

Understanding the Impact of End-User Characteristics in User Acceptance Testing Success



Internship Report
On
**Understanding the Impact of End-user Characteristics in User Acceptance
Testing Success**



Submitted to:

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Letter of Transmittal

10th March, 2014

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Subject: Submission of Internship Report

Dear Sir,

I have completed my internship report, titled “*Understanding the Impact of End-user Characteristics in User Acceptance Testing Success*”, as per your instructions, on Unilever Bangladesh Limited. It is based on my experience at the organization, during the tenure of my internship.

In writing this paper, I earnestly tried to keep it simple and reader-friendly for you and others who may feel interested to go through the prepared work. The information provided is accurate and true, to the best of my knowledge.

However, if any discrepancies or inconsistencies have presented themselves in the paper, I sincerely apologize for them and will be glad to clarify any confusion or answer any question.

Thank you.

Yours sincerely,

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Acknowledgements

At first, I would like to thank the Almighty for giving me the opportunity to study in one of the most renowned private universities of Bangladesh, BRAC University. Without the guidance and teachings provided by the faculty members of BRAC Business School, this paper would not have been possible. In addition, I got the rare opportunity of doing my internship under the finance function of Unilever Bangladesh Limited. The experience of working in Unilever, as well as the inputs provided by its employees, gave both structure and basis to the paper. I am eternally grateful to both the organizations and humbly acknowledge their contributions to this paper.

I would take this opportunity to convey my gratitude to those who have lent their cooperation in making this project successful. In this regard, firstly I would like to thank Mr. Jabir Al Mursalin, my academic supervisor for giving me the opportunity to work on this topic. His continuous assistance on the subject matter and instructions on how to mould the report were invaluable. Without his guidance and help, the conceptualization and preparation of this report would have been impossible.

Secondly, I would like to thank Mr. Tamzeed Ahmed, IM and PEX Lead of Unilever Bangladesh Limited, who acted both as my mentor and on-site supervisor. After completing my internship under his guidance, I was able to understand and analyze the system testing process of Unilever and hence prepare this report. Without the formal training on how things work and assistance in conducting the survey, that he so kindly provided, this paper would not have been possible.

Executive Summary

ERP (Enterprise Resource Planning) softwares are increasingly being used by businesses to streamline their operations. One of the leading ERP platforms is SAP and is used worldwide. Usage of softwares, be it a simple music player or an ERP software, requires updates and migrations. While the end-user only gets the final products in case of openware or commercial off the shelf software, ERP involves the end-user in the testing phase of the software development lifecycle.

The outcome of such tests determines the future performance of the technical solutions and so is incredibly important. However the success of the user acceptance test itself depends on some factors. This paper seeks to understand the impact of certain end-user characteristics on the success of system testing. The user characteristics of age, experience, management position and educational levels are tested for their effects on the level of motivation and participation in system testing. Based on the results the paper draws a conclusion on the employee characteristics that need to be considered to ensure user acceptance testing success.

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1.0 INTRODUCTION TO THE REPORT

1.1 Introduction

The report titled “*Understanding the Impact of End-user Characteristics in User Acceptance Testing Success*” has been prepared by Shahed Ehsan Siddique, on his internship experience in Unilever Bangladesh Limited. It aims to explore and understand what employee characteristics determine the success of user acceptance testing of the system testing process. The report has been prepared under the supervision of Mr. Jabir Al Mursalin and with the assistance of Mr. Tamzeed Ahmed.

1.2 Objective

The primary objective of the report is the completion of the internship programme of the author. Following the three months of internship, BRAC University requires an internship project. So this report has been primarily prepared to complete the internship requirements. The author completed his internship from Unilever Bangladesh Limited, from the Information Management sub-function of Finance.

The secondary objectives of the project include the provision of an in-depth understand of SAP and system testing and an assessment of the impact of end user characteristics on system testing success. To do these, the paper first closely examines the uses of SAP and the benefits of system testing and then focuses on the concerned processes and protocols in Unilever Bangladesh Limited. This mainly involves system testing during project Minerva – a server and data base migration.

The impact of end user characteristics on system testing success is the main objective of the research part and sheds light on how some user attributes affect the success/failure of system testing. This helps determine which factors the group leaders should take into account, when setting up an ERP testing team.

1.3 Scope

The scope of the project is limited to the testing team of Unilever Bangladesh Limited. The team includes employees from Dhaka Corporate Office and Chittagong Factory. However, it will not be wise to generalize the findings for other companies in Bangladesh or even other subsidiaries of Unilever. This is because ERP systems and especially SAP is tailored for each company/subsidiary’s individual need and varies from instance to instance. So the results of the project apply only to Unilever Bangladesh Limited.

Furthermore, the system testing in the project relates partial testing of all processes and system under the Minerva project. Since this was a database and server migration, it did not involve a complete examination of all the processes. So the impact of employee characteristic can only be generalized to user acceptance system of similar ERP tests. ERP tests can be for routine check-ups, version update, system migration or changes or additions to existing modules.

1.4 Methodology

The report has been prepared using data from both primary and secondary sources. The background information on SAP and system testing has been taken from secondary research on previous internship reports, online resources and Unilever materials. The impact of end user characteristics on the success of user acceptance testing have been determined based on a primary research. A survey with thirty-five respondents was conducted inside Unilever Bangladesh Limited for this purpose.

The analysis of the primary result findings has made using Statistical Package for the Social Sciences (SPSS). Analysis includes frequency tables and hypothesis testing. The tests were run in SPSS and the results transferred to this paper. These findings can later be used for future researches on system testing and how its success is determined.

1.5 Limitations

Like any other project, this one also faced certain limitations during its preparation stage. The tenure of the internship was not long enough to have a full understanding of project Minerva. Some of the migrations are still to come when the report is written and some were being transported to the live environment. This limited the scope of the project and also the accessible resources for primary research.

Another limitation presented itself when conducting the survey for this report. The foundation of this report was laid down towards the end of the year 2013 and every year the employees of the organization take their annual leave during the period. So the survey had to be conducted after some time. This put a time gap between the survey and the event being studied (system testing) and maybe responsible for some of the variations in the result.

2.0 ORGANIZATIONAL OVERVIEW

• 2.1 History of Unilever

William Hesketh Lever founded Lever Brothers in 1885. Lever established soap factories around the world. In 1917, he began to diversify into foods, fish, ice cream and canned foods businesses. In the 1930s, Unilever introduced improved technology to the business. The business grew and new ventures were launched in Latin America. The entrepreneurial spirit of the founders and their caring approach to their employees and their communities remain at the heart of Unilever's business today.

Unilever was formed in 1930 when the Dutch margarine company Margarine Unie merged with British soap maker Lever Brothers. Both companies were competing for the same raw materials, both were involved in large-scale marketing of household products and both used similar distribution channels. Between them, they had operations in over 40 countries. Margarine Unie grew through mergers with other margarine companies in the 1920s.

In a history that now crosses three centuries, Unilever's success has been influenced by the major events of the day – economic boom, depression, world wars, changing consumer lifestyles and advances in technology. And throughout they've created products that help people get more out of life – cutting the time spent on household chores, improving nutrition, enabling people to enjoy food and take care of their homes, their clothes and themselves.

