Abstract and Introduction
SMEs are defined as enterprises which have at most 250 employees and an annual turnover not exceeding 50 million Euros. In 1990 growth is being seen in SMEs using computing with a little change in their management staff. It is known that when IT was not very common all the records were on papers but after 1990 when internet was introduced and everyone was taking benefits from IT.

As a part of this research we have conducted interviews besides survey design. The researcher contacted Manager of North West Online. Who has provided a description and explanation for the benefits of the company achieved utilising IT application and services. It was interesting to know that how many other SME’s to be in touch either to develop or update their IT infrastructure. One other aspect lies in the fact that since North West Online is based on IT services to the client. It has given us a chance to analyse not only the North West Online but other SME’s who request services from it. The researcher has visited the take away to explore the possibility of introducing IT application services. Researcher interviewed takeaway manager to understand their requirements. Based on the gathered requirements, the researcher has proposed a software system which he feels can reduce the burden on their behalf and can save the time.

It was necessary to analyze all the received feedback using a well defined methodology. A number of factors were taken into consideration before we decided to plan and design a questionnaire. This questionnaire contained questions which are fully relevant to the area and can give a
complete insight of the selected SME’s. A great interest was shown in replying to our questionnaire by most of the SME’s. We have received a very fined and suitable feedback. A detailed discussion is included in this dissertation. Based on the received feedback we have concluded that IT is playing fundamental role to enhance SME’s performance and their further development. However there is a need to further elaborate on the use and the benefit of IT applications within this sector. We have found where some of the SME’s are fully equipped with IT infrastructure and Application tools. On the other side there good number of SME’s lack in such functionalities. We recommend a program could be run to create awareness of Information Technology role in Small to Medium Size Enterprises. Such program will also assist in reducing work load and to enhance overall production efficiency.

1. Introduction

This work therefore studies Information Technology in the context of Small to Medium Size Enterprises. Rest of this work is organised as follows, in section 2, literature review is presented. An analysis of Information Technology in the context of SMEs is detailed in section 3 whilst conclusions and future work are covered in section 4.

2. Literature Review

Details of the Factors which appear to be most prevalent in the implementation of Information technology are as follows.

2.1. Environmental Factors

There are three factors associated with the environmental factors which are as follows.

- Positive Aspects
- Negative Aspects
- Critical Analysis

Environmental factors refer to the barriers which are caused by the geographical location, cultural and economical conditions of a country as well as the mindset of the people living in the country. Broadly the environmental factors can be split in to the following variables.

- Competitive pressure from other Information technology adopters within the industry.
- Government rules and regulations.
- Variable market or customer base for Information technology.
• Availability of the right partners/vendors with whom to work.
• Supplier readiness for electronic business.

2.2. Knowledge Factors
Knowledge factors relate to executive knowledge and experience, employee expertise, recognition of needs and opportunities, and exposure and experience with technology and change management. Knowledge appears to be the most prevalent of the other factors. It is desired that the head and CEO of organizations implementing information technology should have significant working knowledge of the new technology and people must see the need for change and understand the reason for its existence. Knowledge factors have further three major sub-variables that keep companies from adopting the information technology. These are as follows,

• Application related knowledge barrier refers to the lack of working knowledge of information technology.
• Technology related knowledge barriers refer to the lack of knowledge on part of the people to foresee how a technology can make a change and the reason why it needs to exist.

Other factors that might play some role in different phases of implementation are,

• Change experience refers to employee experience with making major changes.
• Executive experience refers to owner/manager experience with computers and Information technology applications.
• Innovativeness involves willingness of an organization to adopt new technology.
• Availability of models of successful industry use.
• Perceived need for change or implementation of information technology applications.
2.3. Organizational Factors

Similar to the environmental factors, there are three factors falls in this category.

- Positive Aspects
- Negative Aspects
- Critical Analysis

The third category is the organizational factors which relate directly to the availability and use of internal resources. These factors usually refer to the organizational size, type of products and services they deal in, capital, human resources, efficiency, priorities and profitability. The major organization factors which pose barrier to the implementation of an information technology and are categorized as follows:

- Availability of technical expertise which include staff and consultants with the IT skills.
- Priority relative to other projects that require existing resources and time.
- Employee reduction which refers to the resulting reduction in number of employees.
- Projected profitability of Information technology.
- Access to capital for start up.

