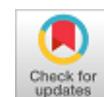


Learning pathway: Content Management and Identification of Student Behavior Through Online Learning Management in Java



Vinayak Hegde, Smruthi.G, Sahana Patil

Abstract: learning path in the online learning system refers to a series of objects which are structured to help students in improving their knowledge in a particular subject. Content is provided to the students and a proper path is set so there will not be any distraction or confusion while studying. In conventional way of teaching if the students would miss one session they will not be able to understand the next session and students will lose interest in the subject, the chances of failure will be more. By providing the content, students can understand the flow so they won't miss any topic and understand the subject. The session is provided so that the students can be tracked and they wouldn't miss any topic and score well. Admin will manage the content by adding or removing the content according to the technology and monitor the session time, teachers will get the information of students by admin and teachers will track the students, students will study the content. It is useful to identify the behaviour of the student through the tracking of the user session. Based on the time spent on the content the behavioural pattern of the students is predicted and analysed. The user is analysed based on the behavioural patterns like time spent on the content, skipping of content and the session time. It is hypothesized that the students will be able to get knowledge deeper and can master the subject. It is a web-based java tutoring system which provides an online platform for students. It provides appropriate content for students to learn and understand the concepts clearly.

Index Terms: Students behavior, page session time, content management, and Education data mining.

I. INTRODUCTION

Learning Paths are beneficial, we provide the proper content to students concerning specific domain and they get full information and they get the right series of content. Maintaining content is a hard and up-to-date, delegating, and enhancing content material this is practically achieved via experimental content, likely imparting links that hyperlink textual content, pictures or links. The Web Content System

management (WCM or WCMS) is a CMS designed for helping manipulate web pages content material. Most famous CMSs are WCMS. Web content material is a concern to text and text content material that interacts with customers and embedded photos, images, maps, video, images, and software code (e.g., for applications). Content control structures usually offer the subsequent functions: 1) Integrated and Online Help 2) Modularity and Extension three) User and Organization Capacity four) Tinplating guide for changing layouts.

The advantage of learning pathway is that if there is any query on a particular topic and the student's searches that topic entire information will be given to the students in a sequenced way. While learning java students will directly start learning from inheritance without understanding the basics of java so there will not be a proper pathway for students before but in this project student will have a proper flow for understanding Java. By providing a pathway students will know from which topic they have to start and have a proper flow for studying so they understand the subject well. To make students understand the subject well the content is provided, content is put in a flow for better understanding for the students. Session is provided for each topic so to keep a track of students how many topics they have studied and how many they have not studied. In conventional way of teaching if the students would miss one session they will not be able to understand the next session and students will lose interest in the subject, the chances of failure will be more. Learning pathway provides a proper path for students so that they won't miss any topic and understand the flow of the subject from the basics.

II. RELATED WORK

C. Romero et al, proposed the studies attempt to assist the administrations of universities, Through most people of the contrast and evaluative studies on LMSs, to achieve the technique of choosing the appropriate LMS in order to incorporate them. Further it highlights the lack of reliable research to evaluate LMS, but in the end, despite having 58 research or more, it is not sufficient to cover the prominent subject of e-learning as most of the research is not proficient enough, incomprehensible and fail to incorporate susceptible criteria. Hence we conclude that there is still a greater need for proficient research and metrics to able to achieve the comparisons effectively. [1]

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Learning pathway: Content Management and Identification of Student Behavior Through Online Learning Management in Java

