

# **A Vision for Talent Pittsburgh**

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## **SUMMARY**

This report presents a vision for development of the Talent Pittsburgh Web site and its associated databases. We suggest that the site should focus on the needs of its users – employers, workers and regional planners – and should be organized around the industry clusters on which regional workforce development efforts have concentrated. We propose that the site function as a toolkit for people working in these clusters, providing tools that facilitate access to training for workers, help employers improve the skills of their workforce and summarize workforce development data for regional planners. Other tools can be used to organize communities of practice that support the industry clusters and help guide development of the site. Within each cluster, needs can be prioritized and tools identified to address these needs. A rapid prototyping environment can help software developers to collaborate with users and refine draft tools for final deployment on the site. Some of these tools will be able to generate revenue to support the operation of the site; we present several options for business models structured around this idea.

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## I. Introduction: A Vision for Talent Pittsburgh

This report has been written under a contract with the Three Rivers Workforce Investment Board (TRWIB) in response to a Request for Proposals (RFP) that sought assistance in three areas:

- Improvements to the WORKS training program database
- Enhancements to the Talent Pittsburgh Web site
- Development of a business plan for Talent Pittsburgh

We have found it useful to recommend a general framework for the Web site – a vision for Talent Pittsburgh – which we describe in the present section. Key to this vision is the idea that Talent Pittsburgh should serve the needs of the industry clusters with which TRWIB works. Section II elaborates upon this idea. Sections III, IV and V detail our reasoning on the three tasks listed in the RFP. Section VI concludes the report with a set of more specific recommendations for implementation in the near and longer term.

**A. Audiences.** Talent Pittsburgh serves the needs of three groups – employers, workers and planners – using information resources gathered from a number of sources, including training programs from affiliated training providers. Central to the proposed vision is a focus on the needs of the three target groups and an effort to involve representatives of these groups in the design and operation of the Talent Pittsburgh Web site.

**B. Tools.** The Web provides an economical mechanism for the collection, analysis and presentation of information. Workforce development is rich in data, and we believe that a successful workforce development system can be driven by timely access to data, including data on training, for each of the target groups mentioned above. Key to the construction of such a system is the availability of tools to collect, analyze and present this data. We propose that the Talent Pittsburgh Web site function as a toolkit for workforce development, with tools selected, used and monitored with the assistance of representatives of the participating groups.

The tools that make up Talent Pittsburgh should (1) rationalize and integrate existing resources, (2) facilitate the development of new data resources, (3) enable users to locate, visualize and understand this data, and (4) build the capacity of the Web site's target groups to utilize this data.

While the primary audiences for these tools will be the three target groups in the local region, there is a potentially broader range of applicability. Given the close ties between Talent Pittsburgh and WEDnet, it might be plausible to use Talent Pittsburgh as a testbed for future resources that can be incorporated into the statewide system. The practicality of this suggestion will depend upon details of coordination between TRWIB and the state Department of Labor and Industry and upon the availability of sufficient funding at the state level.

**C. Standards.** The potential scope of Talent Pittsburgh is large, since each of the target audiences involves large numbers of people. Not only are there potentially many employers and employees interested in materials on the site; there are also many training providers who contribute information to the site. Furthermore, it is easy to

imagine extending the reach of Talent Pittsburgh to a regional, statewide or national system. Indeed, the needs of the Pittsburgh region are similar to the needs of other regions, so that there would be mutual benefits in sharing information resources and associated technical tools with groups working in other regions.

The key to having a site scale gracefully to handle larger numbers of contributors and users is the development of and adherence to standards for the formatting and exchange of data. Such standards facilitate scaling and permit and encourage interoperability among different systems. Interoperability issues extend to the computer systems of participant groups (employers and training providers), systems of other Workforce Investment Boards, and other state and federal systems.

Several standards exist for the classification of materials on the Talent Pittsburgh site. These include the O\*Net job classification of the US Department of Labor and the CIP course classification of the US Department of Education. These and related classifications can be used to provide “smart searching” capabilities on Talent Pittsburgh.

A technology known as XML provides an industry standard for data exchange. To apply XML in any given area, it is necessary to develop an XML schema that defines data fields that arise in that area. We propose to incorporate existing XML schemas for workforce development in Talent Pittsburgh and to work with other Workforce Investment Board and departments of labor to develop new schemas, as needed.

**D. Software.** Information Renaissance believes that standards should extend beyond data description to the software used to manipulate this data – the database and Web server that underlie Talent Pittsburgh. Although the present site is based upon a proprietary solution from Microsoft, we suggest that TRWIB consider the possible advantages of using an Open Source software environment to build a new site.

One virtue of Open Source is its ability to easily support the *rapid prototyping* of new features. In this approach new tools are constructed rapidly and tentatively, given to a set of users for testing, modified in response to test results, and finally deployed only when the user community has judged them as suitable for widespread use. While proprietary tools can be used for rapid prototyping, they have often been constructed more for stand-alone use (typically with a well-developed graphical interface). By contrast, many Open Source tools have been constructed with an eye toward chaining them together to form more complex structures. This is precisely what’s required for rapid prototyping, so these tools work particularly well in this environment.

The rapid prototyping approach to software development is one in which a community of users works with technical support staff to specify a final product. This approach contrasts with one in which a smaller group defines parameters that the software must meet and contracts with a vendor who attempts to match these definitions.

**E. Technology and sociology.** A successful toolkit for workforce development can best be designed with the cooperation of the user community in the specification and testing of the needed tools. In this sense the software development process is an exercise in technology and sociology – or the intersection of these two disciplines. Information Renaissance believes that network technology can itself play a role in this

process – by bringing together people who need to use the tools under development, and by helping to coordinate activities that involve them in specifying the software and testing it.

In Pittsburgh, the Regional Workforce Development Initiative of 1999 created a strategy for workforce development that focuses on five industry clusters, grouping companies whose workers share the same basic expertise. Within each cluster, employers and planners can identify needed skills and the training to provide these skills. Regional efforts around these clusters have typically involved only two of our three targeted groups – employers and planners – but the cluster concept provides a useful organizing principle, and we suggest using it to organize materials and resources on Talent Pittsburgh. Currently the Pittsburgh clusters are: (1) financial services, (2) healthcare, (3) information technology, (4) manufacturing, and (5) hospitality and tourism. For the present purpose it would probably be useful to add a sixth cluster that covers education, government and the non-profit sector, all of which are significant employers in the region.

We hope to develop Talent Pittsburgh as an online gathering place for workers, employers and planners in each of the industry clusters. We propose to use these “communities of interest” to develop more formal “communities of practice.” This will require online tools to facilitate collaboration and staff support to guide the online interactions and help the group to develop a consensus about the most pressing workplace and workforce training needs. Talent Pittsburgh can provide this support and work with the communities of practice to define an evolving focus for the Web site. We envision a collaborative process, with prototypes of designated resources being tested by members of the community until a consensus is reached on the readiness of each tool for deployment online.

This approach can ultimately feed into the identification of a set of indicators relevant to workforce development in the Pittsburgh region, tools to collect data germane to these indicators, and other tools that analyze and display the values of these indicators and highlight their predictive role for the regional economy.

The same approach can be used as an essential element in monitoring the performance of Talent Pittsburgh and evaluating the success of the Web site in meeting the needs of individual users.

**F. General Recommendations.** Our conclusions can be summarized in four main points:

**1. Support and involve industry clusters.** TRWIB has organized its work around the five industry clusters. The clusters are used to identify needs in various sectors of the economy and to develop programs that respond to these needs. Talent Pittsburgh can be used as a productive tool in this process, and can benefit from the close involvement of its users. Suggested areas for involvement are given in Section II.

**2. Rationalize databases.** Current databases on Talent Pittsburgh can be combined, and mechanisms can be established to incorporate related data housed on other Web sites. Tools can be developed to automate the input of information on training programs. This process will be facilitated by the adoption of standards for data formatting and

exchange. Consideration should also be given to converting the entire site to an open standards, Open Source environment. Details of these suggestions are contained in Section III.

Underlying this discussion is a major decision for TRWIB – whether to modify Talent Pittsburgh in incremental stages or to make more fundamental changes to the design and content and introduce these changes to users with a major relaunch of the site. We have tried to include enough detail in our recommendations to allow for the possibility of a major reworking of the site – including the possibility of changes to the underlying operating system – but we believe that this point may rest as much with user perceptions and expectations as with the technical merits of this type of change.