2.4. Technology Factors

The fourth and the final factor effect the implementation and adoption of the information technology applications. Generally technology related factors refer to and includes availability, cost, security, reliability and capabilities. The most important of the technology related factors are categorized as:

- Cost of technology setup and maintenance.
- Information Technology for selling products and services online.
- Access to network services or infrastructure to information technology applications.
• Reliability of information technology applications.
• Security issues.
• Existing technology availability.

3. Evaluation and Discussion

3.1. Interview Findings and Discussion

In this section we present concluded remark in the light of the received feedback based on the provided questionnaire. It is extremely important to analyse received feedback with a view of abstraction relevant information this information will then be collected together to summarise key findings of the conducted research. We understand without analysing each and every question of the questionnaire it is not possible to collect and concede necessary aspects of this project. In this context each question is separately analysed and present with a backup of graphs and tables where ever appropriate.

3.2. Introduction to North West Online

North West Online offers the full range of media services and is listed on the business links suppliers register. It offer solution range from website to Ecommerce, web site observation, CMS/CRM systems, internet and extranet and software development for multinational organisations. The company is known to develop a unique website fit with one requirement and can gain high ranking the major search engines. These types of web sites are known as bespoke website. they develop tesco website uses the latest search engine optimising to ensure the good search engine ranking the company bespoke websites are design to be easy to use and compaline to w3c web standards.

North West Online can create both online and offline database systems. They have a wealth of experience in design development and implementation of all database solution including Dotnet software solution of all sizes from ecommerce systems to large multisize to multinational organisations by combining modern technologies with company established system design they are able to layer cutting edge programming and consultancy.

North West Online has vast experience in providing high quality ecommerce systems for clients for their studio of Liverpool.
Content OCRAM is a web-based application that automates many of the day-to-day activities that form part of running a typical small to medium-sized business. OCRAM is different and at a fraction of the price of large-scale solutions. Because it is a browser-based application, it only requires an internet connection and a web browser to run. On the other hand, content management systems allow simple, non-technical management of website content. Managing an effective website is a content process often involving many internal and external groups working in collaboration. The company has years of experience in the development of full-modular content management systems that are versatile enough to deal with customer requirements. Each solution is created through the reuse of existing code where possible, with specific systems quickly developed and integrated into the solution. By reusing generic modules and developing best book modules where required, customers can be sure to get the best possible solution.

3.2.1. Findings

In the light of our interview, the researcher has found out that the interviewed company is an established company that offers almost all the known application development. The following are the findings based on the discussion of the interview.

As a part of this research, we have conducted interviews besides survey design. The researcher contacted Mr. Amjad Shaheed, Manager of North West Online, who has provided a description and explanation for the benefits of the company achieved utilizing IT application and services. It was interesting to know how many other SMEs are in touch either to develop or update their IT infrastructure. More and more managers of the SMEs are attracting and gaining awareness of the IT role within SMEs. One other aspect lies in the fact that since North West Online is based on IT services to the client, it has given us a chance to analyse not only North West Online but other SMEs who request services from it. We have discovered that services almost all the services as part of the interview outcome are highly demanding in the SMEs.

**Web site Design**

The company offers websites which are designed and structured with search engine in mind. They design websites which are easy to use and fully compliant with W3C standards. They design websites from scratch and tailor their design to suit the client’s requirements.
website normally have high ranking on the major search engines. One important finding is about bespoke website applications which are unique website normally developing high ranking on the major search engines. These websites uses the latest search engine optimisation to ensure good search engine ranking.

**Database Website** the company has a wealth of experience of design and implementation of all database solution including dot net software solution of all sizes from ecommerce systems to large multisize multinational organisations. By combining modern technologies with their established experience they offer cut edge programming and consultancy.

**Content Management System** Through the years of experience have developed a full modular content management to deal with all customer requirements. The company reassure its customers to get the best possible solution by using generic modules and developing bespoke modules where required.