A. Klasnja-Milicevic et al, proposed an automated method in order to identify the mastering styles admired by the Felder-Silverman learning fashion version by means of inferring the knowledge gained on patterns of their behavior in the learning course they have opted on an online medium. The typical techniques utilized in e-mastering are developed for mastering management systems. This approach that is applicable for LMSs is well known. The most used functions in LMSs are appointed to be the idea for patterns. These functions consist: content items, outlines, examples, self-evaluation tests, sporting activities, and dialogue boards. Furthermore, the steersman ship behavior of college students in the path changed is taken into consideration. [2] Denaux et al, proposed the ontology-based technique for integrating interactive person modelling and learning content material management to address regular variation problems on the Semantic internet, such unreliability of person interplay for constructing conceptual UMs, and dynamics of a user's expertise. Onto objectives for adaptive project guidelines and resource surfing at the Semantic net. Preliminary outcomes from person studies were mentioned. Areas of improving onto targets by way of including extra integration and edition capabilities, as suggested with the aid of the consumer studies. ultimately, we take into account research to (a) produce an excellent classification of users' mismatches and patterns for clarification dialog (b) design effective understanding elicitation equipment proper not for ontology engineers, however for customers with a huge range of studies, and (c) use Semantic web offerings for the dynamic allocation of getting to know resources that are then flexibly integrated in Onto objectives. [3] K. Elissa proposed the usage of e-getting to know environments to aid teaching and gaining knowledge of has had first-rate impact at the manner content material is evolved and managed. In maximum instances, each instructor and college students have needed to re-adapt the way they prepare, get admission to and have interaction with instructional be counted. The adjustment in human mechanisms for establishing and interacting with educational content has become necessary due to the remediation of established practices through the advent of software program-primarily based strategies to structure content material, as an example, using metadata. at the same time as metadata requirements offer effective pointers for establishing content material in net-based totally e-mastering environments, era-based total procedures to managing educational sources do now not absolutely cope with social-cultural and Pedagogical aspects of users within the context wherein coaching and mastering takes the region. The paper provides an interest focused approach to abstracting contextually and pedagogically enriched metadata descriptions of instructional content material and interactions with mastering items. [4] D. Mwanza et al proposed the growing quick films may be an advantageous way to get college students to have interaction with the cloth before coming to elegance. College students indicated the videos helped them study the cloth. The professors who reduced their lecture time observed that scholars organized greater for sophistication not only in watching films, however additionally in doing the studying. These students desired shorter lectures and having more time to work on programming in elegance. Additionally, they did higher on the test (although the pattern size was not enough for this to be statistically giant). The motion pictures aren't only helpful for

an on-campus route, but setting them on YouTube may be a simple outreach on your university (we had a massive range of perspectives from 13-17 12 months old). [5]

III. DESIGN

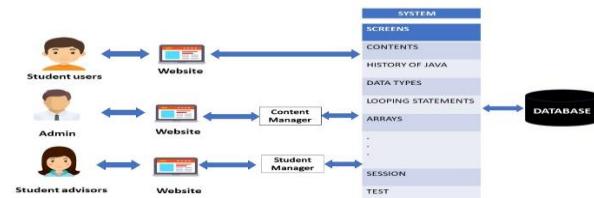
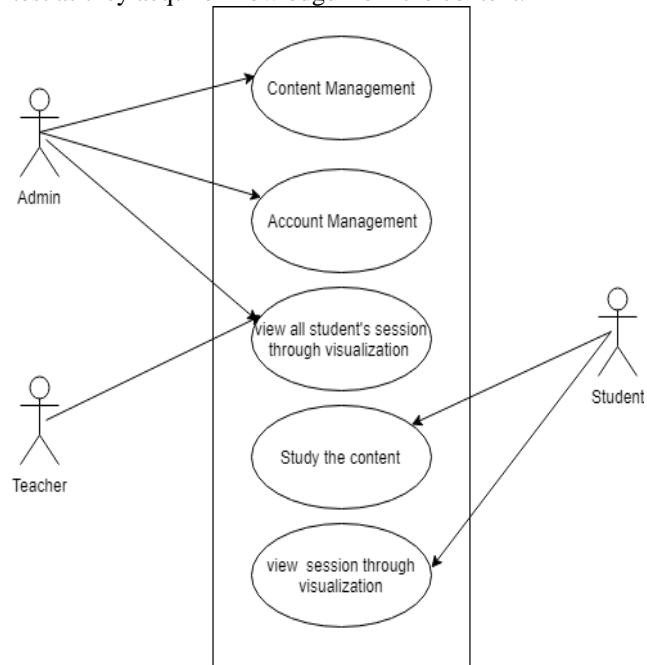


Fig. 1. Overall architecture

In this web application the students will read the content and based on how they have gone through content they will perform in the test. Whenever the technology changes the content can be modified, updated so the students are up-to-date with the technologies and admin will also get the track of the students for how much time they have spent on each page. By which they can analyses the student behavior and learning pattern. By this, the student may do well in the test as they acquire knowledge from the content.