**3. Clean up the Web site.** This involves issues of the services offered, which get to the very purpose of Talent Pittsburgh, and issues of presentation, where best practices from other sites should be adopted, as appropriate. See Section IV for further discussion.

**4. Use a mixed business model.** As discussed in Section V, the most feasible business model seems likely to be one that seeks grant funds to recover one-time development costs and user fees to recover recurring costs.

More specific recommendations are given in Sections II-V and summarized in Section VI.A.

**G. This report.** The present report is based on an examination of the Talent Pittsburgh Web site and other workforce development sites by the staff of Information Renaissance. We have also interviewed principals in workforce development efforts for the Pittsburgh region and people involved in the creation of resources for workforce development at the regional and state levels. These include:

- Paul Anselmo, New Century Careers
- Fred Baer, ERG
- Allan Hall, Manufacturers Resource Center
- Brenda Kuntz, Pittsburgh Regional Alliance
- Steve Mitchell, Workforce Connections
- Sherry Monheim, Duquesne University
- Ron Painter, Three Rivers Workforce Investment Board
- Eric Pferdekamper, CareerLink
- A. J. Reed, New Century Careers
- Marcia Tarasovic, New Century Careers
- Jeff Titchenal, WORKS Partnership, LLC

We would like to thank all of these people for the generous use of their time and for their insights into the complex systems with which they are involved.

## **II. Support for the Industry Clusters**

**A. Principles.** The best way to develop a Web site that users value is to create it so that they see it as their site: that they have a sense of ownership and commitment and are interested in how the site develops over time. This suggests a primary principle: *the community of users should help to define key needs, and the site should provide tools*

*designed to meet these needs.* A secondary principle is that the Web site itself should be used to convene users to prioritize needs, specify desired tools and test prototypes of these tools.

The audience for Talent Pittsburgh is large, including employers, employees and planners across the spectrum of economic activity in the Pittsburgh region. A convenient mechanism for organizing these users is through the industry clusters: financial services, information technology, healthcare, manufacturing, hospitality and tourism. It would be useful to add a sixth category that covers areas of employment omitted from the other categories – largely education and government. We propose that Talent Pittsburgh should work with the coordinators for each of these clusters to develop mechanisms for identifying needed resources and helping to test these resources as they are developed for the site.

This approach will involve users at a level that helps the site to evolve with the changing needs of the region's workplaces and workforce. It will simplify marketing, since the site will involve products identified by the users as providing them with value. And it will suggest which new features should be highlighted to reinforce users' interest.

The design of the Web site should also underscore this user-centered approach. This involves presenting resources from a user perspective, keeping the site simple in appearance, and conducting usability tests to assure that new features meet users' needs, that each section of the Web site is simple and intuitive to navigate and that users can find and register for needed training programs in a minimal number of steps.

To assure that the site adheres to these principles, it is important to have mechanisms for evaluating the site's success and for making modifications and adjustments as needed. Several types of information can be used, as described in Section IV.D: feedback from users, automatically collected data from continuous monitoring of the site and its patterns of use, and comments from the industry clusters.

**B. Organizational issues.** The idea of using Talent Pittsburgh to support the work of the industry clusters requires us to consider the organizational structures that underlie the work of the clusters. We propose to make extensive use of technology to support these structures. In particular, Talent Pittsburgh itself can become a means of support, as outlined below.

A number of non-technical activities will be needed to develop Talent Pittsburgh as a user-centered Web site. One of the most important is to establish groups made up of representatives of industry clusters and planners and, ideally, workers. Over time, user involvement should be developed in several areas:

- Working with TRWIB and cluster coordinators to frame issues and define needs and priorities for new tools
- Taking part in rapid prototyping of tools and Web presentations
- Helping to identify data needs, the extent to which they can be met by data collected from Talent Pittsburgh or other sources, and the most useful presentations of statistical summaries



- Discussing other needs, e.g. capabilities that need to be built among target user groups and how the site might help, including user support and other help in using tools on the site
- Suggesting materials and types of materials that users need and will use
- Periodically helping to evaluate the site, including how it can evolve to meet the changing needs of the region's workplace and workforce
- Identifying areas or targets for marketing, including incentives for target groups to use the site, incentives for employers and workers to contribute data, and incentives for training providers to add data and agree to standards.

Such activities – if used to modify the design and in marketing the site – will not only lead to improvements, but also will help to develop awareness and ownership of the site among the clusters and other users. As noted previously, these activities should be convened and coordinated on the Web. It is expected that the provision of tools and the encouragement for discussion of issues will facilitate the development of online communities of practice among clusters, planners, and/or training providers. These can serve as sources of information and support for their members. Moreover, the stronger these communities become, the more help they can provide to the development and discussion of issues related to the Talent Pittsburgh Web site and the definition of tools.

### **III. Improvements to the WORKS Training Program Database**

**A. Existing architecture.** The present Talent Pittsburgh site is built upon a proprietary Microsoft platform, using a Microsoft Internet Information Server to serve Web pages, with data contained in a Microsoft SQL Server database. The database and Web server are glued together with Active Server Pages that contain scripts written in Visual Basic and Java. On the client side there is a menu system implemented in Javascript, which gives a dynamic feel to the Web pages. As we will discuss below, there are possible alternatives to the chosen platform, but these alternatives would likely retain the site's general architecture.

As with many systems, the structure of the site owes as much to its history as its design. Talent Pittsburgh uses the same software as the state Web site [www.WEDnet.com](http://www.WEDnet.com). While this choice assures interoperability with WEDnet, some features inherited from WEDnet could interfere with the user experience on the site, and a future rethinking of the site's design might be useful.

**B. Consolidated databases.** Talent Pittsburgh provides access to three databases: (1) training providers of regional interest, (2) local degree and certificate programs, and (3) community-based and faith-based organizations that offer training and other services. Similar databases are maintained by other groups: (4) custom training providers that participate in the INDEX program of the Pittsburgh Regional Alliance and (5) training providers approved for the state's Guaranteed Free Training program on WEDnet. Further, there is (6) information on training providers maintained by the state Department of Education.

We recommend that these databases be rationalized and integrated on a practical timetable, with additional fields defined to meet the needs of individual organizations that collect, use and maintain this information. More generally, there should be a state-wide effort to identify databases relevant to workforce development, to develop standards for the interoperability or merger of these databases, and to implement these standards within Talent Pittsburgh.

Talent Pittsburgh can play an important role in convening groups to discuss a standardization effort, create documents that define the standards and provide prototypes (or “reference implementations”) that illustrate how these standards can be deployed.

Without a rationalization of the many existing databases, users are left with an uneven and confusing array of information. If, as we advocate, Talent Pittsburgh is structured to serve the needs of its users, there will be no need to separate training providers into categories defined for the needs of specific state and local programs; instead, it will be possible to call up specific sets of training providers from one database. Further, with the present system it is very hard to tell which data is current and how it was collected.

In addition to the resources currently maintained by Talent Pittsburgh and related Web sites, there is a need for the systematic cataloging of (1) apprenticeship programs, (2) for-profit consultants and (3) customized training programs. We suggest that these resources be included in a comprehensive database that also merges the six other resources listed previously.

The merging of databases is one way to streamline access to information from training providers. The Internet enables another, more elegant approach as well. In this more distributed approach, rather than having training providers contribute information to a central database, the providers maintain their data in some agreed-upon format and make this data available over the net. We will return to this ideal architecture in some of the recommendations that follow.

**C. Batch input.** At present the only mechanism for entering or updating course information is to use a Web form and manually enter the required information one course at a time. This mechanism works well for minor corrections or for the smallest training providers, who have no more than a handful of courses to enter. But it more or less excludes participation by the largest training providers. We will suggest three remedies for this problem, all of which probably have a useful role in a future Talent Pittsburgh site.

**1. File uploads.** The simplest way for training providers to enter information for multiple courses is to take a spreadsheet with the required information in designated columns and to upload the entire spreadsheet to the Talent Pittsburgh site. More specifically, training providers can arrange their course information in columns as specified by Talent Pittsburgh, save this data in a “tab-separated” or “comma-separated” text file (a standard option in all spreadsheets and databases), and use a Web form supplied by Talent Pittsburgh to upload this information to the site. A script handling the upload would verify the format of the uploaded file and load the new information into the site’s database. An approach of this type is used by Training Pages ([www.trainingpages.net](http://www.trainingpages.net)) in the UK.

