Sharing the Power of the ARIS BI Toolkit: The Development and Evolution of a Consulting Protocol for BI Professionals

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Abstract

The ARIS Broader Impacts (BI) Toolkit Consultation Protocol (BITCoP) was designed to help BI professionals deliver foundational knowledge and resources to support higher education staff and faculty in developing BI plans for their NSF proposals. Beyond the scope of the National Science Foundation's Proposal and Award Policies and Procedures Guide, BITCoP was designed to address key terminology, valuable resources, and the usefulness of the ARIS BI Toolkit. Goals of the BITCoP include to give BI professionals nationwide a mechanism for delivering consultations that result in robust BI plans and gain insight into the evolving needs of the research community.

University researchers applying for National Science Foundation (NSF) grants must include Broader Impacts (BI) sections in their research proposals (NSF, 2023). These BI sections are crucial, as they outline how the proposed research will benefit society beyond the immediate academic community. Researchers must demonstrate the potential societal, educational, or economic impacts of their work, such as developing a more diverse, globally competitive STEM workforce; increasing public scientific literacy; and public engagement of science and technology to inform public policy (ARIS, 2024). The BI requirement encourages scientists to consider the broader implications of their research and to engage with a wider audience; its ultimate goal is to ensure that public funding supports projects with significant, far-reaching benefits.

However, many researchers, especially those early in their careers, have little to no experience working with the community in public engagement and outreach. Tools and programs are needed for guiding and supporting all researchers—from early to later career—in the development of robust BI plans.

To address this need and leverage the ARIS Toolkit, the ARIS BI Toolkit Consultation Protocol (BITCoP) was created at The University of Texas at Dallas (UT Dallas). BITCoP is a tool that BI professionals can use to help researchers develop and plan BI activities. An integral part of the BITCoP is the pre- and post-consultation evaluation component. Prior to a consultation, the participating researcher receives a short survey, and the survey responses are then used to guide the discussion between the researcher and the BI professional and maximize the impact of the consultation. After the consultation, the researcher receives a second survey to assess the effectiveness of the consultation, the shared resources, and the Toolkit. To measure the effectiveness of the BITCoP beyond UT Dallas, it was also tested at North Carolina State University (NC State), with minor alterations. This paper describes the development and implementation of the BITCoP at two different universities, the impact on the participating researchers, and the two BI professionals leading the effort.

Literature Review

Consultations

Consultations can be an effective means of providing groups or individual researchers with advice and guidance as they navigate proposal development. The term "consultation" is often associated with the medical field (Lind et al., 2022) and business (Christensen et al., 2013; Turner, 1982), and consultations are often conducted by consultant organizations. In the field of education, one-on-one instructional consultation is more commonly used to increase teacher knowledge and skill (Brinkley-Etzkorn et al., 2016; Finelli et al., 2008; Kaiser et al., 2009).

This article is included in a special issue focused on the Implementation and Evaluation of the ARIS Broader Impacts Toolkit project, which is designed to advance the understanding of mechanisms and supports needed to develop effective Broader Impacts (BI) statements. The full issue can be found at https://jces.ua.edu/37/volume/17/issue/2

Arthur N. Turner, professor of organizational behavior at Harvard Business School, states that management consulting insights can provide helpful guidance in academia when working with researchers. A useful way to study effective consultations is to consider eight fundamental objectives, arranged hierarchically:

1. Providing information to a client
2. Solving a client's problems
3. Making a diagnosis, which may necessitate redefinition of the problem
4. Making recommendations based on the diagnosis
5. Assisting with implementation of recommended solutions
6. Building a consensus and commitment around corrective action
7. Facilitating client learning—that is, teaching clients how to resolve similar problems in the future
8. Permanently improving organizational effectiveness. (Turner, 1982)

Additional measures supporting effective consultations include building a commitment around corrective action and facilitating client learning. Turner notes that a consultant must have the "ability to design and conduct a process for (1) building an agreement about what steps are necessary and (2) establishing the momentum to see these steps through" (Turner, 1982). He also states that "learning during projects is a two-way street. In every engagement, consultants should learn how to be more effective in designing and conducting projects" (Turner, 1982). As the authors developed the BITCoP at the two participating institutions, Turner's fundamental objectives assisted in the process of individualizing the BI support and coaching each researcher received. According to Little and Palmer (2011), it's the process, as much as the content, that matters in consultations.

