**MUHAMMAD ALI JINNAH UNIVERSITY KARACHI**

**Department of Computer Science**

**The PACT analysis of Intelligent E-Learning System (IELS)**

**Course: Human computer interaction**

**Date: 30/March/2019**

**Submitted by:**

|  |  |
| --- | --- |
| **Name** | **ID** |
| Syed Ahmed Khan | SP16-BS-0072 |
| Farid Feroz Ali | SP16-BS-0077 |
| Assad Butt | SP16-BS-0016 |

**Abstract**

Learning is the long process of transforming information as well as experience into knowledge, skills, attitude and behaviors. To make up the wide gap between the demand of increasing higher education and comparatively limited resources, more and more educational institutes are looking into instructional technology. Use of online resources not only reduces the cost of education but also meet the needs of society. Intelligent e-learning has become one of the important channels to reach out to students exceeding geographic boundaries. Besides this, the characteristics of e-learning have complicated the process of education, and have brought challenges to both instructors and students. In this system we are taking one step towards a new family of e-learning systems. Our system aims to reduce the gaps between instructor and the learner and introduce a learner-centered approach to learning.

**PACT**

People are using technologies to undertake activities in contexts (Benyon, 2005). The acronym PACT stands for People, Activities, Contexts and Technologies. PACT was sprung out of the HCI concept and was thought to explicitly cover both social and technological aspects. PACT was a good way of ensuring that systems being evaluated were actually easy for people to use. Anderson (2011) writes that using a PACT analysis enables a greater understanding of existing systems. Since people use technologies in different contexts, the PACT framework was created to all the aspects of human-centered interaction. The PACT Analysis tries to see where activities are conducted with which technologies in different contexts. The variation of each of these four elements makes designing interactive systems challenging, but ultimately rewarding. Technologies will always be available to support everyone to perform activities and when new technologies appear, the way of performing the activities changes (Benyon, 2005).

1. **People**
   1. **Physical differences**

Physical differences cover the attributes of a human being such as height, weight, personality, cognitive behavior, person preferences and how these play a part in affecting the user of the experiences for a user. These are very important to consider when building a new system/device, in order to retain user and make it easier for a new user.

The physical location of the system is World Wide Web which can be accessed from anywhere if you have an internet connection.

It works all the same for a short, tall, fat or a thin user because these kinds of attributes won’t affect the usage of the system and are not taken in consideration but on the other hand cognitive behavior and personal preferences of a user play a big role in this system.

Learners are the people who are going to use this system. As our target area is higher education and specifically computer science domain in higher education. So, the potential users of this system are of a certain age group, from teenagers to people in their thirties may be. But the majority of the users are expected to be young people.

Cognitive level and personal preferences of individuals are different. This system expects some computer literacy from the users, familiarity with English language because the medium of the instruction is English. To start with everything is self-explanatory then through a series of questions system builds a user profile and recommend learning materials to satisfy the learners need and preferences.

IELS system is built for the usage of normal user. This system does not provide any special features for the disabled people. It is built on the general assumption that the user of the system would be a perfectly normal one with no issues of near or farsightedness or any other abnormality.

* 1. **Psychological difference**

People are psychologically different. They can be affected by simple things such as color, complex menus, complex configurations, a little feel of control and no tutorials. Some people can psychologically adapt to complex system quicker than others.

There is nothing complex about the usage of the system but respecting the psychological differences, IELS system will provide a tutorial to new users in order to get them familiar with the system or just guide them through the initial phase.

* 1. **social differences**

Social differences are the distinction made between social groups and persons on the basis of biological, physiological and social cultural factor. IELS is a neutral system when it comes to social differences, this system is designed to be as non-symbolistic as possible. A social difference wouldn’t be of that much consideration in this system as it is intended for anyone who wants to learn, out of passion or for academic purposes.

1. **Activities**
   1. **Complexity**

Complexity defines how well-defined the tasks are. If tasks are well-defined, it becomes easier for a user to manage by themselves, however, if they are vague, users more than often need help to complete a task.