Under this approach it remains the responsibility of the training provider to update its course information in a timely manner and to verify that the information transferred to Talent Pittsburgh is accurate. This can be facilitated by having the Web site display information for one or more uploaded courses and asking the user to verify that it appears in the proper format. Once a training provider has matched its internal data formats with the format required by Talent Pittsburgh, the information transfer will proceed quickly and inexpensively. No intervention will be required on the part of Talent Pittsburgh personnel.

**2. Screen scrapers.** While file uploads will likely satisfy the larger commercial training providers, larger non-profit organizations, such as community colleges, might still find the process too cumbersome. An alternative that involves no work on the part of the training providers is to use robot software to visit the community college Web site, scan through course offerings and harvest the data for use on Talent Pittsburgh. Since the robot browses the remote Web site much as a human user would do and copies material that is intended for display on a screen for the human user, this approach is known as “screen scraping.” The term is intentionally awkward-sounding, to emphasize the awkward programming that must be done to emulate a human user. Further, it is necessary to monitor the accuracy of any screen-scrafer, since this software must be adapted to a specific Web site and will break if any significant changes are made in the site’s layout. Otherwise this approach does take all the humans out of the loop: once a screen scraper is in operation, no intervention would be required either by Talent Pittsburgh or the site being harvested. This means that, aside from monitoring and maintenance, there are no recurring costs for the screen scraper. Monitoring problems will be eased if harvested sites are willing to notify Talent Pittsburgh whenever they are updating their Web designs.

The programming to write one screen scraper is tedious. But there are many similarities between different Web sites, so after a handful of screen scrapers have been developed, the cost of subsequent versions will be much lower.

**3. Web services.** A new technology known as “Web services” provides a way to harvest information from other sites reliably and elegantly. You can think of a Web service as an interface to a Web site that has been designed for other machines to use. Google and Amazon, for example, now provide their familiar online services as Web services, enabling developers to build these resources into other applications. If community colleges were to provide access to their course catalogs through Web services, then Talent Pittsburgh could use this mechanism to display their information simply and reliably.

Web services are a key feature of Microsoft’s .NET initiative, and other major vendors have equivalent ways to implement this technology. Given its importance in machine-to-machine communication, we expect to see this technology universally adopted over the next major cycle of software development, meaning in the next five years or so. Hence we recommend that Talent Pittsburgh embrace Web Services, which will facilitate communication with other state, federal and private sites that use this technology. This will require the development of scripts for the Talent Pittsburgh site, but the required programming for these scripts is not very complex. In the long term we expect Web services to provide the framework for exchange of data between training providers and

their customers and with all of the local, state and federal agencies with whom they do business.

Underlying any Web service is a set of messages that encapsulate data in a format known as XML. This format also has been broadly adopted. A key step in the use of XML is the definition of an XML schema – essentially a vocabulary for the field in question. Where industry and government groups have not already undertaken this effort, there will be a need to develop XML schemas for all facets of workforce development – notably course listings, jobs descriptions and resumes. As with standards, Talent Pittsburgh could play a useful and significant role in convening groups to develop these schema.

To pull together these ideas, we suggest that Talent Pittsburgh should undertake the following efforts:

- Convene a group of training providers to develop an XML schema for course descriptions – or to ratify a schema that has been developed elsewhere.
- Develop a model Web service to publish course information online.
- Construct scripts for Talent Pittsburgh to harvest this information.
- Demonstrate how this approach could be extended to “discover” and display information from multiple training providers.

This last point makes use of one of the very innovative aspects of Web services: the ability of a service to describe itself online in such a manner that clients can discover the existence of the server and automatically learn how to submit queries to it. In a world where all training providers adopted the Web service model, a Web client (such as Talent Pittsburgh) could find a new provider as soon as it began to advertise its services online. And updates to all course information from all training providers would be propagated across the network as soon as they were made.

**D. New services.** The Web service model works in both directions. If a training provider develops a Web service, then Talent Pittsburgh can use this service to harvest information from the provider’s Web site. But, conversely, it could be Talent Pittsburgh that maintained the course information, and the training provider could harvest information from Talent Pittsburgh for presentation to prospective students. Thus if Talent Pittsburgh developed a good interface to online course offerings, it could sell access to this information to interested training providers. This could be supplied either as a Web service, or it could be a logical subset of the Talent Pittsburgh Web site. While this type of service might not be an immediate objective of Talent Pittsburgh, we mention it because it could influence the architecture of the Talent Pittsburgh site.

Similar issues will arise if Talent Pittsburgh seeks to provide registration for courses on its site. There would need to be a secure and reliable mechanism for exchanging registration data with the various training providers. Web services are one option for this. At the very least there would have to be agreement on the format of the data to be exchanged, preferably through the establishment of a standard that would be respected by all training providers.

**E. Open source.** Talent Pittsburgh presently runs on Microsoft's Active Server Pages, which is a technology that predates the .NET initiative. Hence, if Talent Pittsburgh is to be updated to Microsoft's latest technology, as will be necessary to accommodate the provision of Web services, a significant rewrite of the system will be required. We suggest that if such a rewrite is contemplated, consideration should be given to moving from the proprietary Microsoft platform to a more flexible Open Source environment. As indicated in Table 1 (page 30), there are excellent Open Source alternatives to each of the present Microsoft products. All are widely used. Each is available at no cost, in contrast to the high cost (thousands of dollars) for commercial licenses to the Microsoft SQL Server or the development environment for Visual Basic. Many vendors, however, are available to support the Microsoft products.

The real incentive for an Open Source environment isn't just cost. Rather it's the prospect of establishing a collaborative development environment, in which TRWIB could work with other Workforce Investment Boards to create a common software platform. Here the accrued cost savings could be enormous. A further concern, which this collaborative environment could also address, is the question of interoperability. This makes possible the exchange of data among various Workforce Investment Boards, training providers and various state and federal agencies.

#### **IV. Enhancements to the Talent Pittsburgh Web Site**

**A. Services.** If Talent Pittsburgh is to be successful, it is important that it should focus on services of clear value to its users. These services should be developed as fully as possible and presented as smoothly as possible. TRWIB and representatives of the industry clusters should identify what these services should be and should monitor the success of Talent Pittsburgh in providing these services.

The present Talent Pittsburgh site provides two major services:

- ***Information on training providers and listings of courses offered by these providers.*** As discussed previously, this information is spread over several databases. Users can search this information but cannot presently register for courses through the site. Nor can they develop personalized training plans there.
- ***Access to a Learning Management System.*** This facility is used by a small fraction of employers who access Talent Pittsburgh to track progress of their employees in training programs listed on the site.

We believe that the information on training providers is of definite value to employers and employees in the region, but that it could be made much more comprehensive and presented more conveniently than it is at present. Our recommendations in the previous section relate to how the Talent Pittsburgh database can be made more comprehensive. In the paragraphs below we discuss best practices that could be applied to improve the presentation of this information.

The Learning Management System is of less universal appeal. We believe that TRWIB and representatives of the industry clusters should decide if this is an important enough

resource to maintain on the site – or, as discussed in Section V, if Talent Pittsburgh should simply assist its users in access to a variety of such software.

**B. Best practices.** A number of best practices are outlined here. These will need to be developed over time, but implementation can begin immediately.

**1. Accessibility.** The site should comply with Section 508 of the Rehabilitation Act (<http://www.section508.gov>). This requirement, intended to assure that information technology is accessible to people with disabilities, is also an incentive toward simplicity and a logical overall structure. Technologies now exist that allow voicemail-style access to Web resources over telephone lines, should that seem like a useful option to TRWIB.

Several means can be used to make the site accessible to users in other senses. Help buttons, online tutorials, and lists of frequently asked questions (FAQs) should be provided for each target audience. These should evolve as information is collected; FAQs, for example should be updated as new questions arise. As discussed below (see 6. *Other content*), materials should be placed online in formats that are easily read, searched and printed.