**Social Network Website Design.** Social networking is a growing element of websites. More users are expecting the same functionality as available on some of the known social networking websites, by combining various known features it is possible to integrate these features together in to project building brand loyalty and viewing product and services in to the lives of one’s customer. Researcher understands that the success of any social network is based largely on satisfying user’s experiences which keep users coming back. North West Online creates just that a visual design and information structure that encourages the social network that encourages the social aspect of online communities. North West Online has created social networks and online communities with varying functionalities.

**Intranet and Extranet.** In its most basic form in intranet is a website which is only accessible within a organisation. They would typically contain information relevant to the organisation. On the other hand the extranet is similar to the internet however the difference in the fact that it is accessible to the members of an organisation their suppliers and their customers. The purpose of an extranet is to extend efficiency in terms of production in supply chain. North West Online has experience in developing advance systems for corporate organisations and providing bespoke
solutions integrating existing companies’ processes and procedures. Any company from large corporations to small to medium organisations looking to distribution information more quickly throughout their organisation to benefit from the organisation. Intranet structure design and layout can easily be

**A case study blue apple contract catering**

Figure 1 [http://www.blue-apple.co.uk/](http://www.blue-apple.co.uk/)

North West Online develops an extranet site for blue apple contract chattering limited. In addition to holding financial information such as sales, purchasing, staffing hours, taking, the system dynamic functionality means adding a new contract or unit is literally a 30 sec task deliver over the intranet or private network delivery is free. There is no software cost for additional users, clients or new accounts. The flexibility of the systems enables head office to control suppliers and monitors hourly purchases and takings run reports create charts look up and user’s access via IP address, time of day, day of week, all combine with a password security. The user name and password systems allow different user level for different parities for example clients, staff, managers, area managers and head office.

**3D Design and Rendering** North West Online produce 3d renderings for a wide range of companies and individual weather you need a fly through to visualise and extension and to assess with planning permission or to sale develop a plan North West Online can help their 3d rendering, visualisation and photo realistic imaginary is accurate in is accurate in scale and will bring their customer plans to life. North West Online can create static photo pictures or full animated flythrough or walkthroughs s.
3D visualisation, rendering and flythrough case study. From the plans North West Online were sent they begin by creating a basic 3d model of a house with the propose extension, their clients were applying for planning permission for an extension of their cottage situated in green belt land the propose plan included the addition a friend porch as well as site and their extension. Their client expected that it would be difficult to obtain the permission they wanted and therefore leaded to build a storage case before planning permission. They used North West Online architectural rendering services to demonstrate the propose extension would not have an adverse affect on the green belt. The client provide them with plans of the propose extension along with photo graphs of existing area.

**Photography** North West Online offers photography services in house or on site. In their studio enhance photographer uses the latest cameras to ensure the images are of high quality. Images can be digitally enhance if required and supplied to the customer in any required format. Some of the sample images are shown below.

**Housing Software.** Crating a dynamic supporting people and housing software solution is been high on northwest agenda this year. They have been working with novice group to develop a flexible and housing support system. For the housing and support services organisation across its uk services the system as shown in the below figure is available for purchase on lease basis.

![Figure 2 Housing website](image)

The key advantage of this type of system focus around its flexibility and its web based development platform. The system is capable of running online via internet, intranet, extranet, virtual private network this eliminates licensing cost seen with other physical software products and means a central system amendment or update is instantly delivered across the network.

**Bespoke Supporting People and Housing Software Solution.** Northwest online has
now gain considerable knowledge in the construction of knowledge of the novice system and the blue apple catering system by utilizing Microsoft net web for and web technologies they can built and deliver system over the internet that this comparable to desktop software application these system can have access level which allow administrator to know exactly what part of the system users can accessed. Key features include liability to add, remove or amend almost any part of the data a collection process including the type and validity of data collected. Liability to correct to collect accurate data in a dynamic environment allows administrators to set and track every information and easily respond to staff members.

**Key Performance Indication Software** The key performance software is available indication systems is available for outright purchase or lease developed originally for the housing and support organisation who had a requirement to run a KPI system. North West Online created an intrabase key performance indicated data bases to collect and manage the data from the remote locations. The administration module allows the client head office team to dynamically create the key performance indicator.

