

Babajide Akeredolu
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ENG 352-H02

PROPOSAL TO IMPLEMENT A NEW AND INNOVATIVE DELIVERY SYSTEM FOR
CLASSROOMS & LECTURE HALLS ON CAMPUS

Assumptions:

I am an Engineer from JJVOO telecommunications, a subsidiary of JJVoo Corp. I am an Alumni of NJIT who had written a complaint letter over 4 years ago about the State and safety of our professors. I read a section of the STARLEDGER from NJIT asking for proposals to update the schools lecture delivery infrastructure. Recalling my concern from past years, I have decided to develop a system with my system Engineers, Information technology experts and Research Professors from our partner institution The University of Western Australia which will revolutionize lecture delivery as NJIT strives to be at the EDGE IN KNOWLEDGE.

March 1, 2007

Rebecca Thompson
Academic Computing Services
New Jersey Institute of Technology
323 Martin Luther King Blvd,
Student Mall Rm. 45
Newark, NJ 07102

Dear Mrs. Thompson,

I am a sophomore in our prestigious institution and I am writing to express my concern on the state of our Professors. I have noticed that a substantial number are lacking the basic knowledge of our Academic software which includes WebCt and the campus pipeline. It is also important to note that a majority use electronic mail to distribute lecture notes and important documents. This has been to compensate for their inability to use those software and since the recent increase in spam mail, many of such vital information have been unable to reach their targets. This has led to lack of understanding amongst us students and also, frustration amongst our Professors.

Another major concern is the use of cables to display PowerPoint presentations and any other form of multimedia on projector screens. I have seen quite a number of instances where Professors trip over these wires and I believe this is a major safety hazard which could hinder physically, Professors who are valuable assets to this institution.

Undoubtedly, I believe the only approach to solving this problem is to take our Information technology to the next level by incorporating new and innovative devices to do the task of connecting to computers wirelessly which are also capable of allowing file transfer. This eliminates mass emails, dangerous wires and frustrated students and Professors. Another suggestion is coordinating workshops where Professors are introduced to these Academic software's and how they work.

As NJIT advances and as Professors switch from the mediocre forms of information exchange to more digital, multimedia styled approach, adoption of the ideas listed should be a top priority as we strive to be the EDGE in Knowledge.

Yours Sincerely,

Babajide Akeredolu
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**PROPOSAL TO IMPLEMENT A NEW AND INNOVATIVE DELIVERY
SYSTEM FOR CLASSROOMS & LECTURE HALLS ON CAMPUS**

By

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JJVoo COMMUNICATIONS
(A JJVoo corp. company)

EXECUTIVE SUMMARY

This proposal is a reply to the request of your institution to develop a new, state of the Art infrastructure for the learning environments. These locations include but are not limited to; classrooms, lecture halls, conference rooms and Study rooms. This request comes as a result of an incidence involving a professor tripping on a group of cables during a class meeting. This led to a broken bone and a concussion. The professor refused to sue the institution but pleaded with the President to update the campus learning infrastructure for the betterment of the campus community.

The request was also due to numerous complaints by students on the lack of technical know how of the professors of the current campus lecture systems (modules) namely WebCT and Pipeline developed by Blackboard™ inc. and SunGard™ technologies respectively. To resolve this issue as promptly as possible, JJVoo Communications has developed a wireless system infrastructure which will eliminate wires in classrooms by 94% and promote distance learning, an avenue supported greatly by NJIT. At its final stage, the technology is going to be monitored by Campus representatives trained by our specialists. This technology developed initially with Professors from The University of Western Australia and Duke University has been improved upon with patented technology only available in these two pioneer institutions.

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OBJECTIVE

The objective of the project is to redesign the campus wired infrastructure for disseminating information in classrooms and lecture halls into a wireless, stress free environment with equipments in place to allow for real time information transfer all over the campus wirelessly within the 25 acre classroom area. This Information is expected also be retrieved through Lectopia, the software aimed at replacing WebCt. Lectopia when installed will be able to record lectures either audio or video and stream them directly to the campuses iTunesU database to be downloaded on Ipods or via the campus network anywhere in the world.

NEEDS

The New Jersey Institute of technology (NJIT) is a thriving Research institution most notably known for its advancement in Stem cell research and innovations in Homeland security. It boasts of over 9000 graduate and undergraduate students on a 45acre campus in the heart of Newark.

