# *Cyber-Rez Phase II*

**Prepared by: Rose Corporation**

## Executive Summary

On August 6, 1998, President Clinton directed the Department of Commerce, in conjunction with the Department of Interior and Native American tribes, to undertake a technology infrastructure study of American Indian and Alaska Native communities. The study was to fulfill three fundamental goals:

1. Assess the current state of technology infrastructure in Native communities;
2. Identify and describe the challenges and barriers to technology infrastructure development in Native communities; and
3. Propose solutions for overcoming these challenges and barriers.

After conducting a nationwide review of proposals, the Commerce Department's Economic Development Administration contracted with the College of Engineering at New Mexico State University (NMSU) to conduct the study between January and June of 1999. This project presents the findings of that research.

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# Introduction

## The Need

Technology infrastructure in Indian Country has been extensively studied. The most comprehensive report, to date, was done by the College of Engineering, New Mexico State University (NMSU). This report is titled "Assessment of Technology Infrastructure in Native Communities". The report was prepared under ward # 99-07-13799 from the Economic Development Administration, (EDA) U.S. Department of Commerce. It is appropriate that the Executive Summary of this report be included as documented support of the Need. The Executive Summary begins at Scope of Study and ends with Recommendations.

## Scope of Study

This project defined the concept of "technology infrastructure" very broadly to include all forms of infrastructure that routinely affect economic development. While many people automatically associate the term with telecommunications, it is clear that telecommunications infrastructure alone cannot improve the economic conditions in Native communities without a sound network of roads, utilities, and similar infrastructure. Likewise, technology infrastructure development cannot proceed unless Native communities have a certain minimal capacity in the form of a skilled labor force, capability to undertake technology and strategic planning, and resources to finance infrastructure investment. The study included Native communities throughout the lower 48 states and Alaska.

## The Current State of Technology Infrastructure in Native Communities

By just about any measure used, individuals living in Native communities or villages typically have less income, receive less education, and suffer from higher unemployment and poverty rates than individuals in non-Native communities. Native

communities also lag far behind non-Native communities in “basic” infrastructure such as roads, utilities, and housing. The gap between Native and non-Native communities is even greater in “advanced” technology infrastructure such as Internet access, cellular telephone service, and cable TV. Many Native communities have made important gains in some types of basic technology infrastructure. However, these gains are more than offset by the rapid growth in the importance of, and demand for, advanced technology infrastructure.

For example, results from the survey associated with this project show:

- Only 39% of rural households in Native communities have telephones compared to 94% for non-Native rural communities.
- Approximately 26% of tribes report that they do not have 911 services.
- 44% of tribes have no local radio stations, and for those tribes with radio stations, these stations are rarely tribally owned.
- In rural areas, (population areas with less than 2,500 individuals), 12% of Native households lack electricity and 23% lack gas.
- Of rural Native households, only 22% have cable television, 9% have personal computers, and of those, only 8% have Internet access.
- 61% of tribes report not having a single manufacturing facility in their community.
- Only 17% of the responding tribes have a technology infrastructure plan, 44% have an economic development plan and 35% have a strategic plan in place.
- Nearly 90% of Native schools and libraries have both computers and Internet access.

Tribes overwhelmingly identified their top investment priorities as housing, roads, waste water technology and medical facilities while expressing the opinion that basic levels of technology infrastructure must be in place to lay the foundation for more advanced levels.

Today, many Native communities find themselves in a vicious circle. The weak economic base of these communities makes it difficult to support infrastructure investment. And in turn, the poor state of infrastructure undermines their ability to undertake and attract successful economic development initiatives.

## Barriers to Development of Technology Infrastructure in Native Communities:

Native, government and private sector participants in our research identified many barriers that interfere with tribal efforts to develop and maintain technology infrastructure in Native communities. The most important of these include:

- The generally weak economic base of these Native communities that prevents them from investing in either physical infrastructure or worker training necessary to support technology infrastructure;
- Geographical remoteness that raises the cost of providing technology infrastructure;
- Distrust on the part of some Native Americans of specific new technologies and of federal assistance;
- Lack of an integrated, interagency Native American investment strategy;
- Federal policy that fails to reflect the severity of the technology gaps faced by Native Americans,
- Insufficient information dissemination regarding federal programs available to the tribes; and
- Insufficient planning in Native communities. In general, while there are many programs already in place intended to improve the current state of technology infrastructure in Native communities, these programs could be better coordinated into an overall Native American investment strategy.

## Recommendations for Closing the Technology Infrastructure Gap between Native and non-Native Communities:

Based on our research and extensive discussion with project contributors, we recommend that the federal government provide assistance and encourage private investment for developing Native technology infrastructure. This can be accomplished by:

- Developing a long-term, consistent federal investment strategy for Native technology infrastructure that also encourages the development of public and private partnerships. The federal government should continue to serve as a catalyst to spur private investment such as the Administration's New Markets Initiative. This strategy should identify specific investments needed, assign responsibility for those investments to specific agencies and partners, and estimate budgetary needs and timelines to complete the necessary investments;
- Increasing funding, developing incentive programs, and facilitating strategic partnerships for development of Native technology infrastructure. *The most badly needed investments are for physical infrastructure, planning assistance, and workforce development;*
- Improving the efficiency with which existing Native infrastructure programs are delivered. As part of this recommendation, we suggest a series of interagency working groups. The charge of these groups would be to: target specific types of infrastructure initiatives; identify program strengths, weaknesses and gaps, and; maximize synergy between different agency programs funding similar Native infrastructure areas and
- Recognizing the sovereignty of tribes to plan, develop, and manage their own technology infrastructure. Most important, the federal government should give tribes greater authority to grant utility right of ways and to purchase land needed for effective technology infrastructure development.

Consistent with these broad, cross-cutting policy suggestions, we recommend that the federal government support improvements in specific infrastructure areas by:

- Assisting Native communities to upgrade their basic utilities providing funding, establishing programs and involving private sector participants in technology transfer to tribes, as well as simplifying federal review of their development efforts;
- Assisting Native communities to upgrade their educational facilities and programs for workforce development and managerial training. Most notably,
- Greater support is needed for distance education programs and computer facilities in Native schools and the networks needed to connect them to the rest of the world;
- Increasing funding for, and coordination of, federal programs to help Native communities install and maintain telecommunications infrastructure;
- Setting standards, facilitating partnerships and creating programs needed to encourage the development of telemedicine programs; and highlighting successful private initiatives in, Native American economic development activities.
- Increasing program and technical support for, and highlighting successful private initiatives in, Native American economic development activities.

## Methodology

To arrive at these findings, NMSU researchers:

1. Conducted interviews with Native technology experts, tribal planners, utilities managers, federal and private technology infrastructure program managers, and technology transfer experts from the national laboratories;
2. Undertook a technology infrastructure survey targeted at all federally recognized tribes;
3. Convened a Native Technology Infrastructure Summit of nationally recognized Native experts to discuss, analyze, and propose solutions for technology infrastructure development in Native communities; and

**4.** Reviewed prior scientific, governmental and other literature related to Native technology infrastructure development.

*(End of Executive Summary)*

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Rose Corporation observes that the waves of prosperity affecting most Americans serve to illuminate those remaining enclaves of poverty where the economic condition does not and has not reflected these periods of prosperity. As society at large recognizes these enclaves of poverty, the philanthropic community and various governmental agencies concerned with social and economic issues respond with programs and assistance designed to bring these isolated pockets into the mainstream. A great many successes can be attributed to these efforts. Urban renewal projects in cities where the core was effectively bankrupt and abandoned have created vibrant neighborhoods, centers of commerce, and showplaces of the civic pride. Affirmative Action has assisted people of color in overcoming barriers to careers of their choice and has lead the way to a workforce that is beginning to reflect the diversity of the American population at all levels, lifting whole communities in the process. Numerous specific programs of a national or regional nature have been implemented with a great deal of success.

