the extant literature[1,6,9,11,15,20,29,36,53,54]. However, the empowerment has been mostly investigated as a single element, and Menon[3] proposed a new scale to measure empowerment on the dimensions of perceived control, perceived competence and goal internalization. These works have been expanded to study the antecedents to FLE empowerment[2] and for linkages between empowerment and service adaptability[20]

3.1. Definition of FLE Empowerment

Basing on the extant literature and the inputs from the respondents to our qualitative study, the authors define FLE empowerment in the BD driven services context "as the ability of FLEs to access detailed information about service-portfolio including the boundaries of service elements, insightful information about customers both from internal information systems and from external sources to enhance their external marketing capabilities (EMC) to adapt the service to best meet the customer needs in (near) real time."

Whether it is the production of goods or delivering services to the customer needs, frontline empowerment has a positive impact by enabling them to gain access to information, tools and resources to serve the customers in (near) real time and balance the conflicting demands placed by both organizations and customers on the boundary spanners[4,8,37]. Empowerment plays a critical role in structurally enabling an FLE[34] to apply his/her discretion[39,40] to adapt a service to best meet the customer needs[15]. FLEs' empowerment is understood to be delegation of decision making authority that typically emanates from the organizational values and service analytics culture[16]. For achieving effective results from BDA, provider organizations need to leverage on their internal market orientation (IMO) programs to communicate their empowerment initiatives.

The extant literature is sparse on the empowerment construct in the context of BDA driven services. To model and validate the relation between empowerment and service adaptation, it is essential to ascertain the nature of empowerment construct[2,3,20] suitable for high contact BD driven services contexts.

3.2. Dimensions of Empowerment

Synthesizing the extant literature on empowerment and BDAC models, the authors propose that the constituents of empowerment could be: a) information, b) tools and technology, c) decision making, d) training/ capability development and e) discretionary skills. As discussed in the preceding sections the FLEs need to have complete understanding of the firm's products/ services, organizational processes and procedures, know-how about market/ competition, know-how about the tools and technologies and importantly about the customers they serve. In the changing technological climate, to serve informed customers, FLEs need access to tools and technologies that facilitate service delivery. To serve customers in (near) real time FLEs need to make decisions based on data presented to them. To effectively use the tools, technology, access the insights of BDA and make decisions, FLEs need to be trained on an ongoing basis.

The elements a-to-d for empowerment are tied to organizational service analytics culture[17], while discretionary skills depend on the behavioral characteristics of individual FLEs[42]. An organization might provide an appropriate environment, train its resources, and provide the necessary delegation of authority, but if the specific FLE is not prepared to leverage them to serve the customer, the empowerment may become ineffective in producing valuable outcomes for the firm. It implies that organizations need to focus not only on the environmental factors but also emphasize on the behavioral and attitudinal aspects to derive and deliver value to customers.

The authors anticipate their ongoing qualitative study on FLEs' empowerment will enable them to ascertain these dimensions of empowerment and link them to the service adaptive outcomes. The envisaged empowerment structure is presented in Figure 1.

4. Contribution

4.1. Implications to Theory

This research addresses the research question: "What is the role of frontline employees' empowerment on service adaptiveness in a big data driven services environment?" In doing so, the research extends firstly, the theoretical underpinnings of empowerment and service adaptation to a high contact BD driven services context. Secondly, the research provides insights on the components of FLEs empowerment and whether empowerment needs to be treated as a hierarchical construct for the BD services. Thus, the investigation fills major knowledge gaps in the extant services research as well as in BD driven services which constitute the 12 service research priorities [28].

The necessity for FLEs' empowerment is far higher in high contact BD driven services contexts which are not adequately explored in the literature[19,28]. Furthermore, BD proponents have been advocating that there happens a downward shift of power in mature BD settings[12,17,55-57]. This investigation helps to ascertain this downward shift of organizational decision making. By filling these important knowledge gaps in the extant literature, this research extends the FLEs' empowerment to high contact services and tests the validity of the propositions of BD induced power shift to frontline.

