E-learning Enhanced By Web 2 Technologies And Blackboard Services

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INTRODUCTION

"Recent advances in technology have presented remarkable opportunities to enhance the student experience… Whilst we have no intention of being an 'online' University, we do believe that we should strive for excellence in the use of online opportunities to improve learning by our students be they on or off campus." **Dr. Barry G. Blundell**, Open Learning Program, the University of the New South Wales (UNSW), Sydney, Australia.

In today's globally competitive environment, computing technologies allow new opportunities for teachers and learners to be more connected. The Web is becoming the largest data repository in the world and presents a key driving force for a large spectrum of information technology (IT). Tremendous modern tools which support the E-learning process and ease the creation of instruction materials using updated technologies will help for the implementation work in the ubiquitous computing learning society. On the other hand, Web Intelligence has been recognized as a new direction for scientific research and development to explore the fundamental roles and practical impacts of Artificial Intelligence and advanced Information Technology on the next generation of Web services. It is one of the most important as well as promising IT research fields in the era of web technology. How to benefit from intelligent Web-based information systems through the mining of diverse Web data resources is being used in many emerging areas of Web knowledge. To develop effective Web applications and services, it is critical to discover useful knowledge through analyzing large amounts of contents, hidden content structures, or usage patterns of Web data resources. To achieve such a goal, a variety of techniques in diverse areas; such as (besides natural language processing), information extraction, information retrieval, information filtering, knowledge representation, knowledge management, machine learning, databases, data mining, Web mining, text mining, agent, human-computer interaction, and semantic Web etc. are needed to integrate the systems properly.

Web services represent a rapidly expanding approach to the building of distributed software systems across networks such as the Internet. A Web service is an operation typically addressed via a URL, declaratively described using widely accepted standards, and accessed via platform-independent XML-based messages. Understanding the implementation of such specific E-learning and the exchange of knowledge within and among online communities of the five Colleges of Applied Sciences in Sultanate of Oman is the main goal of this paper.

We attempt to define community E-Learning and discuss the key issues, employing results from theoretical and practical studies conducted at Nizwa College by focusing on recent development of web intelligence, web mining and web services. Recommendations for future theorizing and research directions that can help to make the implementation of a modern E-learning much easier will also be endeavored. In this paper, the focus will be on online technologies/web based applications, particularly those used to enhance the e-learning process.

STRATEGIC CHOICES

In many organizations, there is a need to better identify and document a comprehensive learning strategy and to answer the question, "What should we be doing in order to support improved learning and performance?" While students at school and in higher education need to handle an ever increasing amount of knowledge, companies and employees need to adapt to quickly changing working situations characterized by an ever increasing amount of new knowledge and technologies. It is expected that these already high demands will even increase in the future. In order to cope with these high demands, learners need new ways to access and apprehend the new information flow, while companies must be able to provide new information faster and in a more accurate way. Therefore, they all rely on learning materials and applications to better mine for their respective individual information resources, but also, and this is more important, make profit of enormous amounts of information made available on the internet. This is what is often referred to as "web mining".

However, often, tedious work is required from those seekers to mine for that common public information available on the internet and convert it to a specific form of knowledge, tailored to the specific needs of their organizations. Still, today's learning materials and applications are not really suited for the continuously changing users' demands. In fact,

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it is still not easy to exchange and adapt learning materials and methods tailored for a specific knowledge domain. The adaptation of learning material is usually restricted to applications that cannot be easily converted to address needs different from those they were created for.

Therefore, new and more advanced learning systems are necessary to meet the new elaborated and increasingly complicated needs for information and its conversion to knowledge. An example of those new hybrid systems are those combining peer-to-peer (P2P) approaches, like Edutella, with advanced data description languages, developed in the semantic web community. These new hybrid systems can then be incorporated in elaborated and sophisticated information systems suited for a specific need. This will produce new generations of learning systems and learning management systems that are better suited to fulfill the increasingly diversified needs of users, may they be learners or producers of knowledge for internal or external use by their respective organizations. P2P systems enable automated, advanced and reliable search and retrieval methods for learning material, thus capturing the vast amount of learning material provided on the internet. Languages of the semantic web, together with standards for learning material and methods provide the means by which such distributed information systems operate automatically to fulfill the users learning requests.

