



The Texas Course Redesign Learning Object Repository:
Research and Development for a Production System

**THECB Learning Object Repository
Framework for a THECB LOR Marketing Plan**

Prepared for

The Texas Higher Education Coordinating Board

by

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THECB Learning Object Repository Framework for a THECB LOR Marketing Plan

1. Overview

The Texas Higher Education Coordinating Board Learning Object Repository (THECB LOR) is a single-point-of-entry repository of high-quality digital content produced as part of the Texas Course Redesign Project. The primary goal of the THECB LOR is to leverage an investment by the THECB in redesigned core and hybrid courses. These redesigned courses will support the THECB's longer term goals by increasing the passing rate of higher education students who may not be fully prepared to pass for college level courses.

The purpose of this draft marketing plan is to begin dialog between the THECB, TxCDK, and other organizations that will be responsible for implementing parts of the plan or receiving information about the success of the THECB LOR in realizing its objectives. The marketing plan includes eight sections:

1. Introduction, which introduces the goals and objectives of the THECB LOR and the involved organizations' background information
2. Marketing problem goal section states marketing problem and measurable goals to solve this problem
3. Marketing mix section describes the service offered, its price, location, and promotion to be used to accomplish the marketing goals
4. Competitive analysis section describes the competition that offers similar services
5. Marketing research section presents results of surveys, review of the literature, as well as scanning others' websites and speaking with colleagues at other institutions to get their best practices
6. Target audience and market segmentation describes target population
7. Marketing strategies section describes possible marketing strategies and the implementation
8. Timeline and Budget section describes the timeline and budget for the marketing.

2. Introduction

The Texas Higher Education Coordinating Board's Learning Object Repository (THECB LOR) is a repository containing learning objects developed as part of the Texas Course Redesign Project (TCRP). A learning object, as defined in the IEEE Learning Technology Standards Committee (2003) Standard 1484.12.1, is "any entity, digital or non-digital, that may be used for learning, education or training." A learning object could be a lesson, tutorial, illustration, demonstration, simulation, music, game, broadcast, or map.

The THECB LOR is implemented using DSpace, an open source software application for digital repositories. The learning objects contained in the THECB LOR are made available free of charge to all public institutions of higher education within Texas so that resources can be re-purposed and re-used by a wider range of educators. Course contents are decomposed and organized at four granularity levels: unit, lesson, topic, and free standing learning object. They are available for searching, browsing, retrieving, and downloading.

The objectives of the THECB LOR are:

- To provide Texas higher education faculty members a centralized place to go to get rich, quality learning objects to enhance courses, improve teaching, and engage students in learning.
- To achieve cost savings by making available learning objects that are created by and for Texas faculty members and that can be used, reassembled, and reused.

- To allow faculty members to reuse and repurpose learning objects and course design to take advantage of the digital media.
- To allow faculty members to share learning objects and avoid duplication of efforts.
- To facilitate transformation in teaching and learning for developmental education and core courses with rich, engaging, adaptable learning objects.

As described above the THECB LOR was initiated as a part of the TCRP. The TCRP was mandated by the Texas legislature. A demonstration THECB LOR, called the Texas Course Redesign Repository (TCRR) in its final implementation, was developed by the Texas Center for Digital Knowledge (TxCDK) at the University of North Texas. The TCRR is currently available at <<http://txcdk1.unt.edu/TCRR/>>.

The THECB subsequently decided to expand the course redesign repository into a statewide learning object repository called TxLOR, which will be administered by the University of Texas TeleCampus (UTTC). The Texas Digital Library (TDL) will provide development and implementation services for TxLOR. TxLOR will incorporate the redesigned course content produced through the TCRP grants.

In this document, we try to indicate the different “learning object repositories” as follows:

- THECB LOR: The generic label for the initiative by THECB to establish a learning object repository for use in Texas. It may also be used to refer to the statewide learning object which is being developed by UTTC.
- TxLOR: Used to specifically refer to the UTTC developed learning object repository.
- TCRR: Used to specifically refer to the learning object repository developed and implemented by TxCDK.

The missions and goals of these organizations are incorporated in the marketing plan. Therefore, a preliminary task in formulating the LOR marketing plan is to provide a brief description of each organization involved in the development and ongoing operation of the LOR. Marketing strategies will be formulated so that each organization can participate in the marketing plan by utilizing their specific roles and resources in disseminating information. The marketing strategies described later in this plan will build upon the individual and collective resources. Since each of these organizations is invested in the success of the TCRR and TxLOR, a marketing effort that utilizes particular channels associated with these organizations may help bring about a broader alignment of operational goals of the organizations around the further development of quality course objects and an efficient dissemination of these objects through the operational learning object repository.

A brief description of each organization is provided in the next section of this introduction to the THECB LOR Marketing Plan (the marketing plan).

2.1. Participating Organizations

Texas state government is recognized as one of the leading states in the nation in making governmental information and documents available to the general population through advanced information and communication technology (ICT). This recognition has come about as a result of an ongoing state-wide effort to increase the efficiency and accountability of state government to the people of Texas. Efficiency and accountability are two hallmarks of the state’s mission and philosophy.

In 2000 Closing the Gaps by 2015 was developed Texas Legislature to ensure a well-educated workforce for the future and to support research efforts. The plan was created in recognition of the low proportion of Texans enrolled in higher education compared to other states, that too few higher education programs are noted for excellence, and that too few higher education research efforts have reached their full potential.