Through their timeline one can easily see how UBL's brand portfolio has evolved. At the beginning of the 21st century, 'Path to Growth' strategy focused on global high-potential brands and 'Vitality' mission is taking them into a new phase of development now. Unilever's corporate vision – helping people to look good, feel good and get more out of life – shows how clearly the business understands 21st century-consumers and their lives. But the spirit of this mission forms a thread that runs throughout their history.

• The Unilever Timeline

1885	-	Although Unilever wasn't formed until 1930, the companies that joined forces to create the business we know today were already well established before the start of the 20th century.
1899		
1900	-	Unilever's founding companies produced products made of oils and fats, principally soap and margarine. At the beginning of the 20th century their expansion nearly outstrips the supply of raw materials.
1909		
1910	-	Tough economic conditions and the First World War make trading difficult for everyone, so many businesses form trade associations to protect their shared interests.
1919		
1920	-	With businesses expanding fast, companies set up negotiations intending to stop others producing the same types of products. But instead they agree to merge -
1929		and so Unilever is created.

1930 1939	- Unilever's first decade is no easy ride: it starts with the Great Depression and ends with the Second World War. But while the business rationalises operations, it also continues to diversify.
1940 1949	- Unilever's operations around the world begin to fragment, but the business continues to expand further into the foods market and increase investment in research and development.
1950 1959	- Business booms as new technology and the European Economic Community lead to rising standards of living in the West, while new markets open up in emerging economies around the globe.
1960 1969	- As the world economy expands, so does Unilever and it sets about developing new products, entering new markets and running a highly ambitious acquisition programme.
1970 1979	- Hard economic conditions and high inflation make the 70s a tough time for everyone, but things are particularly difficult in the fast-moving consumer goods (FMCG) sector as the big retailers start to flex their muscles.
1980 1989	- Unilever is now one of the world's biggest companies, but takes the decision to focus its portfolio, and rationalise its businesses to focus on core products and brands.
1990 1999	- The business expands into Central and Eastern Europe and further sharpens its focus on fewer product categories, leading to the sale or withdrawal of two-thirds of its brands.
2000 Present	- The 2000s start with the launch of Path to Growth, a five-year strategic plan, sharpened in 2004 with Unilever's Vitality mission focusing on the needs of 21st century consumers. In 2009, Unilever announces a new corporate vision - working to create a better future every day - and enters the 2010s with a new strategy: The Compass. To support this strategy, the Unilever Sustainable Living Plan is launched in 2010.

• 2.2 Unilever Logo

In 2005, Unilever decided to change their logo to represent their new theme of vitality. The new logo was also planned to coincide with the 75th anniversary of the company. The new logo tells the story of Unilever and vitality. It brings together 25 different icons representing Unilever and its brands, the idea of vitality and the benefits Unilever brings to consumers.

The icons are represented below.



Sun: The primary natural resource. All life begins with the sun- the ultimate symbol of vitality. It evokes Unilever's origin in port of sunlight & can represent a number of Unilever brands.



DNA: The double helix. The generic blueprint of life and a symbol of bioscience, it is a key to healthy life. The sun is the biggest ingredient of life and DNA is the smallest.



Bee: Represent creation, pollination, hard works and bio diversity. Bees symbolize both environmental challenges and opportunities.



Hand: A symbol of sensitivity, care and need. It represents both skin and touch.



Flower: Represent fragrance, when seen with the hand, it represents moisturizing cream.



Hair: A symbol of beauty and looking good. Placed next to the flower, it evokes cleanliness and fragrances; placed near the hand it suggests softness.



Palm tree: A natural resource, it produces palm oil as well as many fruits. Coconut and dates also symbolize the same.



Spoon: A symbol of nutrition, tasting and cooking.



Bowl: A bowl of delicious smelling food. It can also represent a ready meal, hot drinks or soup.



Spice & Flavors: Represent chili or fresh ingredients.



Fish: Represent food, sea or fresh water.



Sparkle: Clean, healthy and sparking with energy.



Bird: A symbol of freedom. It suggests relief from daily chores, getting more out of life.



Recycle: Part of commitment to sustainability.



Lips: Represent beauty, looking good & taste



Ice-cream: A treat, pleasure or enjoyment.



Tea: A plant or an extract of a plant, such as tea, also a symbol of growing and farming



Particles: A reference to science bubbles and fizz.



Snowflake: The snowflake represent freezing, a transformational symbol.



Wave: Symbolize cleanliness, freshness and vigorous icon. (With the clothes icon)



Liquid: A reference to clean water and purity.



Container: Symbolizes packaging- a pot of cream associated with personal care.



Clothes: Represent fresh laundry and looking good.



Heart: A symbol of love, care and health



Sauce or Spread: Represent mixing or stirring. It suggests blending in flavors & adding taste.

• 2.3 Unilever Bangladesh Limited

Unilever Bangladesh Limited (UBL) is the leading Fast Moving Consumer Goods Company (FMCG) in Bangladesh with a heritage of 50 years and products that are present in 98% of Bangladeshi households. UBL is a Joint Venture of the Government of Bangladesh and Unilever, one of the world's leading suppliers of fast moving consumer goods with strong local roots in more than 100 countries across the globe. Unilever holds 60.4% share in UBL.

UBL started its journey in Bangladesh with the production of soaps in its factory in Kalurghat, Chittagong. Over the years the company introduced many affordable brands which won the hearts of Bangladeshis all across the country. UBL is the market leader in 7 of the 8 categories it operates in, with 20 brands spanning across home and personal care and foods.

Its operations provide employment to over 10,000 people directly and indirectly through its dedicated suppliers, distributors and service providers. 99.8% of UBL employees are locals with a large number of local UBL employees now working abroad in other Unilever companies as expatriates.

Unilever believes in ambitious growth of the business while at the same time fostering a sustainable environment. They believe the two must be related and hence sustainability is placed at the heart of everything they do. Their philosophy of 'Doing Well by Doing Good' is captured in the Unilever Sustainable Living Plan (USLP).

Some of the initiatives under USLP in Bangladesh are:

- ❖ Lifebuoy Lifesaver Program – a Lifebuoy initiative to reduce child mortality through Handwashing.
- ❖ Oral Health & Hygiene Awareness Programme – led by Pepsodent, this school-based activation program aims to reach 4,00,000 children with its dental checkups and awareness.
- ❖ Lifebuoy Friendship Hospital - Launched in March 2002 in association with the humanitarian organization "Friendship", the hospital is situated on a boat with a

dedicated medical team and reaches out to people who do not have access to proper medical facilities.

- ❖ PureIt: Launched in 2010, PureIt is a water purifier which aims to provide safe drinking water to 2 million people by 2015. It has already reached a million people by 2013.
- ❖ Pollydut: these are young, unemployed youth of the villages of Bangladesh whom UBL has incorporated into their distribution network to provide them with a livelihood.
- ❖ Aporajita – In association with CARE Bangladesh, UBL has created a sustainable business opportunity for rural women in the form of Aporajita. Aporajitas are recruited to sell UBL and other company products, door-to-door. Over 2,500 Aparajitas earn their living by selling UBL products.
- ❖ Project Laser Beam (PLB) – PLB started in 2010 a pilot project between (Global) Unilever Foundation and WFP, targeted towards eradicating child hunger and malnutrition. Today the project includes multiple partners such as WaterAid, Friendship, Care and Brac that work across four pillars – Nutrition, Water, Health and Hygiene and Livelihood.