The above UML diagram depicts the users and their role

IV. METHODOLOGY

Learning management system provides the proper pathway for students to understand the flow of the subject and have a proper structure for their learning. The topics covered and time allocated is provided in this following table:

Sl.no	Topics Covered	Time allocated(minimum)
1	History of Java	30min



2	Data Types in Java	30min
3	Operators in Java	30min
4	control statements	30min
5	Looping statements in Java	30min
6	OOPs concepts in Java	30min
7	Arrays in Java	30min
8	Inheritance in Java	30min
9	Interface in Java	30min
10	Method Overloading in Java	30min
11	Abstract class in Java	30min

This table gives the proper way and flow for students to learn java. From topic 8 to 11 are advanced topic, so the content is provided from different sources in one platform. To smoothen the flow of execution there are three users: 1)Admin – Admin will provide the content and change the content whenever the technologies are updating, session tracking of the student will be done by admin and the result of that will be sent to teachers.

Student Portal Home COURSE ➔ 

Java Tutorial

[Take test](#)

History of Java

Data types

Operators

Control Statements

Looping Statements

Java OOP Concepts

Java Array

Inheritance in Java

Interface in Java

Method Overloading in Java

Abstract Class in Java

Brief history of Java

The history of Java is very interesting. Java was originally designed for interactive television, but it was too advanced technology for the digital cable television industry at the time. The history of java starts from Green Team. Java team members (also known as Green Team), initiated this project to develop a language for digital devices such as set-top boxes, televisions etc. But it was suited for internet programming. Later, Java technology was incorporated by Netscape. The principles for creating Java programming were "Simple, Robust, Portable, Platform-independent, Secured, High Performance, Multithreaded, Architecture Neutral, Object-Oriented, Interpreted and Dynamic". Currently, Java is used in internet programming, mobile devices, games, e-business solutions etc.

These are the major points that describes the history of java:

- 1) James Gosling, Mike Sheridan, and Patrick Naughton initiated the Java language project in June 1991. The small team of sun engineers called Green Team.
- 2) Originally designed for small, embedded systems in electronic appliances like set-top boxes.
- 3) Initially, it was called "Greenlet" by James Gosling and the extension was ".g".
- 4) After that, it was called Oak and was developed as a part of the Green project.

Java Version History

There are many Java versions that have been released. Current stable release of Java is Java SE 10.

1. CKK Java and Beta (1995)
2. J2KE 1.1 (22nd June 1996)
3. CKK 1.1 (19th Feb 1997)
4. J2SE 1.2 (20th Dec 1998)
5. J2SE 1.3 (20th May 2000)
6. J2SE 1.4 (8th Feb 2002)
7. J2SE 5.0 (30th Sep 2004)
8. Java SE 6 (11th June 2006)
9. Java SE 7 (28th July 2011)
10. Java SE 8 (18th March 2014)
11. Java SE 9 (19th Sept 2017)
12. Java SE 10 (29th March 2018)

Fig. 2. Content page

The above figure shows the content provided to the students. The content provided is in the order and related videos are given to the students so that they can get clarity in the content.

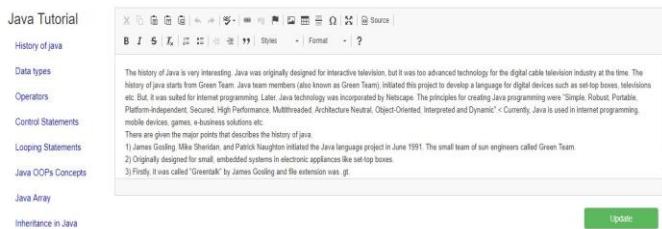


Fig. 3. Editor page.

The above figure shows the editing page when the technology changes the content can be edited so that the student will get the updated version of the content and understand the technology.

- 2) Teachers – the teacher will get information about the student from admin, how much time the student has spent on the topic or skipped the topic the teacher will notify to the student 3) Student- student will study from the content and take the test. The session will be monitored for each topic how much the students have spent on the topic and students behavior is analyzed. Session is a periodic event of time in which the student state is maintained.

```
which the student state is maintained.
```

```
history.jsp
83: 
84:     DateFormat d;
85:     String a=(session.getAttribute("prev")).toString();
86:     //System.out.println(a);
87:     SimpleDateFormat _SG_LOCAL_TIME;
88:     Locale l=LocaleTime.parse(a,d);
89:     LocaleTime time = LocaleTime.now();
90: 
91:     Long j=ChronoUnit.SECONDS.between(l,time);
92:     String c=null;
93:     session.setAttribute("prev",time);
94:     session.setAttribute("diff", j);
95:     session.setAttribute("Userid",a);
96:     String s=session.getAttribute("diff").toString();
97: 
98:     try{
99: 
100:         Connection cons=DBConnect.getConnection();
101:         String gets="Select * from timelog where Roll='"+r+"'";
102:         PreparedStatement p=con.prepareStatement(get);
103: 
104:         // p.setString(1,r);
105:         ResultSet rs=p.executeQuery();
106:         while(rs.next()){
107:             {
108:                 c=rs.getString("Chapter_1");
109:             }
110:             c=rs.getString("Chapter_1");
111: 
112:             int x=Integer.parseInt(c);
113: 
114:             if(x>=j)
115:             {
116:                 session.setAttribute("diff", j);
117:                 session.setAttribute("Userid",a);
118:                 session.setAttribute("prev",time);
119:                 session.setAttribute("diff", j);
120:             }
121:         }
122:     }
123: 
```