The THECB was created by the Texas Legislature in 1965 to ensure quality and efficiency in public higher education. Most of the Coordinating Board’s statutory authority is found in the Texas Education Code, Chapter 61. The Coordinating Board is directed to “provide leadership and coordination for the

Texas higher education system, institutions, and governing boards, to the end that the state of Texas may achieve excellence for college education of its youth through the efficient and effective utilization and concentration of all available resources and the elimination of costly duplication in program offerings, faculties, and physical plants” (Texas Education Code, 1965).

The Texas Higher Education Coordinating Board (THECB) actively monitors and encourages institutional progress toward the goals of Closing the Gaps by 2015 and other significant performance measures through its Higher Education Accountability System. The agency’s mission is to work closely with the state’s higher education institutions, public education entities, businesses, community groups, and others to achieve Closing the Gaps by 2015.

The 79th Texas Legislature passed legislation in House Bill 1, that included the development of college readiness standards to improve college and skilled workforce success, the creation of summer bridge programs for at-risk students, and the implementation of a course redesign pilot project designed to revise and strengthen entry-level college courses. Two provisions of this legislation are Section 61.0762 and Section 61.0763 of the Texas Education Code (1965). These codes require the THECB to initiate the improvement of innovative developmental education and to implement a project under which institutions of higher education will review and revise entry-level lower division academic courses...to improve student learning and reduce the cost of course delivery through the use of information technology to enhance the success of students.

According to the legislature’s directive, the THECB initiated the Texas Course Redesign Project (TCRP) to fund the creation and expansion of redesigned developmental and entry-level academic courses. The initial goal of the TCRP is to have widespread adoption of course designs that promote student success, especially in the critical first year of college. The long-term goal of the TCRP is to see the redesign process lead to multiple models of successfully redesigned courses for a full freshman year of general education curriculum and developmental courses leading to the successful completion of these courses. Finally, the THECB was tasked with determining cost savings and increased student success resulting from the redesigned courses and submit a report outlining the results of the TCRP to the legislature by September 1, 2011.

The Texas Center for Digital Knowledge (TxCDK) is a research center that advances digital knowledge management through collaborative and interdisciplinary projects among top researchers in library and information sciences, business information systems, communication, computer science, computer security, and cognition. It is located within the College of Information (CI) at the University of North Texas (UNT). To assist the THECB in encouraging widespread adoption of learning resources developed in the TCRP, the TxCDK proposed the development of a learning object repository (LOR) to store, manage, and make accessible, objects from the redesigned courses. Specifically, the TxCDK suggested that THECB could leverage the Texas Course Redesign Project investment in course redesign by making entire courses and components of courses available for reuse and repurposing. For Phase I TxCDK developed a proof-of-concept repository application. Phase II was a two-year effort developing the next instance of the LOR.

Funding from THECB for the development of the TCRR offered TxCDK an opportunity to bring together researchers, objects designers, instructional designers, and information technology experts from several UNT academic units to work in conjunction with faculty members from higher educational institutions across the state of Texas. Since LORs are a primary means to make knowledge and information developed for specific purposes available for reuse by others, they are a primary interest of the TxCDK. Development of the initial instance of the LOR and ongoing collaboration with the sponsoring organizations of the THECB LOR will enhance the development of the TxCDK by providing an quality project for the center’s workers and graduate students and a role in contributing to the Closing the Gaps by 2015 effort.

The University of Texas TeleCampus (UTTC) was launched in 1998 and operates at the University of Texas System (UT) administration level. UTTC works with all 15 UT system institutions to build and deliver high-quality online courses, hybrid courses, and degree programs and support services for

distance learners. The UTTC assists system institutions in expanding existing capacity, building new capacities, and preparing faculties to best teach in a technology-mediated environment. Much of the UTTC's efforts directly support state of Texas with Closing the Gaps by 2015 by making higher education more accessible.

The UTTC is envisioned to be the administrative arm of the operational LOR. In this role the UTTC offers expertise in course development and collaboration with numerous campuses across the State of Texas. In addition, the UTTC is involved in implementing the NCAT course designs and can offer guidance for instructors implementing the redesigned courses. In addition, the LOR project offer the UTTC and opportunity to advance knowledge in the area of developing the various NCAT learning designs from discrete learning objects. Currently much of the work done in the NCAT model involves redesigning entire courses. However, using the LOR with the decomposed learning objects offers the UTTC much more flexibility in developing core course suing all the NCAT designs for the previously developed TCRP course objects and objects developed by faculty interested in developing their own redesigned courses.

The Texas Digital Library (TDL) aims to capture intellectual capital that exists in institutions of higher education which is not readily available to faculty, staff, and students throughout the State. The goal of the TDL is to "become a center of excellence for the curation and preservation of digital scholarly information in the state of Texas" (Digital Initiatives, 2005). As noted above the state Texas government has initiated several ITC projects to help streamline and take advantage of economies of scale in all governmental agencies. The TDL is partly a result of this larger effort.

The TDL infrastructure and mission are well positioned to host the THECB LOR. Since the LOR is being envisioned as a statewide repository and the TDL mission is to be a statewide collection of intellectual capital it appears that the vision for the LOR and the TDL are well suited for collaboration. The LOR utilizes Manikin which has been developed by TDL partner institutions as a user interface customization too for DSpace which will allow for a smooth ingestion of the THECB LOR Phase II technical infrastructure to the TDL. Finally, the infrastructure of the TDL is capable of providing efficient access to the LOR through its extensive network connections.

