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Stronger together: A vision for the future of interdisciplinary collaboration

Overcome the challenge of sharing information across disciplines and departments.

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Why interdisciplinary collaboration?

Interdisciplinary collaboration is high on the agenda in academia, industry, and on the global political stage. However, many scientists see a risk involved in sharing information and resources, which means that a competitive approach often prevails.

Industry and governmental pressures are driving the need for interdisciplinary collaboration, as we'll explore in this whitepaper. We will also seek to challenge some of the misconceptions around interdisciplinary collaboration and make the case for a closer alliance between scientists working in different fields and disciplines.

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The current global perspective

The UN Sustainable Development Goals (SDG) demand a radical change in the way educational establishments and private businesses alike conduct research and development[1]. The UN SDGs include targets to eliminate global poverty, end hunger, alleviate illness, reduce environmental damage, and improve innovation in key areas, among other goals. In order to achieve the UN goals, the scientific community agrees that more effective collaboration between disciplines and departments is needed[2].

One of the key areas for improvement is to make sure research within the sciences flows between and across disciplines. In our complex global society, specialist single-discipline knowledge and research abound, but to stimulate further progress and innovation we need to create a more effective way of sharing research between different scientific disciplines.

The brave new post-COVID world

The need for effective interdisciplinary collaboration has never been more evident than during the recent global COVID-19 pandemic. Indeed, the rapid development and rollout of vaccine programs around the world were only made possible by research teams from different disciplines, institutions, and businesses, working together to solve a shared problem and reach a common goal.

However, some argue that the initial response to the pandemic, especially in the West, demonstrated a lack of collaboration. Government departments, doctors, scientists, and public health experts often worked at cross-purposes, delaying the response and confusing the public.

For instance, on the issue of wearing face masks, policymakers initially focused heavily on quantitative evidence from randomized control trials but neglected qualitative evidence from social scientists[3]. In this instance, a more effective interdisciplinary approach could have slowed the spread of the virus and saved lives in the process.

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What's next for interdisciplinary collaboration?

It's clear that the UNSDGs and the demands of the post-covid digital world are promoting a new approach to working across research fields.

In recent years, several digital tools have emerged to help achieve the goal of improved interdisciplinary collaboration by facilitating knowledge sharing, including ResearchGate, Research Exchange (ReX), and Authorea. Google Scholar has become the unofficial go-to index or repository for scientific research.

However, there is a glaring gap in the current approach to interdisciplinary collaboration. Resources and conference materials are not shared with participants in an efficient and timely manner, preventing them from acting on that information. Our team at Morriesser has developed a solution that fills this gap, enabling conference resources to be collated and disseminated rapidly. Making it easier to share conference materials means that cross-disciplinary teams can collaborate.

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What's next for interdisciplinary collaboration? (continued)

The purpose of this whitepaper is to outline the need for sharing scientific research and resources across disciplines. We will share our experience of working with academic and scientific research teams to improve their approach and overcome challenges.

We will begin by defining what interdisciplinary collaboration means, both in theory and practice, and how it can help you to make more of a difference with the ground-breaking and life-changing research you engage in.

Next, we will look at some of the challenges research teams face and the consequences that arise as a result of poor interdisciplinary communication and collaboration.

Finally, we will explore possible solutions and benefits and set out a vision for the future. We will look at various ways to adopt and implement an effective interdisciplinary approach, rather than a competitive and knowledge-shielding approach.

Overall, there will be a strong focus on early-stage research and how cross-sharing information during the initial stages of research can yield improved results.

What will you learn? This whitepaper will describe how to:

Overcome the challenges faced by research teams

Improve interdisciplinary collaboration and communication

Benefit from innovative tools to increase the efficacy of early-stage research

Create a conference library and knowledge sharing process to strengthen the outcomes of your research.

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What is interdisciplinary collaboration?

