Response to Senator Ernst's December 2022 "Make 'em Squeal" Report

The National Science Foundation (NSF) has been the backbone of America's science and engineering research enterprise for over 70 years. In fact, NSF is the only federal agency that supports all fields of fundamental science and engineering research and education. NSF supports cutting-edge research projects — many of which serve as bellwethers for solutions to the myriad complex issues facing society. NSF programs also traditionally integrate research and education, fast tracking innovation excellence via hands-on learning to train our next generation of researchers and innovators.

Each year, NSF competitively awards thousands of grants that collectively advance our nation's scientific capabilities and engage the talents of hundreds of thousands of researchers, postdoctoral fellows, technicians, teachers and students in every field of science and engineering.

NSF is the primary source of federal funding for non-medical basic research, providing approximately 12,000 new awards annually. Through its merit review process, NSF ensures that proposals submitted are reviewed in a fair, competitive and in-depth manner. Competition for funding is intense, with only about one out of five proposals ultimately being approved.

Each proposal submitted to NSF is reviewed by science and engineering experts well-versed in their particular discipline or field of expertise. All proposals submitted to NSF are reviewed according to two merit review criteria: *Intellectual Merit* and *Broader Impacts*. NSF's merit review process is widely considered to be the "gold standard" of scientific review. Perhaps the best evidence of NSF's success is the repeated replication of its merit review model for discovery, education and innovation around the globe.

The results of this process — funding the best and brightest ideas through competitive merit review — have been profound. NSF-supported research has underpinned multitudinous discoveries leading to new inventions — the Internet, web browsers, Doppler radar, Magnetic Resonance Imaging, DNA fingerprinting, and bar codes — to name a few. These diverse examples underscore NSF's significant contributions to our nation's prosperity, health and wellbeing. NSF-funded discoveries have expanded our understanding of the world in which we live, led to life-saving medical advances, enhanced our national security, improved our everyday lives and yielded insights into the creation of the universe.

NSF's task of identifying and funding work at the frontiers of science and engineering requires keeping close track of research around the United States and the world; maintaining constant contact with the research community to advance the horizons of inquiry; and choosing the most promising people to conduct the research.

The following grant cited in the report illustrates an example of promising NSF-funded research awarded support through the merit review process.

Analysis and Response for Trust Tool (ARTT): Expert-Informed Resources for Individuals and Online Communities to Address Vaccine Hesitancy
NSF Contract 49100421C0037
December 2022 "Make 'em Squeal" Report: "Warning! Sharing This Could Place You on Washington's Naughty List"
Hacks/Hackers

Since its establishment in 2019, NSF's Convergence Accelerator has selected transdisciplinary research topics that require the engagement of expertise from across academia, industry, nonprofits and philanthropic organizations, government and communities of practice. Selected topics for the Convergence Accelerator begin in the program's ideation phase, gathering ideas from the NSF research community and public at large. These ideas are further developed through community workshops funded by NSF. The workshop findings assist NSF in developing the final convergence research track topics to be funded for the subsequent three years.

NSF uses a rigorous merit review process to ensure submitted proposals are reviewed in a manner that is fair, competitive, and transparent. Awarded projects begin in the program's Phase 1. During Phase 1, teams develop their initial idea into proofs of concept and identify new team members and partners to support their projects. Phase 1 teams also conduct end-user interviews to elicit feedback on initial solution concepts, contributing to impactful technologies. At the end of Phase 1, teams participate in a formal Phase 2 proposal and pitch. Selected teams move on to Phase 2 and receive additional NSF funding.

The Analysis and Response Toolkit for Trust, or ARTT, project, led by Hacks/Hackers, is part of NSF's Convergence Accelerator Track F: Trust & Authenticity in Communication Systems. Track F was the result of the program's ideation process and NSF-funded workshop on Inauthentic Behavior in Online and Digital Systems (NSF award #2035349).

Emerging technology areas, specifically artificial intelligence, or AI, will impact U.S. competitiveness and national security. New large AI-powered language models like generative pre-trained transformer 3, or GPT-3, can be used maliciously by adversarial governments and other bad actors to target Americans. Federal investments in technologies in trust and authenticity in communication systems could help Americans determine whether to trust what they encounter online.

The ARTT project is focused on providing tangible tools to online communities to help citizens respond to online conversations and information in a respectful manner and to build trust with others as they navigate and analyze the vast amount of information online. The project team includes experts in computer science, social science, media literacy, conflict resolution, and psychology. Partnerships are also vital to all Convergence Accelerator projects. The ARTT team has fostered partnerships with healthcare and journalism practitioners and community leaders to ensure the ARTT tools meet the needs and desires of these stakeholders and end-users.

While in development, the intended ARTT solution plans to include three tools: a guide, catalog, and evaluations. The guide is a software tool that provides a unique framework of possible responses for citizens to use during everyday conversations. These possible responses are presented to the end-user who decides whether to use one of the options, edit them, or ignore

them completely. The ARTT catalog is an online aid, containing references, studies, and reports about how to respond or intervene in conversations. ARTT evaluations help a citizen analyze information. While there are many complex and sensitive conversations occurring online, the ARTT team chose vaccine hesitancy as a starting point. ARTT does not embed opinions from the team or intend to persuade citizens; instead, it's a centralized hub of information to provide transparency, help citizens become informed, form their own opinion, engage, and build trust. As part of the project's offering, the ARTT tool will feature a wide range of lists and collections of information sources and their ratings for the end users to select and choose from. The ARTT project aims to assist end-users in understanding where sources may be found and how to understand their results.

It is also important to distinguish the ARTT project from the broader portfolio of work by Hacks/Hackers. Specifically, the Hacks/Hacker organization also has an activity called the News Quality Initiative, or NewsQ. That activity pre-dates the establishment of NSF's Convergence Accelerator and the ARTT award; NewsQ began in 2018 to support broad constructive engagement on the question of online news quality. The ARTT project was formed upon receiving the NSF award noted above. During Phase 1, the ARTT project leveraged NewsQ to complete a single task [analyzing](#) how journalists and health communicators process high-quality information; this work amounted to less than 1% of the NSF-provided Phase 1 funding. NewsQ is not the subject of the NSF-funded project and no funding from NSF for the Phase 2 ARTT project is supporting NewsQ.