Digitization and Audit Profession

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Abstract: ‘Digitization’ has restructured the auditing profession with upgraded technical skills and knowledge of auditors in India. Softwares such as, CAATT, eaudit, DMS, Aura, on spring, Audit Board, iAuditor and larger safety culture suite assists the auditors to stay ahead with the audit process efficiently and effectively. Digitization helped the auditors to spend less time on paper work and more time lending their knowledge to other high-risk areas of the business. The present study aims at understanding the impact of Digitization on the audit profession in India by using a well-structured questionnaire of 400 respondents from auditor’s profession across India. Factor Analysis (FA) and convarmatory factor analysis (CFA) approach is exploited to generate the results. SEM has been deployed to evaluate the original and modification indices of the model, which further establishes the improvement of path analysis in SEM’s effectiveness with the help of Reliability and Validity tests. The model establishes the significant impact of Digitization on the audit profession in India. Based on results in Structural Equation Modelling, contributions of digitization on the audit profession in India is analysed. Various parameters established based on Force Field Theory (Kurt Lewin’s, 1948) [1] of driving forces and restraining forces such as, auditor’s perception, demographic, socio economic, political, environmental, technological, infrastructural and political. The outcome of the study will help the auditors and corporates practitioners to frame the guidelines to meet global challenges.

Index Terms: Auditing, Automation, Technology, Digitization, Software.

I. INTRODUCTION

The term ‘Digitization’ is believed to be used by Wachal (1971) [2], where he has discussed the implications on the society as a consequence from digitization. Digitization is the usage of technology and digital advances, such as analytics, mobility, social media and smart embedded devices, to radically improve performance. Digitization and sweeping developments in Information Technology (IT) has stimulated the computer program designers to design the softwares to assist Auditors in examining, testing, gathering evidence, conducting analytical tests, evaluating internal control, printing exception reports and preparing audit reports (Crutchley, C., et al. 2007) [3]. Though this process is a topic within auditing research and theory, the auditors and the clients are exploiting and implementing digital innovations to have business efficiencies, increase customer satisfaction, increase productivity and to develop good business strategies [4]. The machines, methods and products become smarter and smarter with advancement in the technology, like ‘Sensors and Radio-frequency.'
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Since auditing profession is an independent and unbiased inspection, where the auditors delivers the appropriate and transparent information about the business transactions (IIFAC, 2001) [6], the first and foremost goal of auditing is to bring in accountability and transparency, and this is expected only with the latest technology that can identify the flaws in the process and system (Harrison MJ, Datta P, 2007) [7] to bring in equity and integrity in operations of organizations. It is observed that, there is no specific definition of audit quality, De Angio (1981) [8] has given a brittle definition as “Audit quality is joint probability that audit will truly present the audit findings in accounting system of its client, for the public.” In general for any auditor profession to have a sustainable quality management practices, internal and external environmental factors need to be considered, such are auditors skills and credentials, auditors qualification, audit tenure, strategic management policies, working environment, infrastructural facilities, socio-economic, cultural, political and environmental conditions, moreover the perception of auditors towards their profession and client satisfaction (Zahargier and Balasundaram, 2011; Baron and Greenbery, 2008; Elder and Davis, 2007) [9]. Countries like India, where there is a threat of corruption is high, ‘Digitization of Transparency Audit System’ (DTAS) will curb the corruption to the maximum extent possible (Masood and Lodhi, 2015) [10]. In India, ‘The Quality Review Board (QRB)’ established by parliament under ‘The Chartered Accountants Act 1949’, is a 10-member panel, 50% of the members are from ‘The Institute of Chartered Accountants of India (ICAI)’ (Gupta, 2008) [11].

The International Auditing and Assurance Standards Board (IAASB) has developed a frame work for ‘Audit Quality’, that gives a clear guideline and describes the “Input-Process-and-Output” factors that contribute to audit quality. According to IAASB, as such there is no clear definition for “Audit Quality”, however, as a term frequently used as a debate and recognised as a very complex subject in nature. For the purpose of the study, the author(s) has identified a model for the audit quality. Force Field Theory (Kurt Lewin, 1948) is adopted and used in this study as ‘investigative tool’ in order to improve the understanding of the revolution that is affecting the auditing profession. It will assist in creating a simplified image to show the forces involved in it and build knowledge around the current shift of the profession. So, there is an indication that the purpose and the quality of audit is to boost the degree of confidence of intended users ¹. The structure of the paper follows primarily with the introduction to the “Digitization of Audit Profession”, objective of the study and hypothesis. The second section brings out related literature, third section highlights on methodology and last section on data analysis, findings and suggestions.

