Context Assessment for Implementation Success

An Options Document

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Ariadne Labs

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Introduction

During Ariadne Labs' first six years, we have seen that our evidence-based solutions work when implemented successfully,[1] but we have also seen that adopting new tools and changing behavior is challenging. Many sites fail to integrate our solutions into practice effectively and sustainably, even when we utilize consistent implementation approaches. For example, when we introduced the Safe Surgery Checklist to all hospitals in South Carolina, fewer than half of those hospitals successfully completed the implementation program.[2] Similarly, despite a highly standardized implementation strategy, we saw significant variation in the number of essential birth practices performed at the sixty intervention sites during the BetterBirth Trial in Uttar Pradesh, India.[3] We are not alone in facing the challenges of implementation: as many as 40-60% of all efforts to introduce innovation in healthcare either fail to be implemented or sustained.[4-6]

One idea that reappeared constantly across Ariadne projects was readiness. However, beyond an intuitive understanding of a site "being ready to implement" (or not), Ariadne as an organization had little knowledge of what readiness entailed, how to measure it, or how to use it. Thus, in order to support Ariadne's goal of improving implementation at scale--both to more effectively support the introduction of our own solutions into practice and to create approaches for the implementation of any evidence-based practices in healthcare systems--we applied for and received a Spark Grant to fund an initial investigation into the available evidence about readiness.

Brief Methodology: Background Research

Broadly, the Readiness Spark Project aimed to recommend one or more pathways forward for Ariadne in incorporating readiness into our implementation work in the future. From October 2017 to August 2018, we combined an extensive (though non-systematic) literature review on organizational readiness theory and tools in the healthcare and business literature and interviews with experts (researchers and practitioners) in the field of organizational readiness. We synthesized a series of conceptual and practical recommendations, attempting to balance our focus between immediately applicable work (e.g. choosing an assessment tool) and longer term contributions to the field (e.g. exploring all of the conceptual possibilities). Additionally, we interviewed key members of Ariadne programs and platforms ("teams") to determine the needs and priorities around readiness across the organization and held multiple internal retreats to elicit feedback on our progress and refine our conclusions.

Readiness and Context "in Theory"

Early literature defined organizational readiness[1] *a priori* as one of many factors contributing to the effectiveness of an organization's implementation of change;[7] for Armenakis et al., "readiness is the *cognitive* precursor to the *behaviors of* either resistance to, or support for, a change effort" (681-682, emphasis original). However, over the ensuing decades of work, the precision of this definition eroded in numerous ways.

The original definition of organizational readiness was inherently about the individual. Readiness predicted the resistance or support of *each employee*, and while improving readiness required understanding and making use of group dynamics such as social networks, readiness itself was measured and understood as an individual trait. Currently, however, most authors describe organizational readiness as "multi-level:" individuals can be more or less ready, but so can meso-level groups (e.g. a department or work group) or a macro-level organization, and while those levels must interact in some (usually unknown) way, all of those levels are considered (part of) readiness.[8-12]

Similarly, while Armenakis et al. defined readiness as a cognitive state, current work also includes concrete and/or structural factors. For example, in much of Weiner et al.'s work, an organization is ready only when it "wants" to change (i.e. psychological or cognitive state) and "is able" to change (e.g. resources, processes, structures).[13] Others use different language: in presenting the DICE framework and tool, for example, Sirkin et al. use "soft" for psychological or motivation-related factors and "hard" for behavioral or capacity-related factors.[14] Regardless of the language used, both cognitive and structural factors are now routinely considered as part of organizational readiness.[8-10,15-17]