Additionally, American-sponsored and directed international aid groups have been successful in bringing whole nations and continents into the modern economy. The developing nations currently have little in common with the so-called third world profiled in the National Geographic just a few decades ago. Obviously, the American method of economic development is widely successful, not only in the United States but also around the world.

Unfortunately, there still remain these enclaves of poverty in America that have simply not responded to the American economic development approaches so successful in other communities. Despite over a century of continuing effort by government at all levels and an increasingly active philanthropic community, these pockets of poverty remain unchanged and unchanging.

Identifying the reasons behind these failures should help in tailoring development programs to fit local needs, and numerous task forces and studies have been commissioned to do just that. However, once identified, the presumed causes of failure are normally not addressed and rectified. Rather, they become excuses to justify continuing failure. These economically isolated communities and regions invariably appear on any listing of high unemployment, low level incomes, children at risk, and the myriad social ills that accompany abject poverty. Depending on the scale of the demographic report, those counties or states where these communities occur can be listed as poverty stricken and poor potential sites for business development, even though the actual impoverished community is only a small, discreet component of the entire report area. Efforts at improving the economy of a county where one community's 80% unemployment rate skews the county average to 12% will continue to be unsuccessful unless the specific problem community is clearly targeted and assisted. Unfortunately, this is not the case.

Dominant among these persisting enclaves of poverty, and perhaps well representative of the entrenched poverty common to all these communities, are the nation's Indian Reservations. As the twentieth century drew to a close, few Native Americans could claim that their lives and economic status were really improved over the lives of their ancestors who started that same century. Despite more than a century of changing laws and federal and philanthropic efforts, communities on the reservations still reflect devastating isolation from the dominant prosperity as well as the social ills that attend deep-seated and unassailable poverty.

In 1999, the aforementioned New Mexico State University College of Engineering undertook a study for the Economic Development Agency with three main goals. These were to: assess the current state of technology infrastructure development in Native communities, identify challenges and barriers to technology infrastructure development in these communities, and propose solutions to the problems identified.

That study provided eight overriding challenges faced by Native American communities, including current poor economic conditions, geographic isolation, distrust

of technology and its supporters, lack of an interagency integrated investment strategy, federal policy which does not reflect the severity of the technological gaps faced by Native communities, poor information dissemination, and insufficient community planning.

As a first step in attacking these challenges and barriers, the study authors propose a series of solutions to help Native communities achieve the technological development necessary for economic competitiveness in today's world. Among those recommendations are assisting Native communities to:

- Upgrade basic utilities and involve private sector participants in technology transfers
- Upgrade educational facilities and programs for workforce development and managerial training, "most notably, more support is needed for distance-education programs"
- Establish the networks needed to connect them to the rest of the world
- Install and maintain telecommunications infrastructure.

Native American households are often separated from each other by large geographic distances and from society at large by both geographic and cultural isolation. As the Harvard Project on Indian Economic Development noted, Native Americans remain by far the poorest ethnic population in the United States. As the New Mexico State University study pointed out, even current gains in technology infrastructure by some tribes are "offset by the rapid growth in the importance of, and demand for advanced technology infrastructure."

Disenchantment with the history of failed economic development efforts leads to the disheartening community outlook that there is no real hope for improvement, and the resignation to accept the status quo rather than seek change.

## Cyber-Rez:

Cyber-Rez is a project by the Rose Corporation that specifically addresses the injection of current and cutting edge communication technology as a critical step in

helping Native Americans enter the modern world and develop stable economies. Cyber-Rez addresses the accomplishment of recommendations in the cited studies, so that the results of these studies can be positive action, rather than more excuses to justify the poor economic conditions in these enclaves of poverty.

The Cyber-Rez project creates an information infrastructure among and between Native Americans for the creation, retention and transference of wealth, knowledge, technology and innovation. Rose Corporation will create a Knowledge network through Cyber-Rez, a "virtual reservation" built upon state of the art, advanced technology infrastructure. "Cyber-Rez" will be a "virtual reservation" in the most valuable meaning of the words "to reserve". Native Americans will stake out a piece of cyber-space where they can be connected in pursuit of educational, business and communications agendas that are consistent with their beliefs, culture and values.

A dedicated portion of Cyber-Rez is designed to support applications in real time interactive virtual distance education, entrepreneurship, Community Development Financial Institutions (CDFI) training and workforce training. Another portion of Cyber-Rez is dedicated to providing services to management and communities by providing long distance, real time video teleconferencing – in fact enabling joint simultaneous and interactive Community Meetings in several isolated sites on large reservations. Cyber-Rez enables extended connectivity in Indian Country through fiber optic, cable, satellite and wireless. These applications and connectivity are the critical value driver for Rose Corporation's and Indian Country's investment oriented development strategies.

This advanced technology was designed to be transferable and adaptable. Connecting at the local level, tribal colleges to reservation business clusters, tribal governments to the community, the extended community to all reservation programs and services; and everyone to the rest of Indian Country. Through Cyber-Rez, an infrastructure model can be implemented throughout Indian Country, that will support multiple investment driven and community based applications.

Rose Corporation recognizes that capital alone is not sufficient to yield productive investments in Indian Country. Technology infrastructure and economic development are

mutually supportive and interdependent. Investments in technology infrastructure to create knowledge clusters must parallel and connect to investments in business clusters.

## Products:

Cyber-Rez Phase I, the creation of a high connectivity search engine, was accomplished in 2008. In 2010, the Federal Communications Commission created the Office of Native Affairs and Policy. Rose Corporation is encouraged by the multiple initiatives undertaken by the Office of Native Affairs and Policy; (1) The Native Nations Notice of Inquiry under which the FCC has recognized that broadband is critical infrastructure for economic growth and job creation and has sought input from Indian Country on what the investment needs are in each individual reservation; (2) The Low-Income Program Notice of Proposed Rulemaking commonly known as Lifeline and Link Up under which the FCC is extending communications services to Indian Country; Universal Service Reform - The Connect America Fund and The Mobility Fund under which the FCC is establishing policies that will increase broadband availability - including mobile broadband - in Indian Country, while preserving existing services; (3) The FCC-Native Nations Broadband Task Force. One of the top requests from Native Nations in the National Broadband Plan was the creation of a new FCC-Native Nations Broadband Task Force under which the FCC commits to ongoing consultation with Indian Country to ensure a continuous dialogue and a shared effort between partners.

Rose Corporation is also encouraged by the fact that the telephone penetration rate is now hovering below 70 percent, where it was 39% in the 1999 study. According to Gila River Telecommunications, Inc., a Tribally-owned tele-communications company, the telephone penetration rate for the Gila River Indian Community stands at 86 percent, still well below the national average of 98 percent but significantly above the average on Tribal lands. Gila River attributes its success in expanding the reach of telephone service largely to Lifeline, given that roughly 91 percent of the Community's elders participate in Lifeline.

Cyber-Rez Phase II is uniquely situated and timed to move forward with the Cyber-Rez project. The FCC mandate, tribal governments, telephone cooperatives, non-profit entities all represent an emerging pattern that the technology infrastructure in Indian Country is breaking out and building out. And critical to the connectivity envisioned by Cyber-Rez, are the accelerating availability of mobile services throughout Indian Country, enabling access to android applications anytime and anywhere.

The following Modules, indexed in the chart below and followed by the individual modules themselves, represent Rose Corporation's product solutions which address the accomplishment of recommendations in the cited studies, so that the results of these studies can be positive action, rather than more excuses to justify the poor economic conditions in these enclaves of poverty.