Manufacturing Facilities

The Company has a Soap Manufacturing factory and a Personal Products Factory located in Chittagong. Besides these, there is a tea packaging operation in Chittagong and three manufacturing units in Dhaka, which are owned and run by third parties exclusively dedicated to Unilever Bangladesh.

• **2.4 Mission of UBL**

Unilever's mission is “To Add Vitality to Life”. They meet everyday needs for nutrition; hygiene and personal care with brands that help people feel good, look good and get more out of life.

• **2.5 Vision of UBL**

“To make cleanliness a commonplace; to lessen work for women; to foster health and contribute to personal attractiveness, in order that life may be more enjoyable and rewarding for the people who use the products.”

• **2.6 Brand Portfolio**

Unilever has a portfolio of about 400 brands globally. However many of these are region-specific that can only be found in certain countries. The number of UBL's existing brands is 19 which are categorized in different sections. In Bangladesh the company operates in four distinct product categories. These are outlined below:

❖ **Food and Drink**

- *Brooke Bond Taaza*
- *Knorr*

❖ **Home Care**

- *Rin Power White*
- *Surf Excel*
- *Vim*
- *Wheel*

❖ **Personal Care**

- *Axe*
- *Clear*
- *Closeup*
- *Dove*
- *Fair & Lovely*
- *Lifebuoy*
- *Lux*
- *Pepsodent*
- *Pond's*
- *Rexona*
- *Sunsilk*
- *Vaseline*

❖ **Water Purifier**

- *Pureit*

• **2.7 Organizational Structure**

Unilever Bangladesh Limited has five departments to carry out all the organizational functions. Each department is led by a functional director. These departments are:

1. Customer Development Department, headed by Customer Development Director (CDD)
2. Brand Building Department, jointly headed by the Brand Building Director (Home Care & Foods) and Brand Building Director (Personal Care) (BBD)
3. Supply Chain Department, headed by the Supply Chain Director (SCD)
4. Finance Department, headed by Finance Director (FD)
5. Human Resources Department, headed by the Human Resources Director (HRD)

Finance Department

The Finance Department is headed by Mr. Vivek Anand. The main objectives of this department are to serve all the division and departments of the companies, to secure and safeguard company assets and interest, to ensure proper internal control within the company and above all, to be cost effective in order to get optimum benefit for the company.

The department consists of four levels of employees. The first level of the functional hierarchy consists of non management staff. These workers report to Level One Managers, who form the second stage. They in turn report to Level Two Managers, who directly report to the Finance Director.

Broadly speaking the department has seven sub-functions, which are:

- ❖ Finance Control
- ❖ Business Unit (BU) Finance
- ❖ Supply Chain (SC) Finance
- ❖ Customer Development (CD) Finance
- ❖ Corporate Risk Control
- ❖ Tax
- ❖ Legal
- ❖ IT

These are illustrated in an organogram in the appendix.

• 2.8 SWOT Analysis

SWOT Analysis is used to evaluate the strengths, weaknesses, opportunities and threats of a company. Strengths and weaknesses are internal factors which the firm can control. Opportunities and threats are external factors that are beyond an organization's control. Unilever Bangladesh Limited's SWOT analysis is listed in the table below.

Strengths	Weaknesses
• Diverse brand portfolio and product range • Strong and efficient distribution channel • Economies of scale in production • Long term presence in Bangladesh • Substantial Research & Development	• Limited localized marketing and advertising • Higher price levels than local substitutes • Not all SKUs are profitable • Limited selection of Unilever products available in Bangladesh.
Opportunities	Threats
• Growing demand for home and personal care items • Growing demand for product varieties • Growth potential in rural areas • Attractive prospects for Unilever Foods Solution • Growing exposure from CSR	• Growing number of local competitors • Customer preference for foreign products • Local competition from global competitors • Consumers are becoming value-conscious.

3.0 INTERNSHIP EXPERIENCE

• 3.1 Job responsibility

As an intern of Unilever Bangladesh Limited, I had some specific and concrete job responsibilities. I was assigned as an intern to the Information Management (IM) and Finance Process Excellence (PEX) Lead, Mr. Tamzeed Ahmed, so my job responsibilities were mostly related to Information Management and Process Excellence. These included:

❖ SAP On-boarding

A new joiner needs his/her own SAP ID to carry out his/her day-to-day work. This requires an on-boarding session for the new joiner. The line manager of the new employee contacted me and requested a new SAP ID. In collaboration with the line manager, I determined which course modules he/she will need as there are separate ones for each function and position. I then contacted the key user who is currently using these modules on a regular basis, and set up an on-boarding timeline. I then forward the relevant PowerPoint presentations, Hands-on-Assessment and MCQ Questions to the key user for conducting the session and assessing the new joiner. Once completed, the key user filled up a License to Operate (LTO) form, which the new joiner's line manager approved, and sent it to me. I then forwarded the completed form to the Local Authorization Coordinator (LAC) who completed the process by placing a request for a new ID.

❖ Processing Change Requests (CRs)

The SAP system is a dynamic one, which needs to be changed with modifications in the local legislations (eg.VAT), regional specifications, reporting standards, etc. However, before such a change can be made, it needs to be tested in a separate test environment. In response to various tickets raised by regional and local offices, the Central Authority Board design and forward a Change Request (CR) and forward it to the Change Management (CM) coordinators. Once I received the CRs, I requested for a test script, had it not been provided, and forwarded it the functional key user responsible for testing. Since the testing was done in a separate test environment, sometimes I needed to send for a password reset request, had the key user forgotten his/her password. I then followed up with the key user and ensured that he/she tested the CR within the given time. After successful testing, I sent the sign-off form to CAB, completing the process.

❖ Business Excellence activities

Business Excellence tasks involve integrating the test-related activities in the employees' job specifications. First I mapped the business excellence structure by identifying the Process Champions (PCs) and Key Users (KUs) for each function/track. Once this was approved by the Business Excellence lead, the line managers of the respective process champions and key users were notified about their subordinates' added responsibilities. This included any CR or system testing and other business excellence activities. I also downloaded the Key Performance Indicators (KPIs) for each track monthly, and sent it to the respective process champions. One particular KPI tracked my own performance. The on-boarding KPIs matched the number of on-boardings completed against the number of new joiners. I have been able to keep the particular KPI green during the tenure of my internship.

❖ **Monitoring My Business Information (MBI)**

My Business Information (MBI) is a global online 'one stop shop' (library) of standard Unilever management reports. It acts as a single point of access for continuous reports. It replaced the existing report distribution methods such as e-mail, sharepoints etc. In Bangladesh, publishers from various departments upload different reports on a daily, weekly, monthly and quarterly basis. There are two separate KPIs that monitor performance of each country in MBI. The first is used to track if the reports are published on time. To keep this KPI green, I was responsible for notifying and following up with the publishers before the due date. In case of their inability to publish the reports in time, due to some other business priority, I had to ensure that they send a mail, stating the reason for delay, with the line manager in cc. I then forwarded the mail to the regional MBI team, asking them to exclude the report from that month's on-time publication KPI. The second KPI tracked the access rate for each report. Each report has a standard number of hit counts which need to be reached in every month, to ensure flow of knowledge and business continuity. In case any reports did not reach the required number of hits, I requested the relevant users to download them again or downloaded them myself to complete the target.