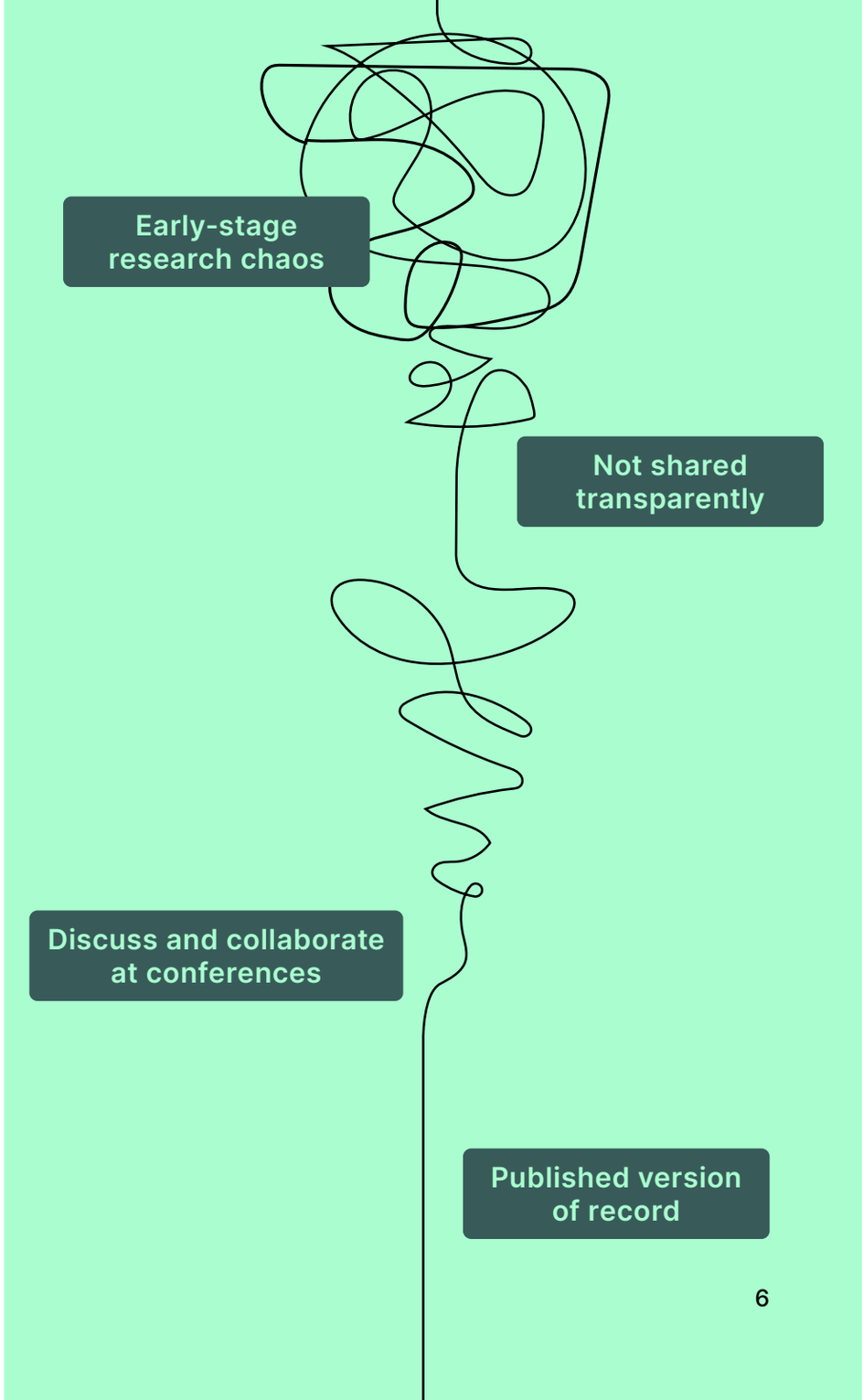
At first glance, the answer to this question may seem obvious – interdisciplinary collaboration means sharing information and skills across different departments and research teams. However, this answer simplifies the true depth of the concept and how putting interdisciplinary collaboration into practice isn't as easy as it seems.

The basis of all collaboration is teamwork and communication. Whenever and wherever colleagues from different disciplines work together to achieve a common goal, or simply to learn about each other's field of expertise, there need to be strong communication channels and processes to aid the transfer of knowledge.

Improving how researchers communicate and share information and knowledge creates opportunities for progress that may not have arisen if interdisciplinary collaboration had not occurred.

As described in a recent *American Psychologist* report, modern scientific and academic research involves teams of people working interdependently, both in terms of leadership responsibility and undertaking research activities such as investigation and experimentation.[4] In other words, different teams, working in different disciplines, are becoming increasingly reliant on each other to make progress in their relative fields.

Conferences are an important part of this interdependence because they facilitate collaboration. Researchers bring their latest work to conferences to discuss and debate with others in their field. Interdisciplinary conferences could have a major positive impact on those discussions. Long before researchers spend months writing a paper and having it peer-reviewed, they could spark those initial points of interdisciplinary collaboration right from the start of the research process.