1. **Adopt HTTP/2 technology for faster performance of the server and websites**
2. **Create a new "Performance Management System" to evaluate performance of students in schools and colleges**
3. **Create a new Job Portal for Native Americans**
4. **Create a new application to connect Technical Trainers to Native Americans for training and offering jobs**
5. **Utilize the technology of cloud computing**
6. **Create Segmented Online Library for people to search reliable information**
7. **Create an application for Online Classes**
8. **Introduce Social Medias for Mass Campaigns to reach out to the public**
9. **Reprogram existing system and optimize with responsive versions, iOS and android application for all websites**
10. **Introduce Web 2.0 Technology**

Through Cyber-Rez Phase II Native Americans will stake out a piece of cyber-space where they can be connected in pursuit of educational, business and communications agendas that are consistent with their beliefs, culture and values.

# Module 1: Adopt HTTP/2 Technology

## Introduction

The way that we use the web has changed a lot over the past two and a half decades. Websites are much more demanding of the network, the protocol, and browsers. HTTP stands for hypertext transfer protocol and it's a way for your browser to communicate with websites. HTTP tells a server to pull the information needed to show you a page on a site. There are different protocols for pulling different types of information. For example, you may have used FTP (file transfer protocol) to download files or POP (post office protocol) to send and receive emails. The transfer protocol we currently encounter most often on the web is HTTP1.1, which came on the scene in 1999.

## What is HTTP/2

HTTP/2 (originally named HTTP/2.0) is the second major version and latest upgraded version of Hyper Text Transfer Protocol network used by World Wide Web. It was developed by a collective of programmers from around the world, and is based on a protocol called SPDY, which was created by Google in 2009.

HTTP/1.1 has served admirably, but people have been starting to hack around the performance limitations it has by changing how their website works. HTTP/2 fixes the underlying problems that drove sites to do that.

HTTP/2 fixes many of the limitations of HTTP1.1 through something called "multiplexing."

## Why HTTP/2

When your browser wants data from a website, it makes a request to a server and the server responds with information—but each piece of information has to wait for the data

in front of it to arrive before it can get through to your browser. Multiplexing is “the ability to chop up requests” so that more data can be sent back and forth at the same time. This makes the connection between a browser and web server much more flexible and efficient.

## Implementation

The proposed changes do not require any changes to how existing web applications work, but new applications can take advantage of new features for increased speed. HTTP/2 leaves most of HTTP 1.1's high level syntax, such as methods, status codes, header fields, and URIs, the same. The element that is modified is how the data is framed and transported between the client and the server. Some implementations have stated that they will only support HTTP/2 when it is used over an encrypted connection. The implementation is to be done at the server level with the help of server engineers and http implementers in languages like Python, Ruby and NodeJS.

## Benefits

HTTP/1.1 requests have a lot of overhead associated with them; if too many requests are made, it hurts performance. The HTTP2

- is binary, instead of textual
- is fully multiplexed, instead of ordered and blocking
- can therefore use one connection for parallelism
- uses header compression to reduce overhead
- allows servers to “push” responses proactively into client caches

# Module 2: Cyber-Rez Students Performance Management System

## Introduction

On an average, there is little aggregation of student data in the school system. Information is siloed, redundant and difficult to share. The technologies used if any are aging and frequently incompatible. This makes searching and upgrading the students' details a tedious task. Cyber- Rez aims to improve achievements through an advanced Student Performance Management System (SPMS). Cyber-Rez targets to attain the following features:

- Easy to handle and feasible system to analyze the performance of students
- A performance Management System at least cost
- Fast and Convenient system utilizing latest technologies and approaches available.

## What is SPMS

SPMS is an online integrated software application for educational institutions to manage student data. SPMS is designed to help the school manage all the essential day to day curricular activities of their students. SPMS provide capabilities for entering student test and other assessment scores, creation of exam reports, build student schedules, Exam Performance Analysis, track student attendance, and manage many other student-related data needs in a school. Short Message Service (SMS) is integrated with each module to provide real time alerts for ensuring transparent and accurate sharing of information, instructions and reports with parents in the easiest possible way. SPMS allows authorized members to access the record of academically registered students. This system maintains the database of the students of all educational institutions registered with Cyber-Rez.

SPMS analyze the performance of students based on both curricular and co-curricular activities, generates statistical reports and shares information with other modules of Cyber-Rez to create more training and opportunities for eligible students.

## Common Functions of SPMS

The common functions of SPMS are to support the maintenance of personal and study information relating to:

- Centralized Registration with Parent/Teacher/Admin Login
- Promotion of Students
- Mark and track Student Attendance
- Homework / Assignment Modules and Tracking
- Online Examinations and Discussion Forums
- Gallery
- Progress Report
- Fee Tracking
- Remarks & Complaints
- Time Table Management
- Student Leave Management
- SMS Alerts

## Implementation

The online examination module replaces the traditional paper assessment by creating customized computer based testing from anywhere. With a rich set of question types, one can create standardized tests that allow students to see test results right away.

The assignment module distributes and manages homework/assignments with defined due dates, subject notes and resources to your students instantly.

Discussion forums enable students, teachers and other employees to collaborate, interact and exchange information and ideas. It encourages thoughtful dialogues by allowing members to post messages and reply to other messages.

Students Attendance Tracking system mark and tracks students' attendance quickly to enable teachers to focus on the lesson at hand.

One can upload and share photos with other students and employees on various events happening in the institution. Gallery is one of the most utilized parts in the system since it helps motivate students by showing their creativity to the world.

SMS Alerts customize your SMS settings to ensure employees, students and parents never miss an alert. It sends and receives SMS alerts about student and employee admission, published exam schedules and exam results, attendance, events etc.

## Benefits

- Tracking of students with real-time feeds
- Single system that can manage Students & Staff
- Period-wise/Teacher-wise/Subject-wise Reporting, Monthly/Semester Reporting
- Optimal Operations, with significant reduction in manual chores
- Teacher's bandwidth increased for quality work
- Real time alerts
- Transparent & Accurate information sharing with parents
- Facts driven counseling from counseling coaches/teachers
- Trends & Analytics Capability
- Single Point of Contact: Hardware & Software Solution Availability under the same umbrella
- Unlike an upgrade to a web browser or a word processor, changes and upgrades to SPMS tend to have significant impact on the day-to-day operations of every school employee. These systems typically touch every aspect of school operations even when only the base modules are used.

# Module 3: Cyber-Rez Job Portal

## Introduction

In the current scenario, there is a rat race in each and every professional field. It is also true for the job market. A job portal is a website dedicated for online information about recruiters as well as job seekers. A job portal helps both the job seekers and recruiters find the right organization for the employees. The immediate goal of job seeking is usually to obtain a job interview with an employer which may lead to getting hired. The job hunter or seeker typically first looks for job vacancies or employment opportunities. Contacting as many people as possible is a highly effective way to find a job. Since the year 2000, the internet has been increasingly popular method for job applications, with many companies giving job applicants the option of applying through their company website, while some companies now have no alternative form of recruitment. Likewise, job seekers are beginning to utilize social networking sites to gather information about job applicants and post resumes. It is estimated that 50% of all jobs are found through networking. Job seekers need to be guided towards the right job opportunities at the right time. Native American Indians require a platform where they can search for employment opportunities suiting their culture and skill.

## Job Portal

A job portal is the perfect online arena, where both the job seekers and the employers find their goal in the pursuit of getting a top notch company for the suitable candidates. The idea of a dedicated job listing site which can bridge the gap between jobseekers and employers will fulfill their dream of being hired. It is a dedicated system which collects information about the latest job openings in various government and private companies inside and outside the exterior boundaries of the Indian Nations/reservation. The job portal will assist the candidates in applying for the most suited jobs. The website provides

an interface where the candidate can see all the latest job openings listed category wise and they can go directly into the website of the job provider where they submit the job application. The job portal will list job opportunities in a specific sector, including but not limited to education, healthcare, hospital management, academics and opportunities in the e non-governmental sector.