**2. Detail.** Users will return more frequently to sites that present useful information in a simple and clean format. To achieve this, the site’s maintainers must pay attention to a number of details. There should be automatic scanning for dead ends, and paths that no longer lead anywhere should be modified or deleted. The site should not promise anything it cannot presently deliver – such as the suggestion of class enrollment or training plans on the present site. Wording should be checked to assure a consistent vocabulary – avoiding, for example, the present use of “certificate and diploma programs” to open a page labeled “curriculum programs.” Also, users should always be able to see where they are in the site, whether in a navigation panel or through an eBay-style path indication (e.g., “Training → Catalog → Course Detail”).

**3. Reference sites.** A number of sites that allow access to training courses databases have been explored. So far we have found no single site that provides a good overall model. There are, however, several useful examples of features that could be of value for Talent Pittsburgh. Popular commercial sites exhibit other useful features. These features – and the sites in which they are found – are summarized in Table 2 (page 31).

**4. Home page.** To assure that the Web site is presented from the perspectives of the expected users, the home page should provide specific, separate paths for employers, workers, planners/policymakers, and training providers. All paths should be visible from a common home page, perhaps with drop-down menus similar to those currently used on the site. Each of the paths should lead to a resource page outlining and linking to pages on the site that are expected to be of interest to the group. Industry clusters should be featured on the home page in the browse option for the online course catalog, but should also appear as links on the employers’ resource page, on feedback forms and in links to the communities of practice that are described below.

Since the course catalog is expected to be one of the main attractions of the site, its presentation on the home page is important. Three means of access to the catalog should appear:

- “Fast search” to allow a one-click keyword search

- “Browse” to go through all course listings
- “Advanced Search” for more detailed options

“Fast Search” would give immediate access to the course catalog based on entry of a keyword. To implement this recommendation without potentially confusing users, it will be necessary to combine the existing databases, plus any additions such as online training, apprenticeships, customized training or for-profit training consultants.

Clicking the “Browse” option would present a pull-down list of clusters. As the course catalog grows, or if preferred by cluster members, it may be helpful to take the user next to a list of sub-categories, so that they can specify choices within the cluster. The Training Pages site mentioned above provides a nice functional example of what we have in mind.

The third option for accessing the course catalog from the home page should be an Advanced Search Option, where the user can choose from several possibilities. Online help would provide, on demand, a brief tutorial on use of the Advanced Search function.

In addition to providing access to the course catalog, it would be advisable to allow users to search the site as a whole. Users who have come to the site before may know exactly the information that they want, but not where it is. As the site develops, new users may be interested in looking for information other than courses. A site map will provide a rapid overview of the site as a whole, while a search engine will assist users to locate specific sought-after resources.

Another feature that could make the home page immediately useful is a space for announcements. This should be added only if entries can be kept up to date, and the space should be blank when there is nothing new to say. An announcement might draw attention to a new feature on the site, a meeting date, a new course or registration date, a new training provider, a cluster activity, or something a related organization (perhaps CareerLink or city job fairs) is doing that might interest users. This feature will be particularly useful if the communities of practice grow to be very active and Talent Pittsburgh becomes a showcase for many new workforce-related online tools.

**5. Course catalog.** A number of modifications in the appearance and features of the site can be made right away. In the longer term, the combining of redundant databases, as suggested in Section II, is an important way to simplify the presentation of the site to users.

Training course sites that have been visited are listed in Table 2 (page 31). They suggest possibilities for Talent Pittsburgh in several areas:

**a. Course titles vs. course content.** Courses are generally presented either as a list of course titles with information in columns (as in the present Talent Pittsburgh site) or as summaries of the course content, whether short (Learn Direct Scotland: <http://www.learndirectscotland.com/>) or longer (UK Training Pages: <http://www.trainingpages.net/x/services.html>). Both have advantages and disadvantages, so this is a good example of a choice that would be interesting to present to users. Summaries are much more descriptive than course titles, but using course titles leaves room for other columns that provide an instant overview of other variables.

**b. Column headings and icons.** The different sites display courses using a variety of column headings. For example, on Access Indiana ([http://www.ai.org/serv/dwd\\_etc](http://www.ai.org/serv/dwd_etc)) WIA-approved programs are simply noted in the left hand column, while on Connecticut's Education and Training Connection (<http://www1.ctdol.state.ct.us/etc/>) WIA courses are somewhat more clearly indicated in the fourth of five columns, with an "information" icon leading to a pop up that explains the WIA program and offers more detail if wanted.

**c. Rearranging the data.** In addition, it might be useful for users to be able to rearrange their view of the information they receive, using for instance "sort by" buttons (one example can be seen on the Expedia site, [www.expedia.com](http://www.expedia.com); this allows sorting airline ticket choices by price, preferred times, shortest flights, and so forth) and/or clicking on column headings. Expedia also illustrates how a large number of options can be presented to users in a relatively clear way, with its links to "top picks" and, in the navigation panel, "change your search," "add fun extras" and "FAQs."

**d. Comparing courses.** Comparisons are another possible feature. The Connecticut site compares courses on the basis of e.g. duration, cost and award, but to make this comparison it is necessary to first place courses in the shopping cart. California's I-train (<http://www.i-train.org/>) offers a simpler possibility, in which checking boxes in the course list allows comparison with respect to success in student placement.

**e. Finding course locations.** None of the training sites listed point to detailed information on course locations or maps giving directions to sites. One possible model however is the zip code window on the US Postal service site (<http://www.mapsonus.com/db/USPS/>), which produces a list of post offices within a specified mileage range, each with a link to a map. This kind of search could be broadened with other information on bus service and disability access, if added to the database by training providers.

**f. Personal portfolios.** A personal portfolio would allow users to save information such as course choices or comparisons, filtering options for course selection or skill sets for particular job classifications, or to request notification of new courses, course availability or registration dates. This could replace the present link "Create a training plan," which only provides a shopping basket to request training providers' brochures. Later a comprehensive planning tool could be explored, offering perhaps information on career paths or an interactive template for constructing a training plan that extends over a period of years, which can be used to guide and track people's career paths.

**g. Dates.** As noted previously, a problem with database-backed Web sites is the quality of the data presented. One simple way to encourage providers to update their entries is to provide "freshness" labeling with the information presented on the Web site.

**h. Screen real estate.** Even with large-screen monitors, screen real estate is a valuable commodity. If the presentation of essential data is cluttered up with details that are not of immediate interest, the vital information may go unnoticed.



Hence, particularly in the presentation of tabular information, it is important to stick with information that is needed by the user and to avoid presentations that involve many repetitive components.

**6. Other content.** Where possible, information and forms should be provided online, using HTML in preference to PDF. Information and links should be added to decrease the need for users to send e-mail and wait for answers (as in the current “Ask for more information” functions).

Criteria for content for specific audiences should be defined as soon as possible, and used in making initial decisions about what content to remove (or what PDFs to replace) and what new content to seek. These criteria should be reviewed with users and updated as necessary. While supplemental materials might be made available in PDF format, the aim should be to provide attractive content within a truly interactive Web site that facilitates navigation, allows users to move among a set of interactive forms, and allows users to customize the presentation to their preferences and needs.

Content criteria should also cover decision making about links to be made available for specific audiences. When these are used, explanations should be added where appropriate to put the material in context and explain how it can be useful. (For example, the O\*Net welcome page at <http://online.onetcenter.org/help/welcome/> provides a brief introduction to O\*Net and an overview of what it offers for various potential users.) User groups should be asked what new material they want or whether they would find new content useful. Examples might include a small business resource center, a career development center for workers, or an overview of workforce development related programs and services, but these decisions need to be taken in light of overall strategies for Talent Pittsburgh, as suggested in the final section of this report.

**7. User support.** A help desk should be maintained for user support, and should be coordinated with changes on the site; the main challenge here may be that with a small number of requests it is more difficult to provide on-going attention. Tutorials can be built in as new tools are put in place, and offers of help can pop up automatically (always with the option to turn off this function) following particular patterns of user behavior such as repeated attempts or several loops between the same pages. Questions and comments from users should be incorporated in FAQs pages for specific user groups, considered in designing additional pop-ups or tutorials, and used as an important part of the evaluation and evolution of the site.

**8. Pre-testing.** To assure proper implementation of the Web site, it will be necessary to test out new features and potential features. Rapid prototyping in cooperation with communities of practice is one example; usability testing of new tools and layouts is another. In some cases (particularly before the communities of practice are formed) it may be desirable to ask users to meet in focus groups, whether face-to-face, online or a combination of the two. Incorporating feedback from such sessions in the design of the site and its tools will help produce a final version that is well-adapted to users’ needs.

