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Organizational Improvement Readiness Assessment (OIRA) Tool Evaluation

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Organizational Improvement Readiness Assessment (OIRA)

Tool Evaluation

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By

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Abstract

Background: Research shows that despite an increase in the number of organizational

improvement initiatives there is a lack of consistent, sustained outcomes. Organizations struggle

with how to reliably and accurately measure their readiness to drive and sustain outcomes. A

search of the literature failed to identify a comprehensive, evidence-based tool that has been

developed or evaluated to assess organizational improvement readiness. The objective of this

project was to evaluate a newly developed Organizational Improvement Readiness Assessment

(OIRA) Tool.

Project Design: Guided by two theoretical models, Delphi-Based Systems Architecting

Framework (DB-SAF) and the Rogers Diffusion of Innovation Model, a 3-round, modified

Delphi nominal group method was utilized. An evaluation panel of 13 organizational

improvement subject matter experts (SMEs) was recruited, with 11 SMEs completing all 3

evaluation rounds. The relevancy and clarity of the OIRA Tool competencies was evaluated

using an item-level content validity index (I-CVI) and a scale-level content validity index (S-

CVI). Additionally, the tool was evaluated from a usability perspective using Google Analytics.

Results: The OIRA Tool was found to be clear, understandable, and relevant for organizations

evaluating their readiness to drive and sustain outcomes improvements (S-CVI index of 0.92 and

I-CVI indices ranging from 0.82 to 1.0). The final version of the tool included 22 competencies,

modified based on expert consensus from the original 25. Usability test results confirmed the

OIRA Tool, a web-based tool, is easy to use and well designed as measured by exit rates

(15.44%), bounce rates (51.81%), and conversion rates (14%), all of which were significantly

better than industry benchmarks.

Recommendations and Conclusions: Results of this project provide evidence of the content

validity and usability of the OIRA Tool. The tool has the potential to help healthcare

organizations assess their readiness to sustain organizational improvements and to identify gaps

in leadership and culture, processes, technologies, and standards. The OIRA Tool provides the

foundation for future analytics modeling and additional studies to test the theory and the

advancement of outcomes improvement science.

Keywords: organizational improvement, readiness assessment, assessment tool evaluation,
readiness for change, content validity

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Organizational Improvement Readiness Assessment Evaluation

Problem

Many healthcare organizations begin organizational improvement efforts only to have them fail (Chassin & Loeb, 2013; Kaplan et al., 2010; Staines, Thor, & Robert, 2015). The recently developed Organizational Improvement Readiness Assessment (OIRA) is a comprehensive, evidence based assessment tool that helps healthcare organizations evaluate their readiness to implement and sustain organizational improvement (see Appendix A). However, the OIRA Tool had not been evaluated to ensure the competencies' descriptions were clear and understandable to users, that the relevant competencies had been included, and that the web-based tool was functional and usable.

Problem Change

Evaluating the relevancy and the clarity of the OIRA Tool competencies and ensuring the tool is functional and usable will help ensure the tool is useful for healthcare organizations to assess their readiness for organizational improvement (Johnson, Wilhelmsson, Börjesonm, & Lindberg, 2014; Kaplan, Provost, Froehle, & Margolis, 2012; Li, Huang, Kuo, & Hung, 2015; Miller, Bakas, Weaver, Buelow, & Sabau, 2015; Persoon, Bakker, Wal-Huisman, & Rikkert, 2015; Shin, Shim, Lee, & Quinn, 2014).

Background and Literature Review

There are significant U. S. healthcare trends that are demanding a focused effort on sustained clinical, operational, and financial organizational improvement. These trends include shrinking operating margins—resulting in the need for healthcare organizations to reduce and manage their costs—the transition from fee-for-service to value-based care, and consumers' demand for healthcare value and transparency (American Hospital Association, 2014; Berwick &

Hackbarth, 2012; Institute for Healthcare Improvement [IHI], 2014; U.S. Department of Health and Human Services, 2015). Research shows that despite an increase in the number of organizational improvement initiatives, there is a lack of consistent, sustained outcomes (Chassin & Loeb, 2013; Kaplan et al., 2010).

Healthcare organizations are seeking to understand the competencies that are necessary to implement and sustain organizational improvement. They want and need to assess their readiness for organizational improvement (Harvey, Jas, & Walshe, 2015; Kaplan et al., 2012). However, there is a lack of research that addresses all of the competencies that contribute to healthcare organizations successfully implementing and sustaining organizational improvement (Brand et al., 2012; Conry et al., 2012; Kaplan et al., 2010; Meacock, Kristensen, & Sutton, 2014).

Organizational assessment tools have been identified as helping organizations prepare for successful change (McConnell, Stewart-Pyne, & Bajnok, 2013). However, a search of the literature failed to identify a comprehensive, evidence based organizational readiness assessment tool that includes the full spectrum of competencies found to be key in driving sustained organizational improvement (Anderson et al., 2015; Bowman, 2013; Carter, Ozieranski, McNichol, Power, & Dixon-Woods, 2014; Conry et al., 2012; Field, Heineke, Langabeer, & DelliFraine, 2014; Glasgow, Scott-Caziewell, & Kaboli, 2010; Health Catalyst, 2014; Kaplan et al., 2010; Kaplan et al., 2012; McDonald, Schultz, & Chang, 2013; McFadden, Stock, & Gowen, 2014; Meacock et al., 2014; Morris, Wooding, & Grant, 2011; Tolf, Nystrom, Tishelman, Brommels, & Hansson, 2015). In addition, the literature did not identify an organizational improvement readiness assessment tool that had been evaluated for content validity, functionality, and usability.

One readiness assessment tool was identified that focused on best practice guideline implementations (Registered Nurses Association of Ontario ([RNAO], 2012). However, major limitations were noted with the RNAO assessment tool as its focus is just on leadership and content factors that contribute to organizational improvement. The tool lacks key factors such as analytics, organizational alignment, and key adoption competencies cited by other research as important for sustaining organizational improvement (Kaplan et al., 2012).

Given the growing need for sustained organizational improvement and the lack of a comprehensive assessment tool, the OIRA Tool was developed by the DNP student. The OIRA Tool competencies and categories were based on the research findings and practice experience. The OIRA Tool needed to be evaluated to ensure the competencies' names and descriptions were clear and understandable to users completing the assessment and the relevant competencies were included (Johnson et al., 2014; Kaplan et al., 2012; Li et al., 2015; Miller et al., 2015; Persoon et al., 2015; Shin et al., 2014). In addition, the web-based tool needed to be tested for functionality and usability (Korgaonkar, O'Leary, & Silverbatt, 2009).

Based on the literature review, the OIRA Tool evaluation utilized a modified Delphi nominal group method summarized in the evidence synthesis table in Appendix B (Hsu & Sanford, 2007; Johnson et al., 2014; Kaplan et al., 2012; Li et al., 2015; Miller et al., 2015; Persoon et al., 2015; Shin et al., 2014). The literature review supported the inclusion of healthcare executives and multidisciplinary organizational improvement team members— including clinicians, operational leaders, and data analysts/architects—for inclusion as evaluation panel subject matter experts (Allen, Dyas, & Jones, 2004; Tucker, 2014; Weiner, Shortell, & Alexander, 1997). Google Analytics was utilized for the usability portion of the evaluation (Google Analytics, 2015). A semi-structured interview and project documentation

were used to collect the lessons learned based on the literature findings (Baaz, Holmberg, Nilsson, Olsson, & Sandberg, 2010; Barba, Cassidy, De Leon, & Williams, 2013; Swan, Scarbrough, & Newell, 2010; Weber, Aha, & Becerra-Fernandez, 2001).

Theoretical Models and Project Frameworks

The theoretical frameworks that were used to guide the project were a Delphi-based framework for designing systems (Aliakbargolkar & Crawley, 2013) and Rogers' Theory of Diffusion of Innovations (Rogers, 2003). The Delphi-Based Systems Architecture Framework (DB-SAF) is an iterative approach that integrates expert opinions where stakeholders could have differing views on the competencies required for driving organizational improvement. The DB-SAF includes 10 major steps: literature review, systems-specific expertise, problem formulation, expert panel formulation, problem formation review with an expert panel, design of interview, elicitation of expert value judgment, aggregate results discussion with individual experts, convergence criteria decision point, and documentation and development of recommendations (see Appendix C). The DB-SAF theoretical model enables a structured approach to develop recommendations concerned with the design of unprecedented work, like the OIRA Tool.

Rogers' Theory of Diffusion of Innovations suggests that diffusion is a process by which innovation is communicated and spread throughout an organization or social system (White & Dudley-Brown, 2012). The process of diffusion relies heavily on human capital because in order to sustain itself, an innovation must be widely adopted. Rogers suggests that within the rate of adoption there is a point at which the innovation achieves critical mass (see Appendix D). The evaluation panel subject matter experts are early adopters and early majority organizational improvement leaders—executives, clinicians, operational leaders, and data analysts/architects. They are the change agents within their healthcare organizations.

Implementation Process Analysis

  Setting and target population. The setting for the OIRA Tool evaluation was the

DNP student's healthcare organization, Health Catalyst. Health Catalyst is a start-up, mission-

driven data warehousing and analytics company that helps healthcare organizations of all sizes

improve clinical, financial, and operational outcomes (Health Catalyst, 2016).

  The evaluation panel of 13 subject matter experts (SMEs) included healthcare

executives and directors responsible for organizational improvement, multidisciplinary

organizational improvement team members (clinicians, data architects, and data analysts), and

healthcare improvement consultants and analysts. The evaluation panel SMEs were selected

based on her or his: organizational improvement expertise; ability to contribute helpful inputs;

willingness to modify their input or previous judgements for the purpose of attaining consensus

(Johnson et al., 2014; Kaplan et al., 2012; Li et al., 2015; Miller et al., 2015; Persoon et al.,

2015; Shin et al., 2014; Zeigler & Decker-Walters, 2010).

  The key internal sponsors and stakeholders consisted of 7 individuals: a senior advisor,

chief clinical officer, vice president of client operations, chief technology officer, chief

information officer, senior vice president of product strategy, and chief operating officer.

Corporate analytics, the 7 key internal sponsors and stakeholders, and outside web development

and usability experts contributed to the development of the OIRA Tool modifications and the

lessons learned in evaluating the assessment tool.

  The setting and the population supported the project. The primary issues that arose

were strong internal sponsor and stakeholder opinions—and diverse, strongly opinionated

evaluation panel SME members. The internal issues were addressed by being data-driven,

using evaluation panel SME feedback and ratings, versus relying on internal sponsor and

stakeholder intuition and opinions. The evaluation panel SME members' feedback was

collected and shared anonymously in the first two rounds to ensure that every evaluation panel

SME had an opportunity to share their expertise. In the third round, the DNP student, as the

skilled facilitator, conducted a virtual web event and ensured feedback was solicited from each

of the evaluation panel members.

Economic, social, and political environment. Health Catalyst, the setting in which

the OIRA Tool evaluation was conducted, is a start-up healthcare IT company. Health Catalyst

completed a Series E funding round in spring, 2016, which enabled funding of its organization

and contributed to the funding of the OIRA Tool development and evaluation. From a social

perspective, Health Catalyst is a mission-driven organization that is focused on helping

healthcare organizations improve outcomes. The OIRA Tool project supports the Health

Catalyst mission and crosses many organizational boundaries: clinical, operations, product

development, marketing, sales, and analytics. The input and the needs of the different groups

were considered and reconciled in the project implementation.

The evaluation panel subject matter experts (SMEs) came from various healthcare

organizations, and healthcare consulting and analyst organizations, each with their own

economic, social, and political environments. The evaluation panel organization types

included academic medical centers, children's hospitals, large and medium sized integrated

health systems, regional community hospitals, accountable care organizations, consulting

firms, and healthcare industry analysts. Every organization was concerned with, and focused

on, improving outcomes. Their political environments varied depending on the organization

and their role within the organization. Some organizations had a collaborative, team-based

approach; other organizations were more fear-based and used a "rank-and-spank" approach to

organizational improvement. These differences were accounted for in the modified Delphi nominal group method as we sought to gain consensus among the evaluation panel SMEs.

Health Catalyst is a start-up healthcare analytics company, with a strong sense of fiscal responsibility. Since the third round was conducted in the summer time, the evaluation panel SMEs' time was limited, and to support the budget limitations of a start-up company, the third round of the evaluation was conducted via a virtual web event versus a live event.