This section of the marketing plan briefly outlined the missions, goals and activities of the sponsoring organizations of the THECB LOR. While this section briefly describes the individual organization's capacities relevant to the THECB LOR project, individual, specific responsibilities related to marketing have not been agreed upon. Long term sustainability and efficient operation of the LOR will depend upon close collaboration among the participating organizations, particularly between the TDL and the UTTC. Hosting the TxLOR will further the TDL work towards its mission of providing statewide access to intellectual products of institutions of higher education. Likewise managing the TxLOR provides the UTTC the opportunity to utilize learning objects decomposed from redesigned core and hybrid/developmental courses. This accessibility will help the UTTC streamline core and hybrid/developmental course development for system member campuses. It is very likely that the UTTC will build on its strong performance as the distance and hybrid course development arm of the UT system by reusing and repurposing the THECB LOR learning objects. This success could serve as an example for other institutions of higher education in the state to utilize the LOR.

3. Situational Analysis

3.1. Consumer Analysis

As e-learning becomes more prevalent, the need for quality educational content in the form of reusable learning objects increases. E-learning in higher education has progressed to the point that important infrastructure is in place to capitalize on technological advances in the development of educational resources. Currently, about 80% of faculty members in the state of Texas have access to learning management systems (LMS). LMS represents a critical enabling technology for the use of learning objects in the development of quality e-learning content. Universities active in e-learning also have devoted funds to hire instructional designers and electronic media designers to assist instructors to

convert conventional teaching materials to an online format, and to integrate this material into LMS. As electronic resources become more available to instructors their use in teaching has increased.

Usually faculty members in institutions of higher education invest a considerable amount of time developing the content of their courses and sometimes duplicate materials that have already been created by somebody else. Some organizations have already established learning object repositories in order to provide better access to learning objects and reduce duplication in developing instructional materials. "Practitioners view a digital object repository as being similar to that of a traditional library (Australian National Training Authority, 2003, p.8)."By establishing these repositories where learning objects can be stored for future reuse, these institutions have begun to demonstrate the viability of a learning objects approach to course design.

3.2. Product Analysis

The TCRR contains learning objects in 5 levels of granularity which, when combined, make up the entire course. These five levels of granularity comprised the structure of a course. The TCRR includes individual LOs, which are the smallest element. Topics are the next largest element and are made up of individual LOs. Lessons, the next level, are made up of topics. Next is the unit which is comprised of lessons. Finally, the broadest level is the course which is made up of units. Each learning object can include multiple assets such as pictures, audio, graphs or illustrations. Learning objects can be thought of as building blocks for creating modules and complete courses, and are similar to "learning content." By definition, a learning object is "a self-contained, reusable, small chunk of learning content that accomplishes a specific learning objective" (IEEE Learning Technology Standards Committee, 2003). Learning content in the form of learning objects can be compared to building blocks, because they can be combined with other learning objects in many ways and re-used for many different purposes.

These learning object types include a diversity of educational content that can be included in the THECB LOR and can be used in a variety of instructional applications. For example, a quality, reusable learning resource on algebraic equations can be shared with an unlimited number of educators to enable students to understand a specific concept. This same resource could be used, for example, in middle or high school Algebra class, a community college nursing course, an evening GED class, and in an entry-level business course. Learning resources can also present and explain difficult concepts using visual, auditory, or tactical/kinesthetic teaching strategies to assist learners with different learning preferences. The learning objects contained in the TCRR are available free of charge to all public institution of higher education.

3.3. Environment Analysis

The current marketing strategy was formulated by analyzing the current economy, online education, and green movements. In analyzing these environments, it was determined that the current economy is the most adequate comparison tool. Future marketing plans should involve heavy action in the department of increased awareness to the potential consumer. Table 1 displays a SWOT analysis.

Environment	Threat	Opportunity	Strength	Weakness	Action
Current Economy	Drop in value of the US dollar	Cheaper forms of education are being looked for	Cost Efficient	Lack of Education Community Awareness	Increase Potential Consumer Awareness
	Lack of Social Security Funding to Seniors	Seniors looking to gain knowledge from computers	Easy to use	Education of general computer knowledge to seniors	Sponsor community learning seminars

Savings Rate Decline	High Education becomes more in demand	LOR can add information to match growing groups needs	Research time needed to enter new course info	Constantly be innovative with the coursework
Drop in Employment Rates	Students returning to college	Class development time is cut in half	Lack of Education Community Awareness	Increase Potential Consumer Awareness

Table 1 SWOT Analysis

4. Marketing Mix

The LOR is capable of serving the entire Texas public higher education system that consists of approximately thousands of faculty and staff responsible for developing educational content. The THECB approach to this effort is based on the ongoing work of the National Center for Academic Transformation (NCAT). NCAT Program in Course Redesign focuses on large enrollment, introductory courses, which have the potential of impacting significant student numbers and generating substantial cost savings (NCAT, n.d.) The THECB has extended this model to facilitate movement towards the Closing the Gaps effort which seeks to increase the success of historically underrepresented groups in institutions of higher education in the State of Texas. Accordingly, the THECB is particularly interested in courses that combine developmental and college level courses. For example, courses combining developmental writing with history and developmental writing and political science have been approved for development by the THECB.

The NCAT redesign model has been effectively implemented in several statewide systems similar to the THECB Texas Course Redesign Project. Success in a large statewide course redesign effort requires a variety of specific course redesign models to be implemented. The NCAT has identified five course models that have been used for successful redesign. These models include: the Supplemental Model, the Replacement Model, the Emporium Model, the Fully Online Model, and the Buffet Model (NCAT, 2005; Twigg, 2003).

- The Supplemental Model is a traditional course model supplemented with technology-based, out-of-class activities, or in-class active learning environment.
- The Replacement Model is characterized by a reduction of in-class meetings and their replacement with out-of-class, online, and/or interactive learning activities. There are also substantial modifications to remaining in-class meetings.
- The Emporium Model replaces all in-class meetings with a resource center. The resource center offers online materials and personalized assistance.
- The Fully Online Model replaces all in-class meetings with online learning using Web-based, multi-media resources, and commercial software
- The Buffet Model features customization of the learning environment for each student taking in consideration students’ background, learning preference, and academic goals.

