Practical Leadership for Team Science:
Experiences from the Imageomics Institute

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The Science of Team Science[1]

The role of team scientists in advancing science

Team Science describes "scientific collaboration, i.e., research conducted by more than one individual in an interdependent fashion, including research conducted by small teams and larger groups."

Team Scientists "empirically examine the processes by which large and small scientific teams, research centers, and institutes organize, communicate, and conduct research" with the goal of creating effective frameworks and strategies for enhancing team effectiveness.

Team effectiveness is a team's "capacity to achieve its goals and objectives."

Introduction

How team science is being applied at the Imageomics Institute

Imageomics (i-'mi-jə-'ō-miks)

A new scientific field in which computational (machine learning) tools built around biological knowledge bases are used by biologists to analyze image data in order to characterize patterns and gain insights into traits and relationships at individual, population and species scales—insights that then get incorporated into the algorithms that run the tools.

Our team scientists have been employing established frameworks and developing new methods for practical applications to both boost team effectiveness within our institute and evaluate the impact of this new field of interdisciplinary science.

Through dissemination of developed resources, we aim to create more effective and adaptable science teams, ensuring the continual advancement of team science.

References

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Science Gatherings

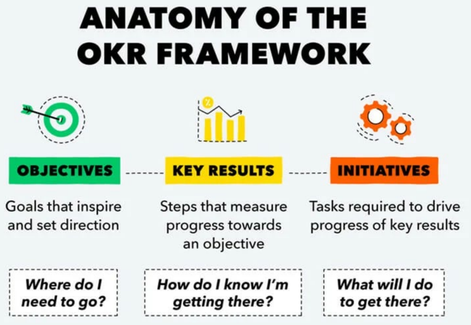
Establishing the Planning Team

When organizing large science gatherings and conferences we utilize the RACI framework (Responsible, Accountable, Consulted and Informed; Miranda and Watts, 2022) and create a planning team of no more than five members.

Responsible	• The person who actually carries out the process task assignment • Responsible to get the job done
Accountable	• The person who is ultimately accountable for process or task being completed appropriately • Responsible person(s) are accountable to this person
Consulted	• People who are not directly involved with carriyng out the task, but who are consulted • May be stakeholder or subject matter expert
Informed	• Those who receive output from the process or task, or have a need to stay informed

Setting Meeting Parameters

Consider the application of the Objectives & Key Results (OKR) Framework throughout the development process.



Big 4 Questions

Exploring the big questions of why, who, what and how helps to set the parameters to creating a meeting that is unique and responsive to the current context and developmental stage of the organization.

WHY: Why are we having this meeting? What is the intention behind it?

WHAT: What are the objectives and key deliverables? Which sessions align with which objectives?

WHO: Who makes up the planning team? What are the roles and responsibilities of each planning team member?

HOW: How might we make this happen? What is the process?

Supporting Team Effectiveness

The 3 P's of Engagement

Purpose	what and why	• Clarify goals and expected outcomes to attendees • Consider your goals for engagement • Provide open communication throughout process
People	who and where	• Key meeting stakeholders • Connections, needs and Interests of attendees • Participant needs in order to prepare and engage • Physical factors of location
Process	how and when	• Consider every stakeholders engagement level • Provide variety within the agenda to increase energy and involvement • Provide space for conversation and reflection

Team-Engaged Facilitation Methods

Pre-meeting

- ✓ Host Open "Town Hall" meeting
  - ➢ gather information about consulted/informed wants/desires to develop your OKR
- ✓ Engage participants strategically use the RACI framework)
  - ➢ Develop content and facilitation plans iteratively and with input from consulted role
  - ➢ Only share information on a need-to-know basis

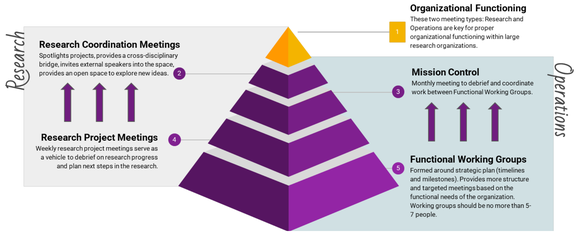
Post-meeting

- ✓ Host Debrief post event
  - ➢ Highlight successes and improvement areas
- ✓ Survey participants
  - ➢ Evaluate main objectives
  - ➢ Gather feedback on improvements and achievements
  - ➢ **Tip:** Build time into your agenda to improve response rate
- ✓ Address To-Dos
  - ➢ Maintain momentum
  - ➢ Critical to fulfilling event OKR

Building Scientific Communities

- ✓ Hold gathering space
  - ➢ Weekly or monthly check-ins
  - ➢ Relevant Field-trips
  - ➢ Informal meetings/events
- ✓ Host town halls
  - ➢ learn more about what the community wants to gather around
- ✓ Help people connect beyond the science
  - ➢ Include non-science activities at every gathering
- ✓ Listen to your community members
  - ➢ If they aren't responding to something let it go
  - ➢ Add new activities based on their research interests

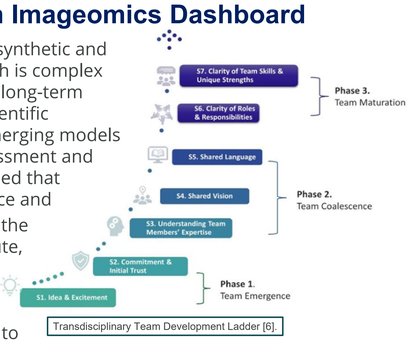
Enhancing Institutional Functioning



Measuring Interdisciplinary Impact

Developing an Imageomics Dashboard

The impact of novel synthetic and convergence research is complex and often requires a long-term horizon to realize scientific products [3, 4, 5]. Emerging models of convergence assessment and evaluation have argued that achieving convergence and synthesis in science, the purpose of an institute, requires evaluation metrics that attend to people and processes as well as to scientific products.



We are measuring a variety of precursors of team performance and emergence of a scientific field, including metrics of team development and team cohesion.

Further Reading

- Jiang G, Boghrat D, Grabmeier J and Cross JE (2023). *Complexity leadership in action: a team science case study.* Frontiers in Research Metrics and Analytics 8:1211554. doi: 10.3389/frma.2023.1211554
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Scan for more team science resources developed by the Imageomics Institute.

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