4.2. Managerial Implications

This research has several managerial implications. The foremost one is the relevance of FLEs' empowerment in delivering adaptable solutions to the needs of the customers. While the individual psychological traits may reflect on the proactive nature of the FLEs towards empathizing with customer's needs [42], without supportive organizational structures FLEs will not be able to serve the customers in the best interests of the firm [34]. So, it is essential that managers promote FLEs empowerment and provide them with the adequate information and decisional aids so that they can excel in their job performance.
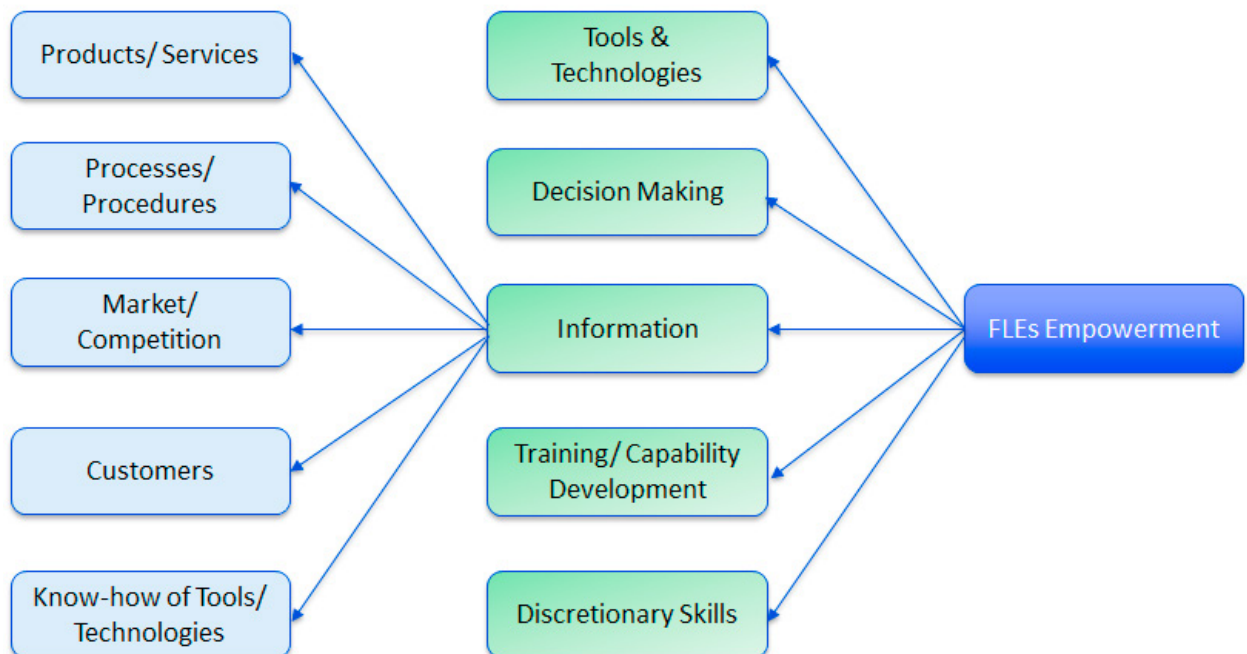

Fig. 1. Dimensions of Empowerment

5. Conclusions

BDA is equally empowering service providers and customers. Managing the new generation of informed customers is increasingly complex and challenging for the frontlines as they need to balance conflicting needs of their organizations and customers. As retrograde to industrial revolution, service adaptation[58,59] to the individual needs of the customers is progressively re-emerging especially in high contact data driven services. BDA is progressively shifting the organizational decision making downwards[17] and as more and more organizations mature in exploiting the benefits of insights drawn from their new class of asset, i.e., data. The extant literature well recognized the roles of FLEs and their empowerment in creating successful service <u>outcomes</u> for both providers and customers. However, there are very few studies focused on the empowerment and its dimensions for the contexts of high contact data driven services. To fill the identified gaps on empowerment the authors initiated a qualitative study to be followed by quantitative examination of the relationships between empowerment and service adaptation.

Preliminary results indicate that the diversity associated with empowerment and the increasing demands for access to information to serve the customers in (near) real time. Awareness of data and relying on it for decision making becomes a reality when organizations cascade information downward so that their frontlines are empowered to serve their customers effectively and contribute to value creation. The authors anticipate that their qualitative study using thematic analysis[60,61] of the interviews will help in confirming the dimensions of empowerment for BDA in high contact service contexts. The authors also intend to conduct a quantitative survey to model the relationships between empowerment and service adaptation. It is viewed that these studies yield valuable know-how for services marketing in leveraging big data analytics.

It is imperative that firms focus on creating a transparent data driven culture, be innovators in BDA, and empower their frontlines with right information and tools, so that they succeed in delivering the marketing promises of the firms.