❖ **System Testing**

During the length of my internship, Unilever was changing their central servers from Oracle to DB2. This involved a system migration and so each and every single aspect of the four systems had to be tested. Two such system migration testing was conducted during my internship period. Firstly, I compiled the list of testers who will need access in the test system that was specially opened for the migration. Then in the User Acceptance Testing (UAT) phase, all the aspects of the system were tested according to a preset plan and any anomalies where escalated to the regional team. I was responsible for giving a weekly update to the regional team and at the same time, following up with the local testers and key users.

• **3.2 Experience**

I started my internship from 1st September 2013 and finished on 30th November 2013. During these three months, Unilever Bangladesh Limited provided a unique and pleasant experience. Their work environment is such that everybody has a part to play, no matter how small. Their best attributes according to me is the informal atmosphere and work flexibility. The informal atmosphere helped create a rapport with my supervisor and other employees, who I worked with on a regular basis. For example, I often discussed football (English Premier League) with my supervisor, and it helped create a friendly relationship between us. The second best attribute was work flexibility. There were a number of strikes and blockades during the tenure of my internship. When there was a serious lack of public transportation, my supervisor gave me the option to work from home. During blockades the office gave over an hour early so that all the employees could reach home safely. We even had to notify our supervisor on safely reaching home, which showed a great deal of compassion and care from the side of Unilever.

My closest colleagues during the internship were of course the other interns. There were interns from East West University, Jahangirnagar University, North South University and BRAC University. We were a closely knit group and often spent time together after office. We helped one another with work when needed, but there was some competition too.

However, as I was the only intern in the Finance Department, I was free of such competitive runs.

All in all, it was a great experience for me. It was my first taste of a corporate atmosphere and I will remember and cherish it for years to come.

• 3.3 Learning Outcome

My internship experience at Unilever Bangladesh Limited provided me with several important learning opportunities. In a broad sense, I have learned corporate etiquettes, interpersonal skills and several other important values such as persistence and conscientiousness. These will definitely help me in my future endeavors. The experience has also taught me some organizational subject and specific issues. I learned about all the different SKUs (Stock Keeping Units) that Unilever Bangladesh Limited has. I learned about its organizational hierarchy, and its position relative to other markets of Unilever. I often had to contact with my regional counterparts, and it taught me more about Unilever's way of business in other countries.

On a different note, it has also taught me a lot about Information Management and Finance. I learned about SAP and the four SAP solutions that Unilever uses. During the various CR and system testing, I caught a glimpse of how the system actually works and what it involves. I learned about the whole value chain from beginning to end and how Information Management makes the whole system more smooth and cohesive. I also learned about Finance by dealing with the various reports in My Business Information. Towards the end of my internship, I was responsible for making the primary sales target report for the following month and it was the highlight of my learning experience.

• 3.4 Personal Recommendation(s)

I would like to offer a few recommendations to Unilever Bangladesh Limited, about their internship program. Unilever does indeed offer its interns a truly rewarding experience. Interns add value to the organization, through their work, which is both illuminating and intrinsically rewarding to the interns. However, interns are usually not invited to the various functional and public relation programs. Including them will only add to their motivation, as they will feel like a true part of the organization. In addition, interns are also not given the free samples that all the other employees get. At any one point of time there are a maximum of 5-6 interns, so giving them the free samples that everybody else gets will not cost the company anything at all.

During the system migration testing, I discovered that most of the testers have very little motivation in conducting the testing. They postpone it till the last moment, and do it only to save face at the last moment. A probable cause of this is the fact that such testing is given in addition to their core responsibilities. Furthermore, there never is any recognition or reward given to them for doing this. So I would like to recommend that the testing process be made more user-friendly and their efforts be recognized for what they are worth.

4.0 PROJECT

• 4.1 Introduction to the Project

The project titled "Understanding the Impact of End-user Characteristics in User Acceptance Testing Success" has been prepared based on the inputs of the employees Unilever Bangladesh Limited. System testing is an integral part of any Information Management System, as a system evolves to cater to the changing needs and usage patterns of its users. Unilever's Information Management system is a SAP based system, which has been developed by Accenture. Like all others, the system needs a version or database update from time to time. Such changes entail elaborate end-to-end testing of the processes, to ensure system continuity and performance in the new environment.

End-to-end system testing requires coordination and planned execution from all the concerned key users. However the motivation and participation of the key users in conducting such tests depend on a variety of factors. This project will in turn discuss about information system and system testing, outline the user acceptance testing process of Unilever Bangladesh Limited and discuss some end-user characteristics which usually affect testing success (defined in terms of key user motivation and participation). Finally the project will test if those factors do in fact affect testing success or not, by using statistical techniques and offer some recommendations.

• 4.2 Project Objective

The primary objective of the project is to comprehend the impact of various end-user characteristics on the success of user acceptance testing. It is nearly impossible to identify and list all the employee characteristics that may affect system testing. In the same way, the success of system testing can be defined in one of several ways. Thus the project requires a specific few end-user characteristics and a concrete measure of system testing success. The end-user characteristics that are being considered in this project are:

- ❖ Employee Age
- ❖ Years of Information System Experience
- ❖ Management Position
- ❖ Educational Level

These characteristics have been chosen based on some literature review of previous researches. This project will test if these factors affect system testing success or not, with the help of hypothesis testing. The success of user acceptance testing depends on the performance of the concerned key users. The performance of the key users and hence the success of system testing depends on:

- ❖ Employee Motivation
- ❖ Employee Participation

In short, this project will assess the degree to which the four employee characteristics mentioned above affect the success of system testing, as measured by motivation and participation.

On a more specific note, the paper will test the following 08 hypothesis:

- ❖ Employee motivation in ERP testing team is greater among young employees
- ❖ Employee participation in ERP testing team is greater among young employees
- ❖ Employee motivation in ERP testing team positively correlates with length of employee experience
- ❖ Employee participation in ERP testing team positively correlates with length of employee experience
- ❖ Employee motivation in ERP testing team is greater among managers than non-management employees
- ❖ Employee participation in ERP testing team is greater among managers than non-management employees
- ❖ Employee motivation in ERP testing team is greater among higher educated employees
- ❖ Employee participation in ERP testing team is greater among higher educated employees

• 4.3 Project Methodology

As stated earlier, the employee characteristics and system testing success factors were determined based on literature review. Once the variables were determined, a questionnaire was developed to gather data (attached in Appendix). A sample of thirty-five (35) Unilever Bangladesh Limited employees were selected and they provided the necessary information. The questionnaires were given to employees in both the Corporate Office in Dhaka, and sent by e-mail to Kalurghat Factory, Chittagong. To ensure proper representation, respondents belonging to different departments and management levels were chosen.

Once the results were gathered, the data was entered in SPSS (Statistical Package for Social Sciences) and 8 hypothesis tests were run. Based on the output, the effect of the various employee characteristics on the success of system were determined. The project also offers some recommendations on system testing, based on the inputs given by the respondents. A separate open-ended question was included in the questionnaire for this purpose. This can provide insights for future research on the matter.

