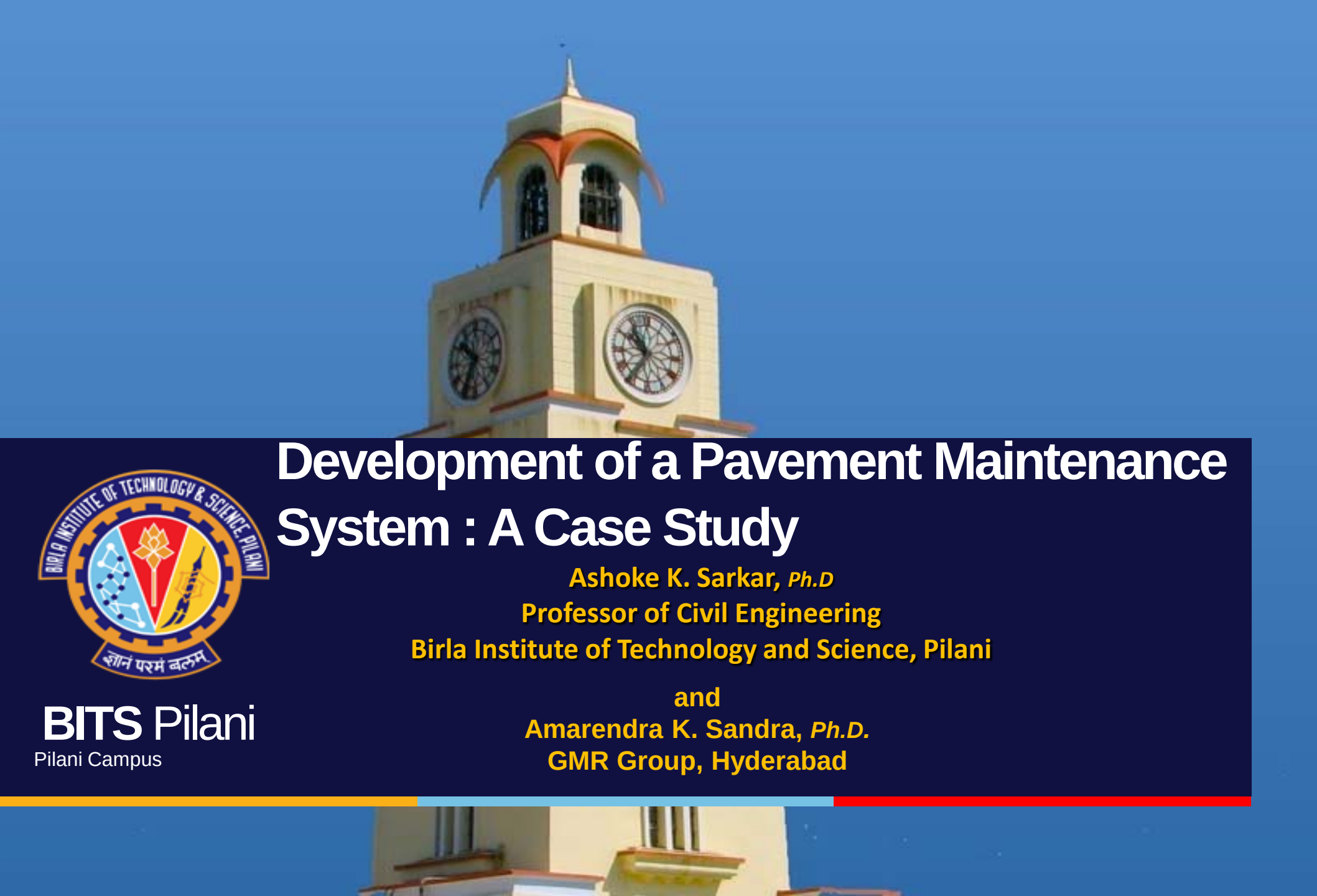

Development of a Pavement Maintenance System : A Case Study

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Need for the study

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- Functional condition of highway pavements deteriorates continuously due to
  - repeated loads of vehicular traffic
  - environmental factors such as temperature, snow and frost
- Number of countries have failed to maintain the roads properly not only due to lack of funds also due to absence of simple maintenance management system to use the funds effectively
- Though number of maintenance management systems are available in the form of comprehensive packages, but most of them require huge database.
  - History of pavement, which might not be easily available in India
  - Collection of data at frequent intervals

- There is a need to develop a system which follows the existing methods used for maintaining the roads by the Public Works Departments (PWD) in various states.

- It is also essential to develop a simple and user friendly software for maintaining the flexible pavement stretches by incorporating the prioritization, grouping techniques and roughness model.

Objectives of the Study

- To establish the relationship between road roughness with the causative distress parameters
- To prioritize the pavement stretches using appropriate prioritization technique
- To identify the homogenous road stretches through a clustering technique.
- To develop a practical network level pavement management strategy using the outcome of the above stages and develop a user friendly computer interface

Methodology

✓Methodology of the present study has been explained in the following steps

- Step 1: Selection and Identification of Pavement Stretches
- Step 2 : Pavement Condition and Pavement Roughness Surveys
- Step 3: Development of Relationship between Roughness and Pavement Distresses
  - Determination of natural or Initial Roughness
  - Development of Model between Roughness and Distresses

- Step 4: Prioritization and Grouping of Pavement Stretches
  - Prioritizing using Fuzzy Approach
  - Classifying the stretches into Manageable Number of groups
- Step 5: Development of a decision-making Software
  - Finding Rank, Predicting the Roughness and Grouping
  - Maintenance of Stretches Under Budgetary Constraints
  - Summary of Budget, Final Roughness and PSI Values

Case study in Rajasthan

- In total 858 stretches of 50m each were chosen from NH, SH and MDR in Rajasthan
- Distresses considered: cracking, pothole, ravelling, patching, rutting and edge failure
- Each distress was divided into three categories low, medium and high depending on severity.

✓ Weight on the distresses: Expert Opinion Survey

- Distress parameters which affect the condition of the pavement might not have same impact; hence, an expert opinion survey was conducted to ascertain the weights of the pavement distress parameters

- As it is difficult to express the weights in quantifiable terms experts were asked to send the responses in linguistic variables such negligible, low, moderate, high and very high