The infrastructure of the THECB LOR accommodates these five models. Collectively, these five models underline the need for the LOR to be fully Sharable Content Object Reference Model (SCORM) compliant. These models emphasize the need to produce content and LOs that are modular and capable of being sequenced in a number of different configurations. In addition, the models also identify an additional potential user groups. It is likely that the emporium model would include personal assistance from individuals with considerably less training than a full faculty member. Implementation of this model could include peer coaches who are students that have mastered the content and offer the personalized assistance. The Buffet model features fully individualized learning that includes pre-assessment and consideration of learning preferences. Therefore, metadata would need to accommodate a branching structure for order LO presentation, pre-assessment, and the ongoing progress of the individual student.

The repository software enables Texas to acquire, contribute, store, manage, and electronically share high-quality digital learning resources in one location. It also enables federated searches with other repositories. Educators can re-use resources during technology-supported learning or traditional classroom instruction or modify existing content to meet classroom needs.

5. Competitive Analysis

In an effort to clearly elaborate on the need for the THECB LOR, this section explores the existing market demands and the realization that the statewide LOR will serve a unique need for higher education faculty in the Texas. The LOR will increase productivity of faculty members minimizing production of new and redundant content through utilization of shared resources, establishing quality assuring for educational materials utilized through-out Texas. The following factors were taken into account when formulating the initial plan for the THECB to see if a reasonable alternative option was currently existed.

Listing 3 examples of LORs will help clarify how working repositories are developed and used. The Wisconsin Online Resource Center Learning Objects Project developed an online learning objects resource center for 9 core courses allowing faculty from 16 college districts access to learning objects to build their courses (Chitwood et al, 2000). Another example of a learning object repository initiative is Ohio State University "Knowledge bank" for collecting, preserving, and reusing teaching and research content (Rogers, 2003). Another example of learning object repository is the MERLOT which has a searchable collection of learning organized to enable faculty and students to find web-based learning materials (Harvey, 2005). The THECB will provide a learning object repository with the features described in the example listed above. In addition the THECB will serve all faculty members working in public institutions of higher education in the state of Texas.

5.1. Competitive Comparison

5.1.1. SREB Regional Approach – SCORE Registry

The SREB SCORE Project involves hosting a metadata harvester to enable the sharing of educational resources among the sixteen member states. After standards are completely defined for inter-repository communication, SREB will provide an infrastructure that will harvest and house metadata for each digital resource to enable the searching of multiple state repositories from one location. Participation costs are \$15,000 per year per agency following the initial fee of \$20,000 per state. Both KDE and CPE are current SCORE members. SCORE members help establish the SCORE metadata schema based on the IEEE Learning Object Metadata (LOM) schema in order to facilitate sharing among member repositories and the harvesting functionality. A set of content evaluation criteria and checklist have also been developed collaboratively to help members adhere to agreed-upon standards to assure quality content. To ensure that these defined standards are implemented across repositories, SCORE has created both hands-on and online training sessions to further the implementation.

5.1.2. Repositories in Other States and Countries

Using the option of a repository already developed and housed in other states or countries was discarded for several reasons. First, a repository becomes a mission critical initiative when it supports direct instruction. It is cost prohibitive and unlikely that institutions of higher education in Texas could subscribe to and only use learning resources from other state repositories.

5.1.3. Open Education Resources Repositories

The Open Education Resources (OER) movement signals a growing trend toward openness for teaching and learning materials. Funded by The William and Flora Hewlett Foundation, the OER Commons (<http://www.oercommons.org/>) is a global teaching and learning network of free-to-use resources – from K-12 lesson plans to college courseware – for users to use, tag, rate, and review. OER Commons forges alliances between trusted content providers and creative users and re-users of Open Educational Resources (OER). In addition to content partnerships, OER Commons, and its creator, ISKME (Institute for the Study of Knowledge Management in Education), builds strategic relationships in order to develop

innovation and new research focused on OER, to advance the field of open education, and to build models for its sustainability. This open access model can be used as a good framework for the THECB LOR and a good source of free content as we garner statewide support.

It is possible that other competitors were missed. But all these repositories have their own goals and missions. As described in above sections, THECB LOR is uniquely established to meet the goals of THECB and TCRP.

6. Market Research

Morgan (1988) suggests that one of the greatest limitations of several approaches to marketing is that they stress looking from the company outwards, whereas the core of marketing should be the looking from the outside into the company and product or service. Consequently, this weakness has led many companies to develop a more customer focus approach where the company focuses its activities and products on consumer demands. Generally there are three ways of doing this: the customer-driven approach, the sense of identifying market changes, and the product innovation approach. In a product innovation approach, an organization pursues product innovation, and then tries to develop a market for the product.

Product innovation drives the process and marketing research is conducted primarily to ensure that profitable market segment(s) exist for the innovation. This process most closely describes how the THECB LOR developed. The THECB was mandated by the legislature to implement the TCRP. Little or no marketing development was done prior to the project. Project developers assumed that the LOR and redesigned course would be readily used by faculty members who would grasp the usefulness of the TCRP and the THECB LOR. Therefore, a product diffusion approach will be used to specify marketing segmentation, strategy and implementation. Before moving to these three sections of the marketing plan, a brief overview of the product diffusion approach will be outlined in the remainder of this market research section.