The project also provides some background on SAP and its applications, the SAP systems used by Unilever, the need and benefits of system testing and the different phases of system testing at Unilever Bangladesh Limited. These information were taken from various primary and secondary sources, a list of which is included at the end of the paper.

• 4.4 SAP

○ 4.4.1 Background

SAP stands for Systems, Applications and Products. SAP by definition is the name of the ERP (Enterprise Resource Planning) software as well as the name of the company. The company was established by Wellenreuther, Hopp, Hector, Plattner and Tschira in 1972. SAP system comprises of a number of fully integrated modules, which covers virtually every aspect of the business management. Usage of SAP enables a company to track and manage all their business activities, i.e. sourcing, production, warehousing, sale, data management, finance, etc.

A SAP system is made up of different components. The components in turn can be further broken down into modules that are specially designed for different functionalities. All these modalities are centrally connected however, meaning a transaction in one module will be visible in the entire system. For example, a purchase order made by the Supply Chain department in its own module will be visible to all the relevant stakeholders. Not everybody can view all the available data however, as access is restricted according to individual job descriptions.

○ 4.4.2 Benefits

Using a SAP system gives a company the following benefits:

- ❖ *Ability to integrate and standardize operations and data* – SAP uses a common software infrastructure to centralize and integrate core business functions. This eliminates disconnected operations and double/multiple processing.
- ❖ *Connectivity with the business network* – The SAP framework enables integration of both ancillary internal and external systems with the central system. This enables a business to synchronize and streamline its activities with the various stakeholders.
- ❖ *Better business insight* – SAP provides access to sensitive and critical data in real-time. Generating real-time reports help managers to track and manage all revenues, cost and cash flows, providing a better business insight.
- ❖ *Built-in Customer Relationship Management Functionality* – Customer and vendor data is made accessible in a standardized format by SAP platform. This gives a wholesome view of customers and enhances sales and services.
- ❖ *Global Footprint* – Companies with a global footprint need to cater to a host of region-specific requirements. SAP has been made available in 40 country-specific versions for multinational giants that have operations in multiple countries.
- ❖ *Flexibility to Adapt to Changing Needs* – SAP's architecture is highly flexible, meaning that it can be customized and molded according to changing business needs. The system allows the addition of functionalities from more than 550 add-on solutions.

● 4.5 SAP in Unilever Bangladesh Limited

SAP was introduced in Unilever Bangladesh Limited in 2010. Accenture helped with the implementation of SAP in the region of South Asia. The implementation project was named U2K2. It is a program of business transformation that aims to achieve the “Serve, Grow, Deliver” vision by enabling the One Unilever operating framework across the region.

In a paper titled “*U2K2 Project and SAP Execution*”, Md. Javed Bin Faruk explains the full form of U2K2. According to him, U2 (Unity2 ASIA-AMET = Unity2AA = Unity 2 = U2) aimed to implement new common business processes with a regional SAP roll-out. U2 delivered a common set of business processes, standards, master data and quality information in a timely fashion, all of which will aimed at improving the speed of decision making.

K2 was a major business transformation program. This relocated some executive functions and key resources to Singapore and also involved the conversion of the Singapore based Regional Headquarter to an operating company – Unilever Asia Private Limited (UAPL). A regional trading unit which will service all countries across AsiaAMET was also set-up within the Supply Chain hub to manage the cross border flows of raw materials and finished goods.

Unilever Bangladesh uses four different components of SAP. They are:

- ❖ APO (Advanced Planner and Optimizer) is a planning tool which is used to plan and optimize supply chain processes.
- ❖ BW (Business Warehouse) is a data warehousing/mining solution for reporting and analysis purposes
- ❖ ECC (Enterprise Central Component) consists of various modules including planning, supply management, production, sales, finance, control, etc.
- ❖ SNC (Supply Network Collaboration) provides a medium for collaborating with vendors and customers.

• 4.6 System Testing

According to softwaretestingclass.com, system testing is the testing of the behavior of a complete and fully integrated software product, based on the software requirements specification (SRS) document. The main focus of this testing is to evaluate Business / Functional / End-user requirements. In addition, businessdictionary.com states that System testing is usually required before and after a system is put in place. A series of systematic procedures are referred to while testing is being performed. These procedures tell the tester how the system should perform and where common mistakes may be found.

System testing is central to the success of any information system. Several reasons make system testing a crucial step in quality management process. According to exforsys.com:

- ❖ In the software development life cycle, system testing is the first level where the system is tested as a whole.
- ❖ The System is tested to verify if it meets the functional and technical requirements.
- ❖ The application/system is tested in an environment that closely resembles the production environment where the application will be finally deployed.
- ❖ System testing enables one to test, verify and validate both the business requirements as well as the application architecture

• 4.7 System Testing Process at Unilever Bangladesh Limited

During the tenure of my internship at Unilever Bangladesh Limited, the company has undertaken a project named Minerva. The purpose is to strategically host the SAP landscapes on a global platform where landscape can be built on global capability instead of programs' own hardware silo. Minerva program covered a new platform for SAP landscape as well a database migration. Previously the company used Oracle's database which were to be migrated to DB2. A change in the company's central server meant that all the components had to be individually tested.

Broadly the entire process was divided into three stages due to the high level of complexity:

- ❖ Minerva BW Migration
- ❖ Minerva ECC & SNC Migration
- ❖ Minerva APO Migration

Minerva project was undertaken for the following reasons:

- ❖ To ensure higher productivity through improved system performance
- ❖ To increase availability and reduce downtime
- ❖ To support global initiatives through convergence and standardization
- ❖ To support the company's growth strategy via capacity on demand
- ❖ To provide financial transparency to what technology costs
- ❖ To reduce energy consumption by consolidating workload
- ❖ To ensure resource sharing, creating reduced run costs

In spite of the fact that the migration was divided into three different parts, all of them followed a similar approach. Each of the migration process was broken down into five parts:

- ❖ Preparation – The live system is refreshed over a sandbox environment. A system migration is made to the sandbox environment. The ERP CoE (Enterprise Resource Planning Centre of Excellence) team conducts initial internal tests and bug fixes.
- ❖ UAT - The live system is refreshed over a UAT (User Acceptance Testing) environment. A system migration is made to the UAT environment. All live countries then conduct UAT.
- ❖ PVT – In PVT (Production Validation Testing), all the changes are transported to UAT environment after refresh. Then PVT is carried out by ERP CoE.
- ❖ Go Live – The changes are migrated to the live system.
- ❖ Intensive Care – A period of close observation where emergency tickets are fixed and all remaining systems are migrated.

The same workflow applied to the three Minerva migrations. However each followed a different timeline. Minerva BW Migration was undertaken first and I had the opportunity to coordinate the entire project. Minerva ECC & SNC Migration is a work in progress and therefore is partially covered by this paper. Minerva APO Migration is to be undertaken in early 2014 and therefore falls outside the scope of this research.