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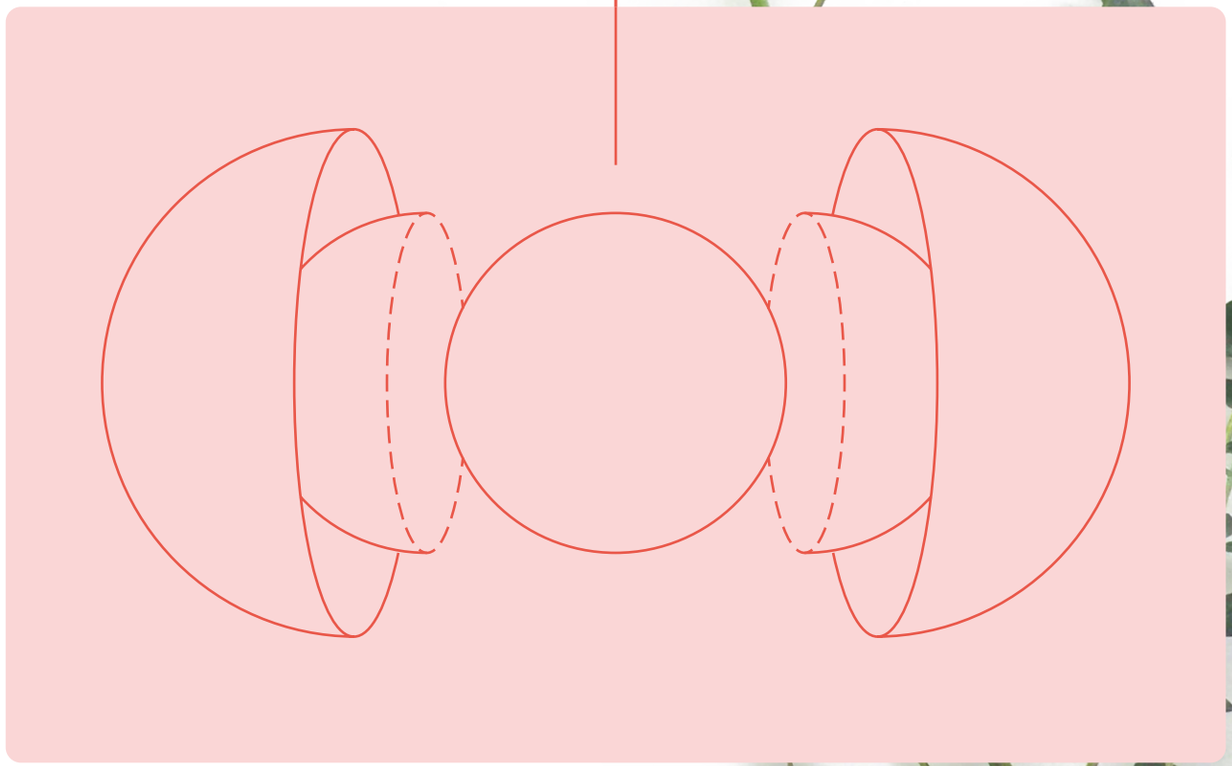
Making it happen

Research teams need interdisciplinary collaboration to make breakthroughs quicker. As many scientists have experienced, people in different departments and disciplines are often unknowingly and unnecessarily duplicating efforts. This is a terrible waste of time and resources.

Adding a social science lens to the way research is carried out and encouraging greater collaboration can solve the problem of duplicated research.

There are also economic drivers to consider. Research is often publicly funded through taxation, so wasting funds through duplicated research has a societal impact. Also, if research is publicly funded then it stands to reason that there should be more public engagement and access to the resulting information, including the development of closer links between academia and industry.