Implementation strategies. A 3- round, modified Delphi nominal group method was utilized for the OIRA Tool evaluation. Evaluation panel subject matter experts (SMEs) were selected to participate based on characteristics identified in the research: organizational improvement expertise; capable of contributing helpful input; willingness to modify their initial or previous judgments for the purpose of attaining consensus (Rubio, Berg-Weger, Tebb, Lee, & Rauch, 2003). At the beginning of the evaluation, the evaluation panel SMEs were provided an overview of the OIRA Tool, a list of the OIRA Tool competencies, and an overview of the 3-round modified Delphi nominal group method that would be used.

In round 1 of the evaluation, the evaluation panel SMEs received an online survey of the 25 OIRA Tool competencies. They were asked to: a) rate the relevancy of each competency using a Likert scale (1= not relevant; 2= somewhat relevant; 3= quite relevant; 4= highly relevant); b) rate the level of clarity for each competency using a Likert scale (1= not clearly; 2 = somewhat clearly; 3 = quite clearly; 4 = extremely clearly); c) suggest improvements to each competency description to ensure the description was clear and understandable (i.e. free text input); d) suggest new competencies they thought were relevant, but were not included. Following round 1, the evaluation panel SMEs' results were collected and analyzed. The proposed competency modifications were vetted with the key project

sponsors and stakeholders in the DNP student's organization.

At the beginning of round 2 the evaluation panel SMEs received a summary of their individual and the other panel members' clarity and relevancy results, including the free text input from round 1. The free text input was provided without identifying who provided the free text input in order to avoid bias. The round 2 evaluation survey included 22 competencies based on round 1 feedback, and was also conducted as an online survey. The evaluation panel SMEs were again asked to rate the relevancy of each competency, rate the clarity of each competency, and to suggest improvements for each competency description to make sure the description was clear and understandable.

The process for the final round was similar to rounds 1 and 2 with the addition of pre-virtual event directions sent via an email, along with a PowerPoint presentation. The email restated the purpose of gaining consensus on the relevancy and clarity of the competencies and detailed the process of listening, asking questions, polling and re-polling in three categories—critical, must, and high want items—since the final round took place virtually, versus using an online survey as was done in the first two rounds. The three categories included critical items (i.e. four items that had relevancy scores of less than 0.78), must items (i.e. six items that had clarity scores of less than 0.78), and high want items (i.e. items that had relevancy and/or clarity ratings higher than, or equal to 0.78, with minor wording changes recommended by the evaluation panel SMEs in round 2).

The PowerPoint presentation included the critical, must, and high want item competency descriptions from round 2 and the proposed, round 3 competency descriptions, based on the evaluation panel SMEs' feedback from round 2. Evaluation panel SMEs were asked to engage in listening and asking questions, to provide their input, and to respond to

other evaluation panel members' comments. An anonymous poll was taken following the discussion for the critical and must items. The process was to re-poll until consensus was achieved.

Two evaluation panel SMEs were not able to attend the virtual web event. A copy of the virtual web event recording was sent to them the day following the virtual event. These individuals completed round 3 via an online survey that included the critical and must items within 72 hours of the virtual web event.

Google Analytics tracking, including bounce rate (percent of individuals who navigate away from the assessment after viewing the first "page" of the assessment), exit rate (percent of individuals who exited from any "page" of the assessment), and conversion rate (i.e. the percent of individuals who start the assessment versus the number of individuals who complete the assessment) was programmed and tested on the Health Catalyst version of the OIRA Tool (Google Analytics, 2015). The Google Analytics data for these measures was analyzed for the usability portion of the tool. Despite some issues with the conversion funnel visualization tagging, the DNP student was able to obtain the conversion rate using the source data.

The final step of the DNP scholarly project was to gather and reflect on the lessons that were learned by the project participants. An online survey and a semi-structured interview process were used to help elicit this information. Prior to the semi-structured interview, the Health Catalyst project team completed the lesson learned questions online from the Centers for Medicare and Medicaid Services standardized lessons learned template (Centers for Medicare and Medicaid Services [CMS], 2015). The project team member feedback was summarized by an administrative assistant in a Word document; the document did not include respondents' names or any other identifiers in order to reduce bias. At the beginning of the

semi-structured interview, a reminder of the DNP student's organization cultural values (humility and transparency) and the online pre-interview lessons learned data were reviewed. The pre-interview lessons learned data did not identify members' names in order to avoid bias. Guidelines for the feedback were also provided, including the fact that all feedback from the online and interview process was being collected and aggregated into a summary document, without any comments being attributed to a specific team member (Baaz et al., 2010; CMS, 2015; Rhodes & Dawson, 2013).

Program outcomes. Logic models (see Appendices E and F) were developed to define project outcomes using the W.K.Kellogg Foundation Logic Model Foundation Guide (2004). The 4 outcomes of the project include:

1. OIRA Tool competencies' descriptions are clear and understandable as indicated by a clarity rating of 0.78 or higher for each item (i.e. competency).

2. OIRA Tool competencies are relevant to organizational improvement as indicated by an item-level content validity index (I-CVI) of 0.78 or higher, and a scale-level content validity index (S-CVI) of 0.9 or higher.

3. OIRA Tool modifications are identified as indicated by an analysis of usability measures (goals: bounce rate of 60 percent or less; exit rate of 25 percent or less; conversation rate of 2 percent or higher).

4. Lessons learned are identified and disseminated for the project as measured by the completion of a project team review and the development of a descriptive method summary matrix.

Project evolution. The project evolved in several ways based on an analysis of what worked and what didn't work. First, the data collection methods were created and revised

several times in order to enable easier analysis of the results and to provide feedback to the

evaluation panel subject matter experts (SMEs). Initially, the plan was to have the online

survey results feed directly into a spreadsheet for analysis. The online survey results come in a

pdf format, with an available Excel extract. The Excel format did not allow for easy extract of

the free text input. Hence, the pdf data was manually entered into an Excel document created

by the DNP student for analysis.

Second, the feedback provided to the evaluation panel SMEs was further refined during

implementation. Initially, the DNP student was going to send out round 2 with just the list of

modified competencies from round 1. However, when reviewing the literature findings again,

the DNP student discovered best practice in a modified Delphi nominal group method is to

provide the evaluation panels SMEs with their individual and the evaluation panel ratings, and

all free text input (Zeigler & Decker-Walters, 2010). Hence, the feedback to the evaluation

panel SMEs was updated to include the individual panel SMEs' ratings, the evaluation panel

ratings, and all free text input to help the evaluation panel SMEs in their subsequent evaluation

rounds.

Third, the project plan was modified in round 2 to evaluate all of the competencies,

versus just those with a relevancy, and/or a clarity score of less than .078. This change was

based on the evaluation panel SME free text input and the fact that 18 out of the 25

competencies in round 1 had clarity ratings of less than 0.78 (see Appendix G).

Fourth, round 3 was done via a virtual web event versus a face-to-face meeting due to

budget and evaluation panel SMEs' time constraints. Fifthly, there were two evaluation panel

SMEs who, at the last minute, could not attend the virtual web event. These individuals

received a copy of the virtual web event recording and completed round 3 via an online survey

that included the critical and must items within 72 hours of the virtual web event. Lastly,

Google Analytics tracking for conversion rates, although tested pre- and at-launch, did not

work for the first 60 days, resulting in a manual creation of the funnel using web log files.

Quality Assurance

  Bias and threats to quality. Bias, threats to quality, and confidentially were controlled

in the project using the methods described below for each outcome:

- OIRA Tool competency descriptions are clear, understandable, and the

  competencies are relevant (Outcome #1 and Outcome #2): Rounds 1 and 2 results

  were collected individually through an online survey. This helped mitigate the

  potential issue of persons' influence or assertiveness impacting others' input. Prior

  to the round 3 virtual web event, the modified Delphi and nominal group method,

  including listening to others and the objective of consensus was reviewed, and

  polling was done anonymously.

- OIRA Tool modifications (Outcome #3): Google Analytics was applied to all users

  of the web-based tool, and consistent with the DNP organization's privacy policy

  and U.S. privacy regulations, the data is not personally identifiable. The Google

  Analytics technical components were implemented on the organization's web pages

  and tracking was validated through quality assurance testing to ensure the data

  collected through the web was being accurately captured and measured.

- Lessons learned (Outcome #4): Prior to the semi-structured interview, the project

  team completed the lessons learned questions online from the CMS standardized

  lessons learned template (CMS, 2015). Neither the project team member names nor

  any other identifiers were provided to the DNP student in the summarized list of

comments in order to reduce bias. Guidelines for the feedback were provided,

including the fact that all lessons learned data collected online and in the interview

would be aggregated into a summary document, without input being attributed to a

specific team member (Baaz et al., 2010; CMS, 2015; Rhodes & Dawson, 2013).

IRB. The project did not involve human subjects testing and therefore an IRB review was

not indicated. See Appendix H for the Boise State University IRB determination letter.

Organizational letter of understanding. Although there was no formal memorandum

of understanding, there was a clear understanding and support of the project by the DNP

student's organization. Weekly meetings were held between the DNP student and the key

organization sponsors. Monthly meetings were conducted by the DNP student with key

stakeholders and the expanded project team.

Results and Outcome Analysis

Data collection and analysis techniques. The data collection and analysis techniques

for each of the outcomes in the logic model that were used will be described in this section (see

Appendix I). Based on the literature, data for Outcomes # 1 and #2 (OIRA Tool competencies'

descriptions are clear and understandable, and the OIRA Tool competencies are relevant to

organizational improvement) was collected using a modified Delphi nominal group method

(Johnson et al., 2014; Kaplan et al., 2012; Li et al., 2015; Miller et al., 2015; Persoon et al.,

2015; Shin, et al., 2014; Zeigler & Decker-Walters, 2010). In rounds 1 and 2, the evaluation

panel subject matter experts (SMEs) received an online copy of the OIRA Tool literature

synthesis, content definitions, categories, and competencies (see Appendix J). The evaluation

panel SMEs were asked to: a) rate the relevancy of each competency using a Likert scale (1=

not relevant; 2= somewhat relevant; 3= quite relevant; 4= highly relevant); b) rate the level of

clarity for each competency (1= not clearly; 2 = somewhat clearly; 3 = quite clearly; 4 = extremely clearly); c) suggest improvements to each competency description to ensure the description was clear and understandable (i.e. free text input); d) suggest new competencies they thought were relevant, but were not included. Round 3 was conducted using a virtual web event to gain consensus on any remaining modification to the OIRA Tool to ensure the competencies were relevant, clear, and understandable.

The data that was collected for the OIRA Tool recommended modifications (Outcome #3) included the content noted above (i.e. relevancy of each competency, clarity rating for each competency, free text input, and suggested new competencies), and modifications to the tool itself (i.e. OIRA Tool usability). The data for the content modifications was collected using the modified Delphi nominal group method. The OIRA Tool usability data that was collected included: bounce rate, exit rate, and conversion rate (Google Analytics, 2015; Jameson, 2013; Lalloo, Kumbhare, Stinson, & Henry, 2014; Li et al., 2013). The data was collected using an online analytics tool, Google Analytics (Google Analytics, 2015).

The literature shows that the data collected for lessons learned (Outcome #4) should include more than just information on what went wrong. Therefore, the following data was collected: a) what worked well (i.e. excellences—achievements and positive experiences); b) what didn't work well (i.e. challenges—problems and negative experiences); c) recommendations for future consideration (Baaz et al., 2010; Project Management Institute, 2013; Rhodes & Dawson, 2013). The data for lessons learned was collected using an online survey before the project team interview, a semi-structured interview with the project team, and project documentation (Baaz et al., 2010; Swan et al., 2010; Thomas, 2015; Weber et al., 2001). A standardized' lessons learned' template created by the CMS was provided to the

project team in advance of the semi-structured interview (CMS, 2015). The CMS template

questions were used online and in the team interview.

        Measures and indicators for assessing project outcomes. The DNP scholarly project

had 4 outcomes analyses goals, as shown in Appendix E. The measures and indicators for

assessing project outcomes for each outcome included:

- Outcome #1: OIRA Tool competencies are clear and understandable. Two measures

  were utilized. First, the number of items that received a clarity rating of 3 or 4 by the

  evaluation panel subject matter experts (SMEs) using a 4-point Likert scale was

  calculated. Second, the free text input was analyzed and evaluated with final

  consensus achieved by the evaluation panel SMEs in round 3 of the evaluation on any

  additional modifications to the OIRA Tool competency descriptions.