(1) Fig. 4. Session code

Above figure depicts the session code in which each page will have the session time

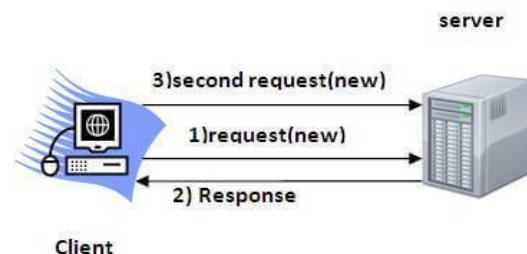


Fig. 5. Session Diagram

The above figure depicts the overall session process that the client request to the server for the connection and server will response for the request.

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Session Table: (in seconds)

S.No.	Roll number	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 9	Chapter 10	Chapter 11
1	MYSC.P2BCA1802	1000	950	1003	1500	1350	1700	1780	1450	1300	1250	1000
2	MYSC.P2BCA1801	1620	1450	1750	1759	1500	1800	1763	1365	1589	1478	1698
3	MYSC.P2BCA1803	1500	1800	1450	1498	1369	1587	1369	1258	1489	1698	1789
4	MYSC.P2BCA1806	1500	1799	1698	1600	1500	1472	1536	1698	1700	1750	1800
5	MYSC.P2BCA1803	1450	1750	1760	1600	1450	1360	1480	1790	1796	1460	1236
6	MYSC.P2BCA1810	1599	1689	1654	1545	1600	900	920	1400	990	1000	1100
7	MYSC.P2BCA1804	900	1500	1050	1090	1200	1500	1600	1700	980	990	1300
8	MYSC.P2BCA1811	950	990	1000	1200	1105	1005	1350	1500	1600	1540	1790
9	MYSC.P2BCA1812	1200	1350	1600	1560	990	1456	1780	1639	1755	1496	1369
10	MYSC.P2BCA1813	1800	1450	1600	980	1780	1469	1569	1369	1597	1322	1288
11	MYSC.P2BCA1814	1600	1800	1475	1698	1369	1509	1236	1477	1200	1800	1422
12	MYSC.P2BCA1815	1700	1593	1478	1692	1369	1255	1455	1444	1758	1699	1630

Fig. 6. Student time spent on each data.

Above figure depicts the data collection of the students who have spent time on the content which has been recorded.

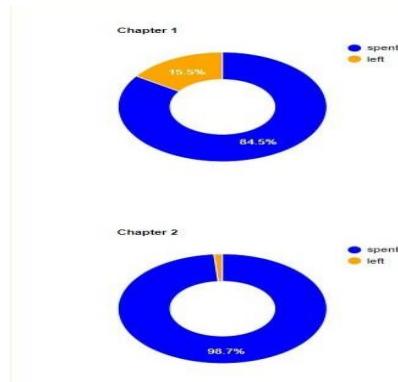


Fig. 7. Session page.

The above figure shows the session time of the student. Which means the session is provided to each page and how many minutes the students has spent on that particular page

V. CONCLUSION

The learning path provides proper route approaches for learners and discover new thoughts and complements their talents. This path affords the proper route and steerage, which is clean to seize coaching deduction for university college students. For example, as an endeavor, the gamer performs an entire step, then freezes the publish-game degree. A similar concept is used inside the manner of getting to know for college youngsters. After finishing a particular difficulty disciple, Content control can set text, along with updating, deleting, and editing, which includes consistent content with the specificity of the faculty's content.

Here we provide material for students, so students can have the right information to test and get the information from the content source. In each web page of the student's thesis we are expecting students overall performance environment, the disciples may skip or fail on that subject, so the failure rate may be reduced, so this assumption helps students to learn better thinking and better in testing.