The tools and frameworks available for assessing organizational readiness reflect this current conceptual breadth. In the Promoting Action on Research Implementation in Health Services (PARIHS) Framework (the basis of the Organizational Readiness to Change [ORCA] tool), for example, "determinants of successful implementation" belong to one of three core elements: "(1) Evidence: the strength and nature of the evidence as perceived by multiple stakeholders; (2) Context: the quality of the context or environment in which the research is implemented, and (3) Facilitation: processes by which implementation is facilitated."[18,19] Others are more specific: one distinguishes between patient factors, provider factors, organizational factors, and structural factors ("the broader sociocultural context or community in which a specific organization is nested").[11] Similarly, the five major domains of the Consolidated Framework for Implementation Research (CFIR) represent similar distinctions: intervention characteristics, outer setting (external, structural, or broader social, political, economic context), inner setting (organizational context), individuals, and implementation.[20]

The names of the PARIHS and CFIR frameworks are instructive: though they are both considered "readiness" frameworks, they claim to generally address implementation success. Organizational readiness has, in many

[1] "Readiness" is a concept that appears across many different fields and operates in a number of varied ways. For the purposes of this project, we defined "organizational readiness" as reflecting how "ready" a site (organization, facility, institution, etc.) is to successfully undergo planned organizational change. Organizational readiness is therefore different from truly individual kinds of readiness (such as "college readiness," which measures a student's ability to cope with post-secondary work) and from preparedness (such as "military readiness," which measures a unit's ability to successfully react as a group to unexpected and generally emergency situations).

ways, broadened into a catch-all term for any factor that improves implementation of organizational changes, possibly a reflection of the common-language understanding of the word "ready." After all, if a site is "ready" to implement a change, they are more likely to be successful at that implementation than a site that is "not ready" to implement; therefore, "readiness" must reflect all the varied factors that determine successful implementation.

Practically, this overly broad definition makes research on the concept much more difficult--literature reviews alone become infinitely more complicated with a lack of consistent terminology and definitions. More importantly, using organizational readiness as a surrogate for "anything that improves the likelihood of successful implementation" leaves us with all of the misconceptions stemming from the common-language use of the word "ready" and none of the intellectual precision and utility of the original definition.

As we discovered in our internal interviews and retreat discussions, using the word "readiness" causes a number of pernicious misconceptions. First, while some researchers apply organizational readiness throughout the implementation process,[21] most follow the common understanding of the word: you can only be ready (or not ready) *before* you act (or, in this case, implement).[22] Once implementation begins, most people find it nonsensical to discuss an organization's "readiness to implement." However, most teams at Ariadne expressed a need for "readiness" information during the implementation process. Similarly, most people naturally assume "ready/not ready" to be a binary state ("more" or "less" ready being much less common concepts in everyday life), which precludes a deeper understanding of the inherent complexity of organizational readiness. Organizations may be more or less ready to implement and may fall differently on that spectrum in various domains. Also, depending on the intervention or change being implemented, the necessary combination of factors and levels of organizational readiness will likely be different.

Given these conditions, teams at Ariadne were understandably hesitant about the concept of organizational readiness, perceiving it to involve a limited but definitive (i.e. binary) judgement about a site's likely success with implementation at a single, early (and possibly premature) point in time. Using such a judgement to determine what kind of and how much collaboration a site received from Ariadne thus seemed shortsighted.

Other researchers have recognized the conceptual difficulties resulting from common-language understandings of "ready." For instance, Wandersman et al. have framed their work--in which assessing and manipulating organizational readiness is an ongoing process throughout implementation--as facilities or organizations being "ready" not for implementation as a whole but for the next step of the implementation process.[2] This kind of semantic work-around does not, however, resolve all of our concerns with organizational readiness.

As an alternative to readiness, context offers a useful framework for understanding variation in implementation success based on setting. Originally (and still) a literary term, context refers to the "setting" of a word, idea, statement, or event in the broadest sense. In implementation, context refers to any factor *inherent to the site of implementation* that will affect the success of implementation. Context includes both concrete, structural factors (e.g. resources) and psychological factors (e.g. motivation) and is a time-neutral concept that can be assessed and manipulated before, during, and after implementation. Perhaps most importantly, context is descriptive rather than discriminatory. Assessing context--as opposed to determining readiness--allows implementers to collect necessary and relevant information about facilities and organizations and to more easily use that information in varied and complex ways.

