Preface

In modern times, where the use of computers have grown manifold; open sourcing is the best way to ensure that the software reaches a large number of users. The advantages of open source are a lot. While in closed source the internals of the program is intentionally hidden from the user; in open source the code is available to anybody. It enables the User to adapt the particular software for a unique problem. It also enables the unlimited tuning and improvement of a software product.

In the educational scenario, there is a lack of motivation, the students are seldom attracted to the mundane study materials provided to them. Such materials are developed in a routine manner, without keeping in view the individual needs of the children. Here also open sourcing is a way to provide an interactive environment for the children to access the educational material at their own pace.

Objectives

Keeping in view the above perspective; an ongoing project, Project OSCAR (Open Source Courseware Animations Repository) aims at creating a repository

![Figure 1: The GUI for searching the Repository in Project OSCAR](image-url)
The project OSCAR portal structure is illustrated in Figure 2. A brief explanation is also given below.

The Project OSCAR portal interface provides the User with facilities for

- searching available animations in the repository. For this no registration or logging in is required.
- registering as a Developer or Mentor.
- interaction between Registered Users (Developers and Mentors) with the OSCAR team or among themselves (once they login) for animation development support.

At present there are more than 100 registered developers and 25 mentors in Project OSCAR. Also available animations cover various categories with more than 50 animations.

The different categories which are now available with Project OSCAR is given in Figure 3.
Methodology

Project OSCAR methodology mainly involves:

- Identify Developers and Mentors

  **Developers:** These are either full-time project staff or students seeking a short-term or a long-term project.

  **Mentors:** These are teachers, course instructors or experts of different subjects. Mentors can suggest an animation to be developed which is then developed by the students/developers. The mentors can suggest modifications so that the animation serves its purpose.

- Identify the concepts to be animated.

  Each animation developed, is typically a Java Applet that focuses on one concept and provides the following through a platform-independent, web-interface:
a) A brief description of the concept, including relevant references.
b) An in-built animation, to explain the concept in detail.
c) An interactive animation, wherein the user defines the parameters.
d) Downloading of the source code, for "local" use/study/modification.

The interactive nature of these Java applets is the key difference from other types of animation, such as openoffice, powerpoint, flash etc.

- Develop the animations following a rigorous software engineering process. The steps involved are:

  a) Literature survey and selection of a concept.
  b) Requirement Specification of the Animations: Develop the design and description of the experiments that the user can perform with the animation in order to understand the concept.
  c) Design of the animation:
     Template design : The general layout of the applet is designed.
     Applet Design : Here the general layout of the applet is customised to suit the particular concept.
  d) Applet implementation
  e) Software design and the documentation.

- Get User feedback.
- Sequencing of the developed animations into a logical course.
- Collect animations from other sources.
Pre processing phase
Course plan per topic
Developer – mentor match

Conceptualisation Phase
Concept Analysis
Design Applet

Standard software engg. Phase
Requirement specification
Detailed Design
Implementation
testing

Submit into OSCAR

OSCAR Admin. Approval

Inclusion into live site and its announcement
Outcome

- The project will develop an open source repository of web-based, interactive animations for teaching.
- Enhance the features of the existing website of Project OSCAR
- Conduct workshops for students and teachers to familiarise the contents developed in Project OSCAR.
- Conduct competitions in applet development.

Schedule

The individual modules of the project can be enumerated as follows:

a. Identification of mentors who are the subject experts in the different subjects (viz. Physics, Chemistry, Biology and Mathematics)
b. Identification of concepts for which animations are to be developed. Categorising them into basic and advanced.
c. Development of animations for the subjects in the basic level.
   (Simultaneous development of animations in different topics is possible depending upon the available manpower)
d. Getting user feedback for the developed animations.
e. Suggesting experiments (suggest some predefined values of parameters and ask the user to observe the results).
f. Development of animations in the advanced level and their testing.
g. Development of related text explanations and documentation.
h. Sequencing of the developed animations into a logical course and integration with the multimodal repository.

Presently, the estimated project duration is one year. A Gantt chart of the time schedule is presented below. The tasks are labeled using the task enumeration above.

<table>
<thead>
<tr>
<th>TASK</th>
<th>0-2 Months</th>
<th>3-4 Months</th>
<th>5-6 Months</th>
<th>7-8 Months</th>
<th>9-10 Months</th>
<th>11-12 Months</th>
</tr>
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<tbody>
<tr>
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Budget

- Manpower, including research staff salary.
- Equipments including desktops, laptops, etc.
- Travel for National as well as International Conferences
- Organization of Training Workshops
- Honorarium to interns/mentors
- Consumables, contingency and institute overhead

<table>
<thead>
<tr>
<th>Item</th>
<th>Per Unit</th>
<th>No. of Units</th>
<th>Total (in rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>Rs. 40,000/-</td>
<td>10</td>
<td>4,00,000/-</td>
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<tr>
<td>Manpower: Proj. Manager</td>
<td>Rs. 12500/-  pm</td>
<td>1 x 12 months</td>
<td>3,00,000/-</td>
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<tr>
<td>Proj. Engineer</td>
<td>Rs. 7500/-  pm</td>
<td>12** x 12 months</td>
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<tr>
<td>Proj. Assistant</td>
<td>Rs. 5000/-  pm</td>
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<tr>
<td>Travel</td>
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<tr>
<td>Software, consumables, etc</td>
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</tr>
<tr>
<td>Contingencies</td>
<td>For one year</td>
<td></td>
<td>1,00,000/-</td>
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</tbody>
</table>

| Sub Total                |              |              | **22,00,000/-**   |
| Institute Overhead       | 15%          |              | 3,30,000/-        |

| Grand Total              |              |              | **25,30,000/-**   |

**: 3 Project engineers per subject (4 subjects viz. Physics, Chemistry, Biology and mathematics).