HIGH GROWTH JOB TRAINING INITIATIVE FOR REMOTE SENSING COMMUNITY

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ABSTRACT:

An innovative geospatial training and awareness program has been initiated by a consortium led by Geospatial21 and the International Center for Remote Sensing Education, to include an apprenticeship component for high school and college students utilizing a combination of e-learning and classroom training augmented with apprenticeships and internships to solidify their textbook learning with hands-on industry experience in the primary geospatial domains of GPS, GIS, and remote sensing. Recognizing the advances in web-based education and the potential for expansion of e-learning for remote sensing, the consortium has developed a strategy to integrate the international resources of ISPRS Commission VI and other appropriate leading remote sensing associations into the framework for creating a geospatial workforce pipeline to be tested in the three cities with the highest concentration of employers that utilize geospatial technologies: Denver, Colorado; Los Angeles, California; and Washington, D.C.. A core-concept for the expansion of the remote sensing/geospatial training series and awareness initiative is to provide fully web-based learning modules online to K-16 students. Based on the success of the initial Kidz Online's (KOL) innovative e-learning program created by Geospatial21, which includes a collection of career interviews with geospatial professionals, documentaries demonstrating how geospatial information affects everyday life, and interactive training tools, the coalition will augment the materials to raise the science literacy and professional levels to those appropriate at the international standards for the remote sensing community. The goal of incorporating continued education levels is to provide the framework, technical, and financial support to ensure upgrades in the materials available to any educational or professional organization attempting to retool the workforce with effective geospatial training as well as build the foundation throughout the educational ladder. A description of the coalition initiative innovations and progress will be presented for both national and international context.

1. INTRODUCTION

1.1 Addressing Job Training Gaps

The U.S. Department of Labor (DOL) promulgated a grant program initiative to address training needs in areas of high growth. In response to the DOL High Growth Job Training Initiative grant, Kidz Online proposed to extend the scope of its foundational technology training content to include geospatial training and awareness components. Upon being awarded $1 million through the DOL grant, Kidz Online created Geospatial21 to produce educationally appropriate videos to highlight exciting areas of the geospatial industry, document the career stories of various industry leaders and professionals, and design an interactive e-learning video series for grades K-14. Building upon the success and momentum of this initial effort, Kidz Online is expanding Geospatial21 to include an apprenticeship component that will channel high school and college students through e-learning and classroom training into apprenticeships and internships to solidify their textbook

learning with hands-on industry experience. This new effort, entitled the Geospatial21 Apprenticeship Program (GAP21), will focus on executing the an apprenticeship project in partnership with leading geospatial organizations, such as, George Mason University, Geospatial Information Technology Association (GITA), and the International Center for Remote Sensing Education (ICRSE). This coalition, (GAP21) was formed to fulfill the growing need for a geospatial workforce pipeline and will center GAP21 in the three cities with the highest concentration of employers that utilize geospatial technologies: Denver, Colorado; Los Angeles, California; and Washington, D.C.

A three-year pilot program has been designed with expectations that the training program will become self-sustaining thereafter.

2. CURRICULUM AND MANAGED LEARNING

2.1 GAP21 Design

GAP21 is designed to create a catalogue of various preexisting courses and programs offered by the high school, community college, and university coalition partners and focus on areas of the geospatial industry, especially remote sensing, that have previously been unaddressed in these curricula. To comprehensively prepare the incoming geospatial workforce and remote sensing professionals for the future, related technologies such as aerospace and information technology will be included in this catalogue. For their part, the educational partners will fill these educational gaps by designing and offering new courses or augmenting their current curricula. Concurrently, Kidz Online will work with its industry partners such as USGIF, GITA, and ICRSE, in addition to the Department of Labor's Employment Training Agency, to map each of the catalogue's courses to a Geospatial Competency Model. All curricular materials will reference the Geospatial Competency model as a base of education and understanding.