[2] Personal Communication: Jonathan Scaccia and Natalie Henrich. June 2018.

Despite the differing central concept, we see a great deal of relevance in past and current work on organizational readiness, particularly in the healthcare and business fields. Our understanding of context, for example, rests on foundational assumptions that are shared by the work on organizational readiness:

1. We can break context (readiness) into discrete "domains" (e.g. leadership, resources).
2. We can measure these domains.
3. We can aggregate these domains into one or more context (readiness) metrics that provide us with information about the likely success of implementation.
4. We can manipulate aspects of context (readiness) to improve domain measurements or context (readiness) metrics in order to increase the chances of implementation success.

While this framework of assumptions does exclude potentially relevant and useful approaches to measuring and improving context,[3] it represents the most readily scalable method. Given its alignment with Ariadne's goal of implementing at scale, we drew upon this framework to identify five major gaps in the research and organize current and future work in context assessment at Ariadne Labs.

Research on Context Assessment and Implementation: Current Gaps

Gap 1 We lack sufficient evidence to determine which context factors (domains) are relevant to implementation success.

Gap 2 We lack sufficient evidence to determine which tools best assess context.

Gap 3 We lack strategies for applying the results of context assessment to improving implementation.

Gap 4 We lack evidence about the impact on implementation success of

- assessing context, and
- applying the results of context assessment.

Gap 5 We lack strategies for integrating context assessment (and the application of its results to implementation) into spread at scale.

Research Gap 1

We lack sufficient evidence to determine which contextual factors (domains) are relevant to implementation success.

The organizational readiness literature provided numerous sources of factors that are potentially relevant to implementation success, of which the Consolidated Framework for Implementation Research (CFIR) is the most comprehensive and widely used.[20] Intended to include "everything but the kitchen sink," CFIR comprises five major domains, each of which incorporates multiple (4-14) subdomains. The comprehensive nature of CFIR is both its blessing and its curse: CFIR incorporates every contextual factor anyone could ever think of--possibly

[3] This analytical approach leaves no room for understanding how holistic evaluation by experts (i.e. "the gut check") works or can be useful, for example.

because after CFIR was published in 2009, most people stopped trying to think of new factors and began using CFIR as a starting point. However, we have little empirical evidence to determine which domains are predictive of implementation success. Tool developers typically select domains based on expert consensus or on experience-informed beliefs about "what matters" in implementation.[23] One notable exception is the DICE tool (BCG), which includes domains that showed statistical correlation with implementation success.[14]

Research Gap 2

We lack sufficient evidence to determine which tools best assess context.

Lack of evidence about the relevance of the various contextual factors has not limited the creation of tools to assess context (usually under the guise of measuring readiness). These tools vary in many ways, reflecting both the conceptual breadth of readiness (see above) and variation in pragmatic issues of measurement:

- Some assess context for implementing a specific intervention, while others assess context more generically (i.e. for implementing any intervention).
- Some are based on a framework or theory, while others are based on empirical experience.
- Some are meant to be completed by individuals, while others are meant to be completed by teams.
- Some are meant to be completed internally (i.e. self-reported by the organization implementing the change), while others are meant to be completed by an external data collector.

We have no empirical evidence about the majority of existing tools. Of those tools that have been tested, most have been tested for internal properties (e.g. internal validity). For a minority of the tools, researchers have tested their correlation with implementation factors, such as the choice of intervention or attitudes toward implementation.[24] Of all the tools we examined, only DICE (BCG) correlated statistically with successful implementation.[14]

Research Gap 3

We lack strategies for applying the results of context assessment to improving implementation.

Little work has been completed on the best way(s) to use context assessment to improve implementation. Uses for context assessment generally fall into one of three categories:

- Screening/Stratification: Ranking sites in terms of context (i.e. readiness to implement) allows implementers to make more informed decisions about how to proceed, whether that decision is a straightforward "ready/not ready" dichotomy or a more nuanced understanding of how a site's context is likely to impact implementation.
- Meeting: Using context assessment in order to identify areas of weakness allows implementers to increase the chances of implementation success by adapting their intervention and/or implementation strategy to better fit the site's context.
- Elevating: Using context assessment to identify areas in which a site needs to "improve" their context allows implementers to increase the chances of implementation success (with a standard intervention and/or implementation approach) by better fitting the site to the implementation.

