OPPORTUNITIES FOR CHANGE:
THE GEOSPATIAL WORKFORCE READINESS SCORECARD

Heather M. Annulis, Ph.D., Cyndi Gaudet, Ph.D., Jon C. Carr, Ph.D.

Abstract: Workforce readiness refers to the ability of a company to have the necessary institutional and managerial components to adapt to new workforce needs. For the geospatial industry, barriers and success factors related to workforce readiness are critically important, given the shortage of qualified geospatial employees within the industry. Using the research methodology from Jim Collin’s bestseller Good to Great, the University of Southern Mississippi’s Workplace Learning and Performance Center conducted a workforce readiness study to identify the barriers and success factors for workforce development for geospatial organizations. The results of this study outline some of the criteria necessary for successful change readiness and have led to the development of the Geospatial Workforce Readiness Scorecard.

INTRODUCTION
In order to create a competitive advantage, organizations employ people who have the knowledge, skills, and abilities to perform specific tasks and understand what the requirements are to achieve an organization’s desired results. Successful outcomes compel organizations to undergo changes and requires careful strategy and analysis of existing culture, capabilities, perceptions of the organization’s support for employees, communication channels and sources, and commitment.

The increased demand to use geospatial technologies in many industries brings about workforce development challenges and opportunities. Specifically, in this high growth, high technology industry, a workforce development tool, the Geospatial Technology Competency Model© (GTCM), exists to aid in the translation of knowledge, skills, and abilities for success. The GTCM include the competencies, work roles, and key deliverables for each role identified in the geospatial industry. Organizations can use the GTCM to describe the kinds of workers needed in the geospatial information technology industry; improve employee recruitment and selection; manage the performance of existing employees; and design geospatial information technology training and education programs. With increased market potential comes an increased need for a systematic approach to developing a workforce to support industry growth. The workforce planning process must be a customer-driven process that determines workforce needs and provides the foundation for appropriate training and education opportunities. The GTCM integrates the technical, business, analytical, and interpersonal skills required to develop a workforce for the geospatial technology industry. The value of the model is in the implementation and outcomes it produces. An organization’s success in reaching competitive advantage depends in part on its ability to revolutionize change implementation. A framework to assess change readiness for geospatial organizations is presented.

The risk to organizations in implementing a competency model without conducting a proper analysis of the organization’s change readiness may result in improper allocation of valuable resources. Organizations in the geospatial industry need a candidacy assessment tool for implementation of the competency model. Specific readiness factors perceived by geospatial human resource managers, which impact the ability of geospatial organizations to implement change, were identified. Change readiness, affective commitment, and perceived organizational support aid in determining the internal characteristics required for change in geospatial organizations. In addition, organizations are better able to assess change readiness by identifying the channels and sources of communication utilized during times of innovation. Identification of the barriers and success factors that impact implementation of a competency model help to ensure smooth execution of the change effort.
A six-section survey instrument was designed for this study. The sections included change literature; perceived organizational support, affective commitment, change readiness, communication channels and sources.

**Change readiness.** Armenakis et al (1993) suggest readiness is evident in organizational members’ beliefs, attitudes, and intentions. Later, Armenakis et al (1999) expands this definition to include employees’ beliefs regarding the appropriateness of, support of, and value of change. Change readiness helps an organization manage change once it identifies and labels the most important forces impacting change and develops strategies to address those forces. As an organization analyzes assets, strategies are developed that point the business to success. When an organization acknowledges and understands restraining forces, change readiness strategies are developed to alleviate barriers (Armenakis et al, 1999).

**Affective Commitment.** Meyer & Allen (1984) suggests affective commitment as the most widespread approach to organizational commitment. Affective commitment refers to an emotional attachment to the organization. An individual with strong affective commitment identifies with, is involved in, and enjoys membership in the organization (Mowday et al, 1979). Affective commitment occurs over time and strengthens the bond between the employee and employer. Subsequently, affective commitment results in an increased propensity of the employee to carry out change initiatives in the organization. Employees who value their associations with organizations are more likely to remain with those organizations and to work toward organizational success. Meyer et al (1989) suggested that when commitment reflects identification with and involvement in the company, the organization may benefit in terms of superior performance.

**Perceived Organizational Support.** Eisenberger et al (1986) introduces the perceived organizational support concept, which focuses on an employee’s perceptions of the supportiveness existing within the employee-organization relationship. They state the beliefs employees’ form about the organization make up these perceptions, and these perceptions drive the actions of employees in and toward the organization’s goals.