A. Objective of the Study

The major objective of this study is to examine conceptually the ‘Digitization on audit profession’ in India, with the secondary objective (s) of:

1. To understand if there is any positive impact of Digitization of audit profession.
2. To test empirically the factors influencing the adoption of digitization.
3. To examine the significant differences in the opinion of auditors in digitization of audit profession in satisfying the stakeholders.
4. To suggest and recommend appropriate strategies based on the empirical results.

B. Hypothesis

There is positive influence of digitization on audit profession in India There is a significant relationship between internal and external environment in adopting Digitization in audit profession. Digitization of audit profession is very effective in satisfying the stakeholders in India.

II. DATA COLLECTION TECHNIQUE AND METHODOLOGY

A self-developed questionnaire of five-point likert scale was employed to explore the impact of digitization on audit quality through multistage random sampling. Drop-off survey was adopted. Through multistage random sampling, 500 respondents were selected from across India. The respondents rate was 80% (400 respondents), which is fairly acceptable. The Factor Analysis (FA) and confirmatory factor analysis (CFA) approach is exploited to generate the results with the help of software IBM SPSS AMOS (Analysis of Moment Structures). SEM has been deployed to evaluate the original and modification indices of the model, which further establishes the improvement of path analysis in SEM’s effectiveness with the help of Reliability and Validity tests.

III. LITERATURE REVIEW

Revisit of previous studies on the ‘Digitization of Audit Profession’ is a basis for defining this research objective(s). For the purpose of this study, a vigorous literature study is conducted to understand the implications of Digitization of audit profession and audit quality. The literature is divided in to two parts, such as, adoption of digitization and the technological advancements of digitization.

A. Literature on Software Advances and Digitization

Digitization of Auditing is a great tool to streamline productivity and guarantee quality. The drastic change in the technology is threat for the businesses, what is considered a new technology to day is old technology tomorrow. Unfortunately, compare to the change in speed of technology the changes in technology adoption in audit profession is slow (Alan W. Anderson, CPA President, ACCOUNT-ability Plus, 2011) [12]. Considering these gap, the below mentioned advances in information technology in assisting digitalizing the audit profession is reviewed.

¹ https://isca.org.sg/tkc/aa/current-issues/hot-topics/audit-quality
(i). CAATTs (Computer-Assisted Audit Tools and Techniques): As a computer program, assists the auditors to test for a specific risk and improve the audit process. Generally CAATTs is used to refer any data extraction and analysis with the help of programs such as spread sheets, databases, SAS, Crystal Reports and business objects. The main advantage of this software for the auditors includes, the auditors are able to avoid corruption with an organised data, helps to have many specific audit routines (sampling), provides good documentation for each test performed and pivot table creation.

(ii). Onspring: Onspring is a plat for ‘Process Automation’ and user friendly, which allows the auditors (users) to manage data, workflow and reporting. Though this software is used for the single business, it has a ability to connect multiple functions, and can be tailored to a company needs without coding. The main functions of this “Process Automation Platform” includes, audit planning and management, business intelligence, quality management, project delivery, assists the users to monitor disaster recovery and coordination.

(iii). AuditBoard: It’s a cloud-based audit software which provides SOX (Sarbanes Oxley Act). This software helps in visualising the data, analyse and control internal data where the users can export the data with the help of PointsPoint or Excel file. This software also provides a platform for creating personalised dashboards.

(iv). iAuditor: This software is designed by SafetyCulture, enables users to capture variety of information from different files digitally to have a quality and safety audits. This helps the users to conduct inspections even without internet, since the users can export the data in the form of PDF, XML, CSV and DOCX. iAuditor is compatible with iOS, Android and Windows mobile devices, and interfaces with the larger SafetyCulture suite.

(v). E-Data: Is a cloud-based audit management software. This software is used extensively in automotive, manufacturing and construction industries. This software helps the auditors to plan, schedule, complaint investigations, PPAP validation and material certification with the help of instant I-charts, R-charts, X-charts. This software is designed to work with both mobile and desktop devices.