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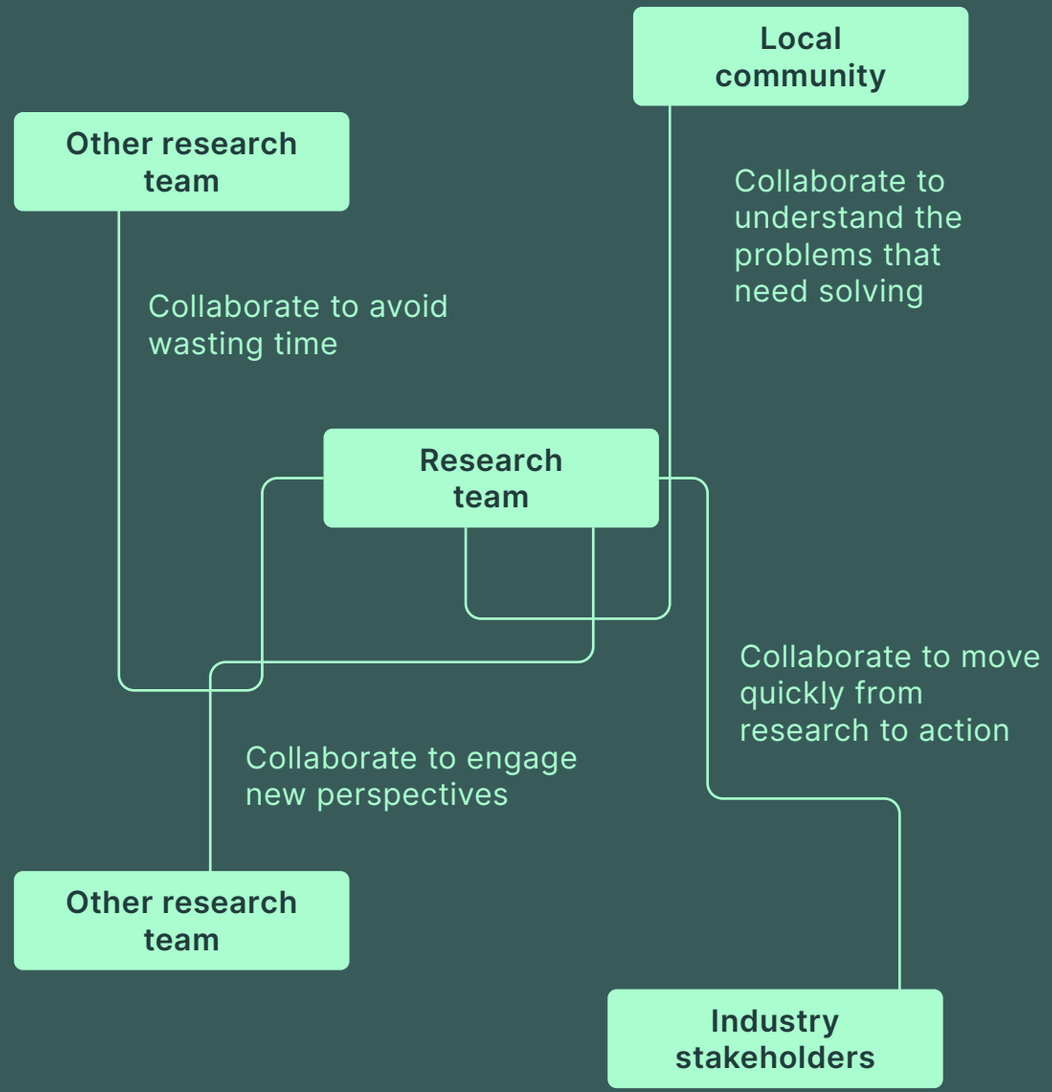
Challenges faced by research teams

As more and more information and data are generated, there is a greater need to improve how these materials are shared, not just between disciplines, but also with the public. Participatory team science places an emphasis on public engagement across multiple research phases.

> *"...the current landscape of how science is understood and practiced is changing, moving not only toward interdisciplinary team science but also to participatory approaches that engage the public."*[5]

In the modern globalized and digital era of science, the "silo" effect stands out as a major challenge to research teams. When research teams are "siloed", they are effectively isolated from other teams, having limited or nonexistent connections and communication with other departments and disciplines.

The isolation of research teams inhibits progress in scientific research in a number of ways. In this section, we will look at the problems caused by following an independent "siloed" approach.



Problem #1 – Lack of information sharing between teams inhibits early-stage research

As any research scientist knows, the journey from initial concept to the publication of a research paper or book can be long and arduous. Depending on the complexity of the topic and the amount of experimentation or investigation involved, the process can take months or years.