- Outcome #2: OIRA Tool competencies are relevant to organizational improvement.

  Two measures were utilized. First, the individual content validity index (I-CVI) for

  each competency was derived from the rating of the content relevance for each

  competency using a 4-point Likert scale. Based on the literature review, the I-CVI

  was calculated as the proportion of items that receive a rating of 3 or 4 by the

  evaluation panel SMEs (Lynn, 1986; Polit & Beck, 2006; Polit, Beck, & Owens,

  2007). Assuming 9 or more evaluation panel SMEs, the I-CVI for each competency

  should be 0.78 or higher for the competency to be considered relevant. Second, an

  entire scale content validity index (S-CVI/Ave) was calculated by averaging I-CVI

  values. The guideline offered by the research was that the S-CVI/Ave should be 0.9 or

  higher (Lynn, 1986; Polit et al., 2007).

- Outcome #3: OIRA Tool modifications are identified. The measures for this outcome

focused on three usability measures identified in the literature: bounce rate, exit rate, and conversion rate. The targets for these measures, as defined by the current DNP's website and industry benchmarks, were: a bounce rate of 60 percent or less; exit rate of 25 percent or less; conversion rate of 2 percent or higher (Google Analytics, 2015; Marketing Sherpa 2012).

- Outcome #4: Lessons learned are identified and disseminated for the project. The measures for this outcome included the completion of a project team review meeting and the development of a descriptive method summary matrix—what worked, what didn't work well, and recommendations for future consideration (Baaz et al., 2010; Goodrick & Roger, 2015; Swan et al., 2010; Thomas, 2015; Weber et al., 2001).

Outcomes evaluation analysis. Eighteen evaluation panel subject matter experts (SMEs) were invited to participate in the modified Delphi nominal group rounds. Fifteen evaluation panel SMEs accepted the invitation. Thirteen evaluation panel SMEs completed round 1; eleven evaluation panel SMEs completed rounds 2 and 3 (see Appendix K). The number of SMEs is acceptable for this type of analysis (Lynn, 1986; Polit et al., 2007).

An analysis for each of the four outcomes was completed and the results are described below and summarized in Appendix L:

- Outcome #1: OIRA Tool competencies are clear and understandable. All free text input was analyzed. Twenty two out of the final 22 competencies received a clarity rating of 0.82 or higher after completion of the 3-round modified Delphi nominal group method, achieving the target goal of 0.78 or higher. Clarity ratings ranged from 0.82 to 1.0. The progression of the OIRA Tool competency descriptions and the relevancy and clarity ratings by each round are shown in Appendix M.

- Outcome #2: OIRA Tool competencies are relevant to organizational improvement. There were initially 25 OIRA Tool competencies. Twenty one of the competency descriptions were modified in the 3-round modified Delphi nominal group method process. Two new competencies were added. Five competencies were deleted or combined, resulting in 22 OIRA Tool competencies. Following round 3, the individual content validity index (I-CVI) target of 0.78 or higher was achieved for all 22 competencies, with I-CVIs ranging from 0.82 to 1.0. The entire scale content validity index (S-CVI/Ave) after round 3 was 0.92, meeting the target of 0.9 or higher.

- Outcome #3: OIRA Tool modifications are identified. The following outcomes were achieved based on 4 months of web traffic analysis: bounce rate of 51.81 percent versus a target of less than or equal to 60 percent; exit rate of 15.44 percent versus a target of less than or equal to 25 percent; conversion rate of 14 percent versus a target of 2 percent or higher (Google Analytics, 2015; Marketing Sherpa 2012).

- Outcome #4: Lessons learned are identified and disseminated for the project. The project team review meeting and the development of a descriptive method summary matrix—what worked, what didn't work well, and recommendations for future consideration—was completed and is included as Appendix N (Baaz et al., 2010; Goodrick & Roger, 2015; Swan et al., 2010; Thomas, 2015; Weber et al., 2001).

Gap analysis. As with any project implementation, there were some differences between what was anticipated and what actually occurred. The third round was held as a virtual web event versus the initial planned live event due to the evaluation panel subject matter experts' (SMEs) availability and to help control budget expenses. Two of the evaluation panel SMEs were unable to attend the virtual web event at the last minute. These 2

individuals were provided with a recording of the virtual web event and completed round 3 via

an online survey. However, the other panel members did not benefit from feedback these 2

individuals may have proffered up during the virtual web event.

The DNP student also expected to use Google conversion funnel analytics to determine

the conversion rate using event tracking in order to help assess the usability of the web-based,

OIRA Tool. The events (parts 1-5 of the assessment, organization form, and the assessment

submission) are tagged with software code to track user interaction through each of the

assessment steps. However, due to event tagging issues, Google log files were used instead to

determine conversion rates. While more time consuming than the planned use of Google

analytics, accurate conversion rates could be manually obtained. Both of these adjustments

were made with little impact to the overall project plan and no impact to outcomes.

Unanticipated consequences. An understanding of the virtual web conferencing

polling functionality was not clearly understood. Thankfully, these limitations (e.g. the ability

for a backup host to record the event and to create modified questions for re-polling) were

identified in advance, and mitigated by the DNP student by conducting the virtual web event

from the main office where multiple video monitors and an expert in the virtual web

conference technology could participate. An unanticipated, favorable consequence of the

project was the request by some of the evaluation panel subject matter experts (SMEs) who

asked to pilot the OIRA Tool within their healthcare organizations.

Financial analysis. A full account of costs and who would bear them was performed.

The project included a 3-5 year budget (see Appendix O), a 1 year expense report (see

Appendix P), and a statement of operations (see Appendix Q). A monthly review of actual

expenses versus budget was tracked. Expenses versus budget were within plus or minus 2

percent , excluding the budget expense for travel, which was reduced from $12K to $4K since

a virtual web event for round 3, rather than a face-to-face meeting was used (see Appendix R).

Discussion and Recommendations

           Maintaining and sustaining change. The sustainability of the project will be

supported by a number of factors. One of the primary sustainability factors is that

organizational improvement is central to the DNP student's organizational mission (Health

Catalyst, 2014). As such, the OIRA Tool will be modified based on the evaluation results, with

ongoing performance evaluations conducted on a 6 month to 1 year cycle.

      The DNP scholarly project evaluation focused on the OIRA Tool content validity and

usability. Future analytics modeling and usability opportunities still remain. One example for

future analytics modeling is an evaluation and analysis of the OIRA Tool competencies from a

prioritization (i.e. weighting) perspective. Currently, the OIRA Tool competencies have equal

weighting. Another example for future analytics modeling is correlating the OIRA Tool results

with healthcare organizations outcomes to analyze the validity of the OIRA Tool. Additional

usability methods can also be considered such as a task analysis using observations, interviews,

and videotaping (Hebda & Czar, 2013).

      The evaluation panel subject matter experts (SMEs) were also invited to participate in

the ongoing evaluations and review of the future analytics modeling, helping to ensuring

sustained engagement of their valuable expertise. Ninety percent of the panel SMEs have

agreed to be ongoing evaluation team members.

      The project sustainability will also be assessed from a financial perspective by

conducting a monthly analysis of actual expenses versus targeted expenses. Following year 1

of the OIRA Tool project, expenses will be reviewed on a quarterly basis over a 5 year period.

Informed decisions and recommendations. The results of this project provide

evidence of the content validity and usability of the OIRA Tool. By using the tool, healthcare

organizations can assess (and re-assess) their readiness to drive and sustain organizational

improvements. Future analytics modeling and usability testing are recommended, including

prioritization of the competencies, validation of the tool (i.e. correlation of the readiness

assessment results with actual outcomes improvements), and usability task analysis (Hebda &

Czar, 2013; Li et al., 2015).

Strategic plan congruence. The evaluation of the OIRA Tool helps ensure the

assessment can be used by healthcare organizations to measure their readiness to drive and

sustain outcomes. The DNP project is perfectly aligned with the mission and vision of Health

Catalyst which is to transform U.S. healthcare, be the recognized leader in data warehousing

and analytics, and to build a great firm (Health Catalyst, 2016). This mission will be

demonstrated by 1,000 (or more) U.S. healthcare organizations with sustained organizational

improvements: organizations who have improved their population health outcomes, enhanced

their patients' experiences, and reduced waste. The OIRA Tool allows healthcare

organizations to assess (and re-assess) their readiness to drive and sustain organizational

improvements. It also enables organizations to identify gaps in their readiness so they can

address them. The OIRA Tool will be instrumental in helping Health Catalyst achieve its

mission.

Implications for practice. U.S. healthcare is undergoing transformational change, a

change that requires healthcare organizations to drive and sustain organizational

improvements. Research shows that despite an increase in the number of organizational

improvement initiatives there is a lack of consistent, sustained outcomes. A search of the

literature failed to identify a comprehensive, tested organizational improvement readiness assessment tool. Healthcare organizations can now assess (and re-assess) their readiness to drive and sustain organizational improvements using the OIRA Tool and help identify gaps in their leadership and culture, processes, technologies, and standards. The tool can help enable healthcare organizations achieve their strategic goals and ensure sustained achievement of the triple aim: population health management, improved cost per capita, and improved patient experience (IHI, 2014).

      Policy implications. As the U.S. healthcare system transitions from a fee-for-service to a value-based model, healthcare organizations want and need to assess their readiness for organizational improvement. This will help to ensure patient safety and quality, optimal patient experience, and reduced per capita costs of care through the use of evidence-based practices, optimized analytics and operational processes, and aligned financial incentives (Harvey, Jas, & Walshe, 2015; Kaplan, Provost, Froehle, & Margolis, 2012).

      The DNP project is the evaluation of recently developed OIRA Tool. The OIRA Tool helps healthcare organizations evaluate their readiness to implement and sustain organizational improvements. The tool has the opportunity to be leveraged by—and potentially further developed in partnership with —government agencies like the Agency for Healthcare Research and Quality (AHRQ) whose focus is on quality improvement. In late 2015, AHRQ provided grants over a 5 year period to 3 Centers of Excellence for the study of how complex delivery systems adopt evidence based practices (AHRQ, 2015). The 3 Centers of Excellence will study many of the OIRA Tool competencies (e.g. organizational culture, patient engagement, incentives, health information technology).

The OIRA Tool statistical quantification of content validity research identified 22

competencies that organizations need in order to drive and sustain organizational improvements.

These 22 competencies were grouped into 5 categories that can provide additional insights into

policy work related to organizational culture, healthcare analytics, best practice, adoption, and

financial alignment. Examples of policy work associated with the OIRA Tool categories and

competencies include:

- Standardizing quality reporting requirements: Healthcare organizations spend an

  inordinate amount of time on quality and agency reporting (The Advisory Board,

  2016). There is an opportunity to drive policies around automated data collection and

  reporting, a competency measured by the OIRA Tool.

- Healthcare technology interoperability: Data collection and integration is particularly

  challenging for healthcare organizations that have heterogeneous electronic health

  records systems (Office of the National Coordinator for Healthcare Information

  Technology, 2015). Policies that address and help improve healthcare technology

  interoperability would greatly assist healthcare organization in driving and sustaining

  organizational improvements because they could spend more time driving

  improvement efforts and less time manually collecting and cobbling together data

  across disparate systems.

- Pay-for-value and incentive programs designed to improve healthcare quality and

  drive affordable care: Policies and politics have and will continue to play a

  significant role in these types of programs. The OIRA Tool measures organizational

  readiness related to payment model alignment with payers (i.e. aligned incentives for

  high quality, cost-effective outcomes), and aligned organization and provider

incentives. Financial alignment is required to successfully move to a value-based

healthcare model (Silow-Carroll, Alteras, & Meyer, 2007).

Policy implications related to organizational improvement will be closely monitored and

integrated into the ongoing OIRA Tool performance evaluations. OIRA Tool analytics can help

provide benchmarks and insights to policy makers and politicians on healthcare organizations'

current readiness (and readiness trends over time) related to the 22 competencies that are

required to drive and sustain organizational improvements.

Lessons learned. An online survey and a semi-structured interview process were used

to identify the lessons learned. A summary matrix that included what worked well, what didn't

work well, and recommendations for future consideration improvements was developed and

distributed to the project sponsors and stakeholders (see Appendix N).