(vi). Audit Applications: Audit Applications is an online service automating and simplifying the audit process. This software assists the auditors to monitor the transactions without any error or fraud. (vii) ACL: Access Control List is an integrated system of software which provides complete control over data access, management, analysis and presentation.

(viii). Arbutus: This software is used for ‘Quality Audit’ and ‘Business Intelligence (BI)’ applications such as audit analytics, continuous monitoring, fraud detection, work group collaboration …etc.

(ix). Audimation: Auditor Assistant, Audit Leverage, CaseWare, CRA Wiz, InfoZoom, MetricStream, Inc, TeamMate Audit and Controls Management, WizRule are some of the softwares that are largely adopted by the auditors to maintain the quality and transparency.

Wachal (1971) [2], is known as an innovator of the term Digitization, where he used this for understanding the implications of adopting the new technology as disruptive in nature. According to David Yang and Liming Guan (2004) [13], the evolution of Information Technology (IT) has contributed drastically for the audit profession by changing the vision of the organizations and businesses across the globe. Iqbal Khadaroo (2005) [14], in his study explored an extraordinary growth of contribution of IT to the auditing profession. Jenny Goodwin (2004) [15] in his study has compared internal audit function between organizations in the private and public sector and digitization. Jayalakshmi et al (2005) [16] has highlighted on the globalization and challenges of auditor’s profession in maintaining the trust and integrity. This is directly connected with the upgradation of technology and digitization of audit profession to be effective and efficient. Hillison et al. (1999) [17] and Roufaiel and Dorweiler (1994) [18] followed the same opinion. Roufaiel and Dorweiler (1994) expressed that “Computer Fraud is easy to Commit but Difficult to Prevent” and therefore, the auditors should define their responsibility for computer fraud. Staciokas R, Rupsys R (2005) [19] explored the auditors approaches in utilising the audit tools, software’s and how technology evaluation affecting their practises. The author has illustrated the Internal Auditor's 10th annual software survey in discussing the issues interconnected with audit software in United States. Richard Lanza (2004) [20], Romas Staciokas and Rolandas Rupsys (2005) [21], Ruud and Bodenmann (2001) [22], Harrison and Datta (2007) [23], Kim et al., (2009) [24] are some of the important studies can refer for digitalization of audit profession.

IV. FINDINGS AND DISCUSSION

Digitization of Auditing Profession is very aggressive in increasing efficiency, productivity, improving transparency, processing transactions in real-time and facilitating global relationships among audit professionals and the stakeholders. Best audit practices are usually conducted by the well trained, qualifies, skilled auditors. Professionally managed corporates provide their audit functions with the resources and authority to effectively fulfil the customer requirements and satisfy their needs. This is possible only with the transiency and unbiased audit practices, which is possible only with the help of digitization.

With this empirical study, it is clearly evident, and there is a positive correlation between Digitization and performance of auditors. The audit companies in India still trying to update their technology as per the market demand and changes in the expectations of the stakeholders. The author identified, that there is a positive impact of external environment, such as, socio-economic, cultural, political, technological and environmental factors on the adoption of digitization and performance of auditors in India. The present study tires to relate the digitization and auditor’s efficiency and performance with external and internal environment.
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Table 1: KMO and Bartlett’s Test

<table>
<thead>
<tr>
<th>Source: Authors Computation</th>
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Table 2: Total Variance Explained

<table>
<thead>
<tr>
<th>Component</th>
<th>Sk</th>
<th>Aq</th>
<th>At</th>
<th>Smp</th>
<th>We</th>
<th>If</th>
<th>Pa</th>
<th>Cs</th>
</tr>
</thead>
</table>
| FA model is represented in figure 2 and respective factor loading values are presented in table 3 development related items shows higher loading (factor loading λ is .81), squared multiple correlation $R^2$=.67. $R^2$ value is used to test reliability and the values between 0.17 and 0.7 are suitable to confirm reliability (Boole, 1989) [25]. The Critical Ratio value (t-value) > 1.96 for a regression weight is considered acceptable with the path is significant at the .05 level of significance. In p-value column, three asterisks (***)) indicates test is significance and all the values that are smaller than .001 indicates items have cleared t-test (p-value). Mahalanobis distance test result shown zero outlier.