![Figure 3. Key performance indication software](image)

Data base to collect and manage the data from the remote location the administration module allows the client head office team to dynamically create the key performance indicators that the offices need to report on as well as allows the company to gather any financial and other useful information about the business in the matter of hours if required. The data base has a user friendly web bas interface. That allows each office to report their monthly key performance data to the head office. The data collected and reports are created to head office users to report the stakeholders. The system capable of running on any pieces or pda equipped with internet explorer eliminates licensing and installation cost.
associated with traditional software product this type of delivery also means systems amendments additional KPA’s or updates are instantly delivered across the system and to all users with no cost.

3.3. Introduction to Sky High Take away and Interview Findings

Sky High is a fast food take away and eats in. The customer’s order by phone to pick it up or they ask for the delivery to their home. Delivery driver delivers the order to their home, if a delivery order is placed. The researcher has visited the take away to explore the possibility of introducing IT application services. Researcher interviewed takeaway manager to understand their requirements. Based on the gathered requirements, the researcher has proposed a software system which he feels can reduce the burden on their behalf and can save the time. This software has much functionality and some of these are as follow.

When the customer order the food the customer name and address along with postcode comes there as the system is connected to the take away telephone via External modem. The history of the customer is also there, previous order and the number of times the customer order is also displayed and recorded. If it is a delivery then the system has preinstalled Map it tells the distance from the take away and shortest route. And at the end of the shift by click of one button the system gives the whole day sale, the deliveries done by different drivers and the overall sale of the shop.

In outcome, as the manager of this particular take approached with the above discussed idea, he decided to consider it but did mentioned that the phone he has, is already capable of saving the addresses of the customer and he is very much familiar to the area therefore he does not a map. He did agree that such system could be beneficial for almost SME’s which fall within the fast food business.

3.3.1. Survey Findings and Discussion

In this section we present concluded remark in the light of the received feedback based on the provided questionnaire. It is extremely important to analyse received feedback with a view of abstraction relevant information this information will then be collected together to summarise key findings of the conducted research. We understand without analysing each and every question of the questionnaire it is not
possible to collect and concede necessary aspects of this project. In this context each question is separately analysed and present with a backup of graphs and tables where ever appropriate.

It was important to find out the number of staff in SMEs. It could be well understood that the greater number of staff increases the possibility of possibility of IT application usage as more staff need more which can fulfil the demand of the type of job they do. In some cases having less staff members means less number of IT application used. It was also important to adopt a fair comments and observation policy during the evaluation. In view of the above explanation unless we determine the number of staff in SMEs. In the light of the received feedback we have discovered that the number of staff vary from 6 to 100 of the staff member. This further shows that SME's could operate on a small to larger scale. Received response could also be seen in figure 4.

![Figure 4. Question 1](image)

Type of company reveals the nature of the work of the SMEs. It is an important factor to discover as a part of this research since use of IT application as to some extend depends on the type of the work it does. Let say for instance if a company main function is to provide to work and travel information to work of the country where it is based. There is high probability that the company has either branches or deals on behalf in other part of the world in this case email, fax to email, video conferences, and the use of web is highly likely. On the other hand if the company operation limited to an area then less IT application will be used. We have discovered that the nature and the operation of SME's covers almost all the non productions which are commonly available in the market however there are
some which deals in certification and e-commerce.

This question is important to establish whether or not computing is in use within premises of SMEs. No doubt without which the concept and the purpose of this research will not stand. In order to evaluate IT role it is one of the basic requirement which must meet before any further work can be done. Response to this question shows that computer facilities are used in almost all the surveyed SME’s. Received responses could be seen in figure 5.

![Computer Facility Used](image1)

**Figure 5 Question 3**

This is to understand and collect both standard of IT application and their usage respectively. This will give us a clear indication about the type of IT application use in the selected surveyed SME. It is crucial to list all the IT application their level and using understanding of the staff. This question will direct us to draw findings and the recommendation of this research. We have discovered that different applications like email, internet, databases, Ecommerce etc are commonly used.

If an SME has trained staff it implies better understanding and usage of IT application. In addition, it could also be observed that in an environment with a lot of trained staff IT application is also current and demanding, with no doubt IT training is an important aspect it could reduce production cost and can enhance company overall efficiency. There was a mix response to this question some SME’s do have trained staff however training is one of the issues with one of the SME’s. Received response could also be seen in figure 6.