Supporting Researchers on BI

Because the NSF has prioritized BI, researchers are seeking assistance from individuals with BI expertise as they develop the BI sections of their proposals (Renoe et al., 2023). BI professionals offer expertise in identifying and articulating the potential societal benefits of research projects to ensure that proposals align with funding agency requirements. They help researchers craft clear, compelling narratives that highlight how their work can enhance public understanding of science, promote diversity in STEM fields, and contribute to technological advancements. Additionally, BI professionals often help researchers establish partnerships with community organizations, educational institutions, and industry stakeholders to amplify the reach and effectiveness of their proposed activities. Research is finding that university organizations play an important role in supporting both researchers and BI professionals (Renoe et al., 2023).

The America COMPETES Reauthorization Act of 2010 encouraged higher education institutions to take a centralized, institutional approach to supporting BI efforts. Since this call to action, NSF has funded initiatives to guide institutions (NSF, 2023; Renoe et al., 2023) and supported the formation of collaborative partnerships across organizations, considering geographical proximity, mission alignment, and strategic partnership for capacity building and resource sharing (NSF, 2023). According to a memorandum from the Executive Office of the President, "community participation in the scientific endeavor enriches and extends the benefits to the Nation, can increase public trust in science, and leads to more innovative research of all kinds, including research that addresses the needs of diverse communities" (Young & Nelson, 2022, p. 9). Centralized BI offices have the additional advantage of supporting researchers with a shared language for BI work, tools to measure institutional impact, and resources to build trust between universities and communities (Renoe et al., 2023).

Many universities, such as UT Dallas, have embraced this recommendation and centralized the expertise and experiences of BI professionals and support staff. By providing strategic guidance and resources, these experts enable researchers to create proposals that are not only scientifically robust but also socially relevant and impactful. However, many other universities continue to maintain decentralized infrastructure, where BI professionals are spread throughout the university (National Alliance for Broader Impacts, 2018). Researchers are left on their own to find the different offices needed to help them develop their BI proposals.

This paper discusses how two universities with different BI infrastructures collaborated to develop an ARIS BI Toolkit consultation protocol designed not only to support their respective institutions' researchers when developing and planning BI proposals but also to provide a set of useful guidelines for all BI professionals working with the BI Toolkit.

Methods and Processes

UT Dallas consulted with their IRB director, sharing the project description and the intended use of survey data. It was determined that the study was program evaluation, not human subjects research as defined by 45 CFR 46 (U.S. Department of Health and Human Services, 2021). NC State also consulted with their IRB staff. The study was termed exempt.

The Need for a Protocol

UT Dallas has a centralized sponsored projects office that provides researchers with a checklist of items required for proposal submission, supporting resources, a proposal review, and assistance with submission to the appropriate funding agency. The office also developed a document that addresses diversity, equity, inclusion, and BI, highlighting terminology and university resources specifically. However, researchers are required to build out their BI plans and long-term partnerships independently. UT Dallas identified a need to better support researchers working on BI proposals and charged the Research Education Program Development and Outreach lead with developing infrastructure within the office to fill this gap. Initial support included (but wasn't limited to) the facilitation of community partnerships, connections within the university, and outside BI training opportunities. Engagement in the ARIS Toolkit project was synergistic with university needs. Participation in the ARIS Toolkit project led to the development of the BITCoP as well as pre- and post-consultation surveys to evaluate how researcher confidence levels changed with respect to developing BI plans. Following the protocol will enable a longitudinal data gathering opportunity that allows UT Dallas BI professionals to continually iterate and optimize the services they offer.

Protocol Development and Implementation

UT Dallas took the lead in developing the BITCoP. The first step was to create a PowerPoint presentation to share during consultations with researchers. The information in the presentation aligned with Turner's (1982) first fundamental objective of an effective protocol: providing information to a client.

After the presentation was created, an email was sent to inform researchers of the opportunity to engage with the BI Toolkit as a fundamental guide for their BI plans. The initial focus of this outreach was to share an overview of NSF and a descriptive marketing blurb advertising the consultations. The email spotlighted the BI Toolkit, its components, and the benefits of using it. It also made researchers aware of what to expect during a consultation, such as a guided tour of the Toolkit and periodic check-ins. The email included a link to the Toolkit as well as a link to register for a consultation. Recipients who proceeded to register were asked to provide their name and date and time preference for a consultation. Consultation information was initially disseminated to researchers using a faculty listserv. After the initial "push," consultations with five individuals and one group of three were scheduled.