Executive sponsorship and engagement, scholarly research and research design, and

internal and external communications were strongly linked to the success of the DNP project.

The research and research design elements that contributed to the success of the project

included project management, the research-based methodology (statistical quantification of

content validity), the breadth and depth of the evaluation panel subject matter experts (SMEs),

and live virtual event facilitation. The design of the web-based OIRA Tool was exceptional in

its ease of use and streamlined design as measured by usability web metrics.

The majority of the communications were positively evaluated. However, the initial

instructions on how to provide comments related to principle-based items could have been

improved by providing a free text, general comment box with instructions provided at the

beginning of the survey. Some evaluation panel SMEs suggested including a free text, general

comment box, which could have saved them time in completing the survey.

From a DNP student perspective, the one word that I would use to describe the number of lessons I learned is "immeasurable." Lessons learned included: the use of research findings to drive the project design, development, implementation, and evaluation; working as part of an interdisciplinary team—the joys and the challenges of aligning on project scope (features, time, resources); continuous quality improvement (learning from each of the modified Delphi nominal group rounds and applying those learnings to the next round); using information technologies and analytics. I learned the value of an incredible mentor, which I had in Dr. Teresa Serratt, who always drove me to be and to accomplish more than I thought I could. The journey was not linear. There were multiple resets, continuous struggles to maintain project scope and to keep the evaluation panel SMEs, key sponsors, and stakeholders engaged, and multiple iterations of the project paper over the almost three year process.

Key recommendations for future consideration include: ensure executive sponsorship and engagement, which was essential to the success of the project; apply the same research and research design methodology to future projects, something the DNP student's organizational senior leadership recognized as a best practice.

Dissemination to Key Stakeholders, Community, and Organizations

Dissemination to the key internal project sponsors from the DNP student's organization occurred weekly; dissemination to key stakeholders and the expanded project team within the DNP student's organization occurred monthly or more frequently as needed. Possibilities for dissemination to the community and other organizations may include an internationally attended Healthcare Analytics Summit, professional services contracts requested through the DNP student's organization, publication opportunities such as the Healthcare Financial Management Association Journal, and local healthcare improvement, analytics, and IT

meetings such as the Idaho Healthcare Information and Management Systems Society chapter.

Conclusion

Significant trends in U. S. healthcare are placing an increasing importance on organizations driving and sustaining clinical, operational, and financial outcomes improvements. No comprehensive, organizational improvement readiness assessment tools that were developed or evaluated for content validity, functionality, and usability were found in the literature.

This DNP project provides evidence of the content validity and usability of the newly developed OIRA Tool. The OIRA Tool enables future analytics modeling to test the theory and the advancement of organizational improvement science and is a tool that can be widely disseminated and used by healthcare organizations to help them in their transformational journey toward sustained organizational improvements.

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Appendices

Appendix A – Organizational Improvement Readiness Assessment (OIRA) Tool

Appendix B – Evidence Synthesis Table: Assessment Content Evaluation

Appendix C – Theoretical Model: Delphi-Based Systems Architecting Framework (DB-

SAF).

Appendix D – Theoretical Model: Rogers Diffusion of Innovation Model

Appendix E – Kellogg Logic Model Step 3

Appendix F – Kellogg Logic Model Step 2

Appendix G – Content Validation: Modified Delphi Nominal Group Methodology

Appendix H — IRB Determination Letter

Appendix I – Outcome Evaluation Plan

Appendix J – Organization Improvement Readiness Assessment Tool Evaluation Form

Appendix K — Evaluation Panel Subject Matter Expert Participants

Appendix L — Modified Delphi Nominal Group Consolidated Results

Appendix M — Post Round 3 OIRA Tool Competencies

Appendix N — Lessons Learned Summary Matrix

Appendix O – Scholarly Project 3-5 Year Budget Plan

Appendix P – Scholarly Project Expense Report

Appendix Q – Scholarly Project State of Operations

Appendix R – Budget Variance Analysis

Appendix A: **OIRA Tool**

Statement	Effectiveness
These 25 statements correspond to competencies in 5 categories of organizational improvement readiness. **For each statement**, **please give an effectiveness score** (your level of agreement on how well your organization is currently performing, range 1-5) **and a priority score** (how important the competency is to your organization, range 1-5).	Rate statements on a scale **1 2 3 4 5** ← -- → 1= Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Adaptive Leadership and Culture

Data-Driven Prioritization: Senior leadership is accountable for improvement initiatives and they use data, versus vocal or politically driven influences, to prioritize strategic improvement initiatives.	1 2 3 4 5
Learning Culture: Our organizational culture promotes dialogue and learning to improve outcomes, versus a punitive environment. Individuals follow because of excellent ideas and a common purpose rather than because of mandates or coercion from those in authority.	1 2 3 4 5
Productive Zone: Our leadership helps individuals stay engaged without becoming overwhelmed as we work on challenging improvement initiatives that balance quality, cost, and patient experience.	1 2 3 4 5
Managing Polarities: Our leadership can appropriately balance the tension between extremes. For example, they remain hopeful, yet realistic, rather than overly idealistic or cynical.	1 2 3 4 5
Board Focus: Our board spends the majority of its time focused on improving care delivery rather than facility management or capital investment strategies.	1 2 3 4 5

Analytics

Automated Data Provisioning: Our analysts spend most of their time interpreting data, rather than hunting for, or gathering data, because our data warehouse extracts and	1 2 3 4 5

integrates data from multiple sources automatically.	
Data Quality: Our clinicians and operators have confidence that our data is accurate, complete, timely, and captured at the most appropriate time in the care delivery workflow.	1 2 3 4 5
Data Definitions: We spend very little time arguing about whose report is "right" because we have standard data definitions and calculations that cover the majority of common measures (e.g. LOS, cost/case, patient days).	1 2 3 4 5
Data Access: Clinical and business data stewards grant generous access to data for improvement purposes and thoroughly audit appropriate use, rather than IT limiting access because of security concerns.	1 2 3 4 5
Internal & External Reporting: We have a consistent and efficient way to produce and distribute management and operational reports that enable self-service, transparent access to data, as well as regulatory and accreditation submissions, payer incentive reports, specialty society/collaborative submissions, and survey initiatives (e.g. U.S. News, etc.).	1 2 3 4 5
Variation Analysis: Our analysts can easily identify variation in a clinical or operational process and they use data mining and predictive algorithms to identify probable cause of inappropriate variation.	1 2 3 4 5
Predictive and Prescriptive Models: We use analytics to predict likely outcomes based on historic and current data, and we prescribe the best course of action to improve patient outcomes**.	1 2 3 4 5
Insight Generation: Our analytics produce significant insights and improve decision making rather than simply generating reports to distribute information.	1 2 3 4 5
Best Practice	
Patient cohort/registries: Comprehensive patient registries are defined by our organization, with inclusion and exclusion criteria, based on evidence and expert consensus.	1 2 3 4 5
Best Practice Development: We have a standardized process for ensuring that the latest, evidence-based guidelines are	1 2 3 4 5

designed and consistently integrated into patient care delivery across the continuum of care.	
Standardized Care Delivery: We measure how consistent we are at leveraging evidence-based standards such as intervention criteria, referral criteria, diagnostic algorithms, order sets, and workflow checklists.	1 2 3 4 5

Adoption

Adequate Improvement Resources: Our organizational improvement leadership provides the resources, staff's time, and operational and financial support to ensure our improvement initiatives can be successfully developed, deployed, and sustained.	1 2 3 4 5
Diffusion of Innovation: We have a systematic approach to identify the early-adopter thought leaders (i.e. physicians and operational leaders) to champion improvement initiatives and to accelerate adoption.	1 2 3 4 5
Improvement Training and Experience: Our improvement team members are trained, and they have experience in quality improvement theory, change management, analytics and leadership to accelerate improvement.	1 2 3 4 5
Permanent Teams: Rather than temporary, project-oriented quality teams, our organization has *permanent*, multidisciplinary workgroups comprised of clinicians, data analysts, business intelligence, and finance staff who work together to drive and sustain improvement.	1 2 3 4 5
Iterative, Continuous Frontline Improvement: Our teams use an iterative improvement methodology, which encourages quick, incremental feedback, and adjustments from frontline staff to ensure rapid, widespread adoption.	1 2 3 4 5
Patient engagement: We share analytics with our patients, which enable them to be more engaged in their own care.	1 2 3 4 5

Financial Alignment

Payment Model Alignment: We can measure how the adoption of best practice guidelines will impact our bottom line and we proactively negotiate payment models that best	1 2 3 4 5

align with the interest of patients.	
Provider Incentives: We have provider incentives that are aligned with achieving outcomes improvement goals in the quality, cost, and experience of care delivery.	1 2 3 4 5
Board Level Goals: Our board level goals have a balance of quality and financial outcome improvement measures, and these goals are tied to incentive compensation at all leadership levels.	1 2 3 4 5

Appendix B: Evidence Synthesis Table: Assessment Content Evaluation Methods/Tools

Author/Year	Assessment Content	Evaluation method/tool	Analysis
Miller et al. (2015).	Life Changes in Epilepsy Scale (LCES)— developed from qualitative data and theoretical framework derived from literature	Content validity: 3 epilepsy content experts were given an evaluation form and asked to: a) assign each item to a domain; b) rate its relevance to adults with epilepsy on a 1- to 5-point scale; c) provide suggestions for changes in wording; d) given the option to remove any item. They were also given space for qualitative comments. Face validity: After the content was validated with 5 persons from a Midwest neuroscience center who had epilepsy and met the inclusion criteria. Participants who took the test via email or postal mail received an evaluation form and rated the clarity and relevance of each item using a Likert scale. They could also indicate items they recommended being removed. Qualitative feedback was obtained through follow-up phone conversations. In both cases, content validity indices (CVIs) were calculated using Polit and Beck guidelines.	Demonstrated use of experts and evaluation questions via an evaluation form—categorization, relevancy, wording, removal of items and qualitative comments.

Appendix C: Theoretical Model: Delphi-Based Systems Architecting Framework (DB-SAF)
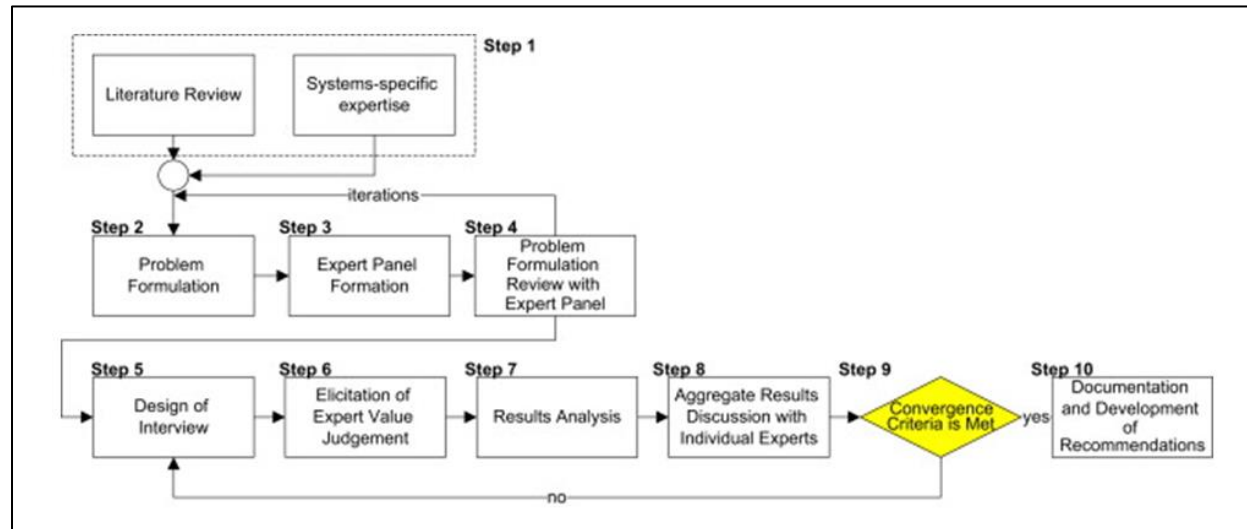
Appendix D: Theoretical Model—Rogers Diffusion of Innovation Model (2003)

The diffusion of innovation

2.5% Innovators — Early Adopters 13.5% — Early Majority 34% — Late Majority 34% — Laggards 16%