**C. Longer-term activities.** Over time the Web site can accommodate other resources and activities. One possibility is to work towards understanding and monitoring the organizational environment of workforce development in the Pittsburgh area. This might

begin with a collaborative effort to “map” workforce development – that is, to work with other organizations to agree on a picture of the many elements in workforce development and how they fit together. An online process, or a combination of online and face-to-face events, could generate discussion and new thinking about for example information flows in the workforce development system and where they might need to be changed. For TRWIB this would be relevant to discussions of the market niche, competitors, possible collaborations and new opportunities. It could also serve to focus attention on the Talent Pittsburgh Web site and its potential contribution to policymaking and planning in workforce development.

A related collaborative effort would be to work towards identifying and using indicators that can help to keep tabs on the status and trends in workforce development, focusing particularly on regional needs and opportunities. A map of the territory would be a useful starting point, both in building collaborative bonds and in setting priorities. The utility of data from Talent Pittsburgh and other local sources, as well as national, state and regional data, might be explored. Again, online interactions could involve a broad group, and interesting online graphic presentations could make the results widely available.

**D. Evaluation mechanisms.** Several mechanisms can be used to assure that the site is functioning smoothly and that it is increasingly useful to the target groups, and to provide information that can lead to needed modifications. Basic measures here include assuring an immediate response to problems (for example, following up on automatic notification that there is a problem with the site) and rapid responses to user support needs, questions or comments. Beyond this, it would be extremely useful to monitor the functioning of the site on a regular basis, using automatically-collected activity logs (showing usage of the site, which pages are most popular and where users are having problems). “Check-up” lists could serve as reminders of what was to be reviewed weekly, monthly and quarterly and could be used to schedule the review of success criteria, online feedback forms, regular user polling, and interactions with industry clusters and other user groups. In later phases, course evaluations might be added.

Feedback forms that are simple, brief and attractive to users are the most likely to be completed. Simple rating buttons such as “did this search help?” can be combined with requests for more extensive feedback, such as a more general short pop-up survey form. Since people will approach the site with different needs and goals, the site could use the entry points – employer, worker, planner or training provider – to approximately separate responses by user category. Feedback forms could also be made specific; for example, a decision tree format could offer different questions to different industry clusters. In addition to these more common feedback mechanisms, it will be essential to link evaluation mechanisms to user groups, building in regular reviews to obtain more detailed feedback on the site.

## **V. Development of a Business Plan for Talent Pittsburgh**

**A. Funding strategy.** *Can Talent Pittsburgh emulate eBay in satisfying user needs and attaining sustainability?* How should Talent Pittsburgh be funded? How should it fund

the development costs of the Web site and database and the ongoing costs of updating, maintenance and marketing? This section of the report outlines a preliminary strategy.

TRWIB's Request for Proposals suggested a comparison with eBay – in terms of its effectiveness, popularity and ability to generate revenues to cover its costs. eBay takes advantage of the efficiencies of the Internet – ease of publishing and infinite reach – to provide a valuable service, recover costs and earn profits. eBay provides functionality that satisfies the needs of its users. It makes it easy to offer products for sale, enables buyers to search easily for desired purchases, provides an online mechanism to complete the purchase and incorporates features that enable users to rate the services provided. Equally important, it generates revenues that cover its costs.

eBay, of course, sells all kinds of products, ranging from pet supplies and televisions to motorcycles and cars. Its market includes 62 million registered users (as of Dec. 31, 2002), of whom 28 million bid on, purchased or listed an item for sale in 2002. It serves the United States and more than 25 other countries. The value eBay adds for sellers is access to broad markets of buyers, an auction system, low distribution costs and the consequent ability to maximize prices and increase sales. The value eBay adds for buyers is a broad variety of products (eBay doesn't sell services other than the use of its Web site), an easily accessible marketplace, low transaction costs and (according to eBay) entertainment. Equally important, eBay's initial success seems to snowball, because its large seller and buyer base makes it an attractive meeting place for additional buyers and sellers.

eBay's financial model entailed raising private capital to fund the company's development costs and its recurring costs until it reached a breakeven revenue level. eBay's revenues from buyers and sellers now make eBay profitable, but eBay continues to require private capital to fund continuing improvements.

eBay charges fees only to sellers, not to buyers:

- Listing fees ranging from \$0.30 to 3.30 for most items<sup>1</sup>
- Optional feature fees of \$0.05 to \$99.95 to increase a listing's prominence
- Final value fees
  - 5.25% of the sales price for transactions up to \$25
  - 2.75% of the amount over \$25
  - 1.5% of any amount over \$1,000<sup>2</sup>

These relatively low fees generated annual revenues in 2002 of more than \$1 billion and \$250 million in net income. Those numbers translate into an average of approximately \$35 in revenue per each of the 28 million users.

Can Talent Pittsburgh use similarly affordable fees to recover the costs of developing and maintaining the database and Web site? What are the factors that will enable or limit the recovery of Talent Pittsburgh's costs? Based upon our research, the challenge for Talent Pittsburgh lies in the following factors:

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<sup>1</sup> eBay charges special listing fees of \$40 for cars and \$50 to \$300 for real estate.

<sup>2</sup> eBay also charges a final value fee of \$40 for the sale of a car and \$25 for a motorcycle.

- The value that can be provided to its users (and the prices users are consequently willing to pay for the services)
- The costs of providing the services
- The size of the market for the services

The discussion below first describes the services that Talent Pittsburgh might be able to provide (or to which it might add value), the magnitude of the costs to be recovered and several potential cost recovery scenarios. It discusses for each scenario the likelihood of recovering costs, based upon examples elsewhere, the value potentially added here and the size of the Pittsburgh market. The conclusion is that Talent Pittsburgh's general strategy should attempt to fund development costs with grants and recurring costs with fees charged to users or training providers. The discussion notes that similar sites do not appear to have succeeded in generating sustaining fee structures. Talent Pittsburgh, nevertheless, can maximize its chances by using the TRWIB's cluster model as a mechanism to effectively identify and serve the needs of the TRWIB's targeted audiences.

**B. Services.** *What value can Talent Pittsburgh provide? What services should Talent Pittsburgh provide? And, additionally, what value can Talent Pittsburgh add to services that are already being offered locally?*

The most basic answer is that Talent Pittsburgh should provide services (and add value) that people need. The focus should be on the identification and satisfaction of needs, because that is the reason people will use the site. The further question of what services people will pay for and how much they will pay is a derivative of the initial question. If a site doesn't provide useful services, no one will want to look at the site, much less pay a fee to use it. If the site provides a useful service, an employer, employee or planner will have a reason to look at the site, and, if the service is sufficiently valuable, the user may also be willing to pay to use it.

One of Information Renaissance's primary recommendations is that the TRWIB actively engage TRWIB's industry clusters to identify workforce development needs and ways Talent Pittsburgh might satisfy them. TRWIB's organizational focus on industry clusters makes the cluster organizations the logical focal point to solicit input on the needs of the audience to be served and on how to incorporate the site into the cluster participants' activities. This input will also be helpful to determine the audience's willingness to pay for the services provided.

For example, based upon the conversations we've had to date, it appears that one of the clusters' primary needs is to recruit and train workers for occupations for which employers have difficulty finding appropriate talent. Talent Pittsburgh currently addresses this need, in part, by providing a catalog of degree and certificate programs, a catalog of training opportunities and a pointer to Learning Management System (LMS) software to track employee training. With input from the clusters, however, Talent Pittsburgh might do more. It might be used to advertise special recruitment and training efforts. It might be integrated into the cluster's activities to help employers develop necessary skill sets among their employees. And it might outline career ladders in various professions and help employees and employers track progress along these ladders.

To develop this report Information Renaissance has talked with local workforce development participants about the services currently offered by Talent Pittsburgh and other workforce development sites, and considered the extent to which these services meet users' needs. Based upon these discussions, it appears that Talent Pittsburgh's services might add value in the following areas:

**1. Access to training courses.** As just noted, easy access to information about training courses in the Southwestern Pennsylvania region appears to be a need for both employers and workers. Training providers publish information about their courses in printed and online material specific to their institutions. An employer or worker researching training opportunities must generally collect this information on an institution-by-institution basis and compare course offerings. This process can be time-consuming.