The school also includes a total of 300 classrooms 25 lecture halls and over 50 conference rooms and meeting halls all located within a 20 acre radius of each other. These premises are composed of over 100,000 wires linked to multimedia devices, lighting and the campus Internet network.

With the college's advancement in technology, statistically over 94% of its professor utilize computers as a means of disseminating information during class lectures. In order to cater for this, the campus boasts at least one media connection outlet in every meeting space (including non education areas such as the campus center and residence halls). These outlets include VGA

ports for connection to a projector, audio ports and AV ports for other multimedia devices that utilize them.

Connection is made through wires usually supplied by the media services department of the Institution. These wires have posed a problem to professors at the institution as it has recently led to the hospitalization of a professor and also numerous complaints by professors of their inability to effectively walk around the classroom to better communicate with their students. This greatly presents a need to revitalize the campus framework and adopt a new wireless infrastructure.

NJIT currently holds licenses with two of the top software manufacturers for Education, Blackboard™ inc. and SunGard™ technologies inc.. They currently utilize the WebCt Platform for class content management and lecture tools. Included also is the SunGard™ SCT pipeline software for university wide individual content management and administrative content management. It is also used sometimes in place of WebCt as it contains similar tools as the WebCt platform. These software's have for years—noting that I was also a student at this fine institution—been a source of discord with the faculty and students mainly because a large number lack the skills required to utilize both platforms. It was made clear by the University that both licenses last for a duration of 12 years and that a new platform would be introduced pending approvals for proposals. The issue that plagued the NJIT faculty community was the very tedious and complicated user interface that came with the WebCt platform.

A case study showed that a staggering 75% of professors that utilized WebCt on campuses in the United States employed students to update information on the GUI, 15% already possessed secretaries who perform the daunting task while the remaining 10% did it themselves. It was as a result of this my firm in conjunction with Duke University and the University of Western Australia developed a new platform with the most accepted and praised user friendly

environment till date and it is with this knowledge and experience we plan to commence our project on the NJIT campus.

METHODS

In order to achieve the objectives mentioned, we plan to design a system unique to the NJIT backbone as detailed below:

Set-top Box:

Specifications:

Processor and storage

- Intel dual core processor
- 40GB hard drive² for storing content locally

System requirements (content downloads)

- Mac or PC
- iTunes
- Mac: Mac OS X v10.3.9 or later
- PC: Windows XP Home/Professional (SP2)
- AirPort Extreme, Wi-Fi 802.11b, 802.11g, or 802.11n wireless network⁶ (wireless video streaming requires 802.11g or 802.11n), or 10/100BASE-T Ethernet network

Ports and interfaces

- HDMI (video and audio)
- Component video
- Optical audio
- Analog RCA stereo audio
- 10/100BASE-T Ethernet
- USB 2.0
- 802.11n wireless networking with a maximum connection of 24 independent computer systems
- Built-in IR receiver

Environmental requirements

- Operating temperature: 32° to 104° F (0° to 40° C)
- Storage temperature: -40° to 185° F (-40° to 85° C)
- Relative humidity: 5% to 95% noncondensing
- Maximum operating altitude: 10,000 feet (3,000 m)

File formats supported

- AAC (16 to 320 Kbps); protected AAC (from iTunes Store); MP3 (16 to 320 Kbps); MP3 VBR; Apple Lossless; AIFF; WAV
- .doc, .ppt, .pdf, .pub, .html, .mov, mpeg, AVI.

Description:

The JJVoo Set-top box is designed specifically for Educational purposes with its ability to connect 24 computers simultaneously to all for downloads of content which might include but are not limited to Lecture notes, PowerPoint slides or syllabuses in multiple file formats. The content being downloaded to the system would initially be from 2 principal sources.

1. A desktop computer or Laptop connected wireless to the set top box streaming data as a DVD player would stream to your TV screen.
2. Information already stored in the central server retrieved via user friendly Lectopia preinstalled in the set top box unit.

