1. **Brynjolfsson and Hitt (2000)**, the use of ICT can help to cut down the costs of coordination, communication, information processing and also enable efficient service provision at lower cost.

2. **Duan et al (2002)**, identified lack of ICT skills and knowledge in SMEs as one of the major challenges faced by all European countries, particularly in the UK, Poland and Portugal in their study.

3. **Jones, et al. (2003)**, identified that the main constraints to E-business development were insufficient time, insufficient financial resources (financial constraints), limited use by customers and suppliers and lack of IT specialist skills thereby supporting the findings of previous research. When these barriers are analyzed by size, Small and Micro enterprises identified insufficient time and limited financial resources as the main factors constraining the speed of E-business development. By contrast, the survey identified that the barriers to speed of E-business development in medium enterprises are identified as insufficient time and lack of IT specialist skills. Thus it can be seen that the disabling factors have less influence in medium and large SMEs.

4. **Lee & Kim (2004)**, shows that the cost for using ICT, Lack of Suitable ICT solutions, Technological knowledge of employees and their management capabilities, security concerns, outsourcing elements buyer/supplier technological awareness and perceived benefits are highly related to new ICT adoption. Besides Government support and support from ICT industry and lack of information channels have an influencing role in ICT adoption in SMEs.

5. **Ritches and Brindley (2005)** studied the significance of Information and Communication Technology (ICT) in the growth of SMEs in Australia. They concluded that adoption of ICT increases the efficiency of the organization.

6. **Beekhuyzene et al. (2005)**, attempted to review the literature of technology adoption across different national cultures and discusses the technology adoption within small and medium sized enterprises (SME). The Australian situation is compared and contrasted with other countries like Italy, USA, and Ireland. The results from an extensive study of published work on the cultural differences in technology adoption in SMEs reveals the
following cultural differences in technology adoption: Technology Spending, Centralised versus Decentralised Environments, Hardware & Telecommunications, Innovation/Risk taking, integration of IS and Strategic Planning and Information Sharing.

7. Wymer and Regan (2005) provided a comprehensive list of incentives and barriers to the adoption and use of e-commerce and e-business information technology by the SMEs. The authors agreed that internet-based ICT adoption offers benefits to SMEs in terms of cost reduction, speedy, and reliable communication between and within businesses and customers, efficient coordination among firms, closer relationship among business partners, facilitate management and organization of businesses; access to market information as well as the identification of new business opportunities. Among the barriers identified comprise of the unsuitability of ICT adoption for business, unavailability of ICT personnel and network infrastructure, high ICT cost, expensive software, imbalanced investment costs and returns, uncertainties with ICT laws, and lack of confidence in ICT security.

8. Kapurubandara & Lawson (2006), concluded that Lack of telecommunication infrastructures, inadequate support and policies, legal frameworks as well as guidelines and procedures from legal regulatory authority, unstable economic position and changing regulation in the country, social and cultural rejection due to lack of e-business awareness and popularity are among external barriers. The internal barriers to ICT adoption are lack of skills, lack of perceived financial gain and business relevance and security concerns with electronic transactions.

9. Ion, P. & Andreea, Z., (2006), investigates how the use of ICT could contribute to the success of small and medium enterprises and therefore analyze the key factors of implementing information and communication technologies in small and medium business within the sector of services. The study is based on evidence provided by articles and research reports. The authors’ reveals that ICT provides many benefits for SMEs and should be used more in SMEs and as such in small business management. ICT are today key tools in management processes which could improve managerial practices of SMEs. SMEs could use ICT in order to grow and to become more innovative. However the costs of ICT in SMEs shows its traces in the process of ICT adoption.
10. **Zailani, S. (2006)**, concluded that the adoption of ICT exhibits significantly positive influences on knowledge management. The influencing factors to ICT adoption has been divided into technological, organizational and environmental characteristics and they have positive influence on the adoption of ICT. The author also claims that explicitness of technology, accumulation of technology, organizational encouragement, and human resource quality and government support exhibit significant influence on the adoption of ICT.

11. **Lal (2007)**, investigating adoption of ICT in Nigerian SMEs, found that one of the major factors inhibiting ICT diffusion and intensive utilization is poor physical infrastructure.

12. **Alberto and Fernando (2007)** argued that the use of ICT can improve business competitiveness with internet providing numerous opportunities for SMEs to compete equally with large corporations; Information and communication is fundamentally changing the way in which business is conducting. ICT forces companies to find out new ways to expand their business market to attract and retain their customers. Use of ICT changes the economy and the way business is conducted. They force companies to find out new ways in which business can compete, attract and retain their business by providing those products and services according to their needs, and restructure their business strategies to deliver products and services more effectively and efficiently.