For universities, as major seekers of information and producers of knowledge, advanced technologies used in distance and distributed e-Learning, integrated learning technologies used to enhance learning, and information systems, such as libraries, provide the infrastructure necessary for meeting the university's goals in learning, discovery, and engagement. Advanced Technologies provide a major support for excellence in learning, discovery, and engagement activities across the entire university community. This support covers different stages of the learning process and takes different forms. In concert with the print and electronic collections maintained by the university library, new technologies provide supports in advancements in educational access, course management, and collaborative learning systems, computer-integrated classrooms, electronic tutorials and portfolios, and research software systems, to only cite some examples.

Excellence in meeting their goals can be realized by the universities through at least three main strategic choices. First, the awareness of students' approaches to meeting their learning needs and of what technologies are available to assist in meeting identified learning outcomes, including access to new knowledge for the global community. Second, the professional development ability, so that everyone has the skills needed to implement change. Third, the crucial choice lies in the integration of pedagogy, learning-space design, technology, support, and policies to enable successful learning. These strategic choices aim at strengthening the role of distance and distributed e-Learning by achieving the university's goals in learning, discovery, and engagement.

E-LEARNING TOOLS

Table1 (below) is a listing of Learning Tools. The total number is more than 2,000 tools suitable for managing personal learning as well as for creating a wide variety of formal, informational and performance support solutions. Many of them are web based applications. They can be used without installation on the local computer. Two thirds of these tools are free of charges: as freeware.