Diffusion of innovations research explores how and why people adopt new products, services and ideas. The goal of diffusion research is to explain the process of an innovation spreading among adopters of a particular innovation (Baudisch & Grupp, 2006). The rationale is that customers may not know what options will be available to them in the future. Diffusion of innovations research explores how and why people adopt new products, services and ideas. The goal of diffusion research is to explain the process of an innovation spreading among adopters of a particular innovation (Baudisch & Grupp, 2006). Development of the marketing plan is based on diffusion of innovation as applied to higher education. The LOR is a technology innovation involving ICT. The LOR includes several services, that when considered together, make up the LOR.

6.1. Definition and brief discussion of diffusion

Diffusion research literature has developed within a number of disciplines (Rogers, 1995). The present product mix research focuses on two disciplinary groups. Within economics and most nonmarketing disciplines, diffusion is defined as the spread of an innovation across social groups over time (Brown, 1981; Stoneman, 2002). As such, the phenomenon is separate from the drivers, which can be consumer income, the product's price, word-of-mouth communication, and so on. In marketing and communication, diffusion typically has come to mean the communication of an innovation through the population (Golder and Tellis, 1998; Mahajan, Muller, and Wind, 2000; Mahajan, Muller, and Bass, 1990; Rogers 2003). In this sense, the phenomenon (spread of a product) is synonymous with its underlying driver (communication). The Webster (2004) definition of the noun "diffusion" is "the spread of a cultural or technological practice or innovation from one region or people to another, as by trade or conquest" and the verb "diffusing" is "pour, spread out or disperse in every direction; spread or scatter widely." This latter interpretation is synonymous with the term's use in economics and most other disciplines (Chandrasekaran & Tellis, 2007)

The goal of diffusion research is to explain the process of an innovation spreading among adopters, i.e. to explain the form of the diffusion curve of an innovation. Our approach is based on the analysis of the four

elements constituting the diffusion process, the innovation, communication, time, the social system, and their interactions, which are now subsequently introduced (Baudisch & Grupp, 2006).

6.1.1. Diffusion of Innovations

Rogers' (2003) Diffusion of Innovations model is a well-known and established framework for innovation studies and is often referenced in literature related to higher educational innovations. It provides a vocabulary and a paradigm for understanding the adoption of innovations and acceptance or resistance to change. When encountering obstacles in innovation diffusion, this model and its principles, developed from a synthesis of several hundred research studies, can assist change facilitators leading an innovation in understanding key issues involved in the innovation process, including the attributes of innovations that help or hinder their adoption, categories of adopters, the innovation-decision process that occurs in using an innovation, and the power of opinion leaders in the adoption process.

Rogers (1995) defines an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 11), and diffusion as "the process by which an innovation is communicated through certain channels of a social system over time" (p. 35). The social system, in which the changes take place, is described as the "interrelated units engaged in joint problem solving to accomplish a common goal" (Rogers, 1995, p. 23). Rogers' (1995) notes that the words "innovation" and "technology" are often used as synonyms. Technology is described as a "design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome" (Rogers, 1995, p. 12).

According to Rogers (1995), a technology usually has two elements; (1) a hardware aspect which is the material or tool, and (2) a software aspect which is the information base of the tool. While it is often easy to visualize and even count the hardware aspect of an innovation (e.g. one can tally the number of computers in a faculty member's office, or the number of accounts on a LMS server), the software aspect, the way information is exchanged using the tool or the way the tool is used to solve certain problems, is more difficult to observe.

At whatever point an innovation-decision is made, Rogers' (1995) theory of innovation diffusion holds that there will be an increased rate of diffusion and adoption (defined as the relative speed in which an innovation is adopted) depending on how the potential adopter perceives the following five attributes of the innovation:

- (1) Relative advantage: is the innovation perceived as better than what is currently available
- (2) Compatibility: the extent that the innovation is well-matched with existing values and needs
- (3) Complexity: the extent that the innovation is easy to comprehend and use
- (4) Trialability: the degree that a potential user can experiment with the innovation without totally committing to its use.
- (5) Observability: the extent to which a potential adopter can see the usefulness of the innovation in his situation

While the attributes of innovation will influence the rate of adoption, so will the characteristics of the individuals involved in the process. Rogers (1995) suggests that an individual reacts differently to change based on his or her personal traits or predispositions. He developed a classification scheme of the "Individual Innovativeness" of potential adopters based on their receptivity to an innovation which has been frequently cited in higher education literature (Hagner, 2001). The bell curve of adopter categories outlined by Rogers (1995) is as follows:

- (1) Innovators (2.5% of the system): risk takers who can tolerate uncertainty and are willing to try something new
- (2) Early adopters (13.5% of the system): respected opinion leaders; their adoption of an innovation is essential to the adoption by the larger, early majority group
- (3) Early majority (13.5% of the system) careful individuals unwilling to risk time or resources who interact frequently with their peers
- (4) Late majority (34% of the system): suspect of change; difficult to move without influence

- (5) Laggards (16% of the system): adamant in resisting change, often isolated and suspicious of innovation, pressure is needed to force change.

6.2. Communication and decision making

Communication is the process by which participants create and share information with one another in order to reach mutual understanding. Diffusion is a particular type of communication in that the messages are concerned with new ideas. Mass media channels are often the most rapid and efficient means to inform an audience of potential adopters about the existence of the innovation, to make them aware of it. Mass media channels are all those means of transmitting messages that involve a mass medium, such as radio, television, and newspapers, which enable a source of one or a few individuals to reach an audience of many. However, mass media channels are deemed to lead to changes only in weakly held attitudes. Interpersonal channels, however, usually accomplish the formation and change of strongly held attitudes. Interpersonal channels involve a face-to-face exchange between two or more individuals. Communication via these channels is more effective in persuading an individual to accept a new idea, especially if the interpersonal channel links two or more individuals who are similar in socioeconomic status, education or other important ways.