Everett Rogers defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system.
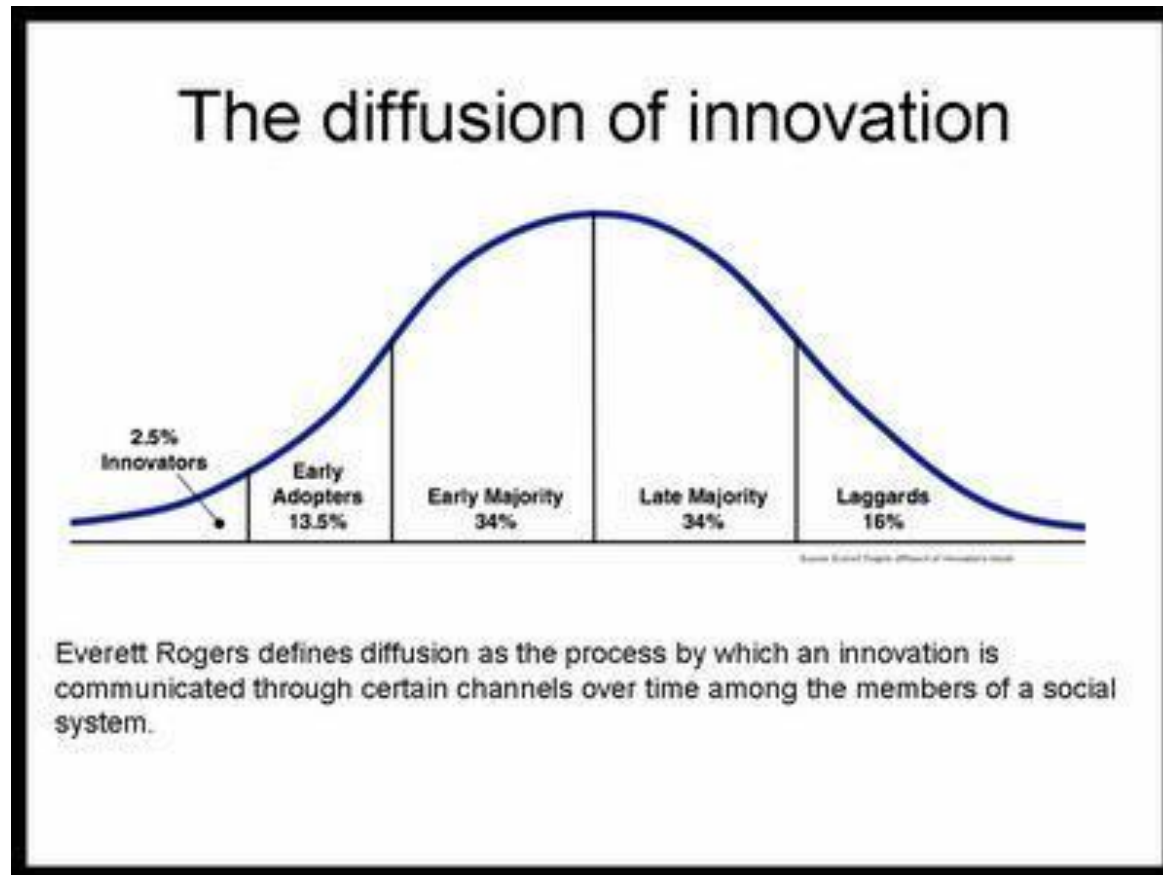
Appendix E: Logic Model Step 3 (W.K. Kellogg Foundation, 2004)

A Resources/ Inputs	B Activities	C Outputs	D Objectives	E Outcomes: Short term	F Outcomes: Long term	G Impact
Includes the human, financial, organizational, and community resources a program has available to direct toward the work.	Includes the processes, tools, events, technology, and actions that are intended to bring changes or results.	Direct products of program activities and my include types, levels and targets of services to be delivered by the program.	Efforts or actions that are intended to attain or accomplish. These begin with an action verb.	Specific changes in program. SMART. Attainable in 6 months to 1 year.	Specific changes in program. SMART. Attainable in 2-5 years.	Fundamental intended or unintended change occurring as a result of program activities in 6-10 years.
Health Catalyst sponsors, client engagement, and corporate analytics team members. 10-16 organizational improvement subject matter experts (SMEs)	Selection and recruitment of 10-16 SMES. OIRA Tool quantitative and qualitative evaluation. Modified Delphi nominal group method.	OIRA Tool evaluation results	1.To evaluate how clear and understandable OIRA Tool competencies are	1. OIRA Tool competencies are clear and understandable. Measurement: Assuming 10-16 evaluator SMEs, greater than or equal to 0.78 consensus on clarity for each individual competency descriptions, on or before July, 2017 (Li, Huang, Kuo, & Hung, 2015; Polit & Beck,	OIRA Tool is used by greater than or equal to 30 percent of the DNP student's healthcare clients on an annual basis to assess their on-going organizational improvement readiness, and by greater than or equal to 25 percent of prospective clients to obtain organizational improvement readiness baseline measures, on or before January, 2021.	OIRA Tool is recognized as the industry assessment tool for organizational improvement readiness. This is measured by adoption by one or more industry organizations or analysts, such as HIMSS, The Advisory Board, or Gartner, on or before January, 2024.

				2006; Polit, Beck, & Owens, 2007; Hsu & Sanford, 2007; Lynn, 1986).		
Health Catalyst sponsors, client engagement, and corporate analytics team members. 10-16 organizational improvement subject matter experts (SMEs)	Selection and recruitment of 10-16 SMES. OIRA Tool quantitative evaluation. Modified Delphi nominal group method.	OIRA Tool evaluation results	2. To evaluate the relevancy of the OIRA Tool competencies	2. OIRA Tool competencies are relevant to organizational improvement. Measurements: Individual competency content validity index (I-CVI) of greater than or equal to 0.78, and a CVI for the entire scale of greater than or equal to 0.9, on or before July, 2017 (Li et al., 2015; Polit & Beck, 2006; Polit et al., 2007; Hsu, 2007; Lynn, 1986).	OIRA Tool is used by greater than or equal to 30 percent of the DNP student's healthcare clients on an annual basis to assess their on-going organizational improvement readiness, and by greater than or equal to 25 percent of prospective clients to obtain organizational improvement readiness baseline measures, on or before January, 2021.	OIRA Tool is recognized as the industry assessment tool for organizational improvement readiness. This is measured by adoption by one or more industry organizations or analysts, such as HIMSS, The Advisory Board, or Gartner, on or before January, 2024.
Health Catalyst sponsors, client engagement, marketing, and corporate analytics team members. External web agency resources.	OIRA Tool quantitative and qualitative content and usability evaluation. Modified Delphi nominal group method, and Google Analytics (2015).	OIRA Tool usability evaluation results	3. To identify OIRA Tool modifications	3. OIRA Tool modifications are identified. Measurements: SME qualitative and quantitative data have been analyzed, I-CVI, and CVI have been calculated, and usability test results have been analyzed (bounce, exit, conversion rate), which have resulted in a list of proposed OIRA Tool modifications, on or before January, 2017.	OIRA Tool competencies are updated (e.g. new, validated competencies are added, existing competencies are modified based on SME analysis, and/or some competencies are deleted)—and the web (or paper) design of the OIRA Tool is modified based on benchmark performance analysis, on a semi-annual basis starting in July, 2017.	OIRA Tool is used by greater than or equal to 50 percent of the DNP student's healthcare clients on an annual basis to assess their on-going organizational improvement readiness, and by greater than or equal to 35 percent of prospective clients to obtain organizational improvement readiness baseline measures, on or before January, 2021. OIRA Tool is recognized as the industry assessment tool for organizational improvement readiness. This is measured by

						adoption by one or more industry organizations or analysts, such as HIMSS, The Advisory Board, or Gartner, on or before January, 2024.
Health Catalyst sponsors, client engagement, marketing, and corporate analytics project team members.	Lessons learned template (Centers for Medicare and Medicaid, 2015) and semi-structured project team interview	Completed lessons learned template	4. To identify and disseminate lessons learned from the project	4. Lessons learned are identified and disseminated for the project. This is measured by 100 percent completion of the lessons learned template, and sharing the lessons learned with key Health Catalyst stakeholders and sponsors (plus, posted on company SharePoint), on or before February, 2017.	Suggestions for improving the OIRA Tool project and similar projects have been implemented in ongoing OIRA Tool refreshes as measured by bi-annual, ongoing continuous process improvement lessons learned sessions, starting in July, 2017.	OIRA Tool is used by greater than or equal to 50 percent of the DNP student's healthcare clients on an annual basis to assess their on-going organizational improvement readiness, and by greater than or equal to 35 percent of prospective clients to obtain organizational improvement readiness baseline measures, on or before January, 2021. OIRA Tool is recognized as the industry assessment tool for organizational improvement readiness. This is measured by adoption by one or more industry organizations or analysts, such as HIMSS, The Advisory Board, or Gartner, on or before January, 2024.

Appendix F: Logic Model Step 2 (W.K. Kellogg Foundation, 2004)

Organizational Improvement Readiness Assessment (OIRA) Tool: And Evaluation

Problem or Issue   1

Many healthcare organizations begin organizational improvement efforts only to have them fail. The OIRA Tool is a comprehensive, evidence based assessment that enables healthcare organizations to evaluate their readiness to implement and sustain organizational improvement. However, the OIRA Tool has been evaluated to ensure the competencies' descriptions are clear and understandable, the competencies are relevant, and the tool is functional and usable (Brand et al., 2012; Kaplan et al. 2010; Health Catalyst, 2014).

Goals and Guiding Principles   2

Goal: To evaluate the newly developed OIRA tool and identify any necessary modifications that will improve the user's understanding of the competencies' terminology, ensure the relevant competencies have been included, and the tool is functional and usable by users.

Guiding principles:
- To help drive U.S. healthcare transformation through sustainable outcomes
- Leverage early adopter and early majority adopters

Define Strategies   6

➤Conduct an evaluation of the OIRA Tool competencies' descriptions to ensure they are clear and understandable, and that the competencies are relevant
➤Conduct a usability evaluation
➤Use continuous process improvement methodologies to identify OIRA Tool modifications and lessons learned (Langley et al., 2009)

Desired Results 5

1. OIRA Tool competencies' descriptions are clear and understandable
2. OIRA Tool competencies' are relevant to organizational improvement
3. OIRA Tool modifications are identified
4. Lessons learned are identified and disseminated for this endeavor

Influential Factors, Resources & Assets 4

➤Transition from fee-for-service to value-based care (U.S. Department of Health and Human Services, 2015)
➤ Many healthcare organizations begin organizational improvement efforts only to have them fail (Chassin & Loeb, 2013; Kaplan et al., 2010)
➤Strong internal sponsor and stakeholder support

Population Needs & Strengths   3

➤Reduce waste (ordering, workflow, and defect)— estimated at $30B annually in the U.S. (Lallemand, 2011)
➤Maximize growing value based, at-risk dollars, currently 6 percent for inpatient (CMS, 2014)
➤Need to understand factors, the interaction of the factors, and the systems that help drive sustainable outcomes

Appendix G: Content Validation—Modified Delphi Nominal Group Method

Modified Delphi Nominal Group Methodology

Round one competencies (25) - online

6 out of 25 competencies had an **I-CVI*** of **< 0.78**; **S-CVI* = 0.85***

18 out of 25 competencies had a **clarity rating*** of **< 0.78**

Round two competencies (22) - online

Due to high number of competencies with clarity ratings of < 0.78, and modifications/deletions/ adds, all round 2 competencies were re-tested for relevancy and clarity

4 out of 22 competencies had an **I-CVI*** of **< 0.78**; **S-CVI* = 0.87** → Round three virtual web event: relevancy discussion and re-evaluation

18 out of 22 competencies had an **I-CVI*** of **≥ 0.78** → No action required

8 out of 22 competencies had a **clarity rating*** of **< 0.78** → Round three virtual web event: clarity discussion and re-evaluation

14 out of 22 competencies had a **clarity rating*** of **≥ 0.78** → No action required

<ins>*Targets</ins>
- Individual Content Validity Index (I-CVI) ≥ 0.78
- Individual Clarity ≥ 0.78
- Scale Content Validity Index (S-CVI) ≥0.9

Appendix H: IRB Determination Letter

BOISE STATE UNIVERSITY
RESEARCH AND ECONOMIC DEVELOPMENT
Research Compliance

June 30, 2015

Ms. Leslie Falk
Graduate Student | Doctorate of Nursing Practice
Boise State University

Dear Ms. Falk,

Thank you for contacting the Office of Research Compliance regarding your DNP project regarding the Organizational Improvement Readiness Assessment (OIRA) Tool: An Evaluation.