Most commonly, implementers use context assessment to elevate sites prior to (or during) implementation. Some researchers have developed, or are in the process of developing, principles and customized technical support materials to accompany their context-assessment tools.[4,25]

We were unable to find any evidence on the impact of context-assessment tools on implementation success; in conversations with researchers who have developed tools, we learned that almost no groups were using these tools at scale. The notable exception is ongoing work by the Wandersman team, who are in the early stages of using their Readiness Measurement Tool (RMT) to support implementation of base-wide health prevention plans at 93 United States Air Force bases and 17 National Guard bases. Each site completes an online readiness assessment and receives an auto-generated report, which includes automatically selected technical assistance materials matching the areas of weakness identified in the assessment.

Research Gap 4

We lack evidence about the impact on implementation success of (1) assessing context and (2) applying the results of context assessment.

Other than the aforementioned data linking BCG's DICE tool to implementation outcomes, we are unaware of any work showing context assessment predicting implementation success.

Research Gap 5

We lack strategies for integrating context assessment (and the application of its results to implementation) into spread at scale.

Other than the aforementioned work being performed by the Wandersman team, we are unaware of any strategies for integrating context into implementation at scale.

Brief Methodology: Tool Development

Domain Analysis

Given the scarcity of data for which context domains matter most, we sought alternative methods of winnowing the comprehensive list of factors in frameworks like CFIR. We recorded the characteristics of 80 readiness tools and identified the domains in the 29 tools that had been tested in some capacity. We ranked the domains based on how many tools included each one and combined this ranking with the results of a Delphi survey on important domains related to organizational readiness for change.[23] Taking into consideration the needs and priorities that Ariadne teams had expressed in our interviews, we generated an initial list of domains we believed likely to be relevant in context assessment. We presented our list at an internal retreat attended by members of the Implementation Platform, SICP, and the Spark Readiness Team (including the executive sponsor).

[4] Personal Communication: Wandersman Team and Natalie Henrich. June 2018.

Tool Analysis

Given the lack of data on the utility of existing tools and the goal of consolidating Ariadne's work on context assessment, we sought to triangulate among multiple kinds of evidence in order to select a tool with which to move forward. First, we developed a series of criteria based on the priorities identified by Ariadne teams. For example, we preferred reliance on closed-ended questions because that characteristic would offer us more flexibility in using it at scale. Excluding any that lacked testing altogether, we created a heat map of the available tools. Second, for the five tools that included all of our priority domains, we assessed other characteristics that were more difficult to standardize into a rubric. For instance, we sought a tool that was "not too burdensome;" however, "not too burdensome" was more than simply the number of questions. More questions that were closed-ended or that required easily accessible information would be less of a burden than fewer questions that were open-ended or that required extensive investigation to answer.

We sought feedback from Ariadne teams on our narrowed list of tools. Additionally, given our high level of interest in the Readiness Measurement Tool (RMT, Wandersman Team) and DICE (BCG) and the opportunities to engage with their creators, we met with both teams to learn more about their tools and to elicit feedback on our five most highly ranked tools. We summarized our analysis of the RMT and DICE below.

Theory of Change

To address the scarcity of information about integrating context assessment into implementation, we created a theory of change to explain how the results of these assessments can inform and enhance implementation at Ariadne.