A technology usually has, as already mentioned, a hardware aspect and a software aspect (Rogers, 1995, p. 12). The software information embodied in a new technology serves to reduce one type of uncertainty which is concerned with the cause-effect relationships involved in achieving a desired outcome. But a technological innovation also creates another kind of uncertainty because of its newness to the individual and motivates him or her to seek information by means of which the new ideas can be evaluated. Rogers, (1995 p.14) calls this the “innovation-evaluation information” which leads to a reduction in uncertainty about an innovation’s expected consequences when obtained. The main questions that an individual typically asks in regard to software information are: “What is the innovation?”, “How does it work?” and “Why does it work?” Besides, an individual usually wants to know such innovation-evaluation information as: “What are an innovation’s consequences?” and “What will its advantages and disadvantages be in my situation?” In making the innovation-decision to adopt, Rogers (1995) describes a mental process, known as the innovation-decision process, where an individual or unit passes from knowledge about the innovation, to forming an attitude toward an innovation, to a decision to adopt, reject, or implement an innovation, to a confirmation of the innovation’s use. Rogers (1995) posits that several distinct stages exist in the innovation-decision process. These stages are detailed as follows:

- (1) Knowledge – individual is exposed to the innovation and gains some understanding of how it works
- (2) Persuasion – an opinion or attitude, either favorable or unfavorable, is formed toward the innovation
- (3) Decision – individual engages in activities that lead to a decision to either reject or accept the innovation
- (4) Implementation – individual uses the innovation
- (5) Confirmation – individual seeks reinforcement for the decision that has been made, and may decide to continue using or reject the innovation
- (6) Discontinuance – the decision to reject after previously adopting an innovation, which may occur for two reasons: (a) something better comes along, or (b) the user is dissatisfied with the innovation.

In addition to adding to the understanding of the types of innovation-decisions, the process that individuals and units go through in making an innovation-decision, and characteristics of both the innovation and the individuals that will influence the adoption rates, Rogers (1995) also helps shape the way we understand the influence of peers on an individual’s willingness to try out and/or adopt an innovation. Rogers (1995) defines this type of peer influence, or opinion leadership, as “the degree to which an individual is able to influence other individual’s attitudes or overt behavior informally in a desired way with relative frequency” (p. 27). Opinion leaders, which may sometimes be, but are not always, early adopters, hold a type of informal leadership and are unique in their influence on their social system’s communication infrastructure.

The opinion leaders' interpersonal networks allow them to have substantial influence over the use of innovation by the rest of the social system, and as members of the system, their belief in the value of the innovation is paramount to others in the system seeing the innovation's value (Rogers, 1995). While change agents, or facilitators, also seek to have influence over a system, as outsiders, they are often mistrusted or resisted by a system. Change agents who seek to encourage the adoption of an innovation in a system will often seek out the system's opinion leaders, recruiting the opinion leaders to help sway the larger group.

7. Target Audience and Market Segmentation

In the broadest terms the target audience for THECB LOR marketing efforts would include all stakeholders for the LOR. The general public, state officials, students and their parents, higher education administrators and faculty members, users and developers of educational resources, and THECB staff have been identified as primary stakeholders in the current project.

Market segmentation will initially rely on these categories of stakeholder groups. The scope of the marketing efforts has not been established; therefore preliminary marketing strategies addressing the entire group of stakeholder will be described. Table 1 provides an overview of the segmentation process. A first step in segmentation process will be to designate the segments of stakeholders as primary or secondary. This classification will focus the marketing efforts towards high value targets that have the highest likelihood of either using or directly supporting the use of the THECB LOR. Secondary segments related to the longer term missions and goals of the participating organizations. Second the main and secondary communication channels for each group will be designated. Third, the innovation decision stage (Rogers, 1995) for each segment will be listed. Fourth the format for each message is given (see Table 2).

Target Audience Segment	Type	Main Communication Channel	Innovation Decision Stage (Rogers, 1995)	Information Need
Higher Education Administrators	Primary	Interpersonal	Implementation	Website
Higher Education Faculty Members	Primary	Interpersonal	Implementation	Website
THECB Staff	Primary	Interpersonal	Decision	Interim Project reports Website
General Public	Secondary	Mass	Knowledge	Website
State Officials	Secondary	Mass	Persuasion	Website, Final Project Report, Reports from stakeholder groups
Higher Education Students' Parents	Secondary	Mass	Persuasion	Website
Higher Education Students	Secondary	Mass and Interpersonal	Persuasion	Website, Course Work
Users of Educational Resources	Secondary	Interpersonal	Decision	Conference Presentations, Journal Publications, Website
Developers of Educational Resources	Secondary	Mass	Decision	Conference Presentations, Journal Publications, Website

Table 2 Target Audience and Promotion Plan

For several of the other target groups, use is not a goal. Instead the message to these groups will center on persuading them that the LOR is of high quality. For example, part of Closing the Gaps by 2015 addresses center of excellence. The THECB has tasked universities to establish high quality programs that are recognized on a national level. A worthwhile goal for the THECB LOR is to reach this

designation. The LOR being recognized as a center of excellence would move the THECB closer to realizing Closing the Gaps by 2015 and would serve as an example to university campuses that the THECB is directly contributing to Closing the Gaps by 2015. In order for this to happen faculty members and outside users and developers of high quality learning objects would recognize the THECB LOR as a high quality repository. Initially properties of the LOR must be communicated to these groups. As time passes and more objects are placed in the repository these groups should be invited to join the community of users.