13. **Hashim, J. (2007)**, conducted a study using a survey instrument developed from the constructs used in the diffusion of innovation theory. The findings show that the level of ICT skills possessed by SME owners in Malaysia is poor, that their use of ICT is low, and that their adoption of ICT is slow and late, primarily because they find that ICT adoption is difficult. The authors presents the implications for government and ICT training providers.

14. **Barba-Sanchez et al. (2007)**, concluded that ICT can provide a wide variety of benefits to different firms. More specifically, ICT can reduce business costs, improve productivity and strengthen growth possibilities. Besides, the adoption and implementation of ICT by firms can improve business cooperation, business relationships, quality and diffusion of knowledge. Moreover, the authors outline the lack of awareness of the benefits to be derived coupled with little or no specific training on ICTs.
15. **Matthews, P. (2007)**, states that a number of factors play a role in the successful deployment of ICT for growth and these can be classified into financial, infrastructural and organizational. According to The author cost, technical literacy and confidence in technology are notable constraints to ICT adoption. This is where training can be strategically targeted. At the same time, product and solution knowledge will enhance the confidence in ICT to support the business. One significant shortfall impacting this system and identified by the survey seems to be in the provision of advice and consultancy as opposed to pure grant or subsidy support.

16. **Alam & Ahsan (2007)**, states that Government support and manager’s ICT knowledge and skills are seen to be the most important factor which could influence an organization to adopt ICT. In addition lack of trained personnel in ICT implementation, limited financial budget along with small business structure and even smaller number of employees, trading partners intimidate SMEs to invest for technology adoption.

17. **Ashrafi & Murtaza (2008)**, reveals that Lack of necessary ICT skills, lack of in-house capabilities, high costs of ICT solutions and implementation and lack of availability of relevant information about suitable ICT technologies and lack of mechanism to find and receive advice and support at their disposal about suitable and effective technologies were some of the major barriers in adopting ICT including no time to implement ICT projects, lack of top management support, bad experience in the past and government regulations and requirements. The results of the study show that the main driving forces for ICT investment are to provide better and faster customer services, high quality products and services to their customers and to establishing better and long term relationship with customers. Other benefits by utilizing ICT in their businesses are to stay ahead of or keeping up with the competition and following top management strategy. Most of the surveyed firms’ long-term plan with regards to their ICT investment was to increase their market share, grow their sales revenue, cut costs and expenses or increase in the business performance.

18. **Arendt (2008)**, reveals that lack of financial resources owner-managers’ and employees lack of knowledge and skills are crucial factors to ICT adoption. Others among the noticed are lack of suitable software, lack of clearly defined Information System Plan (ISP), lack of a long term strategy, lack of standard operating procedures (SOP), lack of
understanding of business processes, lack of suitably qualified personnel, lack of business orientation necessary to run a company (relevance), lack of suitable qualified personnel (employees), lack of long term business strategy (strategy), lack of suitable software.

19. Harindranath et al. (2008a), observed that majority of the SMEs surveyed identified costs as the single biggest factor threatening future investment in ICT. Lack of internal ICT expertise (employees), lack of resources and uncertainty over business benefits also hampered the development of internal ICT environment. This study concluded that, In terms of technology, the most important concern was a fear of technology obsolescence requiring frequent updates. Among some of the key perceived benefits from ICT adoption, most of the benefits relate to operational matters. In addition, SMEs see ICT as helpful in improving the product/ Service quality, improving the response time to customers, improving customer satisfaction and enables them to keep up with their competitors, improving productivity and improved working.

20. Harindranath et al. (2008b) points to a number of key factors that inhibit the widespread adoption and use of ICT, and these include the cost of technology, uncertainty over the business benefits and impacts, and the lack of relevant internal ICT expertise. Day to day challenges such as dependence on external consultants and vendors and the unreliability of systems, potentially owing to technological obsolescence and technical complexity, were also important constraints on ICT use.

21. Modimogale & Kroeze (2009), concluded that the ICT adoption factors ranging from socio-economic issues to technology-related issues: lack of money, power cuts, lack of knowledge, and possibility of fraud, technology intimidation and perceived high cost of ICT.

22. Alam & Noor (2009), identify the lack of suitable technical and managerial staff with sufficient ICT Knowledge and skill as a major barrier to ICT adoption in Malaysian SMEs. Moreover perceived benefit and government support are significant elements of ICT adoption.

