6. HIGH PERFORMANCE TEAMS | Leida Mercado, Joe Colletti, and Julie Klein

Success for your project depends upon your team working together effectively and collaboratively. Such high performance teams (HPT; Leholm and Vlasin 2006) depend upon a set of specific attributes. Participants in the workshop that took place at SESYNC, which generated this primer (see Introduction to this Primer), agreed that HPT are key for the success of large projects addressing SES systems. We identified six attributes that increase the probability of having a HPT (Table 6.1). In this section, we focus on these six attributes and the process of developing and sustaining high performance teams. We have relied substantially on Leholm and Vlasin (2006) and Fiore (2008) in delineating these attributes.

Context

Teams are a "construct" that scientists and engineers use to address complex problems such as those usually addressed in large SES. Thus, it is important to understand what constitutes a team, how teams develop, and what collectively causes a team to perform at a high level to solve complex problems. The need for teams of scientists from multiple disciplines to address complex problems has been driven in part by the "new biology" and "convergence science" of The National Academies (2009) (also as described in a National Research Council, 2014 and MIT 2011). Both groups cite the need for the science and engineering disciplines to collaborate and innovate to provide solutions to societal problems.

The business sector has known about and studied teams and teamwork for some time. Tuckman (1965) and Katzenbach and Smith (1993) have articulated key attributes that enable success, aid development, and enhance performance within business teams. Tuckman's model of forming, storming, norming, and performing provides a very useful mental model for the stages of team development and achievement. Katzenbach and Smith focus on qualities that distinguish high performance teams from "ordinary teams," citing:

- Deeper sense of purpose
- Ambitious performance goals
- More effective work approaches
- Strong mutual accountability with understanding of joint accountability
- Interchangeable and complementary skill set by team members.

Over the past decade, Leholm and Vlasin (2006) and Fiore (2008) have improved understanding of how average teams can become HPTs.

Fiore (2008) distinguishes "taskwork" as the science surrounding achieving the goal of the project and "teamwork" as the attributes and process of functioning as a team (see Section 2, Molding the Team). He also outlines an approach to assessing the ability of potential project participants to work as a team prior to the start of a collaborative project. Finally, he provides a means for ongoing evaluation of the team's collaboration that considers the effectiveness of both taskwork and teamwork.

Leholm and Vlasin (2006) studied ways to ensure the success of business and educational teams, concentrating on what is required for a team to function as an HTP. These teams have:

- A clearly defined purpose;
- A well-developed means for interdependency;
- Strong relationships among members in terms of respect and communications;
- Active participation by all members; and
- A shared leadership approach for fulfilling project purpose and attaining goals.

TABLE 6.1

ATTRIBUTES ASSOCIATED WITH HIGH PERFORMANCE TEAMS AS STATED BY LEHOLM AND VLASIN (2006) ILLUSTRATED BY KEY ITEMS OBSERVED WITHIN HPTS AND LINKS TO THE FOUR PHASES OF PROJECT DEVELOPMENT AND ACTION.

ATTRIBUTES	ITEMS	PHASE I PROPOSAL	PHASE II GETTING STARTED	PHASE III PERFORMING	PHASE IV FINISHING STRONG
Common purpose, vision, goals, and operating procedures	• Developing and owning a shared vision, goals, and outcomes	x	x		
	• Ensuring diversity and inclusion of researchers	x	x		
	• Keeping a balance between rewards and consequences	x	x	x	x
Shared leadership	• Distributing leadership that gets the fundamentals done	x	x	x	x
	• Ensuring authority commensurate with responsibilities	x	x	x	x
Individual and mutual accountability and high level of caring	• Sharing understanding of team operation roles and responsibilities		x	x	x
	• Promoting mentorship		x	x	x
	• Acknowledging work-life balance		x	x	x
High trust	• Collaboration that engenders respectful attribution		x	x	x
	• Establishing rules for attribution credit		x	x	x
	• Creating a culture of constructive criticism		x	x	x
Commitment to innovation, stretch thinking, and conceptual breakthrough	• Supporting systematic time for creative discussions (academic loafing)			x	x
	• Allocating time for creating and sustaining collaboration			x	x
Clear and effective two-way communication	• Utilizing value of face-to-face communication to move the team forward	x	x	x	x
	• Consulting with team-collaboration-via-communication-technology experts	x	x	x	x
		x	x	x	x

Six Characteristics of HPTs

Common purpose, vision, goals, and operating procedures

A HPT has clarity and deep understanding of their purpose, the goals of the project, and the members understand and value a clear work approach with common operating procedures. Diversity of knowledge and professional skills among the team is key for enhancing problem solving. HPT teams focus on process and teamwork (see Section 2, Molding the Team).

Efficient collaboration in a research team at MOSS.
Credit: Anonymous

Shared leadership

During all phases of a project, leadership is important. The key to team success is a leader with a clear vision of where the team is heading and one that inspires team members to accomplish the goals at a high level of performance. However, for HPTs, it is also necessary that the entire team buy into a shared leadership model and understand the hierarchy and decision-making of the organization(s) to whom they are linked (see also Section 3, Culture of Collaboration). Shared leadership is critically important during Phase II (Getting Started), when storming can limit performance and/or end the team. Fisher (2000) (as cited by Leholm and Vlasin 2006), argues that empowerment of participant leadership is necessary for HPT and describes empowerment as a function of authority, resources, information, and accountability. If any individual team member lacks any one of these variables, then that participant is not empowered. Covey (1991; as cited by Leholm and Vlasin 2006) claims that managing through empowerment can unleash peoples´ potential for self-supervision and capture their creativity and innovation. Empowering employees requires that results and guidelines are well established, available resources are identified, and accountability and consequence measures are agreed upon.