Domain Analysis

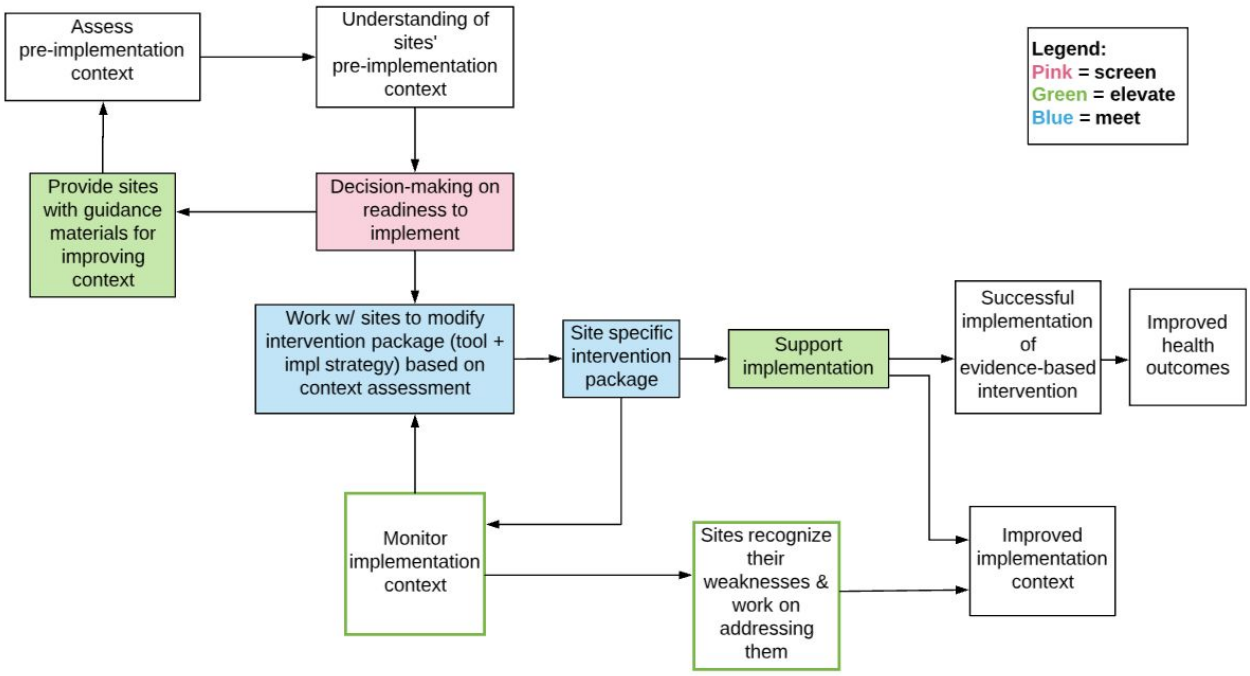
Domain	Definition
Leadership	Leadership commitment to the intervention and governance structure. Respect for leaders.
Clinical Team Functionality	The ability of clinical teams to function as high performing teams.
QI Experience/Ability to Implement	The necessary skills, resources and motivation needed within the organization to implement the intervention. The fit of the intervention with workflow and organizational priorities.
Ability to do the Intervention	The competencies, knowledge and resources needed by individuals to do the intervention. *NB*: Does not include skills necessary to drive implementation.
Internal Context (Climate/Culture)	The internal infrastructure and organizational norms, and values that support or hinder the implementation process.
External Factors	Policies, infrastructure, systems, culture, and other factors that are "larger" than the organization or facility in which the intervention is being implemented.

Tool Analysis

	Benefits	Drawbacks
RMT	• Low burden to complete (closed-ended questions, Likert scale) • Includes all of our key domains except external factors • Adaptable for use across projects • Well-tested internal properties • Currently being tested at scale • Applicable before, during, and after implementation • Designed to be completed by multiple people/roles	• Some items seem redundant • Many questions • No predictiveness testing • Not available in the public domain
DICE	• Tested for predictiveness • Includes several of our key domains • Designed to be completed collaboratively to elicit multiple perspectives and to generate discussion/shared understanding • Applicable across projects without adaptation • Publicly available	• Difficult to scale; requires a trained facilitator • High burden to complete (facilitated group discussion) • Only applicable during implementation

Although we believe these tools to be beneficial, we determined that, in order to meet the needs of Ariadne Labs' project teams, to assess and integrate context at scale, and to fulfill our principle of creating tools that are publicly available, we will develop our own context-assessment tool following the steps of the Ariadne Arc, including rapid-cycle feedback and feasibility, acceptability and perceived utility testing.