A purposeful sifting process identified twenty-seven exemplar companies for inclusion in this study. Using a researcher-administered questionnaire, human resources managers in the geospatial industry were interviewed by telephone and asked to describe factors that impact change initiatives. A 78 percent response rate was yielded by this methodology. Most geospatial organizations surveyed utilize vendor-based, in-house and certificate program training, but all geospatial organizations surveyed indicated certificate programs were not the most frequently used option for training in their organizations. More than half of the geospatial HR managers surveyed reported the primary business of their organization represented government operations. Of the geospatial organizations surveyed, the most frequently reported geospatial applications centered on the use of the technology for national security reasons.

The participants also responded to open-ended questions regarding change implementation and demographic data. Data was analyzed using descriptive statistics including reliability analysis, frequencies, Cronbach’s Alpha, and Friedman’s tests. The survey instrument determined employee perceptions required for change perceived by human resource managers of geospatial organizations as measured by change readiness, affective commitment to change, and perceived organizational support. In addition, the survey instrument provided identification of the channels and sources of communication used during change. Analysis was conducted on each section of the survey to determine items for inclusion in framework development for the workforce readiness scorecard. This framework will ultimately help geospatial organizations assess the ability to implement a competency model.
FACTORS IMPACTING IMPLEMENTATION OF THE GEOSPATIAL TECHNOLOGY COMPETENCY MODEL

Geospatial HR managers determined the existing characteristics required for change as measured by change readiness, affective commitment, perceived organizational support, communication channels and sources. Participants reported that clearly defining the change initiative for geospatial employees is the most important item for assessing change readiness in their organizations. All items were ranked on a scale from “1” (most important to employees) to “9” (least important to employees). Items coded as “clearly defined” were ranked at the top (M=2.19), indicating that most geospatial HR managers believe clearly defining change initiatives for employees is crucial to change implementation success.

When ranking affective commitment items required for change, HR managers of geospatial organizations determined two major characteristics. These items included employees beliefs that “things would be better because of the change” and that “change serves an important purpose.” Participants reported that all items except for one, “this change is a good strategy for this organization,” should be included when assessing a geospatial organization’s change readiness.

HR managers of geospatial organizations did not perceive any difference in items measured by perceived organizational support constructs. All of the items were ranked high on a scale from “1” (most important to employees) to “9” (least important to employees). These items ranged from 3.81-5.76 indicating no difference exists in the way geospatial HR managers perceived items representing perceived organizational support. Respondents agreed all items should be included when assessing an organization’s change readiness. The item, “the company cares about employee opinions during change initiatives,” was rated highest with almost all respondents (N=20), giving an affirmative answer indicating that geospatial organizations should consider this item when assessing change readiness.

Identification of channels of communication used during change as perceived by HR managers of geospatial organizations reveal “face-to-face” communication as the most important channel for geospatial employees. Respondents ranked “bulletin boards” as the least important channel of communication for geospatial employees during times of change. “Meetings with upper management” and “meetings with supervisors” ranked with equal importance as the second most important channels to geospatial employees as perceived by their HR managers. “Bulletin boards”, “newsletters” and “home mail” are not important channels of communication during times of change for geospatial employees as perceived by their HR managers. Identification of sources of communication used during change as perceived by HR managers of geospatial organizations reveals “immediate supervisor” and “top management” are the most important source of communication during times of change. Participants reported the “grapevine” as the least important source of communication for geospatial employees during times of change.

Geospatial HR managers identified factors that impact the ability of geospatial organizations to implement change. Prevalent changes occurring in the past two years in geospatial organizations primarily centered on start up activities and restructuring activities, indicating that geospatial organizations are in a state of flux. Restructuring activities identified by participants included topics such as change of management and leadership, structural changes, downsizing, acquisitions, buyouts, transformational activities, workforce changes, and relocation. Geospatial HR managers indicate formal processes exist in the geospatial industry to implement changes within organizations. However, when human resources managers were asked to describe formal processes to implement change, five respondents could not give details of the processes. Twelve participants indicated processes that included committees, communication, planning, needs analysis, implementation teams, and formal offices dedicated specifically for change initiatives. The formal change processes identified vary among change initiatives and geospatial organizations. Geospatial HR managers indicated most changes implemented in
their organizations were successful. Communication was the most cited factor for successful implementation of change by HR managers in geospatial organizations. Geospatial HR managers specified “multi-level input” as another major factor impacting successful change, indicating the importance of asking for input from top management, supervisors, and line employees during change initiatives. Other factors reported by geospatial HR managers as significant for successful change implementation in geospatial organization included:

- leadership, including top management support
- resources
- competency of staff
- technology
- organization and process planning
- staff acceptance
- roll-out strategy
- evaluation through out the implementation.