## Key Facts of Job Portal

- It provides the candidates the ability to register in the portal and search for jobs and manage their accounts.
- Employers who are willing to publish their job opportunities and offerings to candidates, can register at the job portal, get their own account created and then post jobs to the portal's database.
- Registered Employers can add or remove jobs and these jobs can be seen by various candidates and they can contact the right person for the job.
- The main aim of this web application is to make a user friendly platform where, applicant can search jobs easily and is accessible to everyone who is interested.
- The Purpose of the application is to provide Job portal for Job Seekers, to submit their CV and apply for job, where employer can select the best candidates from the available candidates.

## Implementation

The Job Portal will be created under a different domain name. The application will use the Cyber-Rez server space for deploying the Job Portal. The portal will be created using ASP.Net and SharePoint. Since huge data flow is expected, Big Data technology will be implemented to handle huge volume of data and MapReduce to co-ordinate, combine and process data from multiple sources. Business Intelligence software will be used to identify the trends of openings and data will be submitted to the Cyber-Rez expert committee managing the "Technical Training" module. An API will be created for the

opportunities to be automatically updated in other tribal websites so that the information can have maximum exposure. Once the online portal is created, its mobile version will also be created enabling the access to the portal from any devices. After completion of development and testing of the job portal, an interactive android and iOS mobile applications will be developed for users to quickly respond and browse jobs. The mobile application will download all the latest opportunities relevant to the user including all notifications relevant to those opportunities.

## Benefits

- The Cyber-Rez Job Portal is intended to accelerate the economic growth and development of Indian Nations and individual tribal members seeking employment opportunity. The Job Portal will prioritize opportunities which are specific to Native American preference such as tribal cultural related opportunities.
- The application uses all the latest technologies to function. This ensures better performance and better conversion rates from visitor to users.
- This Job Portal targets Native American opportunities to ensure maximum benefit and performance on behalf of Native Americans.
- The user will also have links to external job sites.
- Since the portal's primary target is Native Americans, any employer who specifically is seeking a Native American for employment that has an Indian preference, can use this Job Portal to hire the right employee from the Native community itself.
- The Job Portal creates competition and opportunity for Native Americans by bringing job opportunities to the reservation via the Portal. This increases the Native American's chance of being employed. Once employed the unemployment rate within the community is correspondingly reduced.
- Providing access through all the internet enabled devices including smart phones and tablets ensures that Job Portal data is instantly available anytime, anywhere to the user.

# Module 4: Cyber-Rez - Connecting Technical Trainers

## Introduction

One of the priorities of Cyber-Rez is to promote competitiveness and generate jobs and economic growth within Indian Nations and their reservation communities. This requires encouraging the Native American, entrepreneurial mindset and stimulating the innovative capacity of all income generating sectors including agriculture, industry and service sectors. "Connecting Technical training people both for training and offering jobs" is part of this process. The module intends to provide people with the skills and competences they need to be able to succeed in the labor market. It also will provide Native American enterprises with the skill base and skill sets they need to be competitive. People don't need to memorize every library function in a technology. They need someone to help them get started, to guide them through the basics until they feel comfortable enough with their own skills to apply them to solve real problems. They need to practice, make mistakes and gain practical knowledge before ever touching a mission-critical project. Such skills are gained only through real experience and feedback. This underlines the requirement for the creation of an application that can connect Trainers to the Youth. This Cyber-Rez module will be interlinked with "Job Opportunities Listing Website" module so as to gain a wide coverage across the targeted areas.

## Connecting Technical training people

Training is essential because technology is developing continuously and at a fast rate. Systems and practices get outdated quickly due to new discoveries in technology, including technical, managerial and behavioral aspects. Organizations that do not develop mechanisms to catch up with and use the growing technology soon become stale. However, developing individuals in the organization can contribute to the effectiveness of the organization.

There are also other reasons for which this training becomes necessary. Explained below are various factors, giving rise to the need for training.

- Employment of inexperienced and new labor requires detailed instructions for effective performance on the job.
- People should not just work for the sake of work, but learn to work effectively with the minimum supervision, minimum cost, waste and spoilage, and produce quality goods and services.
- Enterprises are now continually adapting to the ever changing techniques in production and other operations which then require training employees in the newer methods.
- Senior employees need refresher training to enable them to keep abreast of changing techniques and the use of sophisticated tools and equipment.
- Training is necessary when a person has to move from one job to another because of transfer or promotion.

Such development, however, should be monitored so as to be purposeful. Without proper monitoring, development is likely to increase the frustration of employees if when, once their skills are developed, and expectations raised, they are not given opportunities for the application of such skills. A good training sub-system would help greatly in monitoring the directions in which employees should develop in the best interest of the organization. A good training system also ensures that employees develop in directions congruent with their career plans.

Education alone may not get a person a job. To build a successful career, you need to be guided and trained by skilled persons. Cyber-Rez identifies that connecting technical training people with the youth both for training and offering jobs is the key to the future.

The "Training" module of Cyber-Rez fosters exploration, learning, and achievement in an environment where students and instructors are partners in discovery. The module provides an online platform where theory is put into practice, and students become accomplished builders of technology.

## Promoting Online Training: Challenges

One challenge outlined for implementation of proposed module is to combat structural unemployment by ensuring better correspondence of qualifications and skills to labor market needs. The major policies for combating structural unemployment aim to:

a) Improve active labor market policy measures by a gradual shift from combating consequences of crisis (such as subsidized employment) to traditional active labor market policy measures (such as lifelong learning opportunities for the unemployed and persons at risk of unemployment).
b) Re-engage efficiently the economically inactive population into the labor market and support regional mobility.
c) Promote efficiency of public employment services.
d) Reinforce the lifelong learning approach.

## Implementation

Lifelong learning begins in youth. Not finishing an education either in school or college or not completing a training or certification has a negative effect on both education and employment. Cyber-Rez will review national strategies that aim to keep young people in education and training and lower the dropout rate.

Cyber - Rez will have an Expert Committee that reviews trends and policy developments that are related to technical training and job opportunities. It will also provide policy-makers with data and analysis and offer opportunities for knowledge-sharing and best practice exchange in education and training.

Cyber-Rez has found that in recent years the value of apprenticeships in combating youth unemployment has come to the fore. The Expert Committee in cooperation with the other tribes will help to create apprenticeship alliances with tribal community colleges and other related institutions all across the United States.

The Expert Committee will monitor and review adult learning trends and policy developments. The focus will be on how work-based learning helps people develop the skills that give them better success in finding jobs and improving their careers.

Guidance and counseling will accompany youth and workers at every transition. The system will identify successful initiatives and make recommendations for future trends in job opportunities across Indian Country and throughout the United States.

The project will promote knowledge-sharing between practitioners and decision-makers and make proposals for the professional development of vocational teachers and trainers also.

## Benefits

- The application enables Trainers to share their knowledge and experience to prospective trainees.
- The application maximizes the trainee's skills while minimizing the time and budget investment.
- The application also guides the trainees through a "simulation" process to create a virtual environment so that trainees can feel a real live experience on certain tasks and thereby obtain practical experience through the simulation. This application creates more opportunities for prospective employers desiring to employee people who are already trained and with practical experience.
- The application results in reducing unemployment in the community and the country.
- Investors will be more willing to invest in enterprises and industry where people are already trained, have practical experience and are available to work. The investors will have a ready pool of trained and talented people to execute a job.