These efforts will be integrated into the Geospatial21 Competency Tracking program, a Learning Management System (LMS) that will allow GAP21 to manage the recruitment, enrollment, and placement process of the apprentice candidates. Understanding that each company is unique, the Geospatial21 Competency Tracking Program will allow a geospatial company to design a specific "skillset fingerprint" for various positions within their organization. The Geospatial21 Competency Tracking Program, based on the success of CompTIA's NITAS model for the information technology industry, will track the progress of apprentice candidates and provide statistical data on the number of apprentices placed into full-time, entry-level positions at the conclusion of their training. This process lets a student tailor his/her learning towards a particular career's "skillset fingerprint" within a specific company and also ensures a hiring manager that the recruited apprentice's resume accurately reflects their skills and experience for a specialized job function.

The program will be endorsed and vetted by industry corporations, thus insuring that all training will be applicable and acceptable industry wide. Kidz Online will also offer corporations the option of designing an individual training program, specific to the needs and demands of their corporation. By building upwards from employer and industry needs Kidz Online will assure students that their skill set will secure them future employment, and guarantee employers a workforce with the necessary core competencies to succeed.

The creation of a standard curriculum and training program will benefit employers, who will be able to incorporate best-practice models into their employee training programs and streamline training to improve productivity for both apprentices and their supervisors. In addition to helping the geospatial industry build employees from the ground up at a lower cost, it will also defray costs in training management, building stronger executives as well as entry-level employees.