Theory of Change



Screening (pink box) allows the site and Ariadne to determine the appropriate level of collaboration for the site's context. For implementation sites with key contextual weaknesses, for example, Ariadne may provide resource materials to improve those factors or moderate a community of practice in which the site could receive more individualized feedback from other implementers. Alternatively, for sites with strong contexts, Ariadne might partner directly with the site to learn key lessons from their implementation processes. We aim to direct the right sites to the right resources with the right support to successfully implement beneficial organizational changes.

Meeting (blue boxes) allows the site and Ariadne to adapt Ariadne's intervention (tool + implementation strategy) to better fit the site's context. We might suggest, for example, implementing specific parts of an intervention first (or exclusively) or holding coaching calls more or less frequently. Repeating the context assessment at regular intervals throughout implementation will help us identify any changes in context that must be addressed with further modifications to the tool and/or the implementation strategy.

Elevating (green boxes) allows the site and Ariadne to strengthen a site's context, often as a "side effect" of collaborating with Ariadne on implementation projects or of engaging in a community of practice. For example, working with Ariadne coaches to implement the WHO Safe Childbirth Checklist may lead a site to an increased appreciation for the importance of collecting data and providing feedback to front-line staff in many different areas (not just in the use of the Checklist). However, elevating may also be an explicit goal of implementation: Ariadne may provide sites with resources specifically designed to offer guidance on addressing contextual challenges to implementation, such as promoting buy-in from leadership, potential champions, and resistors or performing low-tech simulations to improve skills.

Moving Forward with Context at Ariadne: Summary of Recommendations

Create a Context-Assessment Toolkit, including an Ariadne Labs-created context-assessment tool and a context-assessment interview guide.

1. **Research Gap 1** Continue to refine our list of domains based on feedback from Ariadne programs and platforms, including listing factors that are likely relevant across all solutions (and would therefore become a "fixed" part of any context assessment) and those that are likely solution-specific. In particular, this work will focus on identifying key external factors and development of a process for assessing these factors and others that are relevant in a particular context.
2. **Research Gap 2** Work with Ariadne teams and external stakeholders as the Toolkit moves across the Ariadne Arc in order to make the Toolkit responsive to Ariadne teams' needs and more broadly useful (and publically available).
3. **Research Gaps 1-3** Hold a convening with our collaborators, implementation partners, funders, and other stakeholders to establish and strengthen relationships necessary for other recommended steps and to elicit feedback on tool development.
4. **Research Gap 3** From the Implementation Platform, elicit criteria and suggestions for their use to interpret context-assessment results for screening purposes. Criteria should broadly reflect the various purposes Ariadne teams have identified: (A) sites in which to test tools (i.e. stacking the deck for success), (B) sites with which to collaborate to learn implementation lessons, and (C) sites with which we have less intensive interaction.

Implement the Context-Assessment Toolkit.

5. **Research Gap 3** After completing testing of the context-assessment tool, we propose testing the feasibility, acceptability and perceived utility of strategies to integrate context assessment throughout the implementation process.
6. **Research Gap 3** Curate and make more readily available resources (materials, principles) Ariadne has already developed that are relevant to elevating sites' context. Rather than leaving this wisdom scattered and buried in various implementation toolkits and guides, we suggest collecting and organizing it in a way that usefully reflects the domains examined in our context assessments.
7. **Research Gap 5** Work with partners to create a testable strategy for scaling context assessment and integrating it into implementation.

Perform Further Research on Context Assessment and Implementation.

8. **Research Gaps 1 and 4** Seek funding for the creation of a data repository to combine information about sites' contexts and their implementation outcomes in order to determine which contextual factors are most highly associated with implementation outcomes. Share this data repository with collaborators who will both contribute to and benefit from it. Consider funding opportunities for the repository and the integration of this repository into a broader data-science team driven repository.

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