# Module 5: Adopt Cloud Computing

## Introduction

In recent years, new Information and Communications Technology (ICT) are being implemented in every sector of the United States and globally. One of the principal sources of income for Indian Nations is agriculture. The large land based tribes, many containing several hundred thousand acres up to several million acres, have agricultural based business enterprises producing multiple commodities and value added products from those commodities. Many enterprises are tribally owned on behalf of the community, but a growing sector is represented by individual, entrepreneurial, Indian owned and operated family enterprises. Therefore, ICT development must also be focused on the Native American agricultural sector. But the significant investment cost for ICT infrastructure and maintenance is one of the primary drawbacks. As a result, the main priority for the information technicians is to create a faster, reliable, efficient user-friendly, but less expensive, ICT tool for this sector. **Cyber-Rez** will include the concept of implementing such an ICT tool which will maintain a huge but customized, updated and secured database with instantaneous connectivity, but at a reasonable investment cost. That new application domain for ICT is Cloud Computing. It allows users to make use of services such as real-time computation, data access, and storage to end-users without the need to know the physical location and configuration of the system that delivers the services. **Cyber-Rez**, through the successful implementation of a new ICT tool, Cloud Computing, into the Native American agriculture sector, will not only accelerate the economic growth and wealth of Indian Nation reservations, but also the individual, entrepreneurial, Indian owned and operated family enterprises within those Nations.

## Cloud Computing

Cloud computing is a tool to enable IT related services to be available in a simplified manner. It hides the complexities of those services. The term "cloud computing" is given to this approach because the users do not really need to know who is providing those services and users consider that the services are rendered by the cloud – an unknown to them. The charm of cloud computing is that the services may be accessed whenever and wherever needed. Cloud computing requires less manpower and maintenance to provide its services which translates into a much reduced cost to the user accessing those services. It also enables the users to be free from certain concerns such as buying software, keeping abreast of updates and maintenance of data etc. All these issues would be taken care of by Cloud providers. Cloud computing offers various models based on the user requirements.

## Key Facts of Cloud Computing

Some of the key facts that are the most prominent in promoting cloud computing globally, according to a study done by one of the cloud service providers, "cloudhypermartket.com", are given below:

- Almost 70% of the users believe that it has simplified the IT management process.
- 72% users have experienced improved end-user assistance.
- 63% users consider that it has brought down the IT performance challenges.
- 73% users believe that it has reduced the cost of infrastructure.
- According to 74% of the users, it has alleviated internal resource pressures.

## Implementation

A key finding in this study, and an encouraging one for Indian Nations with depressed and often impoverished reservation economies, is that the user's economy does not play a vital role in terms of the ability to implement cloud computing in any sector, i.e., Native

American agriculture sector. Cyber-Rez intends to introduce a cloud computing model with two core parts. The first part is to monitor and fulfill user requirements with a user-friendly and faster approach. The second part is to store all relevant data in a centralized location, i.e., the cloud.

**Cloud Agro System:**

This part of the system can be used to monitor the overall functionalities of the system and render the needed services. The system will have online service facilities available to all the users, from any part of the country and at any time. In order to render these services, the Agro system may have the following services:

**Demand-supply:** It can provide an up to date picture of the current demand and supply information of agro products in different parts of the country. It can help Native American farmers in deciding which crops to plant. It can also provide for a comparative analysis of the demand and supply chain.

**Communication:** The system could provide services in their native/national language. The system will also have audio-visual facilities to disseminate information.

**Communication Devices:** Mobile phone services cover most all Indian reservations and almost every family has access to those mobile services, i.e., cell phones. Though many Native American farmers may never have heard of ICT, they all have cell phones and know how to access mobile services. Thus, the Agro System incorporates mobile services and helps farmers in acquiring information from an e-data bank from anywhere, at any time, through mobile phones.

**E-Knowledge sharing:** The system also keeps provision to have online communication with the experts/consultants and attend online training programs using the Community Service Centers (CSC) as the local information bases. The system is not restricted to only local information; cloud agro is a global ICT approach. The system, therefore, will collect and disseminate agriculture related global information to the local farmers. This will be specifically useful if they need information that is not locally available or not yet implemented in the country. Also farmers can be made aware of recent agro related concepts, such as “Organic cultivation” using this global ICT approach.

**Conducting Research:** The Agro System will help national and international researchers to extract Native American agricultural data directly from the e-data bank and analyze that data in order to contribute to the Native American agricultural sector of the nation. The research findings will be kept in the e-data bank and will be available to all its stakeholders.

**E-Data Bank:** It is a central data bank and it can be used to store all the agriculture related information in a centralized cloud, which will be available to all the users at anytime, anywhere. The main concept behind having an e-data bank is to disseminate vital information to the local Native American farmers for decision making. In order to do so, the e-data bank includes the following databases:

**Crop related information:** It captures information related to all the crops grown in the recent past in different regions. This will help the local Native American farmers of different parts of the nation in crop related decision making.

**Weather information:** It stores the region specific weather information and also the weather forecast for a specific duration. It will benefit the farmers in decision making related to selection of crops.

**Soil Information:** Soil information also plays a vital role in crop related decision making. So, this section provides information on nature of soil of different parts of the country. It can also provide the trend of soil in past and will help in forecasting the future trend of soil.

**Growth progress monitoring:** It monitors and captures data on crop growth in different regions on a regular interval. This will be specifically useful in comparing the crop growth region wise and also comparing it with past data will bring a clearer picture.

**Farmers Data:** It captures the region wise farmer related data, to monitor and study the involvement of local farmers in the Native American agricultural sector. It will help the policy makers in designing agricultural policies. This will also help in identifying the core agricultural areas, so that the policy makers can make informed decisions on where to encourage and promote agriculture. This may help in overcoming problems such as unemployment and rural-urban migration.

**Expert Consultation:** It provides solutions to common problems that farmers frequently experience. It can also have a provision to post problems and seek solutions from the experts. It can also have a bundle of frequently asked questions (FAQs) and their answers to provide faster responses to Native American farmers.

## Benefits

**Data management:** The data will be managed by the service provider, a team of professionals. That guarantees a better and organized management of data.

**Data readiness:** The model provides data from the e-data bank databases to its entire stakeholder at any time and at any location.

**Local and global communication:** The model makes the communication between different users much faster, easier and cheaper. Also the communication will be secured.

**Rural-urban migration:** It can be reduced as the model provides its services all over the country at any time no matter how remote the place is. This will also help in controlling unemployment problem in the country.

**Motivation:** It will motivate the farmers and researchers to get more involved in agriculture as communication will be result oriented. That will help in the overall development of the Native American agriculture sector.

**Security:** It provides an enhanced security as the resources will be stored in the cloud and will be maintained centrally by the service providers, addressing any security concerns of the users.

**Reduction of technical issues:** The Agro System drastically reduces the manpower, maintenance and infrastructure requirement normally required of the user, and is instead provided by the service provider.

**Overall economy:** Implementation of the suggested model will not only accelerate the economic growth and wealth of Indian Nation reservations, but also the individual, entrepreneurial, Indian owned and operated family enterprises within those Nations.

# Module 6: Cyber-Rez Segmented Online library

## Introduction

"The need for segmented library arises from the thought of confining the amount of information needed for a specific group of people." Online Libraries are intended for use by people who choose not to - or cannot afford to - purchase an extensive collection themselves. Online libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources. They are extending services beyond the physical walls of a building, by providing material accessible by electronic means, and analyzing very large amounts of information with a variety of digital tools. Cyber-Rez is thus concerned with the idea of implementing such a segmented online library which is much customized in the database level. The objective of the application is to help the tribes to enhance their thinking level and to explore the treasure of knowledge using the most modern available technologies.