To prepare for the consultations, a survey was created with the intent to better understand consultees' needs. The survey included questions to make the consultation more individualized, including "What NSF program are you hoping to apply for?" "What kind of outreach have you done in the past?" and "How did it go?" This information aligned with Turner's (1982) second fundamental objective: solving a client's problem.

The initial consultations were more conversational in nature. A presentation was developed for individual and large group consultations to encapsulate relevant terminology, resources, and a guided tour of the Toolkit. After a brief introduction, NSF guidance was shared: "All NSF proposals are evaluated based on two criteria: Intellectual Merit and Broader Impacts." Then, the consultee(s) were asked how they defined Intellectual Merit (IM) and BI. The Proposal and Award Policies and Procedures Guide (NSF, 2023) was referenced, and the five review criteria relevant to IM and BI were discussed. Additionally, ARIS's Guiding Principles were shared as a resource for consultees to use when developing their BI initiatives. To maintain audience engagement parallel with procuring foundational knowledge, "An Introduction to Broader Impacts" video was shared. This segued nicely into a demonstration of the usefulness of the BI Toolkit.

The first BI Toolkit consultation took place virtually with an engineering department head. The consultee hoped to apply for three funding mechanisms over a 5-month period. At the conclusion of the consultation, the department head invited the BI professional (Willoughby) to present the BI Toolkit to engineering faculty during a summer retreat.

Following the BI Toolkit consultation, Willoughby sent a thank you email including answers to outstanding questions and an offer to further assist. If needed, a follow-on meeting

was scheduled. When no further assistance was needed, a post-consultation survey was sent seeking feedback. The survey sought to evaluate the consultations and the Toolkit's efficacy and utility; seek suggestions for improvement; and further understand which tools were most helpful.

After the initial round of consultations, Willoughby became more aware of and comfortable with sharing the usefulness of the BI Toolkit. Two distinct pathways emerged: one for early-career researchers and another for seasoned researchers. Researchers new to proposal submission were encouraged to utilize the Wizard tab within the BI Toolkit. The Wizard contains literature to build a foundation of BI knowledge and includes the following components: audience, partners, budget, relevance to society, and evaluation. Seasoned researchers were encouraged to use the Plan Elements, which allowed the researcher to draft their BI plan using relevant prompts. At any time, seasoned researchers could refer to the Wizard tools to procure fundamental knowledge, then resume their BI draft.

NC State Replicating the Protocol

To test the BITCoP beyond UT Dallas, the protocol was also used at NC State with minor alterations. The UT Dallas BI professional (Willoughby) connected with a BI professional at NC State (Bug). Together they reviewed the developed strategies for meeting with researchers and shared the presentation and email introductions. Bug modified the PowerPoint and email to accommodate NC State programming needs, with the larger goal of determining whether the BITCoP could be replicated with minor changes. The following section describes processes used with NC State researchers.

An opportunity for a BITCoP consultation occurred when researchers contacted The Engineering Place (TEP) for help with a grant proposal support letter for their BI section. TEP is NC State's K–20 education and resource headquarters for exploring engineering and engineering education. TEP programs target all aspects of the Engineering Education Ecosystem, making the programming unique in the state. BI requests typically occur 1 to 2 weeks before a grant is due. A meeting was immediately requested to go over the researchers' plans and discuss the consultation. The consultation provided an opportunity to share the ARIS BI Toolkit and discuss how it could support and improve the BI component of researchers' proposal. The consulting researchers were informed of the collaboration with UT Dallas to test the BITCoP and the BI Toolkit. The researchers were also asked to complete pre- and post-consultation surveys. Realizing the researchers needed support in understanding the NSF BI expectations, the BITCoP could not have come at a better time.

The email template and PowerPoint presentation were modified with few changes. For example, UT Dallas colors were changed to NC State colors. The notes in the presentation assisted in the consultation preparation and delivery. Below is a sample of three consultations and how the BITCoP was revised along the way. Pseudonyms have been used to protect researchers' identities.