More specific segmentation will take place in the faculty member target audience. This segmentation would be based upon geographical, demographic, psychographic, behavioral, and technographic variables. Much of the communication with this segment will be accomplished through interpersonal channels taking advantage of the linkages the sponsoring organizations have with faculty members. Since the UTTC will be managing the operations of the LOR their current contacts with faculty members in the system could be immensely helpful. Consequently this preliminary discussion of potential segmentation will assume that the UTTC is spearheading the initial marketing efforts aimed at faculty members.

Each UT system campus is located in a unique geographical location ranging from urban to rural. Each of these distinct locations would have various levels of human and physical capital. Many more opportunities for collaboration with business and community organizations exist in urban locations than in rural locations. This opportunity for collaboration could affect the readiness and willingness of faculty members at these locations to use the repository. However, since the UTTC is currently engaged with faculty from each campus dialog with individuals from this organization would be necessary to determine if geographical segmentation is necessary. Commonly rural campuses have lower levels of resource available and faculty from these campuses may be more open to using the repository. If this is the case then, it may make sense to focus on these campuses to bring about early successes.

Demographic variables could be of importance. In many ways higher education faculty members could be relatively homogeneous thereby reducing the use of demographic variables. However, occupation falls under this category of variables. Occupation in this context would refer to discipline. Disciplinary affiliation could be important for two reasons. First, content in the repository could be skewed towards certain disciplines and these would be the disciplines to market towards. Second, members of some disciplines may be more open to using a LOR based upon the unique teaching requirements of the discipline. Likewise psychological variables could vary along discipline. For example a faculty member's values could determine what discipline they pursue. Therefore discipline could be a proxy for values. It is possible that faculty members gravitate towards disciplines that are more closely aligned with traditional values. If so members of these disciplines may be less likely to adopt new technologies.

Two behavioral segmentation variables may help identify faculty members who are more likely to use the LOR. As noted in the literature review many technologies co-diffuse. In the case of LOR adoption, it is likely that LMS use would have an impact on LOR adoption. Different patterns of LMS use could affect a faculty member's need for digital learning objects. If a faculty member is using LMS only for the grade book and class communications features it is likely that they are not using the LMS to deliver content and therefore would not be ready to use the LOR. This situation is related to the fifth and final category of segmentation variables. Technographic variables relate to a faculty member's ownership, use patterns, and attitudes toward information and communication technologies. Of particular interest for the LOR are patterns of current use of co diffusing technologies such as LMS as noted above. In addition, an important task is to identify faculty members who are in two of the categories identified by Rogers (1995). Early adopter and majority members who may have roles as opinion leaders would be particularly important to the diffusion of the LOR.

Based upon the review of the literature on diffusion of technology it is assumed that the adoption of the THECB LOR will follow a fairly predictable pattern of diffusion through the groups identified by Rogers (1995). Conceptualizing the diffusion through these stages allows a consideration of the unique motivations and concerns of each group to be included in the ongoing development and expansion of the LOR. User groups who are most likely to accept the technology because of its relevance to their tasks

and the organizational environment will need to be tested. The purpose of this testing is to see how the users integrate the LOR materials into their course preparation activities. These potential users would be most likely to state they would like to experiment with the technology in their course preparation activities. The motivation for these users would be to an early adopter group in the diffusion of this new technology. In addition, top administrators of institutions of higher education could be surveyed to help determine what organizational factors encourage and support teaching with technology. These variables could be added to the model as inputs so they are taken into consideration.

8. Marketing Strategies

Marketing efforts for the THECB LOR have been incorporated into the project as it progressed from prototype through final product. Since the beginning of Phase II several papers have been presented at conferences and published in LIS journals. Several focus groups have been facilitated at various institutions of higher education in the State of Texas have gleaned import information about user preferences and this information has been incorporated into subsequent work on the LOR. This reflects best practice methodology in involving stakeholders early in the design and development of an innovation in order to maximize support.

The following marketing strategies take the discussion in the first sections of this draft plan into account. The brief research review and market segmentation sections were offered as part of a tentative discussion and meant to trigger additional discussions between the development team and the THECB. Some events/activities included here are planned before the review and assessment phase. Future marketing would require more focus and resource allocation than was contemplated earlier in this project. Marketing initiatives should only proceed if there is a firm administrative commitment to sustain the LOR.

The potential benefits of the LOR to Texas institutions of higher education will be realized by ensuring that the intended users are aware of the LOR. This requires active information dissemination and marketing of the LOR. In collaboration with THECB staff, an appropriate marketing plan will need to be developed that will use a variety of communication channels to reach the intended users. These channels can include traditional venues such as presentations at appropriate state conferences, press releases, and email. Innovative marketing can also include the use of YouTube (for an example of a recent video marketing UNT Libraries' Portal to Texas History, see: <http://www.youtube.com/watch?v=rIDx9n4wFb0>).

Initial marketing efforts will focus on early adaptors, particularly those in the UT system currently working with the UTTC. After the value of the LOR has been established in this group marketing efforts will expand to the full intended user group for the LOR which are faculty members of institutions of higher education in the state of Texas.

The marketing plan will describe a multi-staged marketing approach. Such an approach will help the THECB identify the scope of a marketing plan and allow for later stages to be implemented after initial stages have provided a foundation from which to launch any subsequent stages to reach acceptable levels of use by the intended audience. Accordingly the first stages of this draft marketing plan will describe the implementation of aspects of a marketing approach outlined in the THECB LOR Phase II proposal.

Channels to be utilized will include traditional venues such as presentations at appropriate state conferences, press releases, and email. Innovative marketing can also include the use of YouTube.