## Segmented online library

Segmented online library is an organized collection of sources of information and similar resources, made accessible to a defined community for reference. This facility makes the content of the database confined only to those collections of data which are related to Native Americans. Filtering of digital library contents makes it possible to display quick and better search results and enables ease of access. The books with content related to Native American culture, beliefs, rituals, literature, agriculture and other areas are to be given priority in the online library. With deep archives of thousands of academic journals and articles, the segmented online library will help Native Americans search better and faster.

## Key Facts of Segmented Online Library

Development of an application for the Segmented Online Library is very economical and feasible when compared to the manual work required to manage the system. The fact that the world is moving to an IT dependent space, this application will have a huge impact. The Online factor enables the system to store the primary data online and a copy of it in software database. This also helps the application system not only store information on books, but also store other information such as articles, newspapers, relevant photos, videos etc.

## Implementation

Cyber-Rez will provide access to Online Segmented Libraries for all students and people of the community who register with the application, either through offline software integrated with the online platform or through online interface. People who do not want to register with the application will have an option to search information as a “guest”. Limited access will be given to the guests since their identity is hidden. For those who register with the application, they will have the option to bookmark the articles and books they like for easy retrieval of information at a later stage. This helps the application to identify the reading preferences of the people. The application itself will track key information like most searched “keywords”, “books”, “Videos” etc and rank each article and books accordingly based on the algorithm set by the application. Thus the application can also suggest similar related articles, books, videos or information based on the browsing nature of the member.

The application also identifies people who have a certain reading behavior and suggests to them to contribute more information to the article. There will be a number of users who will also be moderators or contributors so that when information is contributed, the application automatically allocates it to these moderators to evaluate its quality and accuracy of content. Once considerable number of moderators have screened and given approval of the information contributed, then that contributed information will be

published in the online library segment for the public to read. This way, the application will perform its own sustainable algorithm to keep the informational interface alive.

## Benefits

- In real libraries, there is always a limit to the number of book or copies or paper that can be stored. Unlike real libraries, in segmented online libraries, there will be no restriction to the number of copies of information the reader can access. Browsing will be done virtually, not manually. Information remains for ever as a digital copy accessible to the user at any point. This ensures that the database will be constantly growing with new information and data.
- The Web 2.0 technology introduced makes the online interface user friendly and a better look and feel.
- Since data is synced both online and offline, this will enable fast access to the database and speedy loading of the website.
- The android application will enable users to download the application from Google play store so that easy and quick access is possible for the users through the Cyber-Rez application.

# Module 7: Cyber-Rez Online Classes

## Introduction

Online learning or e-learning is perhaps one of the hottest and most controversial developments in the education sector. Online learning has become the standard form of delivery for distance education programs in a number of post-secondary institutions in more economically advanced countries. It has both strong advocates and strong critics. Unfortunately, much of the discussion around online learning is highly emotional and ill-informed. There is a strong link between online learning, new ways of thinking and learning, and a knowledge-based economy. As the knowledge-based economy grows and becomes more important, so too will the need for an effective and modern online distance education system.

The early developments required special software programs such as Virtual Classroom or CoSy, and were limited to short, typed online communication between students, and similar communications between instructors and students. Although this was a major advance in distance education, the lack of common technical standards, the need for core content to be handled mainly by other media such as print or broadcasting, the need for distance students to network over slow and expensive long distance telephone lines, and the lack of user-friendly tools meant that computer-conferencing was limited to a relatively few enthusiasts and pioneers until the mid 1990s. The big breakthrough for online learning came with the development of the World Wide Web, and the consequent rapid spread of the Internet into many homes, offices and most universities in more economically advanced countries. The first Web-based university courses started appearing around 1995.

## Online Classes

Online classes are revolutionizing formal education, and have opened a new genre of outreach on cultural and scientific topics. These courses deliver a series of lessons to a web browser or mobile device, to be conveniently accessed anytime, anyplace. An online course is designed as a built environment for learning. Online classes offer a platform for a variety of courses online to meet the needs of students juggling school, work, and home. Online classes offer the opportunity to learn on their own time and at their own pace. Online classes are the prominent example for E-learning which is the use of electronic educational technology in learning and teaching. Online virtual class is an online, virtual environment or networked environment in which teachers and learners are separated by time and space. Online tutoring, as a reflection of the diversity of the wider Internet, is practiced using many different approaches and is addressed to distinct sets of users. The distinctions are in online content and interface, as well as in tutoring and tutor-training methodologies. Many of the online classroom courses utilize web tools to enhance the classroom experience.

## Key Facts of Online Classes

Online tutoring presupposes a self-motivated and independent learner. The learning aspect of tutoring outweighs the teaching aspect. E-moderating usually refers to group online or web-based learning that

- Is based on constructivist and social-constructivist principles;
- Focuses on using online dialogue and peer learning to enrich learning within the online environment;
- Focuses on achieving goals of independent learning, learner autonomy, self-reflection, knowledge construction, collaborative or group-based learning, online discussion, transformative learning and communities of learning, as opposed to delivering online content via a transmission medium; and

- Is also a way of adding extra value and service to traditional educational services (postal services can be expensive and slow, yielding to the cost-effectiveness and speed of online resources).
- Providing completely free classes will enable all students to earn accredited Continuing Education Units and a Certificate of Completion.
- Implementing the virtual classrooms that provide courses on subjects coming under the University curriculum will enable them to meet their educational goals.

While the majority of academic leaders cite online education as critical for their long-term strategy, they also continue to express concerns about a number of barriers that will impact the growth on online.

## Implementation

Much has been written about the challenges of teaching an online course. While not discounting the unique (and sometimes frustrating) aspects of the online learning environment, it could be said that, despite the numerous differences, many of the same course management strategies that are essential to success in a traditional classroom also apply in the online classroom. These strategies include the importance of a strong syllabus, clear directions, well-organized materials, and timely feedback.

Of course, the big challenge for online instructors is that the very nature of online education amplifies the importance of properly addressing these management issues, while throwing a few more additional obstacles into the mix. Choosing the right communication tools and protocols, addressing technology problems, managing student expectations, and building community are just some of issues that can stretch online instructors to the breaking point.

Cyber Rez, through the concept of virtual classrooms, creates a knowledge hub where students can interact with instructors, experience their presence and learn from them regardless of the distance between them. This helps the community to avail a highly

standard quality education for the students which in turn will result in the creation of qualified youth which results in the development of the society.

The software will also support teachers to create their own web based learning materials This also helps the students to network.

## Benefits

- Increased access to internet and specially designed software help students acquire knowledge from experienced instructors regardless of their location. Distance is not a barrier for them to acquire knowledge.
- Students must be more responsible and self-motivated for their own learning and are able to review material more than once. This improves the quality of learning.
- The Web-based online learning platform designed by Cyber-Rez will allow for self-assessment, multiple-choice testing, and continuing revision, thus providing students more opportunities for self-study than available in a traditional classroom.
- It is more self-guided so that students can spend more time on the concepts that they need help with, and less on concepts that they can pick up quickly.
- It is self guided.
- Convenience of learning is an important factor.
- Students are not affected by other's learning.

# Module 8: Introducing Social Medias

## Introduction

The Internet has become a major source for information and discussions. The number of users and the voracity with which these users consume information on social media sites continues to grow. Social media now permeates almost every aspect of our lives, from how we manage relationships to the way we shop and work. It is not surprising, then, that the private sector has long recognized it's potential as a route for influencing consumers. Campaigners, too, are beginning to recognize its power as an advocacy tool. Social media offers much more than traditional media; it is free, allows campaigners and marketers to reach far more people and gives a voice to those that otherwise might not have one. In addition, platforms such as Twitter enable direct engagement with individuals and groups who have the power to effect change.