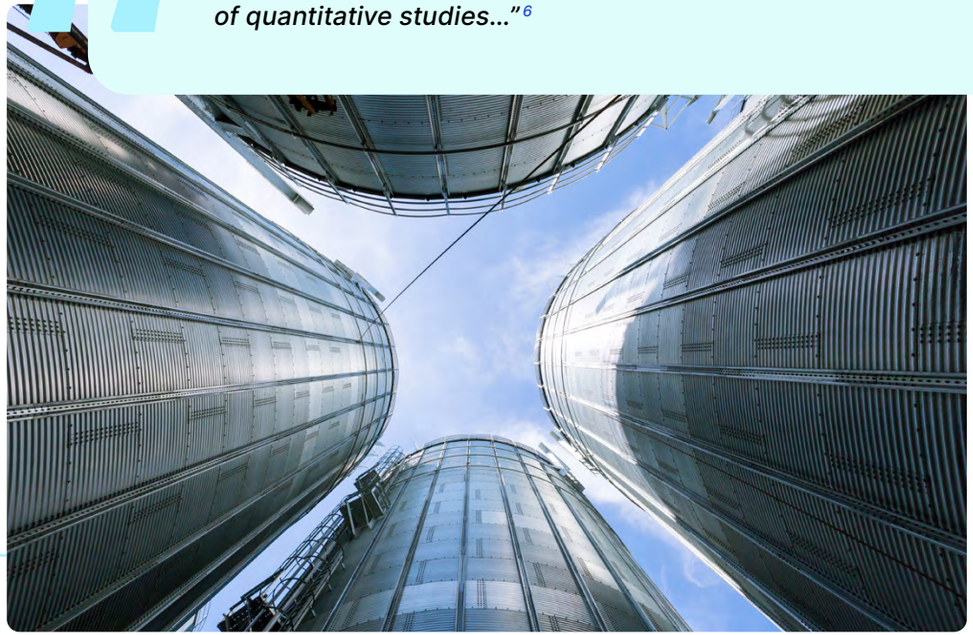
Part of the reason for this extended timeframe is the fact that important, complementary research findings are not easily accessible. In other words, different disciplines are not readily sharing their knowledge, which includes data, conference materials, field notes, and reports.

For instance, a research team working on reducing the amount of carbon emissions from industrial processes by applying a new technology may not share that information with engineering R&D departments working on innovating new machinery or equipment.

The "silo" effect means that most research materials only exist in the offline world and are only shared within a small research peer group, often in a single discipline or department, and wider dissemination only happens after the publication of an academic paper or book.

The main opportunity for sharing early-stage research is at conferences. However, this is still limited to a relatively small number of people, i.e. only the representatives that happen to attend that particular conference or seminar. An interdisciplinary approach would dictate that conference materials should be shared much more widely to accelerate progress across fields. Making the information and knowledge available digitally ensures that it reaches a more diverse and global audience.

> *"...pre-registering research and sharing data throughout the research process can help improve the reproducibility of quantitative studies..."*[6]



Problem #2 – Impenetrable jargon

Each scientific discipline has its own set of jargon words, phrases, and acronyms. Jargon can be a substantial barrier to interdisciplinary collaboration which, by its nature, relies on clear communication and transparency.

The problem for research teams is that the jargon is often indecipherable, even when attempting to minimize it in scientific publications. A study that compared 5000 pieces of lay summaries (i.e., written to be understood by a layperson) revealed that scientists intuitively use far less jargon when writing for the public, but not enough for many concepts to be fully understood.[7]

Worse, in some cases, the use of impenetrable jargon can actually destroy interest in a field of study or slow down progress significantly. A 2020 study took 650 ordinary adults and asked them to read two paragraphs on cutting-edge scientific research, one laden with jargon and the other jargon-free.[8] The results showed that the lack of jargon empowered readers and made them feel more positive about the topic, whereas the jargon-filled text made them feel overwhelmed and switched off from the subject matter.

The only possible exception to the “reducing jargon is good” rule is when scientists are looking for grant funding. A 2019 study showed that abstracts with more specialist language and fewer common words received more grant funding than those that did not.[9] However, the people in charge of funding grants also recognize the barrier to understanding that jargon creates, resulting in mounting pressure for scientists and academics to produce plain language abstracts and summaries to secure funding.