Consultation Delivery 1. The first consultation occurred when two engineering researchers contacted Bug to discuss how TEP could support their outreach initiative. Joe is a full professor with a record of successful grants and Sara is an assistant professor. They were submitting a multinational, multidisciplinary NSF grant. The researchers received and completed the pre-consultation survey. Utilizing their responses, Bug shared the modified PowerPoint presentation, skipping the "Quick Wizard Walkthrough" video and conducting the session more as a presentation rather than a conversation. While the researchers felt the BI Toolkit was helpful, the grant was too far along to integrate the Toolkit. And while the grant received favorable reviews, it was not funded. Timing is a common challenge when working with researchers, as they often reach out to the office when the grant deadline is just weeks away.

Consultation Revision 2. Consultation 2 was with David, a full professor who has received many NSF grants, has served on panels, and is very familiar with BI. He was in the process of submitting an NSF grant. After reflecting on Consultation 1, Bug decided to show the "Quick Wizard Walkthrough" video to help frame the conversation. This consultation was more conversational than the first and felt more effective. After viewing the video, David was asked his opinion on whether the video should be shown in future consultations or whether it could be skipped, allowing researchers to view it later. He felt the video was a great overview and should be shown, as many researchers are busy and may not take the time to go back and watch it. Working through the budget simulator was valuable and became an integral aspect of the consultation. This sparked a great conversation about the importance and costs of BI. When asked about the emphasis NSF places

on IM and BI, David stated that in his experience serving on panels, it had been communicated that the IM is the most important aspect of the review. He felt that BI does not enhance a proposal, but it also should be good enough that it doesn't hurt the proposal. He had never been in a situation where BI was the deciding factor. While this may have been the case in the past, NSF has been emphasizing the importance of well-developed, cohesive, and innovative BI proposals (NSF, 2023, n.d.; Renoe et al., 2023).

Consultation Revision 3. Michelle, an early career researcher, was in the process of developing an NSF CAREER grant proposal and requested a consultation. Since BI is a strong component of a CAREER proposal, the initial presentation was revised to include a slide with the statement "Creative, effective research and education plans . . . build a firm foundation for lifetime contributions to research, education, and their integration." This addition was intended to spark conversation with the researcher about the importance of a strong education plan and supporting budget. One aspect of a robust education plan includes providing a budget that supports the education and BI initiative, yet often researchers neglect to allocate sufficient funds in their budget. Learning about the BI Toolkit helps researchers understand the importance of a strong, integrated BI plan along with an adequate budget.

This revision also included adding a programmatic slide about TEP to inform researchers of the various programs conducted and potential collaborations.

Throughout the consultations, data were collected from the pre- and post-consultation surveys. After the three consultations were completed, the data were analyzed to inform future consultations. The following section describes the usefulness of the BITCoP and suggestions for consultation improvement.

Findings From the Surveys

Participating researchers were asked to complete pre- and post-consultation surveys to capture changes in self-efficacy with respect to BI development, self-perceptions of BI plan elements with which they needed the most assistance, and general feedback regarding the value and use of the Toolkit.

Pre-Survey Data

Thirty-five UT Dallas and 29 NC State researchers completed the pre-survey prior to engaging in the BITCoP. Researchers were asked the following (Table 1).

These responses indicate needs in all five areas, suggesting that consultations need to address them all. The highest identified need was help with designing proposed BI activities

Table 1. Researchers' Needs to Develop BI Plans

With which aspects of developing a Broader Impacts (BI) plan do you most need help?	UT Dallas	NC State	Total
1. Ensuring my BI plan addresses one or more targeted BI priorities, goals, or outcomes as outlined by NSF	13	16	29
2. Designing the proposed BI activities so that an audience is clearly defined and how the activities contribute to benefiting societal outcomes is clearly stated	17	18	35
3. Designing the proposed BI activities to be creative, original, and potentially transformative	13	21	34
4. Ensuring the BI goals, BI budget justification, and BI plan are clearly articulated	13	15	28
5. Ensuring that the qualifications of those who will be conducting BI activities are well described and suited to the anticipated roles	11	17	28
Other: One aspect that I feel I am lacking is some type of evaluation plan on the impact of my activities. Also, it would be nice to be more aware of mechanisms to ensure a lasting impact on the tools or modules developed in the process.	1	1	2

with a clearly defined audience and clearly stated benefit to societal outcomes, closely followed by designing the proposed BI activities to be creative, original, and potentially transformative. Future consultations will highlight these two areas during the conversation. It is also important when starting the consultation to review these aspects to ensure researchers' needs are addressed.