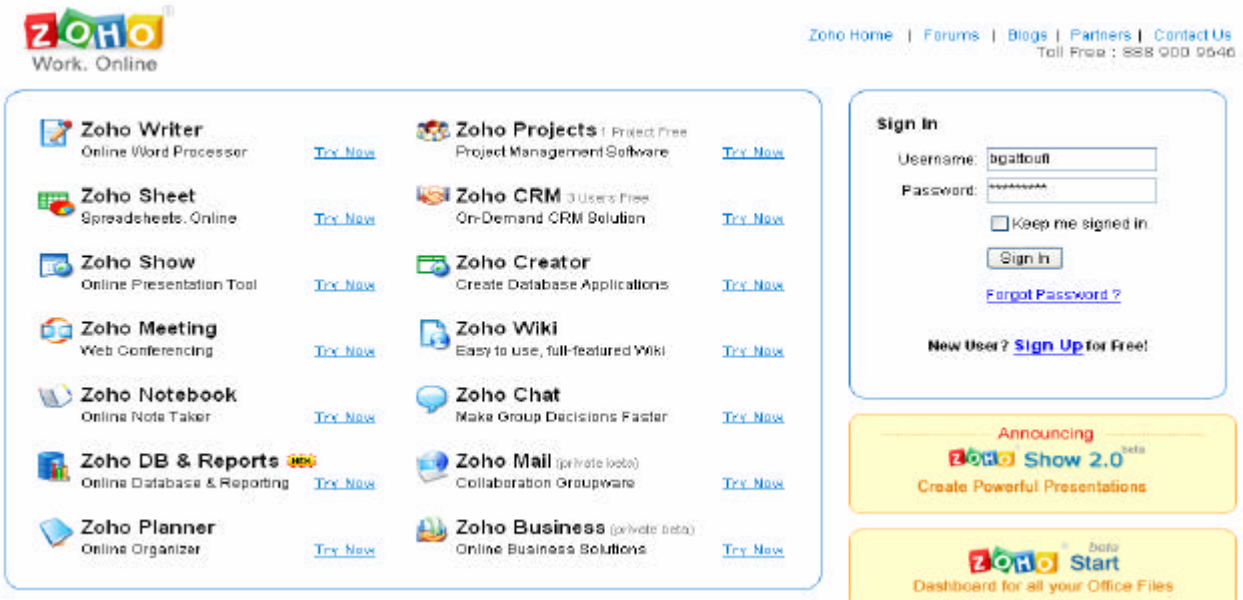
Table 1: Learning Tools List

Sr.	ALPHABETICAL LIST OF TOOLS	All Tools	Free Tools	Commercial Tools
1	**Blogging tools**	**74**	**63**	**11**
2	**Browsers, Extensions and Players**	**76**	**72**	**4**
3	**Calculators**	**10**	**9**	**1**
4	**Calendars, Event & Meeting Scheduling & Shared Maps**	**37**	**32**	**5**
5	**Content Management tools**	**26**	**23**	**3**
6	**Course Authoring tools**	**74**	**14**	**60**
7	**Course & Learning Management tools**	**113**	**37**	**76**
8	**Desktops (Online and Shared) & Remote Access Tools**	**9**	**8**	**1**
9	**Discussion Forum (text and voice) tools**	**16**	**13**	**3**
10	**Document, Spreadsheet & Database tools**	**74**	**51**	**23**
11	**E-Book tools**	**22**	**11**	**11**
12	**EPSS and Help Desk tools**	**7**	**0**	**7**
13	**Email, SMS, Voice & Video Messaging tools**	**66**	**49**	**17**
14	**e-Portfolio tools**	**5**	**3**	**2**
15	**File Hosting/Sharing tools (for documents, photos, videos,.. .)**	**75**	**71**	**4**
16	**Forms, Polling and Survey tools**	**49**	**30**	**19**

17	**Gradebook tools**	**6**	**1**	**5**
18	**Instant Messaging, Voice and Video Call tools**	**77**	**65**	**12**
19	**Interactivity tools**	**21**	**9**	**12**
20	**Learning Games tools**	**18**	**4**	**14**
21	**Live Broadcasting tools**	**6**	**6**	**0**
22	**Live Chat and Shoutbox tools**	**48**	**31**	**17**
23	**Media Creation and Editing tools (for graphics, images, audio, video)**	**71**	**50**	**21**
24	**Mind mapping and brainstorming tools**	**25**	**15**	**10**
25	**Mobile device tools (for phones, iPods, PDAs. etc)**	**28**	**25**	**3**
26	**Mobile Learning Authoring tools**	**7**	**1**	**6**
27	**Note Taking/Sharing and Whiteboard tools**	**52**	**47**	**5**
28	**PDF conversion tools**	**27**	**16**	**11**
29	**PDF readers**	**4**	**3**	**1**
30	**Personal Information Managers / GTD Organisers**	**50**	**39**	**11**
31	**Personal Productivity tools**	**91**	**70**	**21**
32	**Podcasting tools**	**66**	**41**	**25**
33	**Presentation tools**	**92**	**37**	**55**
34	**Quizzing and Testing tools**	**39**	**16**	**23**
35	**(Re)search tools**	**18**	**18**	**0**
36	**RSS Feed tools**	**31**	**27**	**4**
37	**RSS/Feed readers & Alerts**	**59**	**54**	**5**
38	**Screen capture, screencasting, software demo and simulation tools**	**50**	**19**	**31**
39	**Screen Sharing & Web Conferencing tools**	**68**	**26**	**42**
40	**Social Bookmarking tools**	**70**	**70**	**0**
41	**Social Networks and Networking tools**	**54**	**37**	**17**
42	**Start Pages**	**28**	**28**	**0**
43	**Team, Group and Collaboration tools**	**82**	**42**	**40**
44	**Virtual World tools**	**29**	**18**	**11**
45	**Web Authoring tools and HTML editors**	**54**	**34**	**20**
46	**Widgets and Accessories for web and blog pages**	**73**	**67**	**6**
47	**Wiki tools**	**56**	**45**	**11**
	Total number of tools	**2133**	**1447**	**686**

The following screenshot (Figure1) shows ZOHO suite of web based applications. It is one of the many growing number of applications that contribute to the increase web based services and facilities. ZOHO offers a suite of online web applications geared towards increasing productivity and offering easy collaboration by using many online free office tools (http://www.zoho.com).

Figure 1 : Zoho Screenshot



LEARNING MANAGEMENT SYSTEMS (LMS)

Learning Management Systems (LMS) or Virtual Learning Environments (VLE) is widely used on campuses. Often, the LMS is employed in a restricted way and simply supports traditional teaching practices, thereby reducing

the huge spatial flexibility. Therefore, in its widest form, the spatial flexibility of an LMS represents the formation of the so-called 'international classroom' and is underpinned by both the LMS itself and the incorporation of multi-media technologies enhanced by the Ajax/web2 developments. Most of LMS provide common features with a spatial and temporal flexibility including structure and secure environment, managed repository for content sharing, grade accessib ility, student monitoring, class announcements and focal point for discussion, to cite only some of the features offered by these learning integrated systems. The Table 2 below shows the main features with their Strengths/Weaknesses.