This box also features a self diagnosis tool which checks for errors and performs regular disk cleanups to ensure optimum performance every time it is used. Provided an error or situation occurs, a message is sent to the administrator and our technical help branch closest to the campus with details of the error including box location, time of occurrence and file type being rendered amongst other more technical data. This data is sent to us as a precaution given a situation where the technician trained on the NJIT campus is unable to rectify the problem, making communicating the problem easier.

Central Storage Server

As a result of the need to have a dedicated server to contain Lectopia and render files to the individual set top boxes, we have come up with a list of preferred server system which is left to

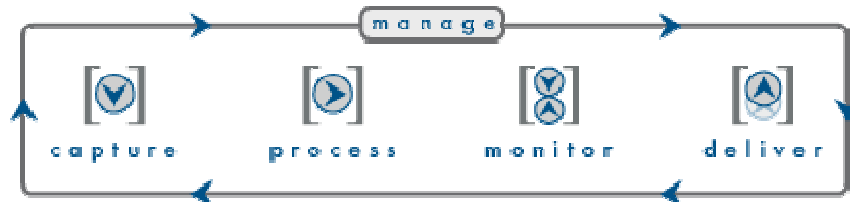
the Colleges discretion to select which one fits their current needs or if they currently maintain some understanding with a certain vendor. This list includes:

1. IBM eServer OpenPower 710
2. HP ProLiant DL585
3. Sun Fire T2000
4. ClearCube PC Blade System

These servers have been known to work exceptionally well with Lectopia and are highly recommended by our technical staff around the world.

Lectopia

Lectopia®, developed at the University of Western Australia, is a leading lecture capture and delivery system for any university wishing to make audio and visual material from lectures available online. It offers an easy-to-use, cost-effective solution for large-scale implementation, and possesses a high-level of reliability and flexibility.



Lectopia was developed around the function of recording live events (specifically lectures) across an entire campus, and making streaming / download / podcast versions of these recordings available on-demand soon after the lecture. The recordings are intended for students who are

unable to attend the live lecture, or for revision purposes. In this way, it is intended to be installed in a large number of lecture theatres, capturing a large proportion of live lectures. Initially, Lectopia utilized an advanced Integration API that allows external information systems to search, retrieve and change information in Lectopia programmatically. This facility provided the ability for Course Management Systems such as WebCt and Blackboard to interface with Lectopia so that users of these systems can interact seamlessly with Lectopia.

With the expertise of JJVoo, Lectopia now boasts its own course management system, making it the only system to possess both media recording capabilities and course management in the world.