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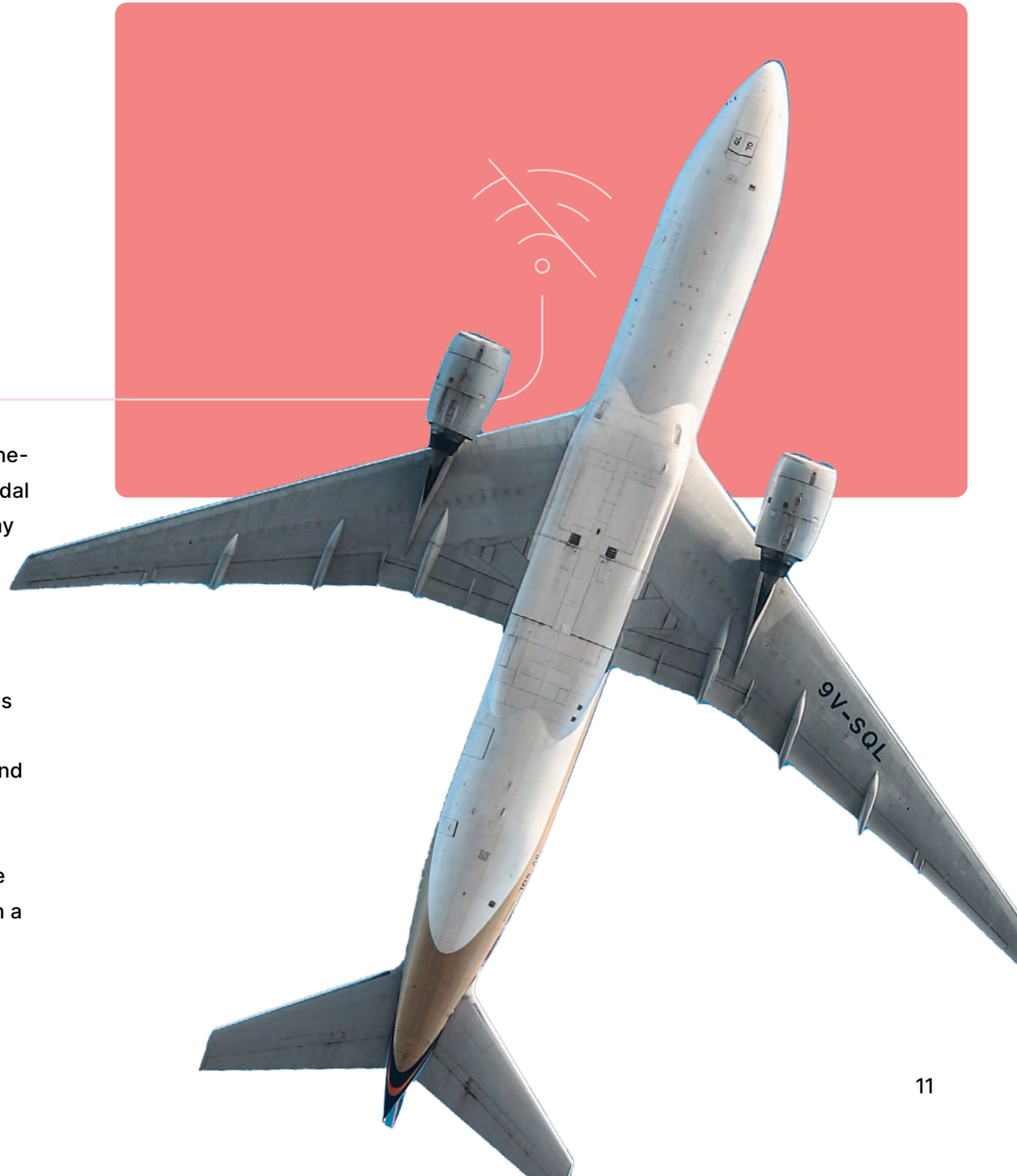
Problem #3 - Lack of bandwidth and information overload

Scientists are busy people, especially those within a research team that has limited time and resources. It can be a struggle to keep up with the demands of their own discipline, let alone seek and build connections with scientists outside of their immediate network.

For instance, a virologist at the University of North Carolina reported that during a one-week period in 2020, he received more than 4,000 papers related to COVID-19.[10] A tidal wave of research this big results in information overload and that is impossible to stay on top of. An estimate of the amount of COVID-19 literature produced between January 2020 and May 2020 put the figure at over 23,000 papers, with the amount doubling every 3 weeks.

With such an explosion of scientific research and literature, knowledge sharing needs to become easier and information needs to become more accessible earlier in the research lifecycle. The demand has given rise to digital tools that help overworked and underfunded scientists make sense of the increased amount of literature.

Morressier's all-in-one virtual platform for knowledge sharing makes it easier to save time and engage with new information early on which is a process we will describe in a later section.



The power of interdisciplinary collaboration

Now that we understand the challenges faced by scientific and academic research teams, we can look a little deeper at the potential solution – **interdisciplinary collaboration.**

As mentioned previously, interdisciplinary collaboration provides a way to accelerate innovation and progress in science and technology. Combining it with public engagement can also speed up the application of new methods and concepts in the real world.