• 4.8 Minerva BW Migration

After conducting initial testing and bug fixes in a sandbox environment, the ERP CoE Team asked us to prepare for UAT. Firstly we made a list of all the people who will conduct the testing from our end and sent it to the support team. The team provided access and new passwords for the usernames of all the testers. The UAT itself was broken down into three parts:

- ❖ *Report Test* - BW is a data warehousing/mining solution that presents the data in a more user-friendly format, in the form of spreadsheets. Data was copied from the live BW environment (B2P) to the BW UAT environment (B2Y) till a certain date, in this case till 16th June 2013. Similarly data was also copied from the live ECC environment (R1P) to the ECC UAT environment (R1Y). This was done because BW reports had to be matched with ECC data. However, as the data is constantly changing in the live system, any changes made after the specified date will lead to a data mismatch. The purpose of this test was to determine if data copied in the new BW environment was correct. Accordingly users were asked to match the BW reports in B2Y with their related data in ECC (R1Q). Unilever Bangladesh Limited tested more than 60 critical reports and found no anomalies.
- ❖ *Data Load Test* – BW pulls data from ECC everyday to generate real-time reports. The data flush happens automatically, once per day. The objective of data load test was to identify if the BW UAT environment was recognizing changes made in the ECC UAT environment. Firstly, users created new reports or made changes to existing reports in R1Y. The ERP CoE team was notified and they refreshed the BW data cube immediately. Users then logged into B2Y and checked if the changes made in R1Y are showing. Unilever Bangladesh Limited conducted four data tests and all of them were successful.
- ❖ *Interface Test* – Countries were also asked to check all inbound and outbound interfaces that are linked with BW. Bangladesh has only two inbound interfaces. This means that data flows into BW from two other inbound systems. They are DMS (Distributor Management System) which is used to track distributor inventory and Nucleus which is used to track vendor sales. To test these, a FTP server was configured and a dummy distributor inventory and vendor sales invoice was placed there. The IP address was shared with the ERP CoE Team, and BW data cube picked it up from that address. Later, the data in B2Y was matched with the files placed in the FTP server. In both the cases, interface test was successful.

• 4.9 Minerva ECC and SNC Migration

Unilever Bangladesh Limited is to roll-out SNC, so this became only a Minerva ECC Migration for the company. ECC includes many different modules including planning, supply management, production, sales, finance, control. So this was a complete end-to-end testing. Unlike Minerva BW Migration, the test plans were not set by ERP Team, but determined by each country. Unilever Bangladesh Limited decided to partially test all the processes, with a small number of test subjects. Accordingly, key users placed purchase requests for raw materials and packaging materials, for both local and foreign, in the test ECC environment (R2S). Purchase orders were created accordingly and released from Supply Chain. The orders were then sent to the make team for raising goods received. Quality management department of the make team checked and released the goods received.

On the other hand, the CD team generated sale orders. Internal orders and trade terms structures were also created in the test environment. The finished goods were distributed to the various depots and primary sales were recorded according to the orders created. Based on the generated figures, finance department conducted mock closing and generated a dummy profit and loss account. This completed the entire end-to-end testing of ECC.

UAT of Minerva ECC Migration also included four interface tests. Two of them were to test the bank collection process, where for one, the bank's interface was the source and for the other, ECC was the source. The third tested internal order creation in IBP (Integrated Business Planning) and the last tested sales order creating DMS.

• 4.10 Research Findings

The research findings of the survey are given below. Firstly there are some frequency tables that describe the composition of the sample. Secondly the hypothesis test results are used to draw conclusions about the impact of end user characteristics on user acceptance testing success.

Age of Respondent

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 20-29	11	31.4	31.4	31.4
30-39	18	51.4	51.4	82.9
40-49	6	17.1	17.1	100.0
Total	35	100.0	100.0	

The first table describes the age composition of the respondents. Of the thirty-five sampling units, 11 respondents are between 20 and 29 years of age (31.4%), 18 respondents are between 30 and 39 years of age (51.4%) and 6 respondents are between 40 and 49 years of age (17.1%).

Information System Experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0 - 4	11	31.4	31.4	31.4
5 - 9	16	45.7	45.7	77.1
10 - 14	4	11.4	11.4	88.6
15 - 19	1	2.9	2.9	91.4
20 - 24	1	2.9	2.9	94.3
25 - 29	2	5.7	5.7	100.0
Total	35	100.0	100.0	

The table at the bottom of the last page describes the information system experience composition of the respondents. Of the thirty-five studied, 11 respondents have an experience of 0 to 4 years (31.4%), 16 respondents have an experience of 5 to 9 years (45.7%), 4 respondents have an experience of 10 to 14 years (11.4%), 1 respondent has an experience of 15 to 19 years (2.9%), 1 respondent has an experience of 20 to 24 years (2.9%) and 2 respondents has an experience of 25 to 29 years (5.7%).

Management Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Work Level 1 Employee	28	80.0	80.0	80.0
	Work Level 2 Employee	7	20.0	20.0	100.0
	Total	35	100.0	100.0	

The above table describes the management composition of the respondents. Of the total thirty-five respondents, 28 respondents are work level 1 employees (80%) and 7 respondents are work level 2 employees (20%).

Educational Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduate Level	13	37.1	37.1	37.1
	Postgraduate Level	22	62.9	62.9	100.0
	Total	35	100.0	100.0	

The above table shows the educational composition of the respondents. Of all the employees who participated in the survey, 13 respondents have completed their graduation (37.1%) and 62.9% completed their postgraduate level of studies (62.9%).

The next part of the paper examines the eight hypotheses about which employee characteristics have an impact on the success of user acceptance testing. For each of the cases, the hypothesis to be tested is given first, followed by definitions of the null and alternate hypothesis. The tables generated from SPSS follows, finishing off with the determination of which hypothesis stands, based on the alpha value.

Please note that the alpha value is taken as 0.05 and the confidence interval is taken as 95%. In six of the cases, independent sample T tests are conducted. On the other two, the testing is done based on the significance level of bivariate correlation.

1. Employee motivation in ERP testing team is greater among younger employees.

So the null and alternate hypotheses are defined as:

$$H_0: M_{YE} \leq M_{OE}$$

$$H_1: M_{YE} > M_{OE}$$

Where M stands for motivation, YE for younger employees and OE for older employees

For this test, the cut of point is 40 years of age, meaning those under 40 are considered as younger employees while those above are considered as older.

Group Statistics

Age of Respondent	N	Mean	Std. Deviation	Std. Error Mean
Level of Motivation ≥ 40	6	3.0000	.89443	.36515
< 40	29	1.9655	.98135	.18223

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.000	.998	2.381	33	.023	1.03448	.43445	.15058	1.91838
Equal variances not assumed			2.535	7.715	.036	1.03448	.40810	.08733	1.98163

As significance value of Levene's Test for equality of variances is 0.998 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.023. Since this is a one-tailed test, the value is halved to (0.023/2) 0.0115. As the significance value of 0.0115 is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee motivation in ERP testing team is greater among younger employees than the older ones.

2. Employee participation in ERP testing team is greater among younger employees.

So the null and alternate hypotheses are defined as:

$$H_0: P_{YE} \leq P_{OE}$$

$$H_1: P_{YE} > P_{OE}$$

Where P stands for participation, YE for younger employees and OE for older employees

For this test, the cut of point is 40 years of age, meaning those under 40 are considered as younger employees while those above are considered as older.

Group Statistics

Age of Respondent	N	Mean	Std. Deviation	Std. Error Mean
Level of Participation >= 40	6	2.5000	.54772	.22361
< 40	29	1.5172	.68768	.12770

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.721	.402	3.279	33	.002	.98276	.29976	.37290	1.59262
Equal variances not assumed			3.817	8.629	.004	.98276	.25750	.39641	1.56910

As significance value of Levene's Test for equality of variances is 0.402 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.002. Since this is a one-tailed test, the value is halved to (0.002/2) 0.001. As the significance value of 0.001 is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee participation in ERP testing team is greater among younger employees than the older ones.