23. Burhanuddin et al. (2009), identify the lack of suitable technical and managerial staff with sufficient ICT expertise as a major barrier to ICT adoption in Malaysian SMEs, lack of a comprehensive framework in terms of policies and expensive infrastructure as ICT challenges in SME.
24. **Ongori (2009)**, states that ICT adoption in SMEs is faced with challenges such as limited funds, frequent power failure, lack of ICT skilled labor, high cost of ICT, lack of owners/managers awareness about the potential benefits of ICT, poor infrastructure and lack of legal framework lack of security and trust. Similarly ICT adoption by SMEs are driven by the availability of human skills both internally and externally. The use of ICT in SMEs enables them to accessing robust information to make thoughtful decisions especially in strategic planning, access global markets, improve business transactions, reduce operational costs and increase business productivity.

25. **Saleh & Burgess (2009)**, finds that finance, employee education including ICT skills, high cost of ICT infrastructure and shortage of skilled human capital, concerns over privacy and security are impeding factors of ICT adoption. The authors concluded that shortage in ICT skills is probably due to the high cost of hiring talented IT personnel and the limited resources available to SMEs. Another interesting finding in this study is that a majority of SMEs in use the internet for small banking transactions and communication with suppliers and/or customers, indicating that SMEs are still hesitant to use the internet for other purposes such as large financial transactions with banking institutions. This is probably due primarily due to perceived concerns over privacy and security.

26. **Ahuja, et al. (2010)**, in his study find that perceived benefits of ICT positively affect technology adoption. The authors further concluded that the categorization of factors affecting ICT adoption for Building project management involved at the three levels of industry, organization and people. At industry level factors include strategic issues, industry drivers, cultural factors, available technology, training and education. At organization level factors include strategic issues, Turnover of the organization, cultural factors, and geographical separation of project team organizations, use of ICT for general administration, IT tools utilized for PM processes. At people level factors include perceived benefits, perceived barriers and training.

27. **Apulu & Lathman (2010)**, argue that some major factors that affect Nigerian SMEs are lack of infrastructural facilities and lack of electricity. Furthermore, lack of resources is another major factor. With reference driving force of ICT, it is certain that there are a number of benefits associated with the use of ICT. ICT offers SMEs a competitive advantage over its competitors (for example increase in production capacity planning and
control), improve managerial practices in SMEs and also assist SMEs to grow and become more innovative.

28. **Ongori and Migiro (2010)**, argues that although ICTs’ adoption will increasingly empower SMEs to participate in the knowledge management economy, still SMEs are faced with many challenges which impede SMEs not to adopt ICTs in their business processes. These challenges include lack of financial, human resources, unsuitability for the type of the business and security and trust of ICTs tools. In addition, most SMEs owners/managers do not understand the benefits of ICTs adoption, lack of legal framework and inadequate infrastructure.

29. **Ongori & Migiro, (2011)**, argues that despite ICTs adoption by SMEs is influenced by many factors, however, there are many forces tends to influence the process of ICTs adoption in SMEs which constitute of the following: environment, human capital, firm structural characteristics, competitive strategy and internal organization.

30. **Bazini, Ph, & Qarri (2011)**, found that the most serious external obstacle to ICT adoption in SMEs is cost of Implementation followed by security concerns. Besides, unfavourable economic environment, lack of customer awareness and reluctance from trading partners are among others. The most serious internal barriers was the shortage of well trained staff along with lack of ICT capabilities, insufficient financial resources, lack of ICT awareness and knowledge, lack of perceived benefits, company size and time.

31. **Apulu & Lathman (2011)**, reveals that the key drivers for ICT adoption amongst SMEs in Nigeria are to have some sort of competitive advantage, satisfy their customers, and to save time and cost. Based on the literature review and the case results, the study confirms that there are wide range of reasons behind ICT decision which have been grouped into some major areas which include: competitive advantage, increase in profit, global reach, efficiency/speed, Communication, Automation/Computerization of records, Information storage, Customer satisfaction, reduce cost/saves time, Online presence, Advertisement and promotions. Adding to prior statements, ICT being Current Trends/Technology of the day and Nature of the business (for example telecommunication) are drivers for ICT adoption.