Pre-Survey Reflections. Many of the participating researchers found they needed help in all areas. When asked which aspects of developing a BI plan they most needed help with when developing proposals, respondents indicated the highest area of need as "Designing the proposed BI activities so that an audience is clearly defined and how the activities contribute to benefiting societal outcomes is clearly stated." Taking additional time to discuss researchers' passions and interests can help them cultivate their BI identity and identify the audience they wish to support. According to Merson et al. (2018), there are multiple dimensions of identity and many contexts researchers can explore to help them identify their BI identity. These dimensions include their science/engineering discipline, scholarship and research, personal preferences, capacities and skill sets, institutional context, and societal needs. Discussing these topics with researchers can help surface their audience of interest and generate conversation about how to best develop beneficial activities to complement their research. The BITCoP evolved to include this conversation with researchers, especially early-career researchers.

The second-greatest need was guidance in designing the proposed BI activities to be creative, original, and potentially transformative. Consultants can discuss how research can build upon known approaches or plug into existing campus programs. Developing a course or having students work in the lab is not considered transformational but part of a professor's job. However, partnering with a university or community organization and building upon or creating a new activity or program is considered transformational. Providing examples of successful BI grant proposals can be helpful, and this was added to the BITCoP.

Post-Survey Data

Immediately after the consultation, researchers were asked to complete the post-consultation survey to identify the usefulness of the consultation and Toolkit. Ten UT Dallas researchers and 28 NC State researchers completed the post-consultation survey. The majority of researchers found the Plan Elements were overall *easy* to *very easy* to follow when asked, "How easy were the ARIS BI Toolkit Plan Elements to follow?"

UT Dallas asked, "What tool helped you the most?" and "What tool did you find least useful?" Researchers selected all that applied. These results (Table 2) indicated that most researchers found the rubric most helpful, suggesting that the consultation should spend more time discussing the rubric and how it can be used to evaluate written proposals. *The Reliability and Validity of the ARIS Broader Impacts Rubric* article by Iverson et al. (2024) in this special edition may provide additional rubric information.

General Comments Regarding Toolkit Value. The following is a sample of anecdotal evidence regarding the usefulness of the BI Toolkit for researchers.

- Speaking about the rubric, it was "helpful having a grade and then being able to localize where improvement needs to happen."
- The Guiding Principles were most helpful because these are applicable to a wide range of solicitation types. The Guiding Principles that helped with specific questions related to team expertise, original and transformative concepts, organization, and path to success, etc. These points help the PI to evaluate if the proposal plan follows the necessary spheres for a successful Broader Impacts section.
- "[The Toolkit] gives a good overall perspective about how to plan and develop a BI section. It is specially (sic) helpful for early career faculty that have not attempted to create a BI section yet."
- "I think this is a great tool and it can be really helpful for many faculty."

Table 2. UT Dallas Researchers' Perceived ARIS BI Toolkit Elements Usefulness

Tool	Most Helpful	Least Useful
Guiding Principles	0	0
Plan Elements	1	1
Wizard	2	0
My Summary page	0	1
Checklist	2	1
Rubric	4	1

- When asked for additional feedback or comments, one researcher stated, "I think this is a great tool and it can be really helpful for many faculty."
- The Toolkit was "Highly recommended for new PIs and those doing new federal proposals."
- "Make everybody aware of ARIS as soon as possible. Emails would be good and inclusion in the Office of Research webpage. Furthermore, when a PI contacts their grant specialist, the specialist could provide a reminder of the existence of all these resources."

General Comments Regarding Consultations. Researchers' iterative feedback regarding consultation effectiveness was important in improving the BITCoP. Both the UT Dallas and NC State post-consultation surveys asked, "In what ways could the consultation better assist you?" The following is a sampling of respondents' comments.

- Reminding researchers to "Review the 'site' (ARIS BI Toolkit site) before the initial meeting to see how it works so the meeting is more interactive and less of a demonstration" would be helpful.
- Another consultee felt that "factual statistics on the type of Broader Impacts activities proposed and budgets for those activities" would be beneficial.
- One consultee felt "providing local resources to folks on campus that could help with parts that are weak" would be helpful.