A. Structural Equation Modelling

After getting good results of reliability, and validity of the model the researcher proceeded to do structural he factors of organizational related factors are divided in to skills and credentials, auditors qualification, audit tenure, strategic management policies, working environment, infrastructural facilities, perception of auditors and client satisfaction is supported by and it is concluded that among all the factors observed and confirmed, the p-values (*** <0.05) is supported very significantly, so, the researcher can conclude there is a positive correlation between Digitization and audit quality, performance and client satisfaction. Figure 2: Confirmatory Factor Analysis (CFA)

Table 3: Rotated Component Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>Sk</th>
<th>Aq</th>
<th>At</th>
<th>Smp</th>
<th>We</th>
<th>If</th>
<th>Pa</th>
<th>Cs</th>
</tr>
</thead>
</table>

Source: Authors own computation

T-Total, V-Variance, C-Cumulative, Ct-Component
Table 4 Measurement Model Fit Indicators for First and Modified

<table>
<thead>
<tr>
<th>Modifed</th>
<th>First-Output</th>
<th>Acceptable value</th>
<th>Model Fit Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>156.4</td>
<td>Small</td>
<td>Chi-Square (χ²)</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>df</td>
<td></td>
<td></td>
</tr>
<tr>
<td>173.3</td>
<td>54</td>
<td>&lt;0.05</td>
<td>p-value of χ²</td>
</tr>
<tr>
<td>63</td>
<td>2.32</td>
<td>&lt;0.05</td>
<td>CMIN /DF (χ²/df)</td>
</tr>
<tr>
<td>0.066</td>
<td>0.049</td>
<td>&lt;0.05 is good, &lt; 0.08 is acceptable</td>
<td>RMSEA</td>
</tr>
<tr>
<td>0.759</td>
<td>0.859</td>
<td>&gt;0.05 great, &gt;0.7 tolerable</td>
<td>CFI</td>
</tr>
<tr>
<td>0.832</td>
<td>0.859</td>
<td>Same</td>
<td>GFI</td>
</tr>
<tr>
<td>0.79</td>
<td>0.859</td>
<td>Same</td>
<td>AGFI</td>
</tr>
<tr>
<td>0.676</td>
<td>0.758</td>
<td>&gt;0.05 great, &gt;0.7 tolerable</td>
<td>NFI</td>
</tr>
<tr>
<td>0.701</td>
<td>0.815</td>
<td>&gt;0.05 great, &gt;0.7 tolerable</td>
<td>TLI</td>
</tr>
<tr>
<td>117.9</td>
<td>8.7</td>
<td>Δχ²</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors own Computation

B. Model modification

Researcher modified the model with the help of modification indices after correlating certain measurement errors and received better results. The final (modified) results are represented in Table 4. We have Δχ² (the difference between two chi-square values).

C. Digitization related and CFA and SEM findings

The main objective of this study to estimate whether Digitization is influencing the auditor’s performance and client satisfaction. The responses revealed that there is a significant impact of Digitization on skills and credentials, auditor’s qualification, audit tenure, strategic management policies, working environment, infrastructural facilities, perception of auditors and client satisfaction. Confirmatory factor analysis (CFA) extracted, overall 9 items are considered that are independent and 14 items are considered as dependent variables to test the model.
The items are ascertained with the help of t-value and p-value and the first output is derived. The priori model (first output) has given acceptable model fit values (Chi-Square (χ²) = 156.489, χ²(df) = 2.645, RMSEA = .049, CFI = .859, GFI = .807, AGFI = .859, NFI = .758, TLI = .815) subsequently this model is modified (χ²(df) = 2.14, RMSEA = .066, CFI = .759, GFI = .832, AGFI = .759, NFI = .676, TLI = .701) with the Δχ² = 117.9. Assumption made for fourth objective is satisfied with acceptable model fit value in confirmatory factor analysis (CFA) values. Thus measurement model is established with convergent validity and discriminant validity values to proceed for the next level of analysis.