After discussing this project with you over the phone on June 30, 2015, I have determined that this project does not fall under our federal definition of human subjects research; it is a performance improvement project and will not be published in order to inform the field with generalizable knowledge. Therefore, an IRB review or determination of exemption is not required. As long as the data is not being used for research purposes to contribute to generalizable knowledge and you do not refer to this project as "research" in any publications, no IRB review or determination of exemption will be required at Boise State University.

If you make any changes to your project that may affect this determination, or if you plan to collect any data for research purposes, please contact me as soon as possible.

Please do not hesitate to contact me if you have any questions:
(208) 426-5871
amysmith4@boisestate.edu
Mail Stop 1138

Sincerely,

Amy J. Smith
IRB Coordinator

1910 University Drive Boise, Idaho 83725-1139
Phone (208) 426-5401   orc@boisestate.edu
This letter is an electronic communication from Boise State University

Appendix I: Outcome Evaluation Plan

Project Objective(s):	Outcome	Outcome Instrument Data	Analysis Goal	Analytic Technique
1. To evaluate how clear and understandable the Organizational Improvement Readiness Assessment (OIRA) Tool competencies are	1. OIRA Tool competencies are clear and understandable	Self-created survey with 4-point Likert clarity rating scale, plus free text input for each OIRA Tool competency.	Describe and summarize the clarity ratings of the OIRA Tool competencies.	Quantitative analysis: competency clarity ratings (Li, Huang, Kuo, & Hung, 2015; Hsu & Sanford, 2007) Qualitative data analysis using a 3round modified Delphi nominal group method: number of modified competencies (Polit & Beck, 2006; Polit, Beck, & Owens, 2007; Lynn, 1986)
2. To evaluate the relevancy of the OIRA Tool competencies to organizational improvement	2. OIRA Tool competencies are relevant to organizational improvement	Self-created survey with 4-point Likert relevancy rating scale for each OIRA Tool competency.	Describe and summarize the relevancy of the OIRA Tool competencies, and the overall scale content validity.	Quantitative analysis: Individual Content Validity Index (I-CVI), Entire Scale Content Validity Index (S-CVI/Ave), number of new competencies added, number of deleted competencies (Li et al., 2015; Polit & Beck, 2006; Polit et al., 2007; Hsu, 2007; Lynn, 1986)
3. To identify OIRA Tool modifications	3. OIRA Tool modifications are identified	Google Analytics (2015), 4 web analytics metrics.	Describe and summarize web metrics related to OIRA Tool usability.	Benchmark performance comparison: bounce rates, exit rates, and conversion rates (number of assessments completed) (Marketing Sherpa, 2012)
4. To identify and disseminate the lessons learned from the project	4. Lessons learned are identified and disseminated for the project	Centers for Medicare and Medicaid Services ([CMS], 2015) template survey for lessons learned focused on what worked well, what didn't work well, and future recommendations.	Describe and summarize lessons learned related to the OIRA Tool team project work.	Qualitative data analysis—descriptive method summary matrix (what worked well, what didn't work well, and recommendations for future consideration) (Goodrick & Roger, 2015; Swan, Scarbrough, & Newell, 2010; Baaz, Holmberg, Olsson, & Sandberg, 2010; Weber, Aha, & Becerra-Fernandez, 2001; Thomas, 2015)

Appendix J: Organizational Improvement Readiness Tool Evaluation Form

Organizational Improvement Readiness Assessment Tool Evaluation

This assessment tool was developed using an integrated literature review of healthcare organizational improvement research across three databases: CINAHL, MEDLINE®, and Web of Science™. The research findings were combined with the practice-based experience of internal Health Catalyst team organizational improvement subject matter experts including executives, clinicians, operational leaders, and data architects/analysts to derive the 25 competencies in this assessment.

The 25 statements listed below are competencies related to organizational improvement readiness. Based on your expertise, please rate the relevancy of each competency as it relates to driving and sustaining outcomes (range 1- 4), the clarity of each statement (range 1-4), and your suggestions for improving the statement to ensure the competency is clear and understandable (free text input). At the end of survey, we will also ask you to suggest any competencies you think are relevant, but were not included in the assessment.

Competency	Relevancy How relevant is this competency to driving and sustaining outcomes? 1 2 3 4 ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	Clarity How clearly does this statement represent the competency? 1 2 3 4 ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Suggestions to improve the clarity of the competency statement Free text input
Data-Driven Prioritization: Senior leadership is accountable for improvement initiatives and they use data, versus vocal or politically driven influences, to prioritize strategic improvement initiatives.	1 2 3 4	1 2 3 4	
Learning Culture: Our organizational culture promotes dialogue and learning to improve outcomes, versus a punitive environment. Individuals follow because of excellent ideas and a common purpose rather than because of mandates or coercion from those in authority.	1 2 3 4	1 2 3 4	
Productive Zone: Our leadership helps individuals stay engaged without becoming overwhelmed as we work on challenging improvement initiatives that balance quality, cost, and patient experience.	1 2 3 4	1 2 3 4	
Managing Polarities: Our leadership can appropriately balance the tension between extremes. For example, they remain hopeful, yet realistic, rather than overly idealistic or cynical.	1 2 3 4	1 2 3 4	
Board Focus: Our board spends the majority of its time focused on improving care delivery rather than facility management or capital investment strategies.	1 2 3 4	1 2 3 4	

Competency	Relevancy How relevant is this competency to driving and sustaining outcomes? **1 2 3 4** ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	Clarity How clearly does this statement represent the competency? **1 2 3 4** ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Suggestions to improve the clarity of the competency statement Free text input
Automated Data Provisioning: Our analysts spend most of their time interpreting data, rather than hunting for, or gathering data, because our data warehouse extracts and integrates data from multiple sources automatically.	1 2 3 4	1 2 3 4	
Data Quality: Our clinicians and operators have confidence that our data is accurate, complete, timely, and captured at the most appropriate time in the care delivery workflow.	1 2 3 4	1 2 3 4	
Data Definitions: We spend very little time arguing about whose report is "right" because we have standard data definitions and calculations that cover the majority of common measures (e.g. LOS, cost/case, patient days).	1 2 3 4	1 2 3 4	
Data Access: Clinical and business data stewards grant generous access to data for improvement purposes and thoroughly audit appropriate use, rather than IT limiting access because of security concerns.	1 2 3 4	1 2 3 4	
Internal & External Reporting: We have a consistent and efficient way to produce and distribute management and operational reports that enable self-service, transparent access to data, as well as regulatory and accreditation	1 2 3 4	1 2 3 4	

Competency	Relevancy	Clarity	Suggestions to improve the clarity of the competency statement
	How relevant is this competency to driving and sustaining outcomes? 1 2 3 4 ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	How clearly does this statement represent the competency? 1 2 3 4 ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Free text input
submissions, payer incentive reports, specialty society/collaborative submissions, and survey initiatives (e.g. U.S. News, etc.).			
Variation Analysis: Our analysts can easily identify variation in a clinical or operational process, and they use data mining and predictive algorithms to identify probable cause of inappropriate variation.	1 2 3 4	1 2 3 4	
Predictive and Prescriptive Models: We use analytics to predict likely outcomes based on historic and current data, and we prescribe the best course of action to improve patient outcomes**.**	1 2 3 4	1 2 3 4	
Insight Generation: Our analytics produce significant insights and improve decision making rather than simply generating reports to distribute information.	1 2 3 4	1 2 3 4	
Patient cohort/registries: Comprehensive patient registries are defined by our organization, with inclusion and exclusion criteria, based on evidence and expert consensus.	1 2 3 4	1 2 3 4	
Best Practice Development: We have a standardized process for ensuring that the latest,	1 2 3 4	1 2 3 4	

Competency	Relevancy How relevant is this competency to driving and sustaining outcomes? 1 2 3 4 ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	Clarity How clearly does this statement represent the competency? 1 2 3 4 ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Suggestions to improve the clarity of the competency statement Free text input
evidence-based guidelines are designed and consistently integrated into patient care delivery across the continuum of care.			
Standardized Care Delivery: We measure how consistent we are at leveraging evidence-based standards such as intervention criteria, referral criteria, diagnostic algorithms, order sets, and workflow checklists.	1 2 3 4	1 2 3 4	
Adequate Improvement Resources: Our organizational improvement leadership provides the resources, staff's time, and operational and financial support to ensure our improvement initiatives can be successfully developed, deployed, and sustained.	1 2 3 4	1 2 3 4	
Diffusion of Innovation: We have a systematic approach to identify the early-adopter thought leaders (i.e. physicians and operational leaders) to champion improvement initiatives and to accelerate adoption.	1 2 3 4	1 2 3 4	
Improvement Training and Experience: Our improvement team members are trained, and they have experience in quality improvement theory, change management, analytics and leadership to accelerate improvement.	1 2 3 4	1 2 3 4	

Competency	Relevancy How relevant is this competency to driving and sustaining outcomes? **1 2 3 4** ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	Clarity How clearly does this statement represent the competency? **1 2 3 4** ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Suggestions to improve the clarity of the competency statement Free text input
Permanent Teams: Rather than temporary, project-oriented quality teams, our organization has *permanent*, multidisciplinary workgroups comprised of clinicians, data analysts, business intelligence, and finance staff who work together to drive and sustain improvement.	1 2 3 4	1 2 3 4	
Iterative, Continuous Frontline Improvement: Our teams use an iterative improvement methodology, which encourages quick, incremental feedback, and adjustments from frontline staff to ensure rapid, widespread adoption.	1 2 3 4	1 2 3 4	
Patient engagement: We share analytics with our patients, which enable them to be more engaged in their own care.	1 2 3 4	1 2 3 4	
Payment Model Alignment: We can measure how the adoption of best practice guidelines will impact our bottom line and we proactively negotiate payment models that best align with the interest of patients.	1 2 3 4	1 2 3 4	
Provider Incentives: We have provider incentives that are aligned with achieving outcomes improvement goals in the quality, cost, and experience of care delivery.	1 2 3 4	1 2 3 4	

Competency	Relevancy How relevant is this competency to driving and sustaining outcomes? **1 2 3 4** ← -- → 1= Not relevant 2 = Somewhat relevant 3 = Quite relevant 4 = Highly relevant	Clarity How clearly does this statement represent the competency? **1 2 3 4** ← -- → 1= Not clearly 2 = Somewhat clearly 3 = Quite clearly 4= Extremely clearly	Suggestions to improve the clarity of the competency statement Free text input
Board Level Goals: Our board level goals have a balance of quality and financial outcome improvement measures, and these goals are tied to incentive compensation at all leadership levels.	1 2 3 4	1 2 3 4	

Please list any additional competencies and a description of the competency, that you think are relevant to an organization being ready to drive and sustain improvement outcomes:

Competency description	Competency statement

Appendix K: Evaluation Panel Subject Matter Expert (SME) Participants

Evaluation Panel Subject Matter Expert (SME) Participants

18 evaluation panel SMEs invited

↓

15 evaluation panel SMEs accepted

↓

13 evaluation panel SMEs completed round 1 online

↓

11 evaluation panel SMEs completed round 2 online

↓

11 evaluation panel SMEs completed round 3 virtual web event*

Final 11 evaluation panel SME characteristics

- 5 Clinicians/Clinical Executives, 4 Business Intelligence/Data Architects/Analysts, 1 Industry Analyst (Gartner), and 1 Member of the Advisory Board

- Representing these types of healthcare organizations: ACOs, large integrated healthcare delivery networks, academic medical centers, children's hospitals, regional medical centers

- 4 females, 7 males

*2 of the 11 were unable to attend the virtual web event. They were sent a recording of the virtual web event to listen to and then they completed round 3 via an online survey.