GAP21 will benefit from the framework set within the current Geospatial21 program, which has quickly moved to incorporate the ETA's recent Industry Competency Initiative. Using the *Building Blocks for Competency Models* as the standard, Geospatial21 examined GIS, GPS, and Remote Sensing careers in the geospatial technology sector to identify common knowledge, skill and ability requirements throughout the industry. By identifying the areas common to geospatial careers, Geospatial21 has more clearly targeted the objectives of the training program. Information on CareerInfo.net was used to find the cross sections of job skills common to all geospatial fields, as well as the skills that are specific to particular industry sectors such as GIS, GPS and remote sensing and specific jobs within each of those three areas. The resulting data was used to create a draft of a Geospatial Competency Model. As evidenced by such events as the recent GITA/AAG 2nd Leadership Roundtable, geospatial competency is still being examined industry wide, so Geospatial21's initial contribution will likely grow and change with industry input and support. It is expected that with further communications with the international remote sensing community, via the ISPRS, that a more complete perspective of gaps and needs for professional training will become apparent. The attached graphic, Figure 1, displays the current Geospatial21 Competency Model.
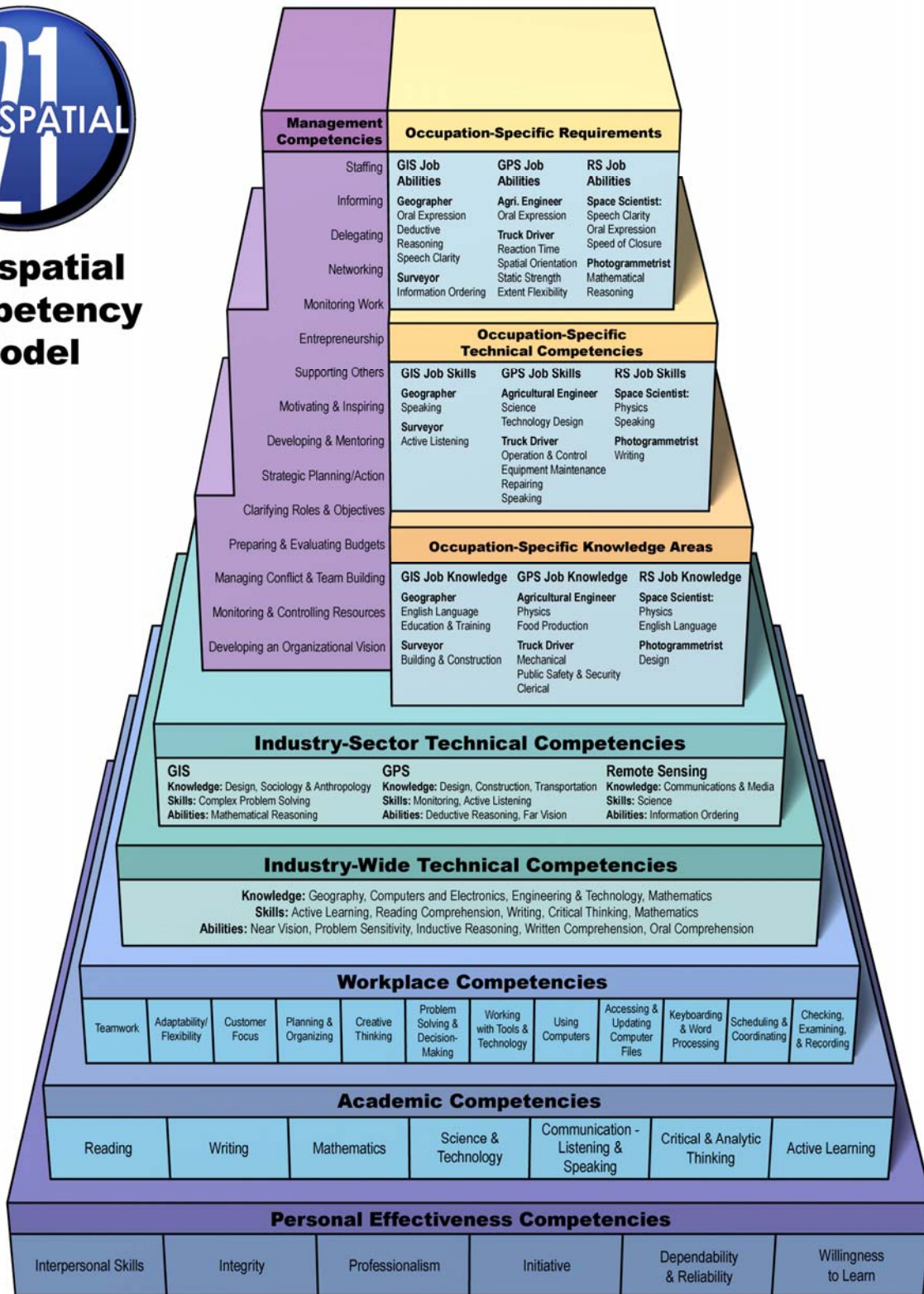
Figure 1. Geospatial Competency Model

2.2 Job and Internship Portal

Beyond providing apprenticeship opportunities, GAP21 will design and implement a job placement web portal that will allow students to seek permanent, full-time employment. Graduates will be able to search for job opportunities focused on only the industries in which they have been trained, without having to filter through employment opportunities that they are uninterested in and for which they are unqualified. With a standard program of training, certification and apprenticeship tied to preset competencies, employers will be assured that applicants to this web portal possess the necessary qualifications and education to be successful in the workplace. Students at the early stages of training, or apprenticeship candidates looking for a low-commitment hands-on experience, can use the portal database to search for internships and work-study positions.

Kidz Online is currently developing a software program, incorporating the Google Earth software, to map where geospatial corporations and community colleges exist in close proximity. This program allows interested students to seek enrollment near their future workplace, and aids industry employers in planning recruitment campaigns. Mapping out all of the available opportunities will be key in creating a strong program that leverages all industry and community support available in the targeted cities. Schools and employers will also be labeled according to their level of participation in GAP21, and students will be able to seek out and enroll in programs commiserate with their interest in the program, their educational needs and overall career goals.

2.3 Centers of Excellence for Educators and Students

The apprenticeship program will be based in the three metropolitan areas with the highest concentration of geospatial technology corporations: Denver, CO; Los Angeles, CA; and Washington, D.C. Fortifying these geospatial hubs, GAP21 plans include construction of a *Center of Excellence* in each of these three cities to provide on-site tutoring and career counseling for K- 14 students. These centers will work closely with state and national workforce investment boards to outline objectives and satisfy goals.

