

PACT ANALYSIS REPORT

Student Attendance System

This report expresses the PACT Analysis for a Student Attendance System of a university which conducts IT postgraduate courses. It concerns People, Activities, Context and Technology aspects in the process for obtain a judgment about a design situation in building a human centered interactive system.

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PACT Analysis that focuses on People, Activities, Contexts, and Technologies is a useful framework which facilitates the designers to understand many aspects before rushing to a particular design. It helps to select the most suitable alternative design approach and leads to develop successful products.

1. PEOPLE ANALYSIS

The people would be the stakeholders of the attendance system. There are three types of stakeholders that could be recognized.

- **Primary Stakeholders (Directly uses the system)**

Academic Staff - Lecturers

Postgraduate Students

Administration - Course Coordinators

- **Secondary Stakeholders (Use occasionally or through an intermediary)**

Board of Management

- **Tertiary Stakeholders (Affected of use)**

Board of Directors

These stakeholders are differing from one another in a variety of ways. Following sections explain those differences.

1.1 Physical Aspects

Physical differences have a huge effect on making design decisions on accessibility and usability for the system.

Age: All the stakeholders are above 18 years and below 70 years approximately. Majority of the students would be around 25 - 35 years.

Gender: Both male and female are included among stakeholders.

Height: Average height of an adult.

Physical Ability: There would be rare occurrences of having students with special needs by means of speech, hearing and visual impairments, mobility problems. Apart from such exceptional situations, stakeholders are physically well.

1.2 Psychological Aspects

Psychological capability decides the learning curve for the system. The stakeholders would be degree level qualified people, so intellectually they are well above. Also they are in employment capacity. Overall they are well educated and could understand things and could adapt to changes.

1.3 Social Differences

Students and majority of the other stakeholders would be with IT backgrounds. English would be the common communication language among all the stakeholders and other local languages are also used accordingly. There would be a probability of having foreign students in less numbers.

2. ACTIVITY ANALYSIS

The overall purpose of the system is to capture the attendance of the students and use it for further analysis, while making the whole process convenient and comfortable to all the stakeholders. Following sections describe the activities and its tasks.

2.1 Capturing Attendance

When a student participates for a lecture or a practical session his attendance must be captured. This activity takes place in every postgraduate course for each subject it has. For each course there would be around 4-8 subjects in a semester and a student should do only 3-4 according to the year. Same lot of students would be in all the mandatory subjects of a semester in a particular batch. But when there are subject selections it would be different. Optional subject selection typically occurs in 2nd year of the batch. Also there would be students of other courses attending for a particular lecture (M.Phil. students).

This activity occurs in the Friday afternoon and weekends. So for a week, there would be around 3-4 times a student's attendance is captured and highest frequency is on Saturdays. Inaccurate or wrongful data capturing and missing of data should be avoided as it would mislead the analysis output and directs the decisions in wrong way.

In the attendance capturing activity, first task is to prepare the name list of students who need to participate for the lecture. It's a onetime task occurred in the beginning of the semester. If there are optional subjects in the semester, name lists can be changed after the semester started when selection process finalized.

2.2 Lecturer Confirmation

Lecturer should be aware of the attendance capturing of his lecture. The data which captured (students who attended, time slot held and place) should be available to the lecturer. A subject can be in-charged by many lecturers sometimes, so lecturers of the lectures in the same subject may vary.

2.3 Backup

The data captured in the attendance capturing activity should be archived in course wise, batch wise, semester wise and subject wise up to a specified period, because there might be students who have not complete the course in the allocated duration.

2.4 Attendance Monitoring

After a particular semester or a batch, attendance data which captured may be analyzed to make decisions on improve the course and its subjects.

3. CONTEXT ANALYSIS

Activities are always happened under a context. To describe this phenomenon there are three distinguishable useful context types that can be used. Following describes each of them.

- **Physical Context**

All the activities take place indoors. Presence of each individual who involved in the activity is necessary in the relevant moment, specially the presence of student in attendance capturing. But it shouldn't disturb the other students and the lecturer or administration.

If the restrictions were implemented for the student attendance and effect to the student performance, security of the data capturing is really important.

- **Social Context**

Student doesn't need to ensure his privacy on attendance data which captured. But lecturers should only be able to access student attendance data on subjects they are in-charged.

In the attendance capturing process, it shouldn't have long waiting queues because most of the students came for lecturers in first 10 minutes after lecture starts. So that kind of approach would be uncomfortable for students.

- **Organizational Context**

Any of the activity should not disturb the university working environment. Students and lecturers are directly communicate with the administration regarding attendance process. If there are students with special needs or foreign students, they shouldn't be discriminate from the process.

4. TECHNOLOGY ANALYSIS

When the name lists are prepared and lectures are scheduled, it is just the matter of capturing whether student has come or not for the lecture. So a small amount of data has to be entered quickly in the attendance capturing. Also the response should be instant in there. Output of the attendance analysis process which can be termed as a batch process, need to be effective output to make valuable decision.

Major role of the technology is to prevent the misuse, resource and effort wastage, unauthorized access and sabotage. In generally, technology can be defined as something used to implement preventive measures. Simultaneously it can make stakeholders more convenient, comfortable and effective. So following technologies are suggested to use and each have its pros and cons.

Technology	Advantages	Disadvantages
Signature Verification	<ul style="list-style-type: none">• No burden for students.• Cost effective.• Time effective.	<ul style="list-style-type: none">• Misuse (Impersonate).• Burden for the administration.• High inaccuracy.

Fingerprint Authentication	<ul style="list-style-type: none"> • High accuracy. • Less processing is needed. • No burden for all the stakeholders. • Prevent Impersonation. 	<ul style="list-style-type: none"> • Cost.
Face Recognition	<ul style="list-style-type: none"> • High accuracy. • No waiting times or queues. • Prevent Impersonation. • No burden for all the stakeholders. 	<ul style="list-style-type: none"> • High information processing. • Cultural Barriers and troublesome students behaviors. • Cost. • Missing data due to occlusion.
Card Readers	<ul style="list-style-type: none"> • High Accuracy. • Less processing is needed. • No burden for Administration. 	<ul style="list-style-type: none"> • Misuse (Impersonate). • Cost. • Burden for students (people may forget to bring the card).

If the cost is affordable, fingerprint authentication attendance system would be a ideal solution.