The interface of IELS is simple and easy to follow. If the user has ever filled any online form or signed up to website before than it would be a cake walk for them. It asks new users to create an account, provide personal information and prior knowledge or educational background. Through a questionnaire (we are following VARK framework for identifying the user’s learning style), system will identify the learner’s learning style preferences and recommend learning material accordingly.

* 1. **Temporal aspects**

Temporal aspects cover how frequently certain activities are performed. Registering the system and creating an account is the one time job which is the first thing the user is asked to do. Now if you have an account the user profiling is a never ending process. Your profile will change according to your learning experience, feedbacks to the system and growing database.

Logging in is a frequent task as every time user visit the system he/she needs to login first before he/she can proceed further. Selecting a module is another frequent task and feedbacks of the content is a frequent task which is needed for the system to adapt accordingly.

* 1. **Cooperative features:**

There is no cooperative features in the IELS as its aim is to provide different contents to different learners, according to their learning preferences and knowledge level. So, this system does not provide any cooperative features. Learners can learn in groups using the content provided by IELS, but on the system level IELS treats every learner as an individual and generates contents to meet his (her) need and requirements.

**2.4 Nature of the data**

The nature of the content provided by IELS system is focused on text for now. For future developments other multimedia contents can be implemented to expand the scope of the system. So, for now IELS creates a user profile, identifies the learning style of the user and provides content accordingly. The contents are links to website where the user will find textual material on the knowledge unit broken up from a knowledge area.

1. **Context**
   1. **Physical environment:**

The physical environment is the actual place where the activity takes place. For instance; it might be outdoors, indoors, in a zoo or wherever. Physical environment also covers things like if it is sunny outside, raining and other natural aspects. (Benyon, 2005).

The physical environment for the IELS system is a web browser within a Windows operating system running on a computer hardware. If you have an internet connection and it is working than this environment is accessible from anywhere any time. The biggest advantage of e-learning systems are that they are not space and time constrained. Disadvantage can be that it won’t provide value to those who do not have a computer or a stable internet connection.

* 1. **Social context**

The social Context within which the activity takes place is also important. A supportive environment will offer plenty of help for the activity. There may be training manuals available, tutorials or experts to hand if people get into trouble (Benyon 2005).

For people who are not familiar with such systems there is an initial tutorial to make them familiar and guide them through the initial phases.

* 1. **organizational context:**

Organizational context is all about where you work. This means that you do your activities in different places, different times and so on. It also covers how technology changes communication and the way you work in an organization (Benyon, 2005).

As IELS is built with the sole purpose to provide personalized learning material to the learner and save them the time of meaningless web surfing to find relevant materials. Organizational context are not taken into consideration.

1. **Technology**
   1. **Input:**

The input devices that works best for the IELS are a simple QWERTY keyboard, a mouse or a touch screen panel. For future we could reconsider implementing a microphone for voice input and Braille keyboard technology to help out the handicap. Currently, the keyboard and mouse are sufficient enough input devices for it.

* 1. **Output:**

IELS outputs the extracted learning materials on a display screen for the users to click and reach the materials. Output screen is a simple interactive web page with textual contents and clickable links.

* 1. **Communication:**

The communication in technologies refers to how people communicate with devices. Communication includes things like bandwidth and speed. Equally important is how the system communicates back to the people (Benyon, 2005).

At the back end the system is communicating with almost the whole World Wide Web. But the user end is simple and abstracted. User communicates by creating a profile, giving necessary information, selecting a domain then a module and the system communicates in the form of contents considering the learner’s profile. Learner then gives feedbacks and the system adapts accordingly.

1. **References:**

[1] Benyon, David, Phil Turner, and Susan Turner. Designing interactive systems: People, activities, contexts, technologies. Pearson Education, 2005.

[2] Book4; Aleksandra Klašnja-Milićević Boban Vesin • Mirjana Ivanović Zoran Budimac • Lakhmi C. Jain E-Learning Systems Intelligent Techniques for Personalization.

[3] Eiman Aeiad & Farid Meziane An adaptable and personalized E-learning system applied to computer science Programmes design.