Part of the problem in creating a workforce pipeline that connects the education system to the geospatial industry is a geospatial-knowledge deficit in educators nationwide. Curriculum development workshops and GIS training classes run through these facilities will enable classroom teachers from all grades to integrate geospatial technologies into their classrooms and design appropriate lesson plans to utilize those technologies for various subject areas, such as science, history, math, geography, and business technology.

While each *Center of Excellence* will work to fulfill the above hands-on training needs, each is uniquely different due to its site partners and the varying sectors each location represents. Given that this program is a pilot

program to evaluate the range of job training needed at different segments of society, three major centers have been selected as follows.

2.3.1 **The Los Angeles Center of Excellence.** This center will be based at Kidz Online's downtown studio. Since Kidz Online is the program lead and has an 8-gigabit digital infrastructure, this facility will serve as GAP21's organizational headquarters and manage the recruitment, enrollment, and placement of apprentices through the online LMS. Given the site's placement in the heart of the Los Angeles Basin, the facility's activities will include the aerospace applications of the geospatial sector. Kidz Online's experience in diversity, at risk, and Job Corps programs will serve the industry well by promoting a more diverse workforce.

2.3.2 **The Washington D.C. Center of Excellence.** This center will exist at George Mason University, which is currently constructing a facility for hands-on geospatial workshops. The campus' location is ideal to focus on government agencies, homeland security and defense.

2.3.3 **The Denver Center of Excellence.** This center does not currently have a selected location or site partner, but Kidz Online will propose to partner with the Denver Metro region to incorporate GAP21 into its $15M, three year DOL grant with emphasis on workforce boards, and civilian uses.

Cooperating with companies in such varied cities ensures a training curriculum applicable nationwide, and will allow students transportability of credentials between geographic areas, as well as helping assure a broad student pool. Particularly in Los Angeles and Washington, the varied ethnic population will help ensure workforce diversity, as well as giving traditionally underrepresented groups an opportunity to succeed in high-level industry careers.

These three facilities will use varying approaches in this pilot program, which will provide insight into how best to support the geospatial workforce pipeline. Once the pilot program is complete, evaluations will reveal advantages and disadvantages to each site's approaches and will serve as a case study in workforce development.

3. CONCLUSIONS

3.1 Outcomes

The Geospatial21 Apprenticeship Program will give students the opportunity to build on their classroom learning with real world experience by working as an apprentice in one of the many geospatial, aerospace or information technology corporations in Denver, Los Angeles or Washington D.C. Students will gain industry-specific skills and workplace competencies through applied training and will discover first-hand the benefits of working in these high-growth industries.

The Geospatial21 Apprenticeship Program will improve the overall productivity of geospatial, information technology and aerospace workers, lower employers' hiring and recruitment costs, as well as provide potential employees with a structured approach to career development. The process will also aid industry corporations in developing and streamlining their new-hire training programs to assure that incoming employees receive the most comprehensive instruction possible in the shortest amount of time.

Upon completion of the program, students will have recognized certifications as well as hands on experience in their chosen field, connections with leading employers and a comprehensive support network to allow them to plug into one of the most dynamic and widely applicable industries in the country today.

4. AKNOWLEDGMENTS

4.1 Project Partners

Geospatial21 is the team leader and facilitator responsible for all operations including infrastructure development, program administration, development and coordination of apprenticeship tracks, development and hosting, online curriculum creation, competency mapping, and marketing activities.

Geospatial21's Advisory Board members include senior executives from BAE Systems, Boeing, Booz Allen Hamilton, General Dynamics, ESRI, Lockheed Martin, Northrop Grumman, Raytheon, and Space Imaging. George Mason University is the primary university in partnership. The International Center for Remote Sensing Education is the lead NGO partner.