3. Employee motivation in ERP testing team positively correlates with length of employee experience.

So the null and alternate hypotheses are defined as:

$$H_0: R_{ME} \leq 0$$

$$H_1: R_{ME} > 0$$

Where R stands for correlation coefficient between employee motivation and length of employee experience

Correlations			
		Years of IS Experience	Level of Motivation
Years of IS Experience	Pearson Correlation	1	.352*
	Sig. (1-tailed)		.019
	N	35	35
Level of Motivation	Pearson Correlation	.352*	1
	Sig. (1-tailed)	.019	
	N	35	35

*. Correlation is significant at the 0.05 level (1-tailed).

The one-tailed significance value is 0.019. Since this is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee motivation in ERP testing team positively correlates with length of employee experience.

4. Employee participation in ERP testing team positively correlates with length of employee experience.

So the null and alternate hypotheses are defined as:

$$H_0: R_{PE} \leq 0$$

$$H_1: R_{PE} > 0$$

Where R stands for correlation coefficient between employee participation and length of employee experience

Correlations

		Years of IS Experience	Level of Participation
Years of IS Experience	Pearson Correlation	1	.392**
	Sig. (1-tailed)		.010
	N	35	35
Level of Participation	Pearson Correlation	.392**	1
	Sig. (1-tailed)	.010	
	N	35	35

** . Correlation is significant at the 0.01 level (1-tailed).

The one-tailed significance value is 0.010. Since this is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee participation in ERP testing team positively correlates with length of employee experience.

5. Employee motivation in ERP testing team is greater among managers than non-management employees.

The organizational structure of Unilever Bangladesh Limited is such that there are no non-management employees involved with system testing. Non-management staffs mostly work on the factory floor. Employees begin as Level 1 managers (includes executives, assistant managers, etc) and after a certain number of promotions, become Level 2 managers (line managers of Level 1 managers). So instead of management employees and non-management employees, the comparison is made between Level 1 and Level 2 managers

So the null and alternate hypotheses are defined as:

$$H_0: M_{L2M} \leq M_{L1M}$$

$$H_1: M_{L2M} > M_{L1M}$$

Where M stands for motivation, L2M for Level 2 Managers and L1M for Level 1 Managers

Group Statistics

Management Position		N	Mean	Std. Deviation	Std. Error Mean
Level of Motivation	Level 2 Managers	7	2.8571	.89974	.34007
	Level 1 Managers	28	1.9643	.99934	.18886

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.026	.872	2.152	33	.039	.89286	.41496	.04861	1.73710
Equal variances not assumed			2.295	10.059	.044	.89286	.38899	.02682	1.75889

As significance value of Levene's Test for equality of variances is 0.872 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.039. Since this is a one-tailed test, the value is halved to (0.039/2) 0.0195. As the significance value of 0.0195 is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee motivation in ERP testing team is greater among managers than non-management employees. More accurately employee motivation in ERP testing team is greater among Level 2 managers than Level 1 managers.

6. Employee participation in ERP testing team is greater among managers than non-management employees.

So the null and alternate hypotheses are defined as:

$$H_0: P_{L2M} \leq P_{L1M}$$

$$H_1: P_{L2M} > P_{L1M}$$

Where P stands for participation, L2M for Level 2 Managers and L1M for Level 1 Managers

Group Statistics

Management Position	N	Mean	Std. Deviation	Std. Error Mean
Level of Participation Level 2 Managers	7	2.1429	.69007	.26082
Level 1 Managers	28	1.5714	.69007	.13041

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.783	.383	1.960	33	.059	.57143	.29161	-.02185	1.16471
Equal variances not assumed			1.960	9.247	.081	.57143	.29161	-.08556	1.22842

As significance value of Levene's Test for equality of variances is 0.389 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.059. Since this is a one-tailed test, the value is halved to $(0.059/2)$ 0.0295. As the significance value of 0.0295 is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee participation in ERP testing team is greater among managers than non-management employees. More accurately employee participation in ERP testing team is greater among Level 2 managers than Level 1 managers.

7. Employee motivation in ERP testing team is greater among higher educated employees.

The employees are divided into two groups: those with a postgraduate degree and those with only a graduate degree. Obviously those with a postgraduate degree are considered as more educated than those who have only completed their graduation.

So the null and alternate hypotheses are defined as:

$$H_0: M_{PG} \leq M_G$$

$$H_1: M_{PG} > M_G$$

Where M stands for motivation, PG for employees with a post graduate degree and G for employees with a graduate degree

Group Statistics

Educational Level		N	Mean	Std. Deviation	Std. Error Mean
Level of Motivation	Postgraduate Level	22	2.4091	1.09801	.23410
	Graduate Level	13	1.6923	.75107	.20831

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.694	.202	2.078	33	.046	.71678	.34495	.01497	1.41860
Equal variances not assumed			2.287	32.149	.029	.71678	.31336	.07861	1.35496

As significance value of Levene's Test for equality of variances is 0.202 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.046. Since this is a one-tailed test, the value is halved to (0.046/2) 0.023. As the significance value of 0.023 is lower than the alpha value of 0.05, the null is rejected.

Thus there is enough evidence to suggest that employee motivation in ERP testing team is greater among higher educated employees.

8. Employee participation in ERP testing team is greater among higher educated employees.

So the null and alternate hypotheses are defined as:

$H_0: P_{PG} \leq P_G$

$H_1: P_{PG} > P_G$

Where P stands for participation, PG for employees with a post graduate degree and G for employees with a graduate degree

Group Statistics

Educational Level		N	Mean	Std. Deviation	Std. Error Mean
Level of Participation	Postgraduate Level	22	1.7273	.76730	.16359
	Graduate Level	13	1.6154	.65044	.18040

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.644	.428	.440	33	.663	.11189	.25432	-.40552	.62930
Equal variances not assumed			.459	28.743	.649	.11189	.24353	-.38637	.61015

As significance value of Levene's Test for equality of variances is 0.428 which is greater than the alpha value of 0.05, equal variances are assumed.

The two-tailed significance value when equal variances are assumed is 0.663. Since this is a one-tailed test, the value is halved to (0.663/2) 0.3315. As the significance value of 0.3315 is higher than the alpha value of 0.05, the null is accepted.

Thus there is not enough evidence to suggest that employee participation in ERP testing team is greater among higher educated employees.

So in conclusion, this research led to the following findings:

- 1. Younger employees are more motivated to do ERP system testing.**
- 2. Younger employees are more participative in ERP system testing.**
- 3. A positive relation exists between IS experience and testing motivation.**
- 4. A positive relation exists between IS experience and testing participation.**
- 5. Higher level managers are more motivated to do ERP system testing.**
- 6. Higher level managers are more participative in ERP system testing.**
- 7. More educated employees are more motivated to do ERP system testing.**
- 8. More educated employees are not more participative in ERP system testing.**

5.0 Recommendations

The findings part can be used to draw recommendations about the composition of an ERP testing team. In addition to that, the survey contained an open-ended question on how the system testing process can be improved. The following recommendations are drawn from the respondents' response to the question.