## Social Media

Social media are computer-mediated tools that allow people to create, share or exchange information, ideas, and pictures/videos in virtual communities and networks. Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content. Furthermore, social media depend on mobile and web-based technologies to create highly interactive platforms through which individuals and communities share, co-create, discuss, and modify user-generated content. They introduce substantial and pervasive changes to communication between businesses, organizations, communities, and individuals. These changes are the focus of the emerging field of techno self studies.

Social Media Campaigns also known to be Public communication campaigns are defined as purposive attempts to inform or influence behaviors in large audiences within a

specified time period using an organized set of communication activities and featuring an array of mediated messages in multiple channels generally to produce noncommercial benefits to individuals and society. The campaign as process is universal across topics and venues, utilizing systematic frameworks and fundamental strategic principles developed over the past half century. Campaign designers perform a situational analysis and set objectives leading to development of a coherent set of strategies and implement the campaign by creating informational and persuasive messages that are disseminated via traditional mass media, new technologies, and interpersonal networks.

Social-media technologies take on many different forms including magazines, Internet forums, weblogs, social blogs, micro blogging, wikis, social networks, podcasts, photographs or pictures, video, rating and social bookmarking. Technologies include blogging, picture-sharing, vlogs, wall-posting, music-sharing, crowd sourcing and voice over IP, to name a few. Social network aggregation can integrate many of the platforms in use.

## Key Facts of Social Media

One defining characteristic of all social media is their potential to facilitate engagement—the interactive, synchronous communication and collaboration among numerous participants via technology. There is a multi-way communication, at the same time but in different places, functionality available through social media, enabling people, group or organizations to move from basic information dissemination typical of traditional mass media to a fully interactive information sharing dialogue.

Social media have also been recognized for the way they have changed how public relations professionals conduct their jobs. They have provided an open arena where people are free to exchange ideas on companies, brands, and products.

## Implementation

Focusing on technical advancement, Cyber-Rez targets to build its own social media as a framework that is defined by seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation, and groups.

**Identity:** This block represents the extent to which users reveal their identities in a social media setting. This can include disclosing information such as name, age, gender, profession, location, and also information that portrays users in certain ways.

**Conversations:** This block represents the extent to which users communicate with other users in a social media setting. Many social media sites are designed primarily to facilitate conversations among individuals and groups. These conversations happen for all sorts of reasons. People tweet, blog, et cetera to meet new like-minded people, to find true love, to build their self-esteem, or to be on the cutting edge of new ideas or trending topics. Yet others see social media as a way of making their message heard and positively impacting humanitarian causes, environmental problems, economic issues, or political debates.

**Sharing:** This block represents the extent to which users exchange, distribute, and receive content. The term 'social' often implies that exchanges between people are crucial. In many cases, however, sociality is about the objects that mediate these ties between people—the reasons why they meet online and associate with each other.

**Presence:** This block represents the extent to which users can know if other users are accessible. It includes knowing where others are, in the virtual world and/or in the real world, and whether they are available.

**Relationships:** This block represents the extent to which users can be related to other users. Two or more users have some form of association that leads them to converse, share objects of sociality, meet up, or simply just list each other as a friend or fan.

**Reputation:** This block represents the extent to which users can identify the standing of others, including themselves, in a social media setting. Reputation can have different meanings on social media platforms. In most cases, reputation is a matter of trust, but because information technologies are not yet good at determining such highly qualitative

criteria, social media sites rely on 'mechanical Turks': tools that automatically aggregate user-generated information to determine trustworthiness. Reputation management is another aspect and use of social media.

**Groups:** This block represents the extent to which users can form communities and sub-communities. The more 'social' a network becomes, the bigger the group of friends, followers, and contacts.

## Benefits

- The success of social media is based on one thing and that is conversation. When you use social media sites for expanding your presence, it allows you to magnify the conversation (or buzz) that surrounds your identity.
- Social media is an effective way to allow others to know you and your identity and to form relationships that are built on trust, mutual respect and loyalty.
- Social media is most effective when it is treated as an interactive forum; not only does this allow supporters to become involved and heighten their commitment, but, whenever they comment, the campaign message gains visibility within their own networks.
- It establishes a professional online presence, through which all social media platforms can connect.

# Module 9: Cyber-Rez Mobile, Android & iOS version

## Introduction

Customers are changing the way they search for information. They're going mobile. Google analytics shows that between 30-50% of website traffic can be attributed to mobile phones and tablets. This trend is gaining momentum and statistics are projecting by end of 2015 more web browsing will be done on a mobile device rather than a desktop computer.

Google has said it "highly recommends using responsive design" and announced this has become an important part of its search engine algorithm in 2014.

An updated website helps the organization from the outside in. Currently, an updated website does not just include the minimalist, sleeker look of current designs (which is important in being visually impressive/inviting) but may or may not display well on a phone or tablet. It means having a website that is designed for the mobile user is first and foremost.

Statistics say:

- 95% of mobile users use their devices for searches
- 52% of all searches are done on a mobile device

If your website is obsolete, your organization will follow suit. If users can't find you, they won't use you. If they aren't impressed, you will lose them.

## Mobile Website

The mobile web refers to access to the World Wide Web, i.e. the use of browser-based Internet services, from a handheld mobile device, such as a smart phone or a feature phone, connected to a mobile network or other wireless network.

A mobile app is a software application developed specifically for use on small, wireless computing devices, such as smart phones and tablets, rather than desktop or laptop computers.

Apps are usually available through an application distribution platform and are typically operated by the owner of the mobile operating system, such as the Apple App Store, Google Play, Windows Phone Store, and BlackBerry App World. Some apps are free, while others must be bought. Usually, they are downloaded from the platform to a target device, such as an iPhone, BlackBerry, Android phone or Windows Phone, but sometimes they can be downloaded to laptops or desktop computers.

Mobile apps were originally offered for general productivity and information retrieval, including email, calendar, contacts, stock market and weather information. However, public demand and the availability of developer tools drove rapid expansion into other categories, such as word processing, social media, picture sharing, mobile games, factory automation, GPS mapping and location-based services, banking, networking and file transfer, education, video streaming, order tracking, ticket purchases and recently mobile medical apps. The explosion in number and variety of apps made discovery a challenge, which in turn led to the creation of a wide range of review, recommendation, and curation sources, including blogs, magazines, and dedicated online app-discovery services. The popularity of mobile apps has continued to rise, as their usage has become increasingly prevalent across mobile phone users.

## Key Facts of Mobile versions and apps

**Improve Google ranking:** Google is now focusing on the user experience and wants to return search results that will enhance the user experience no matter what device they use. Websites that do provide a better user experience through well written content and a well-designed user interface across multiple devices including mobile phones and tablets will take priority in searches improving their Google ranking.

**Higher conversions:** We can also see direct results in Google Analytics for websites that are responsive in design with a well-designed user interface enhances the user experience which keeps them on the site longer, decreases the bounce rate and increases the conversion rate. A goal we're all trying to achieve.

**Cost effective:** Having a website that is responsive in design means one site for all devices. No need for a separate mobile website build saving you money. Time is another important factor here, one website to update, host, market and maintain. Saving time equals saving money.

Apps are actual applications that are downloaded and installed on your mobile device, rather than being rendered within a browser. Users visit device-specific portals such as Apple's App Store, Android Market, or Blackberry App World in order to find and download apps for a given operating system. The app may pull content and data from the Internet, in similar fashion to a website, or it may download the content so that it can be accessed without an Internet connection.

Organizations are adopting BYOD (Bring Your Own Device) strategy by offering mobile devices and tablets that run on OS's like Android to its workforce. Android App Development helps the enterprise to create custom solutions catering the business needs and demands.