BASIC INFRASTRUCTURE

Below is a detailed description of how the network will operate

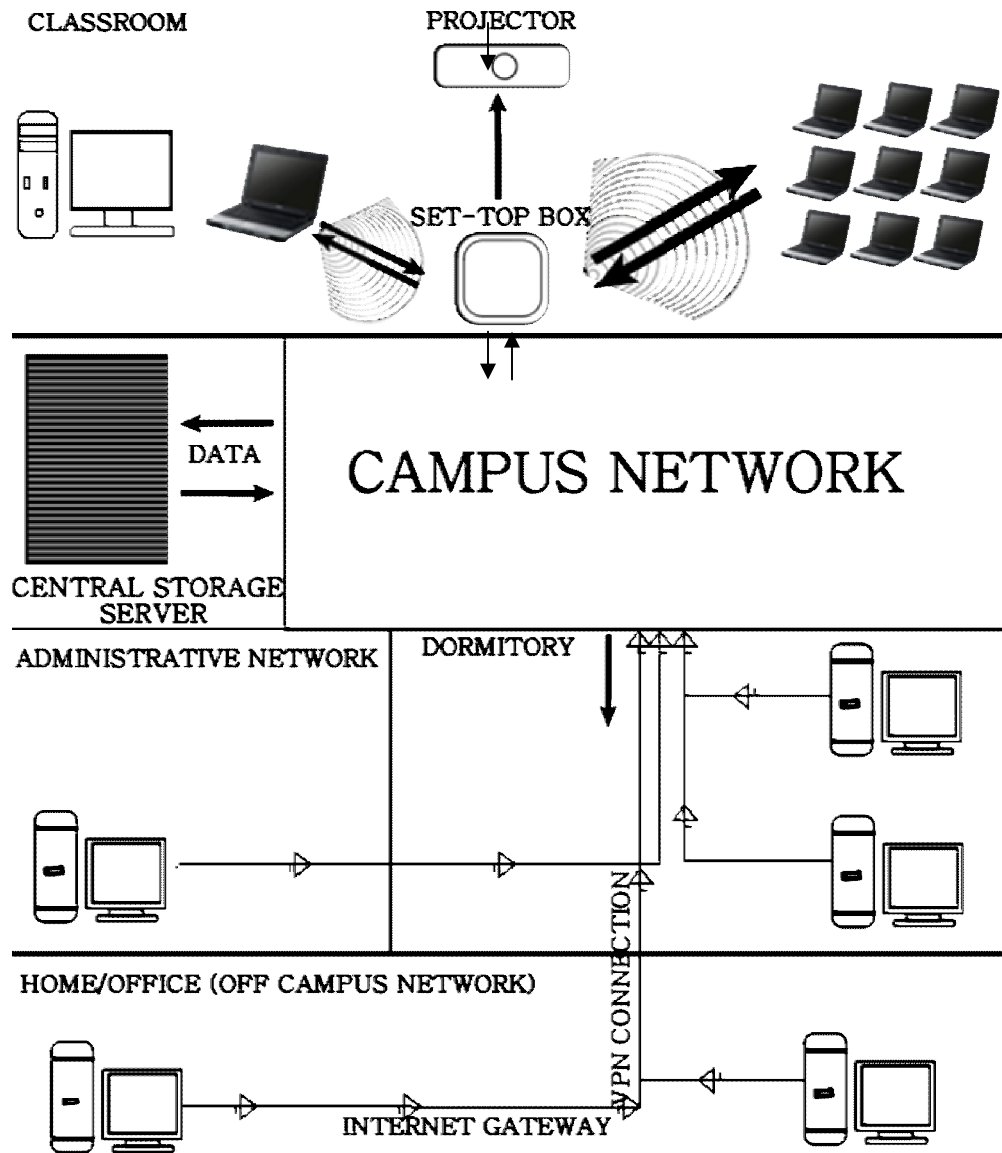


Figure 1: Network system infrastructure

The figure details the new system. It is divided into 4 environments; the classroom, the server side (administrative), the Campus Network and the off campus network.

EVALUATION

At the completion of our project, we expect a full scale campus wide transition to the wireless system which will also include access to all the data stored in the storage server via the campus internet network and off campus through VPN. Full implementation will be in 95% of all classrooms, lecture halls and meeting rooms. The remaining 5% as revealed by the campus already possess wireless capabilities for experimental purposes and therefore do not need further modification. Also, we expect a total of 10 personnel trained by our firm to have mastered the architecture to a level necessary to maintain the system.

Evaluations by our firm will be conducted to ensure that the campus community accepts and are satisfied with the technology. Our expectations from the full initialization will depend on the result of this survey as our firm's foundation is complete customer satisfaction. Below is a statistical representation of what we expect and provided these numbers are not closely achieved in the Excellent and Very satisfied groups, JJVoo will refund 20% of what was paid for the services rendered. This survey will be available on your campus Pipeline system's voting platform for the public to see.

Customer satisfaction	Percentage
Excellent	15
Very satisfied	60
Somewhat satisfied	15
Prefer old system (WebCt)	10

Figure 3: Presumed poll results

QUALIFICATIONS

- JJVoo communications a subsidiary of JJVoo corp. is an Information technology firm with expertise in wireless communication implementations. JJVoo communications boasts over 300 patents within only 3 years of its implementation, an achievement unseen in the industry we currently operate in.
- In only three years, JJVoo has worked on implementing wireless communication platforms in over 10 college campuses including Duke University, Princeton and Harvard, all Ivy League schools that strive for perfection in their entire Endeavour's. These platforms similar to that being proposed for your community have been operational for over 2 years and have been embraced by all the communities they have been set up for.
- JJVoo currently employs over 300 employees all possessing at least a masters degree in their respective discipline with a majority in the fields of wireless telecommunications and Information technology.
 - Of the employees stated above, we are recruiting our best PhD experts to develop the NJIT system and mutually manage the entire project. Attached with this proposal are the resumes of those who will coordinate the entire project.
- JJVoo communications also owns and operates over \$3,000,000 dollars worth of state of the art telecommunications equipments which include our set top boxes fully customizable to meet the needs of our clients to servers which constantly monitor every system we install remotely to ensure that everything is running at optimum performance.
- For three years straight, JJVoo was awarded the JD power and associates award for being the leader in innovations in the wireless communications category. This award is granted

after careful review of over 2000 firms including top firms like IBM, Apple and Cisco systems.