Post-Survey Reflections. The data indicated that almost all faculty members were interested in learning about a tool that could help them develop more effective BI proposals. When asked to rate the usefulness of each Toolkit element, UT Dallas researchers found the rubric the most beneficial, while the NC State researchers found the Guiding Principles the most beneficial. Overall, there was no consensus among the two groups regarding which Toolkit element was the most helpful, indicating that researchers' needs are unique. Because of this uniqueness, if the BITCoP is conducted with an individual researcher, spending a few minutes to learn about their experiences and BI research identity may help focus Toolkit element emphasis. In a group consultation, equal emphasis on all elements is important.

BITCoP Evolution

Through extensive implementation and collaboration among the two universities, the BITCoP[1] was developed and iterated, resulting in the following steps:

1. Recruiting mechanism: Send an email blast to engage researchers in a consultation with a BI professional. The email should include information about the ARIS BI Toolkit, consultation expectations, a link to sign up for a consultation, and BI professional contact information.
2. Pre-survey: Distribute a pre-consultation survey to researchers requesting assistance. Use consistent questions such as "What NSF program are you hoping to apply for?" and "What kind of outreach have you done in the past?" Use the information gathered from the pre-survey to tailor the consultation to researchers' specific needs. Using consistent questions, which can be iterated over time, will assist with longitudinal data gathering and understanding of the needs of the researcher community at the institution.
3. Content: Create a PowerPoint presentation to help guide the conversations with the researchers. The presentation should include an introduction to the BI professional, a reference to the importance of IM and BI, an overview of ARIS's Guiding Principles, an ARIS BI Toolkit Wizard video presentation, and a link to the BI Toolkit. The consultation should also include a BI professional–led ARIS BI Toolkit walk-though. Below are links to the iterations of the presentation during the development process:
   a. First iteration
   b. Second iteration
   c. Third iteration
4. Post-survey and follow-up: Touch base with the researcher shortly after the consultation to understand if any follow-up conversations or additional resources are required. In addition, provide a post-survey to understand the value of the consultation for the researcher and determine any needs for improvement in the BITCoP.
5. Longitudinal evaluation: Maintain a database of the survey responses and revisit periodically to determine any emerging patterns or consistent needs of the researcher community at the institution.

[1] https://utd.link/BITCoPResources

Next Steps

The BITCoP will continue as an iterative mechanism for improving professional support of researchers' BI needs. The development and piloting process identified areas for improvement. Some improvements will occur with increased implementation of the BITCoP, such as understanding communication cadence. For example, consultees initially failed to complete the post-consultation survey. After email requests to complete the survey proved ineffective, the communication was reviewed and updated to ensure that the purpose of the post-survey and its value were noted, as well as the time it would take for the consultee to complete it. A quick response (QR) code to access the survey was added to the end of a slide deck used during the consultation. From project start to finish, one-third of the consultees completed the post-consultation survey. As the effort progresses, additional mechanisms to increase the response rate and continued engagement will be investigated.

Some improvements will require raising broader awareness of the time needed to develop BI plans. As mentioned previously, many consultations occurred just 1–2 weeks prior to grant deadlines. While it was appreciated that researchers sought consultations to help them create BI plans, it is difficult to generate a robust BI plan and potentially engage partners in such a short timeframe. This is a serious obstacle to success. There is no quick fix, and it is a widespread issue challenging BI professionals. Evolution of the BITCoP will involve inward- and outward-facing efforts. Inward, there will be an effort to craft messaging and campaigns to nudge researchers into understanding the need to spend more time on BI plan development, generated in concert with large NSF calls, for example the CAREER program. Outward-facing efforts will involve conversations with other BI professionals for their "tips and tricks" and seek other resources for improving communications to cultivate an understanding of the importance of thoughtfulness when creating a BI plan.

Finally, the engagement of more educational institutions will be key not only for scaling the use of the BITCoP but also for pooling survey data to better understand trends in the research community's BI needs and to improve BI professional services across several institutions.

Conclusions

The BITCoP provides a framework for BI professionals to use when consulting with researchers at their respective institutions. The interactive sessions arm the researchers with an arsenal of tools they can use to plan for, develop, and assess their planned BI activities. BI professionals and staff at other universities can use the BITCoP with minor modifications. The modifications should include all the local resources and support mechanisms for researchers developing and enacting BI plans. Pre- and post-consultation surveys are a crucial component of the BITCoP; they help BI professionals both better understand researcher needs and optimize the services they provide. In addition to the data driving iteration and improvement to services, the data are a valuable tool for understanding the evolving needs of the research community, both within the institution and nationwide.

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