Talent Pittsburgh can add value by not only consolidating the course offerings of the region's training providers in a single online location, but also by organizing course offerings to be readily comparable and providing the ability to enroll in courses online. The primary challenges here are to collect and display a broad range of courses from many training providers, to organize the course offerings in a readily comparable format and to maintain accurate and up to date information. The database recommendations outlined in Section III seek to address these issues by establishing computer systems to continually retrieve up to date information without the need for human data entry.

Online enrollment is another area in which data exchange is important. If Talent Pittsburgh intends to enroll students on its site, it needs a secure mechanism for transferring enrollment information to the training provider. Similarly, if payments are to be made via Talent Pittsburgh, there must be a trustworthy means for crediting the appropriate accounts.

Another service that Talent Pittsburgh could develop would be a rating system for the accuracy of training providers' listings. Training providers, for example, will be challenged to keep their course information accurate and up to date. A rating system might help users monitor training providers' attention to this challenge. This would present more of a challenge than eBay's sellers' ratings, but could be valuable if a mechanism could be developed to obtain students' responses for the majority of listed courses.

A different kind of ratings option is used by California's I-Train. Vendors' data includes the date of last graduation and number of graduates; further, vendors are asked to state the percentage of trainees who obtain new jobs as a result of their training. This suggests the further possibility of approaches that are less subjective than simple popularity ratings, which – at the university level – often push the least demanding instructors to the top.

Talent Pittsburgh might also attempt to address the perceived need for human assistance and/or counseling in selecting training courses and programs. A common concern voiced in our discussions with workforce professionals was the need for human interaction with an employer or user seeking training information. Some amount of personal instruction might be required to inform potential users of the availability of counseling services and their value. Thereafter, the selection of training programs and

courses and the decision of whether to seek customized help also often requires conversations with a workforce development professional. A Web site may not be able to serve these functions directly. It was recommended, for example, that the Web site be linked to sources of counseling.<sup>3</sup> Service providers could be charged for these listings.

To some extent it may be possible to provide services of this type online. If a procedure can be outlined in the form of a flow chart, with yes/no or multiple choice questions determining the path to follow through the chart, then an *expert system* can be constructed to lead users through the procedure. Such systems have been used for such diverse purposes as physicians' assistants and virtual OSHA inspections; they can encompass a large amount of data and help users work their way through information in an efficient manner. Of course expert systems can't substitute for subjective judgment, so they are not applicable in every situation. Nonetheless they can streamline processes where some level of human invention may be useful but a majority of the interaction is data-based rather than intuitive.

**2. Workforce development software.** Employers may also need to track and manage employee training. Several workforce development Web sites offer software to meet these needs. WEDnet, for example, sells licenses to the WORKS LMS system, which enables employers to track employee training. The Possibility Network in Indiana sells licenses for software that enables employers to track the courses taken by employees in employer-provided tuition reimbursement programs. The software license sales are used to help fund the sites' recurring costs.

There was a difference of opinion among our interviewees on the need for and value of such software. Some professionals said large employers already possess software to perform this function, and small employers may lack the volume of training activity to justify its purchase – leaving a likely market comprised of only mid-sized businesses. Others thought that software, such as the Learning Management System currently available in the WEDnet system and available as a link on the Talent Pittsburgh site, was universally useful to businesses of all sizes.

Software sales, however, do not appear to have been especially successful. The Manufacturing Resource Center (MRC) in Lehigh County packages the software into a bundle of workforce development services that it provides for a \$495 annual fee, and requires the use of the software to manage employers' receipt of funds for WEDnet subsidized training. The 80 employers MRC works with on WEDnet training therefore use the LMS software, although some use WEDnet funds to pay the annual fee. In Allegheny County, five employers are currently testing the LMS software to evaluate its utility and ease of use.

One issue to consider, in particular, is whether Talent Pittsburgh should adopt the sale of one software package or whether it might instead simply provide space for vendors to

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<sup>3</sup> This is a difference from eBay, which notes that its site is useful for the purchase and sale of products in part because of the ease with which the essential information about the product can be displayed on the Web site. Information about services, especially customized services, is not as easily described.

post software programs for licensing just as Talent Pittsburgh posts training courses. We recommend that the cluster network be requested to analyze the needs of employers for such software and that any offerings be tailored to serve those unmet needs.

**3. Ancillary products and services.** In addition to software, Talent Pittsburgh could also sell books, CDs and other services relating to job training and placement. Talent Pittsburgh could serve some needs of workforce participants with such services, but the primary need it might serve would be Talent Pittsburgh's interest in recovering its costs. The Possibility Network in Indiana provides the capability to purchase books, but they are competing with sites such as amazon.com, which operate on a much larger scale and can afford to provide better support for their software.

One area where Talent Pittsburgh might reasonably expand its offerings is in the area of listing online training providers. At present there does not appear to be any regional clearinghouse for such a service, which is likely to find an expanding market.

**4. Access to workforce development statistics.** Workforce development planners and some employers need accurate, primary data on characteristics of the local workforce. Those needs are currently served by a variety of data sources, but Talent Pittsburgh offers the potential to provide more up-to-date access to primary data on local characteristics – the Pittsburgh CareerLink data. The CareerLink data on job seekers and the skills can be used for its own inherent value and, potentially, as a basis to extrapolate more general local trends.

The primary challenge here is obtaining access to the data CareerLink sends to the Pennsylvania Department of Labor and Industry. Currently, CareerLink collects the data and sends it to the state Department of Labor and Industry, but it is unable to retain or retrieve the data for its own use. Better collaboration with state officials and/or technical solutions are needed.

Talent Pittsburgh can also offer access to additional data collected by the Departments of Labor and Industry and Education if agreement can be reached on ways to standardize the agencies' databases to facilitate the data exchange. Further, Talent Pittsburgh also has the potential to collect and make accessible data from local employers, which will require addressing the same issues of standardized databases and data exchange.

What is the demand for such data, however, and who would pay for it? The data would be useful to TRWIB and other workforce development planners. We recommend that TRWIB's industry clusters be asked to determine the value of this data and to provide input on ways to collect it and make it available.

**5. Marketing training courses for training providers.** Training providers have a need to advertise their courses to employers and workers. In the course of providing employers and workers information and access to training courses, Talent Pittsburgh is also helping training providers to market their services.

Advertising course offerings can be a valuable service to training providers, but the exact value – and the price training providers will be willing to pay – depends upon the extent to which Talent Pittsburgh itself is effectively developed and marketed. Prices

need to be low enough to encourage listings; otherwise the Web site will be less effective. On the other hand, this income may be needed to support marketing. The Possibility Network in Indiana reportedly undertook an expensive marketing campaign through a variety of media and events. However, its attempt to recover its costs through relatively high fees to training providers appears to have been abandoned.

This service, too, is properly discussed in the cluster organizations, including the potential willingness of employers to participate in funding; it also will require input from training providers. Talent Pittsburgh's marketing can be accomplished informally through existing networks, such as TRWIB's industry clusters and the Workforce Connection's Regional Learning Network. Or Talent Pittsburgh could raise funds from grants, training providers and/or employers to conduct more expensive print and broadcast marketing. This is discussed further in the following section.

**C. Costs.** The previous sections have included a number of specific suggestions relating to the Talent Pittsburgh Web site and database and several ideas for new services and procedures that could be included. In Table 3 (page 32) we summarize these recommendations with cost estimates, grouping them in accord with the recommendations outlined in Section I.F. We estimate two types of costs: one-time costs (to establish a service or complete a well-defined task) and recurring costs (to maintain an ongoing activity or service). The one-time costs are often much larger than the recurring costs. The development costs include design work, coordination with workforce development participants and initial implementation. Recurring costs typically include costs for management of the people and systems, monitoring of the Web site and database and modifications as required to fix bugs or upgrade system security.

In addition to the costs to physically construct and operate the site, another cost is the broad but critical function of "marketing." The targeted audience's awareness of the Web site is crucial. No one will use the site if they don't know of its existence. Moreover, any number of Web sites can potentially perform some or all of the functions provided by Talent Pittsburgh, and some, if not many, already do. Talent Pittsburgh must distinguish itself in some way to continue to attract users. eBay recognized the need to establish such an identity and spent considerable resources to promote it. Any marketing should be based on a specific plan, targeted to the audiences involved. This should be based in turn on the creation of a strategy for development of Talent Pittsburgh, including its audiences, market niche and the timing to be followed.