Acknowledgements

References

1. Singh J, Saatcioglu A. Role theory approaches for effectiveness of marketing-oriented boundary spanners comparative review, configural extension, and potential contributions. *Review of Marketing Research.* Vol 42008:148-182.
2. Melhem Y. The antecedents of customer‑contact employees' empowerment. *Employee Relations.* 2004;26(1):72-93.
3. Menon ST. Employee empowerment: An integrative psychological approach. *Applied Psychology.* 2001;50(1):153-180.
4. Tatikonda LU, Tatikonda RJ. Top ten reasons your TQM effort is failing to improve profit. *Production and Inventory Management Journal.* 1996;37(3):5-9.
5. Bowen DE, Lawler EEI. The empowerment of service workers: what, why, how, and when. *Sloan management review.* 1992;33(3):31-39.
6. Chebat JC, Kollias P. The impact of empowerment on customer contact employees' roles in service organizations. *Journal of Service Research.* 2000;3(1):66-81.
7. Parasuraman A, Zeithaml VA, Berry LL. SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions. *Journal of Retailing.* 1988;64(1):12-40.
8. Zemke R, Schaaf D. *The Service Edge: 101 Companies That Profit From Customer Care.* New York: New American Library; 1989.
9. Sood A, Lings I. Empowerment and role stress in the human interface between the firm and its markets. *International Journal of Services, Technology and Management.* 2010;14(2-3):233-249.
10. Motamarri S, Akter S, Yanamandram V. Does Big Data Analytics Influence Frontline Employees in Services Marketing? *Business Process Management Journal.* 2017;23(3).
11. Bettencourt LA, Gwinner K. Customization of the service experience: The role of the frontline employee. *International Journal of Service Industry Management.* 1996;7(2):3-20.
12. Brown B, Court D, McGuire T. Views from the front lines of the data-analytics revolution. *McKinsey Quarterly.* 2014;2014(1, March).
13. Dean AM, Rainnie A. Frontline employees' views on organizational factors that affect the delivery of service quality in call centers. *Journal of Services Marketing.* 2009;23(5):326-337.
14. Devi A, Sharma J. Investigating role stress in frontline bank employees: A cluster based approach. *IIMB Management Review.* 2013;25(3):171-178.
15. Gwinner KP, Bitner MJ, Brown SW, Kumar A. Service customization through employee adaptiveness. *Journal of Service Research.* 2005;8(2):131-148.
16. Kiron D. Innovating with Airborne Analytics. *MIT Sloan Management Review.* 2015;57(1).
17. Kiron D, Prentice PK, Ferguson RB. *The Analytics Mandate: Findings from the 2014 Data & Analytics Global Executive Study and Research*

Report. Cambridge, MA: MIT Sloan Management Review; 2014 2014. 55480.