Team of TIGR (three self-directed teams of the *Institute for Genomic Research) case study*

Shared leadership and self/mutual accountability are highly related to each other. The TIGR case study shows the productivity power that can be achieved from deliberately seeking divergent thinking and approaches, and respecting and building on them. Three teams experienced unusual increases in performance when the organization moved to a shared-leadership and responsibility-based environment. Through seeking diversity in knowledge.

Individual and mutual accountability and high level of caring

Individual accountability is defined as the belief that everyone will be responsible for her/his performance and learning. It helps to avoid free riding and social loafing (Laat et al. 2013). On the other hand, mutual accountability is defined as "a reciprocally authorized behavior among team members of evaluating one another's progress on the team's task. Unlike performance pressure, which is externally enforced accountability on a team, mutual accountability is internal to a team" (Rashid 2015).

HPTs and their individual members all hold themselves accountable for completing the taskwork of the project while genuinely caring about one another's personal and professional growth. HPT members possess a deep and enduring commitment to mutual accountability and to the growth and development of all team members. These attributes are shared by most of the HPTs studied by Leholm and Vlasin (2006).

Trust

Trust is fundamental for HPTs as it is for all effective relationships. High trust among the team, including team members and team leaders, and between all project personnel is requisite for HPT. Trust must be established during the initial project phase and nurtured throughout the project. During Phase III (Performing), the payoffs from having a trusting team are almost completely realized. Without a high level of trust, a team's participation, collaboration, and attainment of project goals will be thwarted and it will not be high performing. Trust is a quality that team

members must have in order to formulate goals that they are able to maintain during established periods of time. The case study of the Labor-Management Leadership Team (LMLT) of Quaker Oats presented by (Leholm and Vlasin (2006) is a good example about how important trust is and how to build it.

Key elements in building trust are:

- A conscious effort to create trust from both the team leader and team members
- Credibility of those building trust
- Establishing rules of engagement to create a trusting environment, which include respect between team members and the team manager
- Open and transparent communication
- Sharing of information Resolving conflicts in advance.

Innovation, "stretch thinking," conceptual breakthroughs

HPT addressing SES projects will encourage and seek innovation in methodology and technology, stretch each other's thinking because of the high level of trust, and value diverse approaches and views (Section 3, Creating a Culture of Collaboration). In order for this to happen, some conditions need to exist.

High-performance teams depend upon effective two-way communication. Credit: Anonymous

Clear and effective two-way communication

HPT establish and maintain open lines of communication that are timely and accurate (see also Section 3, Culture of Collaboration). Starting in Phase I (Proposal), and plateauing in Phase III (Performing) and Phase IV (Finishing Strong), HPTs utilize interpersonal best practices such as expressing support, asking for clarification, active listening, seeking accuracy, challenging ideas (rather than team members), and stretch thinking. These interpersonal team skills enable open communication and high performance by the team.

A triptych jointly created by the students in the REACCH project to express and transmit the multifaceted efforts of the project. Credit: Dianne Daley Laursen

Attributes Critical to Ensure High Performance Throughout an SES Project: Phases I to IV

Within the four phases for large, complex and collaborative SES projects, the six requisite attributes for HPT are indicated. Those highlighted **in bold** we consider essential to achieving high performance (Table 6.1).

1 "Stretch thinking" is defined as someone adding new ideas or making new connections within the team. A team member takes ideas from their team members and creates a new idea or makes a new connection.

Take Away Messages:

- High Performance Teams (HPT) are key for the success of large SES projects.
- The literature identifies certain attributes are requisite, but do not ensure HPT success. Six attributes noted by Leholm and Vlasin (2006) were present in all the teams they evaluated.
    1. A common purpose
    2. Shared leadership
    3. Mutual accountability and caring
    4. Trust
    5. Commitment to innovation
    6. Clear, effective two-way communication
- Ancillary or cross-cutting impacts from HPTs include promoting the "pipeline" for development of the next generation of scientists and engineers better prepared and with more experience in teamwork and teamtasks.

Cited and Suggested Readings and Resources

Covey, S. R. 1991. Principle-centred leadership. Simon and Schuster, New York, NY.

Fiore, S. M. 2008. Interdisciplinarity as teamwork: how the science of teams can inform team science. Small Group Research **39**:251-277.

Katzenbach, J. R., and D. K. Smith. 1993. The wisdom of teams: creating the high-performance organization. Harvard Business School Press, Boston.

Laal, M., L. Geranpaye, and M. Daemi. 2013. Individual accountability in collaborative learning. Procedia - Social and Behavioral Sciences **93**:286 – 289.

Leholm, A., and R. Vlasin. 2006. Increasing the odds for high-performance teams – lessons learned. Michigan State University Press, East Lansing, MI.

MIT (Massachusetts Institute Of Technology). 2011. The third revolution: the convergence of the life sciences, physical sciences, and engineering. http://dc.mit.edu/sites/dc.mit.edu/files/MIT%20White%20Paper%20on%20Convergence.pdf

NRC (National Research Council). 2009. A new biology for the 21st century. The National Academies Press, Washington, DC.

National Academy of Sciences: Committee on Facilitating Interdisciplinary Research and the Committee on Science Engineering and Public Policy. 2005. Facilitating interdisciplinary research. The National Academies Press, Washington, DC.

National Research Council of the National Academies. 2014. Convergence: Facilitating transdisciplinary integration of life sciences, physical sciences, engineering, and beyond. The National Academies Press, Washington, D.C..

Tuckman, B. W. 1965. Developmental sequence in small groups. American Psychological Association Psychological Bulletin 63:384-399.