Table2: LMS - Strengths/Weaknesses

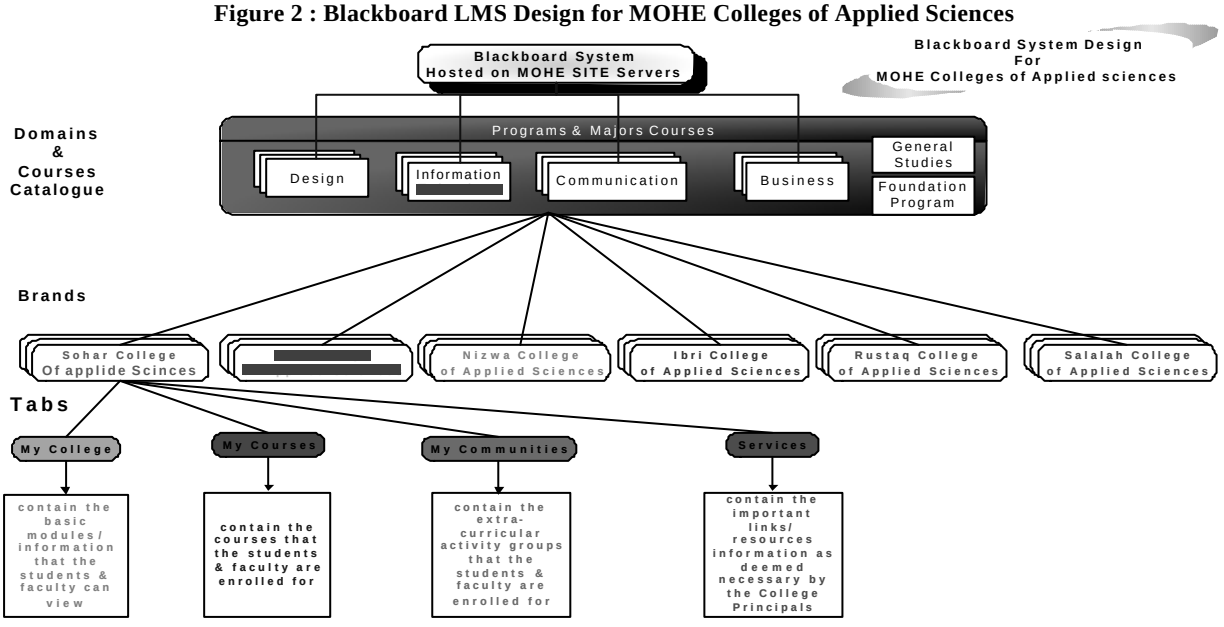
Main Features	Strengths	Weaknesses
Structure and secure environment	Plagiarism detection.	LMS – administrative and management effort
Managed repository for content sharing	Content sharing and materials accessibility.	Content must be maintained in order to remain up-to-date.
	Participation of subject experts – research content infusion.	
	Support for team-based teaching.	Veracity of content.
	Temporal and spatial flexibility.	Copyright issues.
Grade accessibility	Transparency of grading – no surprises.	Need more time for preparation.
Student monitoring	Monitoring of student participation – early warning.	Interference with multi-faceted aspects of human communication.
Class announcements	Reliable communication.	Coping with student engagement and communication issues.
Focal point for discussion	Forum for dynamic discussion.	Balance of focus – maintenance of direct contact.

BLACKBOARD TOOLS

Al-Gattoufi et al. (2007) developed and discussed the elements indicating the readiness of colleges to shift from the traditional learning into E-Learning system, through an LMS case study describing the adoption of WebCT and Moodle at Nizwa College of Applied Sciences in Sultanate of Oman.

Ministry of Higher Education (MOHE) in Oman has purchased Blackboard Learning Management System (BBLMS) as a tool to introduce technology into their teaching and learning for its six Applied Sciences Colleges. The current phase will include six colleges. It will first act as a supplement to their teaching and learning and then can be used for hybrid teaching. MOHE has purchased BBLMS, and Community Portal; which comprises part of the Blackboard Academic Suite version 7.3. The project for MOHE is for the implementation of the BBLMS and community Portal system to be implemented across colleges of applied Sciences. The academic suite is build with five systems: Learning, Community, Portfolio, Content and Outcomes. BBLMS will be implemented shortly. In fact, this represents a tremendous step towards a more elaborate LMS. The figure2 below shows the design layout of the project roll-out of BBLMS within Colleges of Applied Sciences.