32. **Irefin et al. (2012)**, test a model hypothesizing relationships among: Cost, Business Size, and Infrastructure, Government support and Management support and intent to adopt
ICT. The authors concluded that availability of ICT infrastructure contributes significantly to the adoption of ICT in SME. Cost was also discovered as the most potent factor in ICT adoption. Also high cost of computer, internet facilities and other ICT equipment’s which form the core ICT infrastructure is also affecting the adoption of ICT by SMEs. Moreover, government support has a significant and strong positive relation to ICT adoption. It should be considered as one of the factors militating against the adoption of ICT by SMEs in Nigeria. It is widely believed that ICT adoption and utilization is predicated on availability of physical infrastructure, legal and regulatory issues, adequate research and development, and proper policy. All these can be put in place only when there is adequate support from the government. The research shows a negative relationship between business size and ICT adoption however, management support has also a positive relation to the adoption of ICT in SMEs.

33. **H. Zaid (2012)**, According to the results, technical barriers are the most important barriers followed by legal and regulatory barriers then political barriers, and the least important barriers are social and culture barriers. All respondents agreed that lack of Internet security is the highest barrier that inhibit the implementation of e-commerce in SMEs in Egypt, whereas the majority of respondents ranked the following barriers: limited use of Internet banking and web portals by SMEs; cost too high; changes in government policy and lack of e-commerce standards as the most important barriers. Barriers like difficulty in changing the existing working procedures; and lack of external pressure from suppliers and customers received low importance compared with other barriers. The findings implied that more efforts are needed to help and encourage SMEs in Egypt to speed up e-commerce adoption.

34. **Manure et al. (2012)**, revealed that both, internal and external barriers inhibit the adoption of ICT by SMEs. The external barriers divided into cultural, infrastructure, political, social and legal and regulatory barriers. The internal barriers include cost, lack of IT skilled staff, lack of perceived financial gains, security concerns, Lack of business relevance.

35. **Consoli (2012)**, states existing literature supports the classification of the determinant factors of ICT adoption in SMEs into five groups: individual, organizational, environmental, Technological, economical. He added that Literature have discussed a lot
with respect to ICT impacts on organizations and classify them into following groups namely performance, growth, expansion and new products. Performances include efficiency, effectiveness, competitiveness, Innovative business and Intangible benefits. Growths include Productivity growth, Strategic growth and Sales increase. Expansions include organization expansion, Supply chain improvements and International communication. New products include new products and services, Product quality and Customer satisfaction.

36. Akomea-bonsu & Sampong (2012), in their study find that the most important concern among SMEs was a fear of technology obsolescence requiring frequent updates, frequent operational problems encountered with their ICT. Furthermore, lack of internal capabilities, lack of financial support, lack of infrastructure and personal reasons like lack of knowledge about its usage were the major barriers in adopting ICT.

37. Akbari & Pijani (2013) find that weak managerial support, lack of available skills, weak strategic vision regarding the ICT, weak innovative environment and insufficient financial resources are among the internal barriers. External barriers include weak governmental supports, legal environment, low cultural acceptance and weak pressures from customers, suppliers and competitors. Finally, low perceived usefulness and compatibility are among the ICT specifications that limit ICT adoption by SMEs.

38. Ndiege, J. R. A., et al. (2014), attempt to establish whether there is a correlation between SMEs’ AC and their IT adoption strategies employed by SMEs in Kenya. It suggest that AC plays a critical role in the performance of SMEs in Kenya. The study provided sufficient evidence for us to endorse the fact that those SMEs that possess strong AC have superior IT adoption strategies in comparison with their counterparts that had low levels of or weak AC. The researchers submit that, if exploited, AC has the potential to improve the IT adoption strategies of SMEs in Kenya and those of other developing countries that operate within similar environments.

39. Zafar, et al. (2014), discusses the role of technology innovation in competitive advantage and its barriers for businesses due to which they are unable to reach the level of achieving competitive advantage and their inability to add value in their businesses in developing countries, with the help of case studies and literature review.
40. Chairoel, L., et al., (2015), the study concluded that Majority of SMEs show limited usage of ICT adoption in business activities because of both internal and external factors. The study found that the characteristic of technology, organization and managerial are included as internal factors in adopting ICT. In the meantime, environment factors also are includes as the external factor. The influence of ICT adoption pays contributions on the efficiency and effectiveness of the organization. The adoptions of ICT in business activity give the impact on SMEs business processes. Furthermore, the use of ICT also show impact on organization performance or in general contributions to organization, including cost saving, expanded markets, additional sales, reduced costs, time saving, productivity, profitability and market value. This research considers organizational performance as both operational performance and financial performance as well.