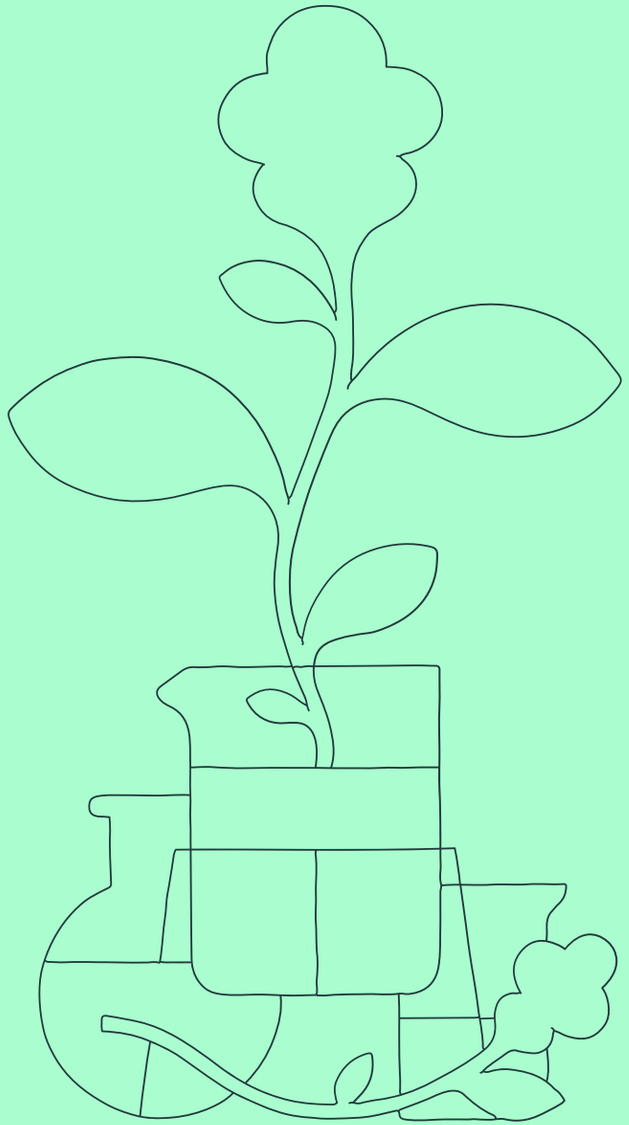
Examples of interdisciplinary collaboration

In the medical sector, interdisciplinary collaboration can help improve the patient journey and outcomes. Furthermore, providing patients with new information and consulting with them to gain feedback can be beneficial too. For example, a collaborative effort between endocrinology specialists and cardiovascular disease researchers, as well as patients, can boost progress in the treatment of serious diseases.

The interdisciplinary collaboration could yield more research publications, faster development of pharmaceuticals, improved diagnosis and treatment technology, and better patient outcomes.

Imagine enlisting social scientists to collaborate with virologists to help reveal the social and societal elements of disease transmission, and to deal with misinformation and conspiracy theories, e.g. the vaccine hesitation and refusal that was a feature of the COVID-19 pandemic. In the USA, the effects of misinformation were particularly profound with a quarter of the population believing that the COVID-19 pandemic was a planned conspiracy and 58% of Americans showing vaccine hesitancy.[11]

Perhaps some of these negative consequences could have been avoided with greater interdisciplinary collaboration between STEM (Science, Technology, Engineering, and Mathematics) disciplines and SHAPE (Social Science, Humanities, Arts, People and Economic) disciplines. SHAPE research may have helped doctors and scientists understand human behavior and motivations when it came to applying STEM-based public health solutions.



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Are conferences the future of interdisciplinary collaboration?

We've already seen how the "silo" effect is damaging to scientific progress, and nowhere is this more evident than at traditional, old-fashioned conferences. Traditionally, conferences have been insular affairs, where scientists come together to discuss their research, make connections, and share resources with others in closely related fields. In the name of interdisciplinary collaboration, the traditional conference needs to evolve.

At Morressier, we envision a revolution in the way conferences are organized and executed. The focus will be on cross-discipline collaboration that advances science for the good of the scientific community and society at large.

A great virtual leap forward in knowledge sharing

Our powerful digital platform is making possible our vision of a future in which virtual conferences become launchpads for new methods of interdisciplinary thinking and discovery.

Conferences no longer need to be insular and exclusive. Virtual conferencing opens the door to not only interdisciplinary collaboration, but international collaboration – an exciting new world of scientific opportunities and possibilities.

Closing the gap between specialist conferences and academic study

All too often, a gap emerges between commercial research and academic study, or theory and practice. Part of the reason for this is a lack of knowledge sharing and communication flow.

Our digital content library helps to close this gap by bringing people together to share their findings. It gives people the opportunity to network and sparks new ideas, concepts, and directions for their research.

Raising awareness of new research and best practices

When interdisciplinary collaboration takes place, scientists discover how different disciplines approach problems and conduct research. Becoming aware of different disciplines and their practices helps to generate a better understanding of various fields and can help take science, and society, in a more productive direction.