Table 3 includes a modest level of marketing costs, based upon the TRWIB's use of its informal marketing network. As noted above, the TRWIB's cluster network and Workforce Connection's Regional Learning Network can provide a relatively inexpensive but potentially effective mechanism to market Talent Pittsburgh. Alternatively, additional resources can be spent explicitly on direct marketing with print and broadcast media. Marketing budgets in the range of \$750,000 to \$1 million can be expected for substantial broadcast advertising. The \$1 million spent by the Possibility Network in Indiana was mentioned earlier. A similar local advertising campaign using broadcast media is estimated to cost approximately \$750,000. Consistent with our other cost estimates, we recommend a marketing budget of at least \$50,000 annually, which would be adequate for efforts to market through TRWIB's network of workforce development professionals.



**D. Cost recovery scenarios.** Information Renaissance has outlined three general cost recovery scenarios using a combination of grant funds and fees – (1) complete grant funding for development and recurring costs, (2) complete funding with fees, and (3) grant funding for development costs with user for recurring costs.

**1. Grant funding for development and recurring costs.** The attached cost estimates indicate that Talent Pittsburgh would need to raise on the order of \$225,000 to design, develop and implement the recommended improvements to the site's databases and Web site. Funds of this magnitude might be raised from foundation and government sources – and perhaps even from employers, to the extent Talent Pittsburgh can serve substantial needs of this group.<sup>4</sup>

One-time costs for special activities or events, such as targeted recruiting and training campaigns, might also be funded with grants. Employers in need of hard-to-fill positions might cooperate to sponsor such activities. The Pittsburgh CareerLink program, for example, is working with a number of health care providers this Fall to sponsor a public awareness campaign to recruit people into entry level health care positions. The campaign is being sponsored with grants from foundations and employers.

Another funding strategy is for Talent Pittsburgh to seek grants to develop prototype Internet tools. Federal and state grant funds may be available for such work to the extent it presents a potential for replication at state and other workforce development sites.

The estimated \$175,000 in annual recurring costs for the recommended improvements might also be sought from the same sources, but these sources are likely to encourage the TRWIB to seek matching funds for these purposes.

**2. Fees – alone or combined with grants.** Talent Pittsburgh might also seek to recover all or a portion of its costs through fees assessed to training providers, employers, workers, workforce development professionals and/or vendors selling products and services in which any of the participants might have an interest. Our research indicates that sites similar to Talent Pittsburgh have attempted innovative revenue generating techniques, but they have not generally been successful in generating the revenues they need to recover their full costs.

**a. The eBay model.** As we describe pricing models we've observed from Internet sites similar to Talent Pittsburgh, we believe it might be useful to consider eBay's model for perspective. Although serving a different market, eBay's business model highlights two principles that are also significant here. First, to encourage activity, eBay charges fees only to sellers, not to buyers. This removes any last minute discouragement to making a transaction. Second, eBay relies on scale – a large market of sellers and buyers – both to provide an incentive for sellers to advertise their offerings (despite transaction fees) and to be able to keep the transaction fees low.

**b. The size of the local market.** It's also useful, when discussing fees, to keep in mind the size of the relevant market. Regardless of the needs Talent

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<sup>4</sup> eBay's initial public offering in 1998, by comparison, raised \$66 million.

Pittsburgh serves, its market will be significantly smaller than the 62 million customers registered with eBay. But how many participants might there be? Talent Pittsburgh will serve Southwestern Pennsylvania, while eBay serves the world. The region currently has 28 organizations posting courses on Talent Pittsburgh.<sup>5</sup> Allegheny County over 34,000 employers with more than 600,000 people in the labor force.<sup>6</sup> Compared to the more than 1,000 categories of products sold on eBay, Talent Pittsburgh will also have a far smaller number of services to offer and sell. The costs of developing and maintaining the site are also smaller, but it is not clear that the potential base of services and participants will have the requisite size to fund it.

### **c. Examples of fees**

**(i) Charges to training providers.** Sites similar to Talent Pittsburgh have charged varying combinations of the types of fees charged by eBay – listing, feature and sales fees. Although it has been difficult to get figures on the revenues actually generated by these fees, the pricing models at least suggest what might be possible locally.

The Possibility Network initially charged substantial fees to training providers posting courses on its site. The charges were intended to help fund the substantial marketing costs for the site itself. The system, however, failed to generate the level of revenues desired.

Training Pages allows training providers to upload courses manually at no charge but charges providers \$5-\$10 per course to do batch uploads to the database.<sup>7</sup> It is not clear how much these charges generate in annual revenues.

Training Pages charges listing fees with the option of additional feature fees. These fees enable training providers to display their commercial logos next to their course offerings. Other options include highlighted prominence on special pages or banner ads at the top of the site's home page.

**(ii) Charges to employers.** As described in section V.B.2, the Manufacturing Resource Center in Lehigh County includes LMS software from the WORKS Partnership in a package of technical assistance and tools that it provides to 80 employers for an annual fee of \$495. The package is required for employers (some of whom are subsidized) seeking training grants under the WEDnet program. The proceeds are used to fund MRC's workforce development programs. MRC doesn't identify the

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<sup>5</sup> Talent Pittsburgh includes 5 community colleges, 10 colleges and universities and 13 private training providers.

<sup>6</sup> A full 50% of Allegheny County's employers have four or fewer employees. 96% have fewer than 100 employees. 49 employers have 1,000 employees or more.

<sup>7</sup> Current prices are £75 for up to 15 courses, £125 for up to 15 courses with a template for scheduling, £195 for up to 49 courses, and £245 for up to 49 courses with scheduling templates.

fraction of its Internet activities covered by these fees. MRC employs a help desk staff person to assist the employers with the LMS. It initially hired a staff person to update the course listings and market Internet tools, but funding for these activities has been discontinued.

**(iii) Charges to workers.** We haven't observed any sites assessing explicit charges to workers using the sites to register for courses.

**(iv) Charges to workforce professionals.** Although the idea of charging end users might discourage the use of a service, an end user charge might be the best means to recover the costs of displaying data on local workforce characteristics. The best option here might be to charge the end users, the workforce professionals. One means to do so might be to offer a limited edition of data that is free but to charge a fee for increasingly extensive data. Another option would be to decrease costs by enlisting professionals' assistance in developing the data, but to make it available for free.

We recommend that Talent Pittsburgh follow the principles of the eBay model. Talent Pittsburgh can also focus its charges on sellers, i.e., the training providers, but it needs to develop a large market to generate the scale to keep fees affordable. This means a substantial marketing effort (with adequate resources) to attract a large number of sellers and buyers, a Web site with relatively low recurring costs and a pool of vendors large enough to absorb the costs.

The size of the marketing effort Talent Pittsburgh can mount is unclear. It will depend upon the interest it can attract which will likely depend in turn upon the needs it appears it can satisfy. The size of the potential market is also unclear. Two possible strategies have been identified in Section V.C. The first, direct marketing to the target audience, is likely to be expensive. The second, involving members of the industry clusters or providers of customized training services, could be effective while costing far less money. These two strategies give a range for marketing costs. It would also be possible to develop an intermediate plan, using for example media and events targeted to employers and working to reach employees through company newsletters and human resources departments.<sup>8</sup>

If we amortize one-time costs over a three-year period and attempt to fully recover recurring costs on an annual basis, then the annual cost to implement the recommendations would come to \$250,000 per year, which would lead to sizable fees. Based upon our general estimates of costs, full recovery of development and recurring costs from 50 training providers would result in an average charge of \$5,000 per provider. Full recovery of these costs from 30 providers would result in an average charge of \$8,333 per provider. (Talent Pittsburgh currently has 28 training providers).

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<sup>8</sup> eBay, for example, focuses its marketing on where it might best find its users. Initially, eBay says it relied upon word of mouth and, to a lesser extent, on distribution or sponsorship relationships with high traffic Web sites. More recently, eBay uses strategic purchases of online advertising along with traditional media such as print media, trade shows and other events.