Geospatial HR managers reported barriers to successful change implementation within geospatial organizations included:

- lack of communication
- technology
- resources
- management decisions
- lack of leadership
- improper use of decision models.

Participants reported communication and leadership as the most important factors cited for successful implementation of change in their organizations.

CONCLUSION
A framework was developed to assess change readiness for geospatial organizations based on data from the present study. Figure 1 depicts items the HR manager in the geospatial industry could use to assess the organization’s readiness to implement the GTCM. This framework includes categories from this research project: perceived organizational support, affective commitment, change readiness, communication channels and sources. It also contains one item that allows the respondent to give a personal opinion about the organization’s readiness for change. The researcher used the top three ranked items from each category mentioned above. Based on peer-review of other scorecards, a scorecard scale was created: very ready = 100-80; ready = 79-60; somewhat ready = 59-40; not ready = 39-20; not ready at all = 19-0.

In order to determine a change readiness score for the geospatial organization, a geospatial HR manager would be provided an overview of the Geospatial Technology Competency Model© through a short vignette and instructed to review the GTCM brochure. A five point Likert scale from very ready to not ready at all is included for each item. The geospatial HR managers would circle the levels of agreement with each item, as they perceived the employees in their organizations would respond. The items would be tallied to determine scores. The total score indicates the degree of readiness of the organization to implement the GTCM.

This research was an initial attempt to determine factors impacting a change initiative for the geospatial industry. The research creates a framework for a workforce readiness scorecard for implementation of the Geospatial Technology Competency Model©.
More empirical research is needed to fully understand change readiness in the geospatial industry; further studies are needed to gain understanding about implementation of competency models in the geospatial industry. Assessing the readiness of a geospatial organization to implement the GTCM is only the first step for successful implementation. Development of a systematic process for implementation of the GTCM is required for successful outcomes of implementation of this change initiative.
Is Your Organization a Candidate for Implementation of the Geospatial Technology Competency Model©?

*Human Resource managers: Read each question and circle the level of agreement with each item, as they perceive the employees in the organization would respond.*

<table>
<thead>
<tr>
<th>Employees would respond</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My organization regards employee best interests in decisions relating to change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>2. The company shows concern for employees during change initiatives.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>3. The company cares about employee’s opinions during change initiatives.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>4. My organization makes every effort to clearly define change efforts.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>5. Benefits of change initiatives are well defined by my organization.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>6. Changes have apparent rationale in my organization.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>7. My organization will be better because of change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8. Change serves an important purpose in my organization.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9. I believe in the value of change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>10. Face-to-face communication is important channel for information during change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>11. Meetings with upper management are important channels of communication during change.</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>12. Meetings with supervisors are important channels of communication during change.</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>13. Immediate supervisors are important sources of communication during change.</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>14. Top Management is an important source of communication during change.</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>15. Coworkers are an important source of communication during change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>16. Communication is an important factor when implementing change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>17. Leadership is an important factor when implementing change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>18. Multi-level input is an important factor when implementing change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>19. Availability of resources is an important factor when implementing change.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>20. My organization is ready to implement the Geospatial Technology Competency Model.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

Total Score _____

How prepared is your organization to implement the Geospatial Technology Competency Model? (Compare total score to scale)

<table>
<thead>
<tr>
<th></th>
<th>Very ready</th>
<th>Ready</th>
<th>Somewhat ready</th>
<th>Not Ready</th>
<th>Not ready at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>100-80</td>
<td>79-60</td>
<td>59-40</td>
<td>39-20</td>
<td>19-0</td>
</tr>
</tbody>
</table>

Figure 1. Framework for Geospatial Technology Industry Workforce Readiness Scorecard©
REFERENCES


CONTACT INFORMATION
Heather M. Annulis, Ph.D., Assistant Professor of Workforce Training
Cyndi Gaudet, Ph.D., Associate Professor and Director, Workforce Learning and Performance Center
Jon Carr, Ph.D., Assistant Professor of Management and Research Scientist
The University of Southern Mississippi
Workplace Learning and Performance Center
730 East Beach Boulevard
Long Beach, MS 39560
(601) 266-6181 (telephone)
(601) 266-4630 (fax)
Heather.Annulis@usm.edu
Cyndi.Gaudet@usm.edu
Jon.Carr@usm.edu