With our innovations and expertise, we believe we can create the best infrastructure which will surpass those already in existence as a result of our never ending research endeavors and pursuit for perfection.

TIMETABLE

This project is expected to be completed within a time frame of 7 months in 5 stages from the beginning of the summer session to the end of the fall semester.

1. Analyze critically, the Colleges current Network Architecture noting its current transition to the NJEDge network.
 - ✚ This initial foundational process is integral to ensure that we are installing a platform which is supported on the campus network. It is expected to be completed within 2weeks of execution and will determine where the central server will be located before heading to stage 2.
2. Install the central server which will contain the Lectopia backbone and vital storage space for media files to be accessed and downloaded. Included with the server will be JJVoo Set-top Boxes in two main lecture halls (Tiernan I & II) and classrooms in the Kupfrain hall building which will serve as test systems before final implementation.
 - ✚ This process is expected to span a time period of a month and 2 weeks. This is mainly due to the issues facing the installation of a system independent of the

current platform already in place. It also is as a result of wiring from the location of the central server will be placed and the halls already selected as test points.

3. Conduct campus wide tests and satisfaction surveys of the server and classroom improvements.

- ✚ This aspect of our project will only occur for 2 weeks to allow for adequate feed back from members of the NJIT community who have experimented on the new platform.

4. Upon approval, Installation the remaining systems will commence throughout the campus and full connections with iTunesU will be initiated.

- ✚ This is the core of our project, it is expected to last for 4months and will involve information sessions and workshops for professors and students around campus. It will also require strong support from the registrar as to not conflict with important class dates.

5. Training of University staff will commence and the system will be handed over to the University.

- ✚ This training process will last for a month and will ensure that the college possesses people who are familiar with the system, annihilating the need to constantly contact our representative. It is also important to note that our firm will have a representative full time on campus for a year diagnosing issue and training new staff which will be a secondary stage of development.

BUDGET

Below is a cost analysis of the project proposed:

Task (Equipments, service)	Cost
400 set top boxes @ \$400 per box	\$160,000
Central storage server (as chosen by NJIT)	\$120,000-\$200,000
Lectopia License (1year)	\$40,000
JJVoo communications charges	\$320,000

Analysis

The set value of 400 for the set top boxes is a rough estimate of the number of rooms present on your campus. Stage 1 will determine the exact number of boxes required to satisfy our goal. The cost of each unit at our MSRP is \$450 (four hundred and fifty dollars) but as a result of the number being purchased, we have included a \$100 discount on each unit.

The price range shown for the central storage system is a range from the list of servers in the methods section of this proposal. As stated earlier, it is at your discretion of what server to purchase.

The Lectopia license price which is valued at \$52,000 is retailed at the JJVoo discounted price offered by the University of West Australia and Duke.

Compared to our competitors, JJVoo communications charges almost 40% less and also includes a ten year full service warranty on our products. These numbers can be negotiated.

CONCLUSION

Implementation of this new and innovative technology will not only solidify your position as a college at the forefront of technology but will also bring a campus wide satisfaction and ultimately an increase in enrolment. Noting that we have included discounts on all our equipments and services, we at JJVoo communications believe this is the first step to a strong and long lasting relationship with our New Jersey Neighbor in areas of research as we strive to encourage your community to help improve this technology.

Annotated Bibliography:

University of Western Australia (2003). Lectopia, *overview and system architecture*. Retrieved Friday 20th April 2007, from http://ilectures.uwa.edu.au/about-overview.lasso?-session=iComm_Client:80EBF9500a5a70CFD6uYQ117364F

This site was used as the source of all the information of the architecture and basics of Lectopia. The page contained all the technical information of the content management system which was used in the methods section of the proposal detailing the capabilities of Lectopia.

Apple.com (2007). Apple TV tech specs. Retrieved Monday May 07 2007, from

<http://www.apple.com/appletv/specs.html>

This site was used to create the technical specifications of the JJVoo set top boxes methods section of the Proposal.