Identification and Evaluation of Initiatives to Improve Health and Health Care
Utilizing Ultra-High-Speed Internet Connectivity
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Introduction
• The University of Kansas Medical Center (KUMC) has been identifying and evaluating project ideas and partnerships to improve health care delivery, research and education that will utilize Google’s first ultra-high-speed fiber-to-the-home network (1 gigabit per second or 1 Gbps) which is being deployed in the Kansas City area beginning in October 2012.

Project Idea Submission
• Formal project proposal process established utilizing an online proposal form to allow documentation of concepts for review and selection for presentation.

• Twenty-seven proposals were received and triaged.
  • Major topical areas of the submissions categorized under one or more following themes/interests:
    o Diabetes treatment and prevention
    o Elder care
    o Pediatric obesity, nutrition and fitness
    o Teen health
    o Counseling for at-risk families
    o K-12 health education initiatives
    o Professional education
    o Telehealth/fall-community transition support
    o Radiological imaging
  • Both home-based and school-based settings were proposed in that Google is connecting educational and public facilities to the network.

Initial Project Selection
• Six projects selected for presentation in a town hall setting which included both internal and external reviewers.
  • Considered the key criteria but also heavily influenced by the bandwidth requirement of the project idea. Video and imaging-based applications were favorably considered due to higher bandwidth consumption.
  • Broad concepts selected based on the anticipated benefit of the project, the utilization of technology/bandwidth and the overall feasibility of implementation.

• Four key criteria established:
  o Accelerate improvement in the health of the community.
  o Demonstrate innovation in the delivery of health care and health education.
  o Improve the quality of research.
  o Reduce health care costs.
  o Projects needed to be innovative and would utilize (at least to some extent) high bandwidth.

• Formal project proposal process established utilizing an online proposal form to allow documentation of concepts for review and selection for presentation.

• Proposes to use high-definition telemedicine technology to provide initial school-based and subsequently in-home parent and service provider training to improve early intervention and mental health services for at-risk families.
  • Key project objectives:
    o Expand family services, training, and technical assistance to families and child care providers who would not otherwise be able to access these resources;
    o Reduce cost of services by decreasing travel and time.

In-Home Video Monitoring for Family Caregivers of Persons with Dementia
• Aligned with a clinical pilot focused on home video-monitoring to support family caregivers of persons with Alzheimer’s disease who exhibit disruptive behaviors.
• Provides observational data interpreted by experts who can guide family caregivers strategies to continue to care for their loved one at home.

KUMC is a partner in US Ignite, a National Science Foundation (NSF)/White House Office of Science and Technology Policy initiative focused on ensuring US leadership in the development of applications and services for ultra-fast broadband and software-defined networks.

• Accepted a NSF-US Ignite EAGER grant to further develop and evaluate “In-Home Video Monitoring for Family Caregivers of Persons with Dementia.”
  • Includes KUMC’s Division of Medical Informatics, KUMC’s School of Nursing, Center for Telemedicine and Telehealth, KUMC’s School of Medicine and Telecommunications Technology Center.
  • Focuses on expanding the in-home technological tools available to strengthen the linkage between patients and caregivers with their healthcare team via multi-camera full-motion/high definition video monitoring.
  • Captured video will be streamed and stored on secure cloud-based servers.
  • Upon notification and authorization by caregivers, the videos can be made accessible for viewing by clinical experts from web-enabled devices for the purpose of providing feedback to the caregivers in the home.

• On July 26, 2012, Google Fiber announced their product offering and their proposed deployment areas.
  • In support of this announcement, KUMC has been participating as a content partner in the Google Fiber Space, a storefront technology demonstration center.
  • KUMC is offering demonstrations of tele-video that simulate the delivery of health care within a home-based setting.
  • These simulations are being conducted in the form of nutritional educational sessions, both group presentations as well as one-on-one sessions in a private room.

Community Engagement
• Playing an active role in local community teams/forums created to identify opportunities.
  • Mayor’s Bi-state Innovation Team formed by Mayors of KCK and Kansas City, Missouri.
  • Health care sector sub-team defined high level projects for community demonstration in Kansas City’s “Playing to Win” Playbook.

• Additional engagement with local technology organizations inclusive of the KUMC-affiliated Bioscience and Technology Business Center (supporting start-ups and commercialization initiatives) has been an area of focus.

US Ignite
KUMC support for promotional materials

Showcase Partnership
Google Fiber Space
Kansas City, MO

Early Lessons Learned
Key observations and lessons learned from initial activities include the following:
• Information from Google regarding their product offering and specific service areas was initially very limited. This made project planning challenging in the period prior to the formal product announcement.
• Google initially provided a short-term resource for support in defining projects. This would have had greater value in the post-product announcement phase in light of the early lack of information. (No such resources is currently committed).
• Health care applications for in-home use that require significant bandwidth are only in the very early stages of development.
• Technology companies are mostly engineering products, inclusive of portals, sensors and monitors, for low/moderate bandwidth consumption to support a broader and more near-term market.
• KUMC’s focus on identifying and evaluating initiatives that utilize ultra-high-bandwidth has provided a very unique and positive means of engaging with both local and national technology organizations and initiatives.
• The Google Fiber asset within Kansas City uniquely positions KUMC’s Division of Medical Informatics (and the University of Kansas Hospital) for future research opportunities that would otherwise not be available.
• Local and national interest in the Google Fiber deployment remains high and future technological advances in health care and other sectors are eagerly anticipated.

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Google Fiber logo courtesy of Google, Inc.

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Follow our progress at our website:
http://informatics.kumc.edu/work/ke/NetworkInnovation