D. Finding from Structural Model

For proving assumption for this objective the researcher established a hypothetical model in structural equation model (SEM). The structural model is conceptually developed with the causal relationship between the dependent and independent factors found appropriate model fit for the first output of the data gathered through questionnaire (Chi-Square (χ²) = 156.489, χ²(df) = 2.645, RMSEA = .049, CFI = .859, GFI = .807, AGFI = .859, NFI = .758, TLI = .815) subsequently this model is modified (χ²(df) = 173.384, χ²(df) = 2.14, RMSEA = .066, CFI = .759, GFI = .832, AGFI = .759, NFI = .676, TLI = .701) with the Δχ² = 117.9. Estimation values indicates the path analysis estimates of the structural model. Digitization impact on the Audit quality and client satisfaction is supported with significant p-value (**). So, the study empirically supports Digitization can definitely improve the audit quality and client satisfaction.

V. LIMITATIONS

The present study also experienced the below mentioned limitations, which can be recommended as research gap for further study, such as, Cyber Security, data privacy, user administration, change management, IT governance, connecting with customers and clients, data management, records retention, regulatory compliance, third-party vendors, and fraud.

VI. CONTRIBUTION

A. Theoretical contributions of this study

This research explored the concept of digitalization of auditing profession. Since there is no much studies conducted in this area, it is assumed to be a preliminary one “digitization of auditing profession”. It analysed with the help of theories in order to identify past, present and futures forces that will drive the change towards digitalization of the auditing profession. By doing this, this study aimed to assist the auditing research field by providing an innovative qualitative study. By answering our research questions and applying change theories as diagnostic tools for change in regards to digitalization, this study has made a valuable theoretical contribution to the field of auditing research by building new knowledge. It has opened the field to explore the concept of digitalization from a broad perspective, with a qualitative research that has identified driving forces for change. Furthermore, by laying down a theoretical foundation for further research on change, we as the authors of this study argue for and sincerely hope that this exploratory study inspires and increases incentives to conduct relevant future research.

B. Practical contributions of this study

We previously discussed how the practical contributions of this thesis will be of use in regard to stakeholders that has an interest in the future of the auditing profession. After presenting our findings, analysis and conclusion we are sure to say that this statement still holds as this study yielded satisfactory results, especially among the data collected that is presented. As much of the discussion is interesting but however not specifically relevant for the exact purpose of this study, it can be interesting to read a broad discussion of what practitioners say about the future and ongoing change. To illustrate a stakeholder for which this study might be practically interesting an auditing student can for example, choose to use the findings in this study for practical use. The audit student might want to know how the job-market is perceived by auditors or to see the potential need for IT auditors. Considering the impact of digitalization in relation to the auditing profession, one topic to further investigate could be how smaller audit firms without dedicated IT-departments look upon digitalization, and how they embrace it. Similar research settings could as well be applied to audit firms with only older employees. This would be interesting to investigate further since these two audit groups are perceived to face larger challenges from competition in the industry. Furthermore, it was discovered that digitalization is a driver for outsourcing of simpler audit services, this could be an interesting topic to address in the future since the Indian auditing industry could potentially change drastically if more advanced tasks can be outsourced in the future. This could have severe impact on the future role of auditors. Other impacts on the auditing profession in relation to digitalization that could be highlighted in future research is how audit firms’ customers perceive digitalization and if digitalization can impact value-adding services for them. One example of that could be real-time financial reporting and potential possibilities and challenges with that, for both customers and auditing firms. Overall potential risks and possibilities that can be connected to digitalization for the auditing profession, as well as potential ethical issues closely related to digitalization within the auditing profession are also important to focus future research on. Turnover intentions were noticed as a perceived general problem within the auditing industry, it was mentioned that newly recruited auditors have a tendency to leave the profession due to more attractive working conditions within other industries. This is an issue that could be interesting for future researchers to investigate deeper.
How to attract auditors to stay longer in the profession and reasons for why the auditing industry is facing problems to maintain talented personnel. Overall there seem to be a resistance among auditors towards quantitative research, several auditors expressed that they received heaps of requests to participate in quantitative research via e-mail and it was conveyed that qualitative research, where the auditors can freely speak their mind was favoured to participate in. This indicates that further research should be of qualitative nature and address issues where opinions can be elaborated to in a quantitative study. Finally, an extension to our research in a future setting to further analyse the development of digitalization in relation to the auditing profession could be interesting to study.

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