APPENDIX

Fig1: Home Page

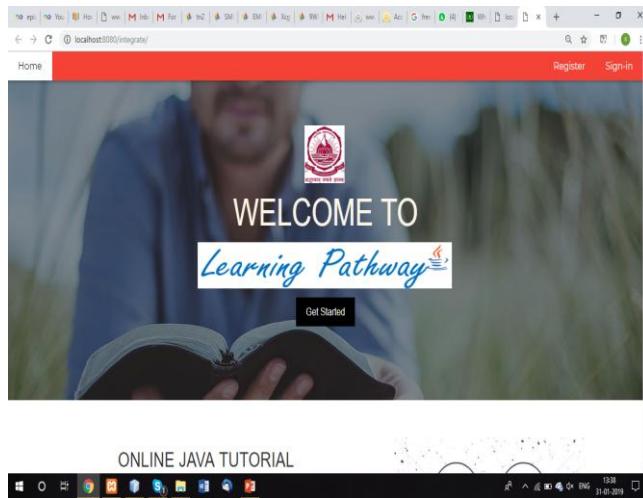


Fig 2: Registration Page

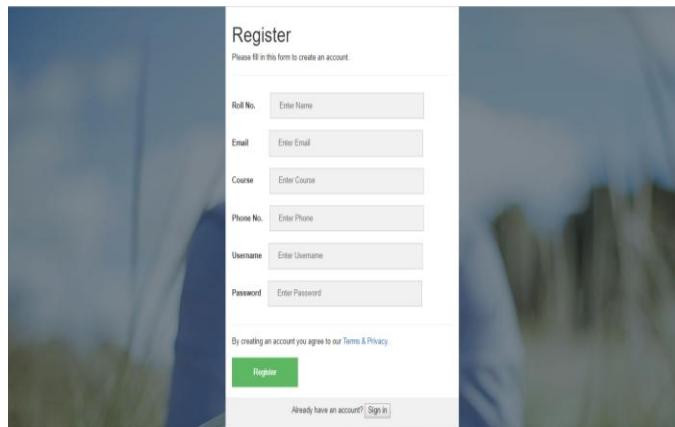


Fig 3: Login Page



Fig 4: Welcome Page

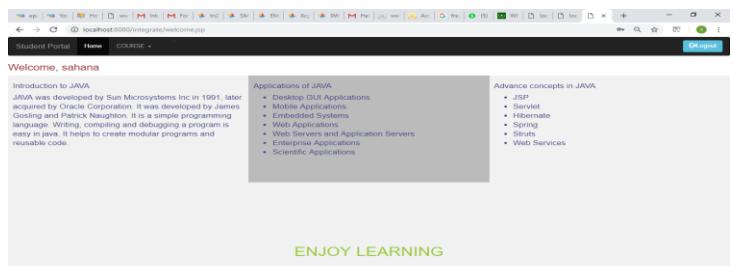


Fig 5: Table of Content Page



Serial number	Chapter	Duration
1	History of Java	30 min
2	Data types in JAVA	30 min
3	Operators in JAVA	30 min
4	Control statement in JAVA	30 min
5	Looping statement in JAVA	30 min
6	OOPs concept JAVA	30 min
7	Array in JAVA	30 min
8	Inheritance in JAVA	30 min
9	Interface in JAVA	30 min
10	Method Overloading in JAVA	30 min
11	Abstract class in JAVA	30 min

Welcome Admin!



Fig 6: Session Result



Fig 9: Admin Content Page

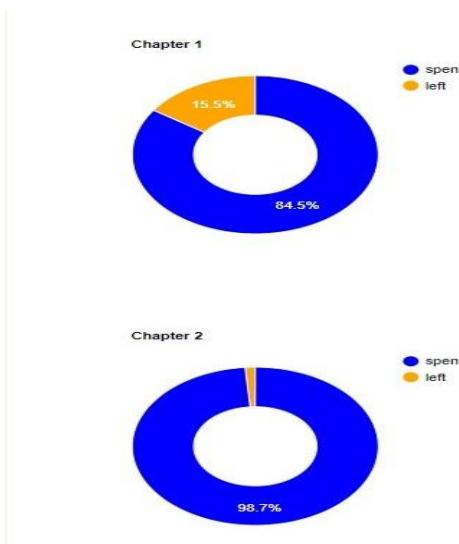


Fig 7: Admin Login Page

Fig 10: Admin Editing Page

Admin Editing Page



Fig 8: Welcome Page



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