Appendix L: Modified Delphi Nominal Group Consolidated Results

Modified Delphi Nominal Group Consolidated Results

Keys	Initial	Modified	New	Deleted/Combined	Final Total	Final I-CVI Ratings*	Final Clarity Ratings*
Leadership, Culture and Governance	5	5	0	1 (combined "Managing Polarities" within Leadership competencies)	4	0.82 to 1.0	0.82 to 1.0
Analytics	8	7	2 ("Patient Engagement" split into two: External Data Sharing" and "Patient Reported Data")	1 (combined the concept of "Insight Generation" into other analytics competencies)	9	0.82 to 1.0	0.82 to 1.0
Best Practice	3	2	0	1 (combined "Best Practice Development and Measurement")	2	0.91	0.82 to 0.91
Adoption	6	5	0	1 (combined "Support and Accountability" within other Leadership competencies)	5	0.82 to 1.0	0.82 to 1.0
Financial Alignment	3	2	0	1 (combined "Board Level Goals" into "Board Focus" and "Organizational/Provider Incentives")	2	0.82 to 0.91	0.91 to 1.0

Final Scale Content Validity Index (S-CVI) = 0.92*

*Targets
- I-CVI ≥ 0.78
- Individual Clarity ≥ 0.78
- S-CVI ≥0.9

Appendix M: Post Round 3 OIRA Tool Competencies

Overall Scale Content Validity Index (S-CVI). Round 1 had 13 panel subject matter experts (SMEs); round 2 had 11 panel SMEs								
Round 1: S-CVI = 0.85; Round 2: S-CVI = 0.87; Round 3: S-CVI = 0.92								
			Relevancy			Clarity		
Original Competencies (Round 1)	**Round 2 Competencies**	**Round Three Evaluation Competency Statement (Proposed Change)**	**Round 1 I-CVI**	**Round 2 I-CVI**	**Round 3 I-CVI**	**Round 1 Clarity**	**Round 2 Clarity**	**Round 3 Clarity**
Data-Driven Prioritization: Senior leadership is accountable for improvement initiatives and they use data, versus vocal or politically driven influences, to prioritize strategic improvement initiatives.	**Context and Data:** Senior leadership understands our organizational culture and they consistently use data-driven methods, linked to our organization's strategic plan, to prioritize and drive sustained outcomes across our organization.	**Context and Data:** Senior leadership consistently uses data-driven methods linked to our organization's strategic priorities—with an understanding of our culture—to prioritize, drive, and sustain outcomes.	1.0	**1.0**	No action required	0.69	**0.82**	No action required
Learning Culture: Our organizational culture promotes dialogue and learning to improve outcomes, versus a punitive environment. Individuals follow because of excellent ideas and a common purpose rather than because of mandates or coercion from those in authority.	**Adaptive Learning Culture:** Our organization promotes dialogue as evidenced by an exchange of ideas, generous listening and curiosity where it is safe to disagree and not acceptable to disengage, while providing direction that invites followership to drive outcomes.	**Adaptive Learning Culture:** Our organization promotes dialogue and learning where it is safe to disagree and not acceptable to disengage as evidenced by an exchange of ideas, generous listening, and innovation.	0.85	**0.82**	No action required	0.77	0.64	**1.0**
Productive Zone: Our leadership helps individuals stay engaged without becoming overwhelmed as we work on challenging improvement initiatives that balance quality, cost, and patient experience.	**Support and Accountability:** Our leadership provides the support and the resources that improvement teams need and they hold the improvement teams accountable for driving sustained outcomes.	**Support and Accountability:** Our leadership provides the support and resources that improvement teams need, and holds improvement teams accountable for driving and sustaining outcomes.	0.85	**0.91**	No action required	0.31	**1.0**	No action required
Managing Polarities: Our leadership can appropriately balance the tension between extremes. For example, they remain hopeful, yet realistic, rather than overly idealistic or cynical.	Concept integrated into leadership, culture, and governance competencies as "and" statements. Not used in rounds 2-3.		0.54			0.46		

Board Focus: Our board spends the majority of its time focused on improving care delivery rather than facility management or capital investment strategies.	**Board Focus:** Our board takes a balanced approach to improving care delivery, while meeting our financial stewardship responsibilities.	**Board Focus:** Our board recognizes the importance of improving care delivery and appropriately allocates time and resources to it.	0.69	**0.82**	No action required	0.69	0.73	**1.0**
Automated Data Provisioning: Our analysts spend most of their time interpreting data, rather than hunting for, or gathering data, because our data warehouse extracts and integrates data from multiple sources automatically.	**Automated Data Integration and Use:** Our leaders and clinicians spend the majority of their time using data to drive outcomes rather than searching for, collecting, and integrating data**.**	**Automated Data Integration and Use:** Our improvement teams spend more time driving outcomes based on insights from the data than they do searching for, collecting, and integrating data.	0.85	**0.91**	No action required	0.69	**0.82**	No action required
Data Quality: Our clinicians and operators have confidence that our data is accurate, complete, timely, and captured at the most appropriate time in the care delivery workflow.	**Efficient Data Capture and Quality:** Accurate data is captured at the most appropriate time in our care delivery workflows, and our leaders and clinicians trust the data to drive outcomes.	**Data Quality and Timeliness:** We have confidence in the accuracy and completeness of our data, and our data is captured in a timely manner to provide actionable insights.	0.92	**0.82**	No action required	0.69	0.73	**0.91**
Data Definitions: We spend very little time arguing about whose report is "right" because we have standard data definitions and calculations that cover the majority of common measures (e.g. LOS, cost/case, patient days).	**Data Governance and Definitions:** We have effective data governance standards and processes for defining common definitions so that we can collaborate on driving outcomes (e.g. LOS, cost per case, patient days, etc.).	**Data Governance and Definitions:** We have effective data governance standards, processes, and owners for defining common metrics (e.g., length of stay, cost per case, patient days, outpatient visits, covered lives) so that we can collaborate on driving outcomes.	1.0	**0.91**	No action required	0.92	**0.82**	No action required
Data Access: Clinical and business data stewards grant generous access to data for improvement purposes, and thoroughly audit appropriate use, rather than IT limiting access because of security concerns.	**Timely Data Access:** Our leaders and clinicians partner with data stewards to define what data is needed and how the data will be used, and they are given timely access to data to perform self-service analytics.	**Data Access:** As an organization, we partner with data stewards and IT to define the data we need, ensure literacy, and grant timely access to data in an efficient, effective, and continuous manner.	0.85	0.73	**1.0**	0.46	0.91	**0.91**

Internal & External Reporting: We have a consistent and efficient way to produce and distribute management and operational reports that enable self-service, transparent access to data, as well as regulatory and accreditation submissions, payer incentive reports, specialty society/collaborative submissions, and survey initiatives (e.g., U.S. News, etc.).	**Internal & External Reporting:** We have a consistent and efficient way to produce and distribute operational and clinical reports internally and externally.	**Internal & External Reporting:** We have a consistent and efficient way of producing and distributing operational and clinical reports internally and externally.	1.0	**1.0**	No action required	0.46	**0.91**	No action required
This is a new competency added in round 2 based on panel feedback.	**External Data Sharing and Benchmarking:** We have efficient processes and standards to share data externally for population health management and benchmarking purposes.	**External Data Sharing:** We have efficient and secure processes for importing and sharing external data to provide insights for improvement opportunities.		0.73	**1.0**		1.0	**1.0**
Variation Analysis: Our analysts can easily identify variation in a clinical or operational process, and they use data mining and predictive algorithms to identify probable cause of inappropriate variation.	**Identifying and Interpreting Variation:** Our improvement teams know how to identify and interpret variation using analytics tools and how to make adjustments to drive sustained outcomes.	**Identifying and Interpreting Variation:** Our improvement teams know how to identify and interpret variation using analytics tools and how to test, adapt, and implement interventions to drive sustained outcomes.	1.0	**1.0**	No action required	0.85	**0.91**	No action required
Predictive and Prescriptive Models: We use analytics to predict likely outcomes based on historic and current data, and we prescribe the best course of action to improve patient outcomes.	**Prescriptive and Predictive Models:** Our organization uses analytics to prescribe the best course of action to improve patient outcomes and to predict likely outcomes based on historic and current data.	**Prescriptive and Predictive Models:** Our organization uses analytics to identify the best course of action to improve patient outcomes and to predict likely outcomes based on historic and current data.	0.85	**0.91**	No action required	0.77	**0.82**	No action required
This is a new competency based on splitting out patient engagement in round 3		**Patient Reported Data:** We collect patient-reported data (e.g., symptoms, quality of life, activities of daily living) to inform clinical and provider			**1.0**			**0.82**

	decisions.							
Insight Generation: Our analytics produce significant insights and improve decision making rather than simply generating reports to distribute information.	Not included based on feedback that this is duplicative to data use, variation analysis, and timely data access. Not used in round 2-3.		0.92	0.77				
Patient cohort/registries: Comprehensive patient registries are defined by our organization, with inclusion and exclusion criteria, based on evidence and expert consensus.	**Patient cohort/registries:** Comprehensive patient registries are defined by our organization through a standard process, with inclusion and exclusion criteria, based on clinical and administrative data.	**Patient Cohort/Registries:** Our patient cohorts/registries are defined through a standard process with transparent inclusion and exclusion criteria based on clinical and administrative data.	0.92	**0.91**	No action required	0.85	**0.91**	No action required
Best Practice Development: We have a standardized process for ensuring that the latest, evidence-based guidelines are designed and consistently integrated into patient care delivery across the continuum of care.	**Best Practice Development and Integration:** We have a standardized process for ensuring current, evidence based guidelines and practices are developed and integrated into our care delivery processes.	**Best Practice Adoption and Measurement:** We have a standardized method for ensuring that current evidence- and consensus- based best practices are integrated into our care delivery guidelines and processes—and we have automated ways to measure the use and impact on our outcomes.	0.92	**0.91**	No action required	0.69	**0.82**	No action required
Standardized Care Delivery: We measure how consistent we are at leveraging evidence-based standards such as intervention criteria, referral criteria, diagnostic algorithms, order sets, and workflow checklists.	**Standardized Care Delivery Measurements**: We have automated ways to measure how consistently we are using evidence-based guidelines and practices and to measure their impact on outcomes.	Combined with the Best Practice Adoption and Measurement based on panel SME feedback in round 3.	0.85	0.91		0.85	1.0	
Adequate Improvement Resources: Our organizational improvement leadership provides the resources, staff's time, and operational and financial support to ensure our improvement initiatives can be successfully developed, deployed, and sustained.	Combined with the Support and Accountability competencies in round 2. Not used in rounds 2-3.		0.92			0.77		
Diffusion of Innovation: We have a	**Spread and Sustain Adoption:** We	**Spread and Sustain Adoption:** We	0.62	**0.91**	No	0.77	**0.91**	No

systematic approach to identify the early-adopters thought leaders (i.e. physicians and operational leaders) to champion improvement initiatives and to accelerate adoption.	have a systematic approach to identify change leaders (i.e. physicians and operational leaders) who champion and spread the implementation of outcomes initiatives.	have change leaders (e.g., physicians, operational leaders) who champion outcomes improvement initiatives and promote adoption of best practices.			action required			action required
Improvement Training and Experience: Our improvement team members are trained, and they have experience in quality improvement theory, change management, analytics, and leadership to accelerate improvement.	**Improvement Team Experience:** Our improvement teams have experienced resources who have a proven track record of driving and communicating sustained outcomes using quality improvement, change management, and analytics methodologies.	**Experienced Improvement Teams:** Our improvement teams include people with skills and experience in driving and sustaining outcomes using quality improvement, change management, analytic methodologies, and effective communications.	0.85	**0.82**	No action required	0.69	0.73	**1.0**
Permanent Teams: Rather than temporary, project-oriented quality teams, our organization has *permanent*, multidisciplinary workgroups comprised of clinicians, data analysts, and business intelligence and finance staff who work together to drive and sustain improvement.	**Improvement Teams:** Our organization has permanent teams who are accountable for sustained outcomes in prioritized clinical and operational domains and functional, project-oriented teams. The team members often include clinicians, data analysts, developers, and experts in quality improvement, operations and finance.	**Improvement Teams:** We have an interdisciplinary team structure and strategy with the capacity to spread and sustain existing improvements while simultaneously achieving new improvements.	0.69	**0.82**	No action required	0.77	0.36	**0.91**
Iterative, Continuous Frontline Improvement: Our teams use an iterative improvement methodology, which encourages quick, incremental feedback, and adjustments from frontline staff to ensure rapid, widespread adoption.	**Continuous Improvement:** Our improvement teams use continuous improvement methods, soliciting frontline staff feedback to inform and make rapid changes that ensure widespread adoption.	**Continuous Improvement** Our improvement teams use continuous improvement methods, soliciting frontline staff feedback to inform and make rapid changes that refine our work and foster adoption of best practice.	1.0	**1.0**	No action required	0.85	**0.91**	No action required
Patient engagement: We share analytics with our patients, which enable them to be more engaged in their own care.	**Patient Reported Outcomes and Engagement:** We collect patient reported outcomes and we share appropriate information with our	**Patient Engagement:** We share information with our patients to ensure shared decision making occurs and provide relevant tools that help them	0.77	0.55	**1.0**	0.77	0.64	**1.0**