Figure 2 : Blackboard LMS Design for MOHE Colleges of Applied Sciences



CONCLUSION AND RECOMMENDATIONS

In the beginning of this paper, we proved how huge are the number of web technologies developed nowadays. So, the many adjectives are allocated to the word "web". Many of the e-learning applications will be provided by BBLMS. The present situation at the Colleges of Applied Sciences makes it clear that the prospective implementation of Blackboard for creating an e-learning environment is quite promising, especially with the integration of so many expected e-learning services as shown in the Appendix.

During the blackboard implementation step, we recommend the following:

- Increase the number of academic departments engaged in developing and delivering e-learning courses.
- Expand the number of distance and distributed e-learning course offerings and the percentage of students indicating satisfaction with their e-learning experience to 90 percent or better.
- Increase the value-of-investment (VOI) by an average of 10 percent per year.
- Integrate advanced technology and information systems applications that assist collaboration, reflection, assessment, and sharing among all colleges' members, students, and staff members.
- Continue to lead, develop, implement, and assess technology-integration efforts aimed at increasing the information technology fluency of colleges, staff, and students in e-learning, discovery, and engagement activities.
- Implement, and manage integrated learning and collaboration tools to enable course, non-course related, e-portfolio, and Web publishing activities to be engaged through a common framework.
- Update established classroom functionality and equipment standards, regularly review and upgrade processes, and support a comprehensive structure for routine maintenance.
- Re-establish funding options to support integrating technology in e-learning activities in strategically targeted curricular areas.
- Strengthen the ability of the library systems to acquire, preserve, and manage research-level collections and user services that advance Colleges Tech's research capabilities.
- Preserve print and electronic collections within the university library system that support faculty and student research needs.
- Provide programs that develop information literacy skills.
- Re-purpose physical spaces to meet user needs through renovations.

Appendix : Blackboard Learning Management System Services

Content Authoring	Features include a WYSIWYG editing tool for creating diverse content and a Syllabus Builder that enables instructors to upload an existing syllabus, or easily design and develop their own lesson plans.
Course Cartridges and e-Packs	Created by major education publishers with pre-packaged content and course materials in the Blackboard format. Cartridges include materials such as additional readings, updated information, multi-media and question pools.
Adaptive Release	Means instructors can create custom learning paths by determining when students can access content items, discussions, assessments, assignments or other learning activities.
Discussion Board	Enables instructors to create multiple forums around different topics to facilitate threaded, asynchronous discussions. Grading and rating tools enable student response, feedback and peer review.
Assessments and Surveys	Allow instructors to deliver online, automatically-scored assessments and surveys. They can create assessments from scratch or draw upon personal, institutional or commercially available "test banks" of questions. Varied question types (e.g. true/false, multiple choice, calculated) can be used.
Grade book	Stores student performance results, including support for custom grading scales, grade weighting, item analysis and efficient uploading/downloading.
Reporting and	Provides a view of student progress and indicates whether students have reviewed specific content items.
Performance Dashboard	The dashboard also enables usage data to be viewed for an entire course.
Early Warning System	Enables instructors to proactively measure and monitor student performance based on key performance metrics. This efficient tool can monitor for both positive and negative trends to quickly identify students that fit a particular performance profile.

SERVICES1: LEARNING SYSTEM

Course Artefacts	Also called: examples of a student's learning are easily incorporated into the Blackboard Portfolio System with just one click from a student's online course.
Personal Reflection Capabilities	Allow users to create blogs and journals within their portfolio that reflect on their learning.
Flexible Layouts	Empower users to personalize their portfolios with fonts, backgrounds and navigation menus of their choosing.
Easy Collection	Easy Collection of student work is possible by uploading any kind of document, rich multimedia or presentations. Alternatively, use the HTML editor to create materials directly.