**3. Grant funding for development costs; fees for recurring costs.** Given the difficulty of fully recovering all of Talent Pittsburgh’s costs with fees, a final option is a business plan that consists of a combination of grant funds and fees. The most logical option here is to seek grant funds for development costs and fees for recurring costs.<sup>9</sup> Development costs are substantially larger than the recurring costs, but foundations and government agencies are often interested in funding one-time costs for projects that can be replicated elsewhere. Moreover, fees are more likely to be adequate to recover the lower level of recurring costs.

If we focus solely on the recurring costs for the recommendations, then the average cost per training provider would be \$3,500 (assuming 50 providers) and \$5,833 (assuming 30 providers). Implementation of fees for the training providers would require the development of a model for the structure of these fees – whether to charge a flat fee for each provider or to charge per course, and whether to differentiate between for-profit and non-profit providers in these charges.

This arithmetic underscores another point – the virtues of working at a larger scale. It is very difficult to sustain a service for a region as small as Pittsburgh through fees alone. But the cost per WIB of providing a service for all the WIBs in the state – or even all the WIBs in the nation – would be much smaller than the cost of only working in the local area. Hence the idea of using Talent Pittsburgh as a testbed for WEDnet or other statewide or national service is something that makes sense financially as well politically. We have not attempted to construct a business model for statewide or national services, since this would take us well beyond the intended scope of this report, but it is clearly something that TRWIB might want to consider in the future.

## VI. Conclusions

**A. Detailed Recommendations.** This report contains a number of recommendations for the Talent Pittsburgh Web site and its associated database – and for the programs and procedures that support these resources. In Table 3 (page 32) we have summarized these recommendations in four broad categories, corresponding to suggestions in Sections II, III, IV and V. For each recommendation we have provided a rough estimate of the expected costs, including both one-time costs and annual recurring costs. The four categories are as follows:

**1. Support and involve industry clusters.** Suggested tasks include the establishment of communities of practice and a rapid prototyping environment to support the development of a toolkit that serves the needs of the industry clusters. One-time costs include the programming to set up the communities of practice, and hardware and software needs for the rapid prototyping environment and toolkit. Recurring costs relate to programming for the rapid prototyping environment and toolkit, facilitation for the communities of practice and coordination of the development efforts of the communities

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<sup>9</sup> At the risk of taking the eBay comparison too far, it’s worth noting that this combination of initial capital and user fees is, of course, the business model adopted by eBay and other private businesses.

of practice. The one-time cost for this work is estimated to be approximately \$25,000, with recurring costs of \$75,000 annually.

**2. Improvements to the WORKS training program database.** The tasks related to our discussion in Section III include consolidation of databases on the Talent Pittsburgh site, development of mechanisms for the bulk upload of course information and conversion of the site to an Open Source platform. The primary costs for these activities are all one-time development costs, with a breakdown as indicated in Table 3. Total cost for these activities is estimated to be approximately \$100,000.

**3. Enhancements to the Talent Pittsburgh Web site.** Activities here include improvements to existing services, implementation of best practices, development of longer-term activities such as knowledge mapping and the presentation of indicators for the labor market, and ongoing evaluation for the site. Total one-time costs for these activities is approximately \$100,000 with recurring costs of \$50,000 annually.

**4. Development of a business plan for Talent Pittsburgh.** Based upon the expected preferences of grant sources, the business model that appears most likely to recover the highest percentage of TRWIB's costs would use grant funds for one-time development costs and fees for recurring costs. We recommend that the details of any business model be considered with the input of the industry clusters. Our research suggests, however, that fees should generally be charged to sellers (in this case, training providers) rather than to buyers and that a large scale of activity will be required to recover the TRWIB's costs. In this regard, we also note that marketing of the site will be a key factor in generating this required scale. Marketing costs can vary widely depending upon the approach taken. In keeping with our other cost estimates for the site, we regard a figure of \$50,000 as reasonable and necessary.

**B. Strategy.** Our recommendations have the potential to help the TRWIB achieve a more specific market niche for Talent Pittsburgh. Defining the desired niche should be a conscious part of a strategy for Talent Pittsburgh – a strategy that is guided by a strong sense of the desired audience, services and management structure for the Web site. We suggest that this strategy should guide the TRWIB in its choice of near- and longer-term options among the recommendations of this report.

## Appendix A: Tables

**Table 1: Open Source and proprietary solutions**

<b>Component</b>	<b>Microsoft</b>	<b>Open Source</b>
Web Server	Internet Information Server	Apache
Scripting Language	Visual Basic	Perl, Python, Java
Database	Microsoft SQL Server	Mysql

**Table 2: Reference sites**

Name	URL	Features
Amazon	www.amazon.com	<ul style="list-style-type: none"> <li>• Web service interface</li> <li>• Solicits reader comments</li> <li>• Suggests items of possible interest, based on earlier choices</li> </ul>
eBay	ebay.com	<ul style="list-style-type: none"> <li>• Clear organization of product listings</li> <li>• Fees charged to sellers</li> <li>• Listing, feature &amp; final value fees</li> <li>• Large market of users</li> <li>• Online ratings of sellers</li> </ul>
Expedia	www.expedia.com	<ul style="list-style-type: none"> <li>• Compact listings; allows sorting options</li> </ul>
Google	www.google.com	<ul style="list-style-type: none"> <li>• Exemplary one-click keyword search</li> <li>• Web service interface</li> </ul>
US Postal Service	www.mapsonus.com/db/USPS/	<ul style="list-style-type: none"> <li>• Geographic search with inks to maps</li> </ul>
Arkansas WIB	www.arworks.org/search/training/index.php	<ul style="list-style-type: none"> <li>• Course listing by geographic area, topic, and industry cluster</li> </ul>
Connecticut's Education and Training Connection	www1.ctdol.state.ct.us/etc/	<ul style="list-style-type: none"> <li>• Course offerings are related to professions</li> <li>• Advanced search with multiple fields</li> <li>• Selected courses marked with WIA approval and linked to course detail</li> </ul>
California I-Train	www.i-train.org	<ul style="list-style-type: none"> <li>• Course search has a lot of data</li> <li>• Compare courses re: placement success</li> <li>• Lists union apprenticeships</li> </ul>
Access Indiana	www.ai.org.serv/dwd_etc	<ul style="list-style-type: none"> <li>• Advanced search by region, cluster, WIA approval and training provider</li> <li>• Convenient comparison of courses</li> </ul>
Possibility Network	www.indianalearn.com	<ul style="list-style-type: none"> <li>• Online training</li> <li>• Sales of associated products</li> <li>• Requires Flash for many services</li> </ul>
Seattle Step Program	www.cityofseattle.net/business/step	<ul style="list-style-type: none"> <li>• Apprenticeship programs</li> </ul>
Learn Direct Scotland	www.learndirectscotland.com	<ul style="list-style-type: none"> <li>• Employee focus</li> <li>• Short summaries linked to detailed course descriptions</li> </ul>
UK Training Pages	www.trainingpages.net	<ul style="list-style-type: none"> <li>• Categories facilitate course searches</li> <li>• Detailed course summaries</li> <li>• Several creative options to generate revenue for the site</li> </ul>

**Table 3: Cost estimates for major recommendations**

Recommendation		Recurring Costs	One-time Costs
<b><i>Support for the industry clusters</i></b>			
1	Communities of practice	\$15,000	\$20,000
2	Rapid prototyping environment	\$30,000	\$2,500
3	Toolkit to serve industry clusters	\$30,000	\$2,500
	<b>SUBTOTAL</b>	<b>\$75,000</b>	<b>\$25,000</b>
<b><i>Improvements to the WORKS Training Program Database</i></b>			
1	Rationalize and integrate overlapping databases.		\$35,000
2a	Allow bulk uploads using text files.		\$2,500
2b	Collect course data with screen scrapers.		\$2,500
2c	Implement a Web service model for course information.		\$20,000
3	Convert to an Open Source platform		\$40,000
	<b>SUBTOTAL</b>		<b>\$100,000</b>
<b><i>Enhancements to the Talent Pittsburgh Web site</i></b>			
1	Services		\$10,000
2	Best practices	\$20,000	\$35,000
3	Longer-term activities		\$52,500
4	Evaluation mechanisms	\$30,000	\$2,500
	<b>SUBTOTAL</b>	<b>\$50,000</b>	<b>\$100,000</b>
<b><i>Marketing</i></b>		<b>\$50,000</b>	