	patients, which enables them to be more engaged in their care.	manage their care.						
Payment Model Alignment: We can measure how the adoption of best practice guidelines will impact our bottom line and we proactively negotiate payment models that best align with the interest of patients.	**Payment Model Alignment:** We proactively negotiate payment models with our payers that incent outcome improvements.	**Payment Model Alignment:** We negotiate payment models with our payers to align incentives for high quality, cost-effective outcomes.	0.77	**0.82**	No action required	0.69	0.73	**1.0**
Provider Incentives: We have provider incentives that are aligned with achieving outcomes improvement goals in the quality, cost, and experience of care delivery.	**Provider Incentives.** We have provider incentives that are aligned with achieving our organization's prioritized quality, cost, and experience of care delivery goals.	**Organizational and Provider Incentives:** Our organizational and provider incentives are aligned with achieving our goals for quality, cost, and patient experience.	0.85	**0.91**	No action required	0.92	**0.91**	No action required
Board Level Goals: Our board level goals have a balance of quality and financial outcome improvement measures, and these goals are tied to incentive compensation at all leadership levels.	Duplicative to board focus and provider incentives. Not used in rounds 2-3.		0.85			0.85		

Appendix N: Lessons Learned Summary Matrix

What worked well

• Executive sponsorship and engagement: leadership team (sponsors and stakeholders) and subject matter experts (SMEs)
 • Research and research design
      • Planning and timeline (including response and results turnaround)
      • Research-based methodology (e.g. content validation; detailed feedback from previous rounds and tracked progression)
      • Recruitment (breadth and depth of SMEs, accounted for attrition)
      • Facilitation of live virtual event
 • Communications: Internal and external (regular, "gentle" reminders)
 • Web development and user experience: Easy to use interface/navigation

What didn't work well

• Research and research design
      • Free text input: some of the feedback was more principle-based and were applicable across all competencies (SMEs felt like they were repeating their feedback and it was time intensive; they suggested a general comments box be included)
      • Turnaround time between modified Delphi nominal group rounds (did it contribute to attrition?; what was the impact of summer vacations?)
      • Some SMEs stated it was hard to know if their recommendations were taken
      • Virtual web event polling limitations were identified at the last minute (thankfully addressed)
 • Web development and user experience
      • Web development resources and agency project management
      • Scope creep

Recommendations for future considerations improvements

• Executive sponsorship and engagement: Continued support of similar projects (rigorous exploration and new insights)
 • Research and research design
      • Continuous and ongoing reiteration of the research purpose and outcome goals
      • Trust the process– not sure we would reach consensus in the virtual web event, but we did!
      • Pilot face-to-face meeting versus just electronic/virtual web event
      • Investigate other virtual web event/polling capabilities

- • Make certain, if repeated, to pay attention to details—it makes a difference
- Future assessment tool modifications
  - • Simplify the assessment. Future analytics modeling to determine priorities, benchmarks.
  - • Avoid custom surveys
  - • Integrate into customer life cycle and drive organizational (not just executive) engagement
- Web development and user experience: Defined logic— pre-defined, validated use case tests—project checkpoints

Appendix O: Scholarly Project 3-5 Year Budget Plan

IEP							
Revenues	**Budget Year 1**	**Budget Year 2**	**Budget Year 3**	**Budget Year 4**	**Budget Year 5**		**Rationale/Notes**
Assessment Tool development	$ 14,000	$ 2,000					Year 2- A/B testing
Database Integration development	$ 3,000	$ 6,000	$ 500	$ 500	$ 500		Year 1- flat CSV file; Year 2- direct connect to database; Year 3- beyond/minor field changes
Modified Delphi nominal group rounds	$ 2,300		$ 2,300				Re-assessment of categories and competencies in year 3
Education and training	$ 1,800		$ 1,800				Re-assessment of categories and competencies in year 3
Evaluation program resources	$ 4,600	$ 4,600					Program evaluation in years 1 and 2
Management and operations salaries	$ 16,745	$ 4,600	$ 4,600	$ 4,600	$ 4,600		Year 2 and beyond, one project manager for 2 weeks per year
Administrative supplies and support	$ 750		$ 750				
Travel	$ 12,720		$12,000				Re-assessment of categories

						and competencies in year 3
Marketing and advertising	$ 3,000	$ 1,200	$ 1,200	$ 1,200	$ 1,200	On-going marketing and advertising
Total	$58,915	$18,400	$23,150	$6,300	$6,300	
Expenses						
Education initial training	$ 1,800					
On-going training			$1,800			Re-assessment of categories and competencies in year 3
Evaluation assessment salaries (1st and 2nd year)	$ 4,600	$ 4,600				Program evaluation in years 1 and 2
Modified Delphi nominal group rounds	$ 2,300		$2,300			
Management and operations salaries (1st and 2nd year)	$ 16,745	$ 4,600	$4,600	$4,600	$4,600	Year 2 and beyond, one project manager for 2 weeks per year
Materials and supplies	$ 17,000	$ 8,000	$ 500	$ 500	$ 500	
Administrative supplies and support	$ 750		$ 750			

Travel		$ 12,720				$12,000				Re-assessment of categories and competencies in year 3
Marketing & Advertising		$ 3,000		$1,200		$ 1,200		$1,200		$1,200	On-going marketing and advertising
Total		$ 58,915		*$18,400*		*$23,150*		*$6,300*		*$6,300*	
Operating Income		*$0*		*$0*		*$0*		*$0*		*$0*	

Appendix P: Scholarly Project Expense Report

Source of Expense	Expense Description	Dollar Value	Type of Cost (fixed or variable)	Description of Cost	Estimated Volume	Expense Per Unit
Web Development & Usability Testing		**Cost ($)**				
Materials/supplies	Assessment UI/UX design; mock-up or InVision app of the site to demonstrate the flow of data and user experience; development of experience in AngularJS to give an "App-like" experience; develop assessment flow and logic; show results on screen/email/pdf	$10,000	Fixed	Web development		$10,000
Materials/supplies	Testing of app functionality,	$ 2,000	Fixed	Quality assurance		$ 2,000

	including workflow			testing by 3rd party web agency		
Materials/supplies	Program and test application's ability to track, bounce rates, exit rates, and funnel conversion	$ 2,000	Fixed	Usability programming by 3rd party web agency		$ 2,000
	Total Requested:	**$14,000**				
Database Integration		**Cost ($)**				
Materials/supplies	Investigate CSV or API integration options to export from InVision application into the results database	$3,000	Fixed	Database integration by 3rd party web agency		$3,000
	Total Requested:	**$3,000**				
Survey Development		**Cost ($)**				
Administrative supplies	Printer cartridges, phone	$500	Fixed	Supplies		$500

and support	charges, paper					
	Total Requested:	**$ 500**				
Modified Delphi Nominal Group Rounds		**Cost ($)**				
Salaries	Salary for corporate analytics, $50/hour (fully loaded), for estimated 40 hours	$2,000	Fixed	Cost for corporate analytics to program and collect modified Delphi nominal group results	40 hours	$50
Fringe @ 15%		$ 300	Fixed	Fringe		$300
Materials/supplies costs	Supply costs for printing surveys for review, estimated at $50 per round	$ 150	Variable	Supplies	3 rounds	$ 50

		Cost ($)				
Travel expenses	Travel expenses for evaluator subject matter experts (SMEs), assuming 12 individuals, with one face-to-face meeting, and estimated costs of $1,000 each.	$12,000	Variable	SME evaluators costs from their offices to DNP student's organization in SLC	12 persons	$1,000
	Total Requested	**$14,450**				
Education & Training		**Cost ($)**				
Salaries	Salary for 6 (peer to peer), $50/hr for 6, one-hour sessions	$1,800	Fixed	Cost to hire personnel to educate the providers at 30 offices	6 persons at 6 sessions	$50
Travel expenses	Travel Expenses to SLC for 6- training sessions estimated at $20/person for each training session	$ 720	Variable	Cost of travel to and from # offices	6 persons at 6 sessions	$20

Materials/supplies	Educational materials, development of brochures and printing costs, training materials	$ 100	Variable	Cost to provide education materials		$100
	Total Requested	**$3, 880**				
Evaluation/Assessment		**Cost ($)**				
Evaluation & assessment salaries	Administration of modified Delphi nominal group rounds, personnel time for preparation, follow-up and survey data entry/analyses	$4,000	Fixed	Cost to evaluate program x hours	100 hours	$40
Fringe @ 15%		$ 600	Fixed	Fringe		$600
	Total Requested	**$4,600**				
Management & Operations Salary		**Cost ($)**				
Project manager	Project operations salaries = $ 40/hour times 15% fringe	$6,400	Fixed	Operations salaries x 160	160 hours	$40

	times; estimated 160 hours			hours		
Fringe @ 15%		$ 960	Fixed	Fringe 15%		$960
Stakeholders and sponsors	Stakeholder and sponsor salaries = $ 70/ hour times 15% fringe; estimated 70 hours for team meeting reviews	$ 4,900	Fixed	Stakeholder and sponsor salaries x 70 hours	70 hours	$70
Fringe @ 15%		$ 735	Fixed	Fringe 15%		$735
Executive leadership team	Executive leadership salaries = $ 125/ hour times 15% fringe; estimated 25 hours for leadership reviews	$3,125	Fixed	Executive leadership salaries x 25 hours	25 hours	$125
Fringe @ 20%		$ 625	Fixed	Fringe 25%		$625
	Total Requested	**$16,745**				
Marketing & Advertising						
Marketing & advertising	Marketing costs	$3,000	Variable	Marketing		$3,000

	Total Requested	**$3,000**			
	Grand Total	**$58,915**			

Appendix Q: Scholarly Project State of Operations

Statement of Operations	
	Budget Year 1
Revenues	
Assessment Tool development	$ 14,000
Database Integration development	$ 3,000
Modified Delphi Nominal Group rounds	$ 2,300
Education and Training	$ 1,800
Evaluation program resources	$ 4,600
Management and operations salaries	$ 16,745
Administrative supplies and support	$ 750
Travel	$ 12,720
Marketing and advertising	$ 3,000
Total	**$ 58,915**
Expenses	

Education initial training	$ 1,800
Evaluation assessment salaries (1st and 2nd year)	$ 4,600
Modified Delphi Nominal Group rounds	$ 2,300
Management and operations salaries (1st and 2nd year)	$ 16,745
Materials and supplies	$ 17,000
Administrative supplies and support	$ 750
Travel	$ 12,720
Marketing & Advertising	$ 3,000
Total	**$ 58,915**
Operating Income	*$0*

Appendix R: Budget Variance Analysis

Budget Variance Analysis				
Expenses	Budget Year 1 (Target)	Actuals to Date	Variance Analysis	Notes
Education initial training	$ 1,800	$1,200	($ 600)	Company-wide assessment tool education expenses
Evaluation assessment salaries	$ 4,600	$4,500	($ 100)	
Delphi and Nominal Group rounds	$ 2,300	$2,450	$ 150	
Management and operations salaries	$ 16,745	$17,240	$ 495	
Materials and supplies	$ 17,000	$17,000	($ 0)	Assessment tool development and database integration. Completed on budget.
Administrative supplies and support	$ 750	$800	$ 50	
Travel	$ 12,720	$4,000	($8,720)	Travel was allocated in the budget for a potential round 3 as a face-to-face. Due to panel SME availability, time, and budget, a virtual web event was used. $2K was used for DNP student to conduct the virtual web event, and $2K to conduct the lessons learned face-to-face meetings at the organization's

				corporate headquarters.
Marketing & Advertising	$ 3,000	$2,000	($ 0)	
Total	**$ 58,915**	**$50,190**	**(89,725)**	