Meaningful Feedback	Meaningful Feedback from students, advisors and instructors is easy to obtain with Discussion Boards imbedded within a portfolio.
Shared Portfolios	Allow learning groups and project teams to develop portfolios together, encouraging collaboration and social learning.
Templates	Templates are a streamlined way to give guidance and direction to students and other authors, as well as create a consistent format throughout the institution.
Reports	Reports track reviewer viewing patterns in order to make informed adjustments to your portfolio.

SERVICES 2 : PORTFOLIO

Learning Communities	Enable users to extend learning beyond the classroom. Students and faculty are able to congregate online and communicate more effectively.
Groups, Committees and Clubs	Can have quick access to shared resources, e-mail, discussions, chat and other powerful tools.
Modules, Tabs and Channels	Allow institutions to post information, without knowing HTML. Third-party academic services like wikis and virtual worlds can be integrated as well.
Timely and Relevant Services	Are delivered to today's busy faculty and students with individual modules that can be updated and personalized by the appropriate owner.
e-Commerce	Functionality allows institutions to charge for items via a student's campus card or credit card. This includes anything from books to parking passes or club fees.
Multi-Institution Branding	Facilitates separation of multiple institutions or communities on one Blackboard installation. Each community can have its own URL and unique look and feel.
Domains	Allow distinct institutions or communities to have individual administrators with the rights and privileges the general system administrator designates for them.
Role-Based Rules	Allow users more than one role in multiple communities. This capability improves a user's interaction throughout the entire Blackboard Academic Suite.

SERVICES 3 : COMMUNITY

Standards, Goals and Student Learning Objectives	Document the intended outcomes of courses, programs, departments, colleges, universities and standards bodies to communicate intent and connect assessment activities.
Rubrics	Facilitate shared, consistent evaluation of outcomes. Making them searchable, reusable and publishable and they also increase their impact and extend their reach.
Curriculum Maps	Highlight the connection or lack of connection between program goals and the courses and co-curricular educational experiences that provide them.
Outcomes, Artifacts and Portfolios	Simplify the collection of student work and its evaluation against shared rubrics.
Surveys and Course Evaluations	Obtain attitudes and opinions from constituents on-and off-campus by collecting useful indirect assessment data.
Improvement Projects	Manage the structured process of departmental assessment supporting accreditation self-studies, strategic planning and program assessments.
Operational and Analytic Reports	Provide the comprehensive insight into assessment plans, activities, data, follow-up actions and correlations to guide improvement at all levels of an institution.
Models	Enable each discipline, academic unit and administrative department to tailor assessment workflow, terminology, data and reports to their individual specifications.

SERVICES 4 : OUTCOMES

Collaborative Web-Enabled File Storage	Includes dedicated file and content storage areas for individual users, courses, organizations, the library and constituent groups within an institution—all leveraging the WebDAV protocol to drag and drop management.
Content and File Management	Enables collaboration across the educational institution by allowing content and files to be used in multiple contexts (e.g. multiple sections) without duplication.
Versioning	Allows users to automatically archive and track previous versions of their files. The system creates separate copies every time each contributor changes the document, thus providing an automatic backup for overwritten files.
Disk Space and Bandwidth Management	Tools enable system administrators to control the amount of disk space and establish bandwidth limits for individuals, courses and organizations.
Workflow	Activities provide users with the ability to route content to others for review or approval, and designate settings such as priority, deadline and permissions.
Portfolios	Enable students and faculty members to assemble and share information online to document academic growth, career evaluation and course preparation.
Learning Object Catalog	Enables a searchable, hierarchical taxonomy to catalog best-of-breed learning objects and resources accessible by individuals inside and outside an institution.
e-Reserves	These are digital versions of copyright-cleared reserve readings that libraries create for faculty and students. Separate e-Reserve folders can be enabled for every course.

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consumers are generally familiar with such products, home their attitudes and values related to purchase and consumption will be different. The conversion of rural consumers to purchase sophisticated products is a great challenge for the marketers. But this kind ensures a good demand for sophisticated products in the future. Here, the marketers may have to work harder to sell their goods in rural areas, because of the diversity of values and attitudes present in these regions.

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The restaurant management can increase their sale and market share by taking into account these underlying factors. The various factors are payment options and behavior of staff, presentation, price, hygiene and quality of food, quality of beverages, ambience and experience, behavior and loyalty, comfort and promptness, packaging and service.

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