18. Oh JH, Park J, Rutherford BN. Management of frontline financial sales personnel. *Journal of Financial Services Marketing.* 2014;19(3):208-220.
19. Rust RT, Huang MH. The service revolution and the transformation of marketing science. *Marketing Science.* 2014;33(2):206-221.
20. Wilder KM, Collier JE, Barnes DC. Tailoring to Customers' Needs: Understanding How to Promote an Adaptive Service Experience With Frontline Employees. *Journal of Service Research.* 2014;17(4):446-459 417)444).
21. Germann F, Lilien GL, Rangaswamy A. Performance implications of deploying marketing analytics. *International Journal of Research in Marketing.* 2013;30(2):114-128.
22. Kiron D, Shockley R. Creating Business Value with Analytics. *MIT Sloan Management Review.* 2011;53(1):57-63.
23. Davenport TH, Harris J, Shapiro J. COMPETING ON TALENT ANALYTICS. *Harvard Business Review.* 2010;88(10):52-58.
24. Overby S. Invasion of the Data Scientists. (cover story). *CIO.* 2013;26(14):30-38.
25. Beaujean M, Davidson J, Madge S. The 'moment of truth' in customer service. *The McKinsey Quarterly*2006:62-73.
26. Motamarri S, Akter S, Yanamandram V. Does Frontline Employees' Empowerment Make A Difference In Data Driven Services? Frontiers in Service Conference 2017; 23-25 Jun, 2017, 2017; Fordham University, New York, USA.
27. Ransbotham S, Kiron D, Prentice PK. The Talent Dividend: Analytics talent is driving competitive advantage at data-oriented companies. *MIT Sloan Management Review.* Vol April, 2015. Cambridge, MA: MIT; 2015.
28. Ostrom AL, Parasuraman A, Bowen DE, Patrício L, Voss CA. Service Research Priorities in a Rapidly Changing Context. *Journal of Service Research.* 2015;18(2):127-159.
29. Bowen DE. The changing role of employees in service theory and practice: An interdisciplinary view. *Human Resource Management Review.* 2016;26(1):4-13.
30. Lashley C. Employee empowerment in services: a framework for analysis. *Personnel Review.* 1999;28(3):169-191.
31. Creswell JW. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* 4 ed. Thousand Oaks, CA, USA: SAGE Publications; 2014.
32. Rappaport J. In praise of paradox: A social policy of empowerment over prevention. *American Journal of Community Psychology.* 1981;9(1):1-25.
33. Calvès A-E. Empowerment: généalogie d'un concept clé du discours contemporain sur le développement. *Revue Tiers Monde.* 2009;4(No. 200):735-749.
34. Kanter RM. *Men and Women of the Corporation.* 2 ed. New York, NY: Basic Books; 1993.
35. Orgambídez-Ramos A, Borrego-Alés Y. *Empowering Employees: Structural Empowerment as Antecedent of Job Satisfaction in University Settings.* Vol 72014.
36. Bradbury-Jones C, Sambrook S, Irvine F. The meaning of empowerment for nursing students: A critical incident study. *Journal of Advanced Nursing.* 2007;59(4):342-351.
37. Rafiq M, Ahmed PK. A customer‐oriented framework for empowering service employees. *Journal of Services Marketing.* 1998;12(5):379-396.
38. Spreitzer GM. Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal.* 1995;38(5):1442-1465.
39. Kelley SW. Discretion and the service employee. *Journal of Retailing.* 1993;69(1):104-126.
40. Kelley SW, Longfellow T, Malehorn J. Organizational determinants of service employees' exercise of routine, creative, and deviant discretion. *Journal of Retailing.* 1996;72(2):135-157.
41. Shostack GL. Service positioning through structural change. *Journal of Marketing.* 1987;51(January):34-43.
42. Di Mascio R. The service models of frontline employees. *Journal of Marketing.* 2010;74(4):63-80.
43. Spiro RL, Weitz BA. Adaptive selling: Conceptualization, measurement, and nomological validity. *Journal of marketing research.* 1990;27(February):61-69.
44. Weitz BA, Sujan H, Sujan M. Knowledge, motivation, and adaptive behavior: A framework for improving selling effectiveness. *Journal of Marketing.* 1986;50(OCTOBER):174-191.
45. Klidas A, Van Den Berg PT, Wilderom CPM. Managing employee empowerment in luxury hotels in Europe. *International Journal of Service Industry Management.* 2007;18(1):70-88.
46. Auh S, Menguc B, Jung YS. Unpacking the relationship between empowering leadership and service-oriented citizenship behaviors: A multilevel approach. *Journal of the Academy of Marketing Science.* 2014;42(5):558-579.
47. Conger JA, Kanungo RN. The empowerment process: Integrating theory and practice. *Academy of Management Review.* 1988;13(3):471-482.
48. Thomas KW, Velthouse BA. Cognitive elements of empowerment: An "interpretive" model of intrinsic task motivation. *Academy of Management Review.* 1990;15(4):666-681.
49. Akter S, Wamba SF, Gunasekaran A, Dubey R, Childe SJ. How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics.* 2016;182:113-131.
50. Haas M, Kunz WH. How to Master the Challenges of Service Mass Customization - A Persona-Based Approach. *Handbook of Research in Mass Customization and Personalization, Forthcoming.* Available at SSRN: http://ssrn.com/abstract=15945882009.
51. Sony M, Mekoth N. A typology for frontline employee adaptability to gain insights in service customisation: A viewpoint. *International Journal of Services and Operations Management.* 2012;12(4):490-508.
52. Sony M, Mekoth N. FLE adaptability in high contact and high customisable services: Theoretical underpinnings and conceptual model. *International Journal of Services and Operations Management.* 2014;19(1):49-82.
53. Chiang FFT, Birtch TA, Cai ZY. Front-line Service Employees' Job Satisfaction in the Hospitality Industry: The Influence of Job Demand Variability and the Moderating Roles of Job Content and Job Context Factors. *Cornell Hospitality Quarterly.* 2014;55(4):398-407.
54. Chung BG, Schneider B. Serving multiple masters: Role conflict experienced by service employees. *Journal of Services Marketing.* 2002;16(1):70-87.
55. Schmarzo B. Big Data Business Model Maturity Chart. 2012; https://infocus.emc.com/william_schmarzo/big-data-business-model-maturity-chart/. Accessed 03-Dec-2015, 2015.

56. Schmarzo B. Big Data Business Maturity Index. 2013; https://infocus.emc.com/william_schmarzo/learnings-from-the-field/. Accessed 03-Dec-2015, 2015.
57. Kiron D, Kirk Prentice P, Ferguson RB. Innovating With Analytics. *MIT Sloan Management Review.* 2012;54(1):47-51.
58. Motamarri S. The Convergence of SDL and STD Towards Co-creation. ANZMAC-2015; Nov-Dec, 2015, 2015; UNSW, Sydney, Australia.
59. Vargo SL, Lusch RF. Evolving to a New Dominant Logic for Marketing. *Journal of Marketing.* 2004;68(Jan-2004):1-17.
60. Akter S, Wamba SF. Big data analytics in E-commerce: a systematic review and agenda for future research. *Electronic Markets.* 2016;26(2):173-194.
61. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology.* 2006;3(2):77-101.