8.1 Awareness Campaign

The identified stakeholders groups will each have targeted campaigns to ensure that the message is relevant to that group. Higher education administrators will be interested in cost avoidance and support of administrative objectives. Awareness campaign is ongoing with an emphasis on cost avoidance/savings and support of curriculum. Communication will be on a regular basis and will be crafted to meet stakeholder needs. These communications can take the form of formal reports at regular meetings, the announcement of an event at which the THECB will be participating, the arrival of the e-newsletter, an

analysis of the evaluations from a training event, results of an assessment, etc. These may be in person, by email, by UPS mail, and at an event as a presenter or exhibitor. It is important that the stakeholders be knowledgeable about the THECB particularly as to their role as funders or support in obtaining funding through other avenues.

Educators will be interested in how content can be used to enrich their teaching. An awareness campaign is ongoing and each level of higher education faculty will be targeted as appropriate. Communication on a regular basis is imperative and should be crafted to meet educators' specific needs. A core group of opinion leaders will be identified early in this awareness process as champions. This group will be developed as information experts. This group will present at appropriate institution-based events, contribute copy to internal publications, and market one-on-one.

Learning Object Creators/Authors will be interested in how they and/or their affiliated institutions will benefit from their repurposing existing or by contributing new content to the collection. Because funding is not currently available (nor will it likely be in the future) to actually pay these creators/authors, efforts will be made to ensure that the valuable work of these professionals is recognized.

8.2. Implementation

8.2.1. Marketing Committee

A THECB LOR marketing committee will be formed and tasked with creating a practical marketing plan to include content and deployment options. The committee will also work with appropriate individuals in the creation, deployment, and analysis of and response to all evaluations and assessments. Members will represent teacher/faculty peer members, Learning Object creators/authors, representative stakeholders, and other appropriate representatives.

8.2.2. Marketing Outlets

Communication outlets will be investigated to determine their feasibility and appropriateness. This list is intended to be an initial, tentative list from which to identify final strategies to be implemented.

- *Website:* The THECB LOR website will offer marketing tools appropriate for each audience for use by any advocate. These will include PowerPoint, webinars, and other types of presentations that can be used by advocates in their efforts on behalf of the THECB. Appropriate websites will be identified such as universities, professional organizations, etc., and will be linked to the THECB LOR.
- *Listserves:* Listservs will be created for each community. These listservs will be utilized for communications about events and training as well as to serve as a discussion forum for specific stakeholder communities.
- *Marketing Packet:* A packet of information will be created and posted on the THECB LOR website to be used for presentations to create awareness.
- *E-Newsletter:* The THECB LOR will sponsor an e-newsletter which will be published periodically, linked on the website, and delivered to the Listservs, targeted audience distribution lists, and to potential funders including, but not limited to, legislators.
- *Press Releases:* As appropriate, press releases will be distributed to media markets. Releases will report accomplishments and make announcements. More numerous will be press releases distributed to appropriate professional organizations' publications, internal institutional publications and Intranets.

- *Event Exhibits:* Appropriate events which user community members and stakeholders attend will be identified. As budget and resources allow, we will engage in exhibits and/or apply to present at these events.
- *Conferences:* When appropriate, the THECB LOR team will present papers and posters at the appropriate conferences to broaden support base for the repository.

8.2.3. Campus Crusade

According to Texas Higher Education Quick Facts 2008, there were 143 public and independent institutions of higher education in Texas State: 50 public community college districts (with multiple campuses); 32 public four-year universities; 3 public two-year, upper-division universities and centers; 4 campuses in the Texas State Technical College System (including three extension centers); 9 public health-related institutions; 3 public two-year, lower-division Lamar state colleges; 39 independent four-year colleges and universities; 1 independent medical school; 2 independent junior colleges. All of these universities and colleges have faculty centers or the similar organizations which are in charge of faculty training and education technology implementation. The THECB marketing committee will outreach these faculty centers and organizations one by one to inform them the presence and launching of THECB LOR / TxLOR and the LOR's benefits to education and faculty's teaching. Through these centers and organizations, faculty will be reached on campuses. These organizations and centers are also expected to collaborate with the marketing committee to schedule the faculty training for use of THECB LOR.

8.2.4. Incorporating into Existing Resources

Libraries are the most important sources or educational resources. Adding a link on the libraries' websites to point to THECB LOR is a very useful way to exhibit the presence of the LOR. It is part of the responsibility to persuade Texas higher education institutions to incorporate the LOR into their own resources so that faculty and students may be benefited.

8.2.5. Informing the Presence of THECB LOR

Inform all the targeted campaigns mentioned in the section 7.1, higher education administrators, educators and faculty, group opinion leaders, LO creators by the appropriate outlets described above. Besides these main targeted groups, the public population which includes students, students' parents who are supposed to be informed by mass media also. Their opinions will effectively inspire faculty to adopt the LOR.

9. Marketing Budget and Timeline

This section includes the sample budget and timeline for THECB LOR Marketing. These can serve as a guide for developing the detailed information needed.

9.1. Marketing Budget

The budget and timeline need to be planned before the implementation of marketing. The sample budget table (Table 3) shows the proposed financial needs which will cover the expense of marketing activities and employees' salary.

9.2. Timeline

The Table 4 provides the sample timeline for marketing implementation.

Marketing Expenses Budget	Qtr 1	Qtr 2	Qtr 3	Qtr 4	2010
Website					
Listserves					
Marketing Packet					
E-Newsletter					
Press Releases					
Event Exhibits					
Conferences					
Marketing Team Salary					
Total Marketing Expenses					

Table 3. Sample THECB LOR Marketing Budget

Activities	2010						2011
	July	August	September	October	November	December		
Marketing Implementation								
Outlets preparation								
Marketing Plan Approving								
Establish Marketing Committee								
.....								

Table 4. Sample THECB LOR Marketing Timeline

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