## Implementation

As a part of technological advancement, Cyber-Rez has decided to opt for creation of mobile versions and mobile applications for all of their web related activities including modules such as Student's Performance Evaluation, Job Portal, Technical Training, Segmented Online Libraries, Online classes and Social medias.

## Benefits

1. **Low Investment & High ROI:** Android comparatively has a low barrier to entry. Android provides for free its Software Development Kit (SDK) to the developer community, which minimizes the development and licensing costs. The development costs can be divided into three stages: Stage #1 – application development, Stage #2 – testing, and Stage #3 – hardware cost for testing and deploying the android mobile application.
2. **Open Source:** Get the open source advantage from licensing, royalty-free, and the best technology framework offered by the Android community. The architecture of the Android SDK is open-source which means you can actually interact with the community for the upcoming expansions of android mobile application development. This is what makes the Android mobile application development platform very attractive for handset manufacturers & wireless operators, which results in a faster development of Android based phones, and better opportunities for developers to earn more. That's the magic of Android.
3. **Easy to Integrate:** The entire platform is ready for customization. You can integrate and tweak the mobile app according to your business need. Android is the best mobile platform between the application and processes architecture. Most of the platforms allow background processes helping you to integrate the apps.
4. **Multiple Sales Channels:** Unlike other mobile platforms, Android applications can be deployed in different ways. You do not have to rely on a single market to distribute your applications. You can use third-party application marketplace (especially in Google Android Market), but you can also form your own distribution and sales channel: applications for vertical markets, to develop new application stores, and also place it on your website. You build it, you publish it. With your choice of promotional strategy, you can reach your end users through multiple channels.
5. **Easy Adoption:** Android applications are scripted in Java language with the help of a rich set of libraries. Anyone can build Android applications with the knowledge of

Java. According to a recent survey, a lot of Java programmers find it easy to adopt and script code for mobile applications in the Android OS. It is now very beneficial for Java developers to transition the code script into a mobile application, and can also implement android application development services in the app.

iOS 8 is the world's most advanced mobile OS. In its most advanced form, with an easy-to-use interface, amazing features and security at its core, iOS 8 is the foundation of iPhone, iPad and iPod touch. It's designed to look beautiful and work beautifully, so even the simplest tasks are more engaging. And because iOS 8 is engineered to take full advantage of the advanced technologies built into Apple hardware, your devices are always years ahead — from day one to day whenever.

# Module 10: Adopt Web 2.0 Technology

## Introduction

Web 2.0 is a term that describes the changing trends in the use of World Wide Web technology and Web design that aim to enhance creativity, secure information sharing, increase collaboration, and improve the functionality of the Web as we know it (Web 1.0). These have led to the development and evolution of Web-based communities and hosted services, such as social-networking sites (i.e. Facebook, MySpace), video sharing sites (i.e. YouTube), wikis, blogs, etc. Although the term suggests a new version of the World Wide Web, it does not refer to any actual change in technical specifications, but rather to changes in the ways software developers and end users utilize the Web. Web 2.0 is a catch-all term used to describe a variety of developments on the Web and a perceived shift in the way it is used. This shift can be characterized as the evolution of Web use from passive consumption of content to more active participation, creation and sharing. Web 2.0 Websites allow users to do more than just retrieve information. Now users can build on the interactive facilities of Web 1.0 to provide "network as platform" computing, allowing users to run software-applications entirely through a browser. Users are able to co-author the data on a Web 2.0 site and exercise control over it. These sites have an "architecture of participation" that encourages users to add value to the application as they use it. This stands in contrast to traditional Websites, which limit visitors to passive viewing and whose content only the site owners can modify.

## Web 2.0

Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as a platform, and an attempt to understand rules for success on the new platform. Web 2.0 Websites typically include some of the following features/techniques:

- **Search:** the ease of finding information through keyword searching.

- **Links:** guides to important pieces of information. The best pages are the most frequently linked to.
- **Authoring:** the ability to create constantly updating content that is co-created by users. In wikis, the content is iterative in the sense that the people undo and redo each other's work. In blogs, it is cumulative in that posts and comments of individuals are accumulated over time.
- **Tags:** categorization of content by creating tags that are simple, one-word descriptions to facilitate searching and avoid having to fit into rigid, pre-made categories.
- **Extensions:** automation of pattern matching for customization by using algorithms (i.e. Amazon.com recommendations).
- **Signals:** the use of RSS (Real Simple Syndication) technology to create a subscription model which notifies users of any content changes.

## Key Facts of Web 2.0

Web 2.0 is difficult to define because it is not really a thing, but an approach, or shift, in how we use the Web we already have. The key is a change to a more active user who actually creates content rather than just passively receiving it. This change in how Cyber-Rez experiences the Web mimics a parallel shift occurring in education. Instead of a top-down, "sage on the stage" approach to teaching, Cyber-Rez is moving towards a more constructivist, "guide on the side" pedagogy which empowers students and encourages them to take responsibility for, and co-create, their learning experience.

Web 2.0 innovations harmonize well with current thinking about educational practice. In particular, Web 2.0 offers students new opportunities to take more control of their learning and create customized information, resources, tools, and services. Web 2.0 also encourages a wider range of expressive capability, facilitates more collaborative ways of

working, enables community creation, dialogue and knowledge sharing, and creates a setting for learners to attract authentic audiences.

## Implementation

Web 2.0 is a ladder or a platform created to reach World Wide Web. Web Design provides the design & implementation of interactive media for the World Wide Web. Implementation of Web 2.0 results in including more innovative products and services, more effective marketing, better access to knowledge, lower cost of doing business, higher revenues, customer support turning visitors into customers, mass population to communicate etc. Cyber – Rez identifies that the approach has to be updated to Web 2.0 from existing Web 1.0 for maximum utilization of resources by Native Americans. The new Web 2.0 system allows users to take the platform giving rise to better exposure for all. More people are able to interact with one another and their favorite or in some cases least favorite businesses. Cyber-Rez will implement Web 2.0 approach throughout all web related modules under this technical paper and will also do activities like social networking, bookmarking etc so as to expand its presence throughout Indian Country and across the United States.

## Benefits

- It ensures increased knowledge sharing
- More people will be able to interact with one another
- It will help increase our presence throughout
- It results in more innovative products and services
- It helps in more effective marketing of Cyber - Rez services
- They support collaboration across time and space and is of low - cost
- They are easily accessible, easy to use and have very little “downtime”
- Many people already have a comfort level using them.

## Conclusion

Rose Corporation's mission is to empower Indian economic development in the efficient allocation, concentration and preservation of Indian resources, for the purpose of building sustainable, independent and sovereign Indian Nations.

To that end, Cyber-Rez Phase II will provide the information infrastructure among and between Native Americans for the creation, retention and transference of wealth, knowledge, technology and innovation. Native Americans will be able to stake out a piece of cyber-space, their own "virtual reservation", where they can be connected in pursuit of educational, business and communications agendas that are consistent with their beliefs, culture and values.

Cyber-Rez Phase II will accelerate sustainable, long-term economic development, for these traditionally impoverished Native communities, by creating and servicing the technological linkages necessary to join the twenty-first century world on equal footing in the new knowledge-based economy.

The Modules to be created and implemented under Cyber-Rez Phase II respect the beliefs, culture, values, traditions and priorities of sovereign Native communities. The Modules create not only an information infrastructure and connectivity to the global knowledge based economy, but also connect to each other through mobile service applications by linking economic growth to education and training among others; all to the benefit of integrating every level of community enterprise development into the global economy at a competitive advantage.

The Modules not only specifically address the need for an information infrastructure and advanced technology as a critical step in helping Native America enter the 21st century global knowledge based economy, but they also specifically address the accomplishment of the recommendations in the cited studies, so that the results of these studies can be positive action, rather than more excuses to justify the poor economic conditions in these enclaves of poverty.

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