As system testing requires the engagement of multiple employees from different functions, a common platform and coordinated effort is required to ensure UAT success. Often individual employees are asked to test certain codes in the system by their line managers. Without an understanding of the entire picture, it is extremely difficult to conduct a proper test. Also when testing requires a multi-step approach, an information gap often exists due to segmented testing. This problem came into attention in the last end-to-end system testing, where each employee was doing their individual parts, but due to a lack of coordination, it was difficult to determine the completion rate or what exactly the next person needs to do.

Often the time given for testing is inadequate and clashes with other deadlines such as month-end reporting and closing. This creates pressure on the employees as testing activities are given in addition to their regular day-to-day activities. The end result is that most employees half-heartedly test the required systems, without proper concentration or attention to detail. So when scheduling system testing, the ERP CoE team should take into account factors like timeline, other deadlines, work pressure, etc. If possible, it should be planned around month-end closing and reporting and other routine activities that are of critical business importance.

Another recommendation that came up in the survey was the request for practice runs in the system before Go Live. Often, only the person who conducted the system test knows about the exact changes and when the changes are implemented in the live system, the other users face various problems. This can be avoided by implementing a period of dry runs in the test environment, where all the users understand and acknowledge the changes to be implemented, before they are to be transported to the live system. This can help reduce the number of remedy tickets raised and hence the number of user education incidents.

6.0 CONCLUSION

System testing is a necessary process for those organizations that use ERP (Enterprise Resource Planning) software in their business. The success of such testing depends on a variety of factors. This paper started out to determine the impact of employee characteristics on the success of user acceptance testing. The employee characteristics of age, experience, management position and educational level were studied and their effects determined on the employees' motivation and participation in system testing. Based on the findings, the following conclusions are drawn:

- Employee motivation in system testing is greater among younger employees.
- Employee participation in system testing is greater among younger employees.
- Employee motivation in system testing and experience are positively correlated.
- Employee participation in system testing and experience are positively correlated.
- Employee motivation in system testing is greater among managers.
- Employee participation in system testing is greater among managers.
- Employee motivation in system testing is greater among more educated employees.
- Employee participation in system testing is not greater among more educated employees.

So in conclusion, in order to build an ERP testing team that is more motivated to do system testing, managers should focus on including, people who are comparatively younger, have more information system experience, are in an upper management position and have completed higher education.

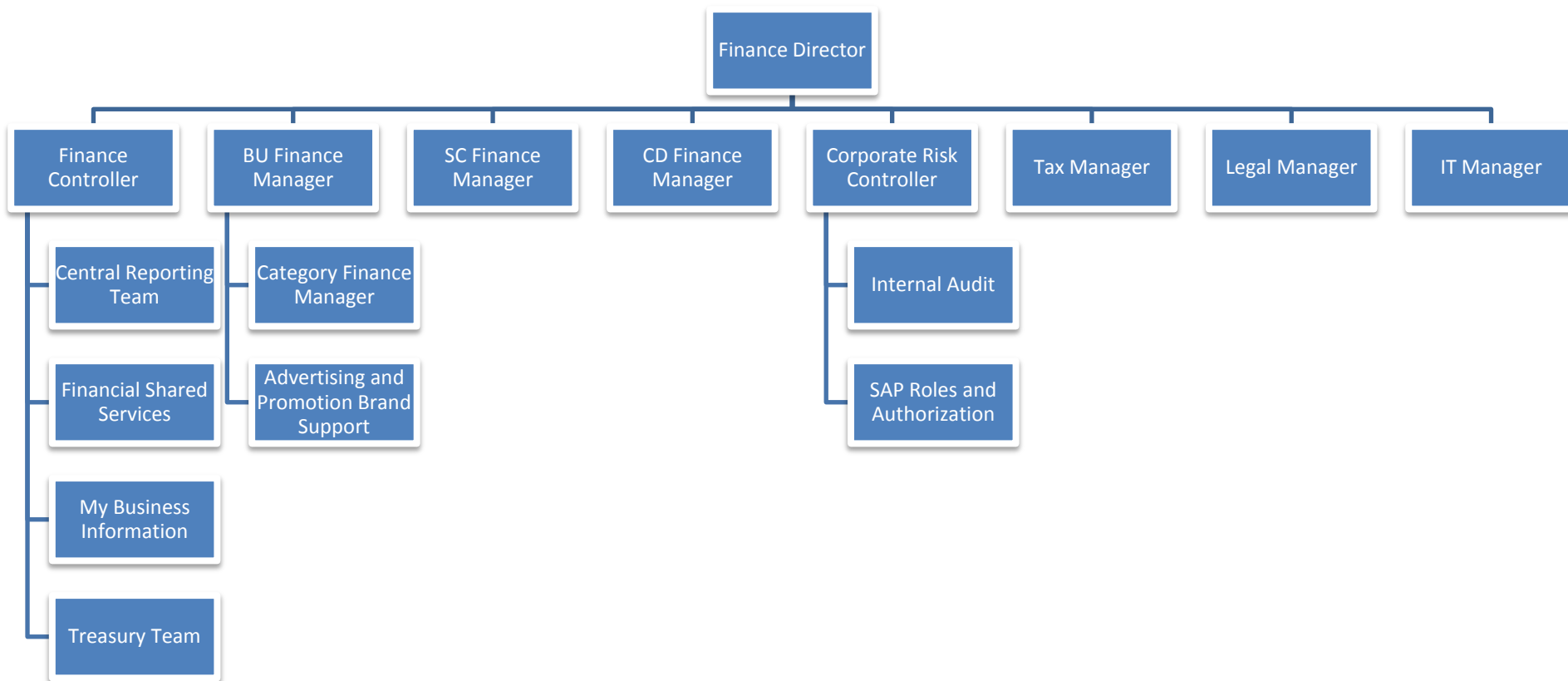
On the other hand, in order to build an ERP testing team that is more participative in system testing, managers should focus on including, people who are comparatively younger, have more information system experience, and are in an upper management position. There is no conclusive evidence to suggest that employee participation and education level is related.

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8.0 APPENDIX

1. Organogram of Finance Department of Unilever Bangladesh Limited
2. Questionnaire used in survey to collect data



Impact of Employee Characteristics on System Testing

I am a student of BRAC University and I recently completed my internship from Unilever Bangladesh Limited. I am required to submit a report on it and for this purpose I am conducting a research to study the impact of employee characteristics on system testing.

Disclaimer: Your responses will be kept confidential and used for academic purposes only.

- Please tick the correct answer or write your response in the space provided.

1. Your age:

20 – 40 years

40 – 60 years

60 + years

2. Years of Information System (IS) experience: _____ years

For how many years have you been working with various Information Systems (IS)?

3. Your Management Position:

Non-Management Staff

Level 1

Level 2

4. Level of Education Attained:

Graduate Level

Post Graduate Level

Others (Please Specify) _____

5. Your level of motivation in conducting the various system testing:

Highly Motivated

Somewhat Motivated

Neutral

Somewhat Demotivated

Highly Demotivated

6. The level of importance that you assign to such testing:

Very Important

Somewhat Important

Neutral

Somewhat Unimportant

Very Unimportant

7. Your suggestion(s) on how such testing can be improved:

Thank you for your cooperation.