![Trained Staff](image2)

**Figure 6**
This question is related on the observation of both staff and director of SME. It is good to have something written on survey and then draw conclusion on the basis received feedback. However direct observation is something which in this particular case is preferable. It saves both the time and analytical skills of the researcher to have direct conclusion from the members and staff of a SME. It was discovered that everybody enormously agreed that computer has brought an ease and comfort in their day to day operation. Received response could be seen in figure 7.

![Graph](image)

**Figure 7, question 6**

Do you see any IT role in success of SME’s?

This question is the continuation of the question above in this question members of SME are asked to provide their observation as to what they think about the success of SMEs of the use of IT. It is sometime more feasible to draw concrete and solid results via direct observation then reported literature. IT may not bring the direct profit for the company but it makes the life easy. Most of the directors of SME’s are agreed that now a day’s IT is playing a major role in enhancing SME’s performance and production. Received responses could be seen in figure 8.

![Graph](image)

**Figure 9, question 7**

Do you think IT play major role in future use.

This question is asked as a summary of the previous question this will show understanding and feasibility of IT for SME through SME personnel. In the light
of the received responses this could be observed that everybody is in the view that IT will assess SME’s in meeting their future challenges. Received responses could also be seen in figure 9.

It is not sufficient to present previous study and observation in order to convince someone to bring in IT infrastructure in once company premises. Therefore once own understanding always play an important role. We have attempted to gather importance of IT infrastructure according to the understanding of SMEs owner. This idea is widely accepted and acknowledge by most of the surveyed SME’s. Received responses could be seen in figure 10.

From your experience can you suggest any IT application particularly needed in SME’s?

This question will have an identifying most common IT Application use in the SMEs. This will be helpful in concluding recommendation of this project. The received response was mix but most of them suggested databases and internet as some of the crucial applications within SME’s.

Is it fruit–full to spend on IT infrastructure in your company?

4. Conclusion and Future Work

We have designed as systematic procedure of data collection and it was collected using surveys these surveys contains meaning full questions to reflect the main research theme data was collected and analyse to abstract and to
compile the findings of the conducted research. It could well be seen in almost all of the survey answered everyone is agreed that the use of Information Technology is absolutely crucial and necessary not only in the growth but also for the smooth operation of SMEs.

As a part of this research we have conducted interviews besides survey design. The researcher contacted Mr. Amjad Shaheed Manager of North West Online. Who has provided a description and explanation for the benefits of the company achieved utilising IT application and services. It was interesting to know that how many other SME’s to be in touch either to develop or update their IT infrastructure. More and more managers of the SME’s are attracting and gaining awareness IT role within SME’s. One other aspect lies in the fact that since North West Online is based on IT services to the client. It has given us a chance to analyse not only the North West Online but other SME’s who request services from it. We have discovered that services almost all the services as the part of the interview outcome are highly demanding in the SME’s.

Data bases are normally used to maintain records and to reduce the proportion of old file system now a day’s data bases are taken as one of the necessary IT application this fact is based on the received survey feedback as mentioned one of the other factor is the use of internet, explanation of which might require a whole chapter however in summary it could be written that everybody in all the survey feedback agreed that use of internet now a days necessary both for the business output and to promote the business not limited to online bank transactions internet is seen as useful in offering sales and to further extend the company services using the company website.

It is interesting to know that those people who don’t have computer background have full and fair understanding of its usage. Everybody is well aware of application like Microsoft world, email, and World Wide Web in particular social websites to share their life with friends and colleague it won’t be wrong to say usage of the internet as the computing application enhanced both staff and the directors learning about different aspect of computer science. Some of the staff member are eager to step-up their exiting knowledge with some of the short courses. We have discovered ecommerce and
elective website of the company beside Microsoft word and email system are considered some of the necessary application required to in a Small to Medium size Enterprise.

We have identified and carried out a research which is directly to some extend related with our normal living. This research focused on IT application with in SMEs and focused on how well effective their usage within the selected environment the future work could also take in one of many directional and find out how the awareness and effectiveness of IT application can e increased in SMEs