> *"Interdisciplinary collaboration is important for patient long-term outcomes – by accelerating the medical treatments for illnesses, improving overall drug effectiveness and, conclusively, bridging science with real-world applications that have a positive impact."*
>
> Joe Adams, Senior Director, Sales & Partnership
> Morressier

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Morressier: Creating a space for scientists to share knowledge easier, earlier, and faster

At Morressier, we believe in doing things differently. Our virtual conferencing platform places a strong focus on early-stage interdisciplinary collaboration, resource curation, and knowledge sharing.

A collaborative tool that extends beyond the conference

Morressier is designed to meet the needs of research teams and academics.

. **Resource curation and knowledge sharing**
Our platform provides participants (and community members) with curated and indexed conference libraries. The libraries allow people to engage with the latest research more quickly and efficiently.

. **Closing the gap between conference and academic publications**
We have partnered with more than 200 societies and publications (including ACS, IOP, and other prestigious publishers) across the globe to give users access to high-quality research and resources.

. **Specialists in virtual and hybrid conferencing**
We started reimagining conferences more than seven years ago. We pioneered virtual and hybrid solutions in the pre-COVID world, and we continue to innovate with our vision to create a joined-up, interdisciplinary future for scientific research.

. **Multi-faceted and committed to ROI**
Morressier helps our participants generate value for their research in terms of funding, reaching research goals, and disseminating knowledge.

. **Accelerating scientific progress**
Our overall mission is to help a wide-ranging community of scientists, academics, publishers, and the public to create a better future where interdisciplinary collaboration powers scientific research.

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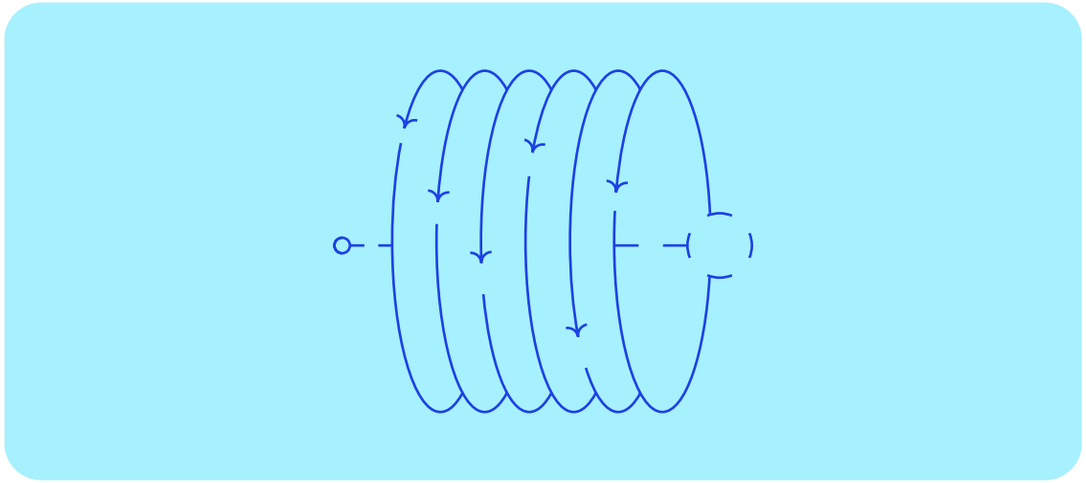
Helping all researchers and stakeholders to reach their goals

In today's world, interdisciplinary collaboration is the key to more successful outcomes for everyone involved in the research community. In this section, we will discuss some of the main benefits of taking a collaborative approach.



Benefits for societies and conference organizers:

. **Post-event engagement**
Conference library helps people to discover new research and identify and connect with future collaborators.

. **Organize ground-breaking joint conferences**
Societies can work alongside other teams and individuals to host conferences that take research in a new direction.

. **Improved outcomes for society at large**
The improved sharing of knowledge and research will lead to better solutions and outcomes for scientists and the general public.

Benefits for academic institutions:

. **Driving innovation**
Sharing knowledge and data across disciplines, both during and after the conference, helps to accelerate progress in various fields.

. **Creating new opportunities**
Researchers from different departments can share their work and plan projects with other disciplines, taking things in exciting new directions.

. **Cross-pollination of ideas**
Opportunities to combine fields of research that would not normally cross paths. For instance, STEM and SHAPE researchers work together.

Benefits for publishers:

. **Inspiration for future publications**
Publishers can mine conference content to plan and create new publications.

. **Bridge gaps between research and publishers**
Curated conference libraries help publishers find and understand important research.

. **Make research accessible to the public**
Increase public awareness and support for different fields of research and help to secure more funding.

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Resources

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Virtual and hybrid conference solutions that significantly increase content engagement and add new revenue streams – learn more about how your organization can benefit from Morressier's support.

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