Constructing a Team Model
Creating a Foundation for Evidence-based Teams

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Teams are the fundamental element of work in the contemporary clinical setting. As interdisciplinary teams become an essential component of the evidence-based framework for clinical practice, their formalization, integration, and synthesis within the practice framework will become increasingly mandatory. Outlined here is a contextual model for team action that is formalized as the organizational leadership continuously addresses the structural and process components of team dynamics in a continuous and cybernetic frame that assures all of the elements of effective teamwork. The theoretical foundations for team modeling are explicated, the elements of the systems approach to team process are outlined, and a necessary synthesis of team processes is described and established as a foundation for evidence-based clinical practice. Key words: cybernetic, evidence-based teams, interdisciplinary, systems models, team dynamics, teams

TEAMS are increasingly becoming the format for ways of doing work as the nature of clinical work is being dramatically transformed. Creating models that conceptualize and contextualize team processes are important to clinical leaders in order to provide an evidence-based context to the work of leadership and to delineate the elements, relationships, and flow of teams. Outlined here is an innovative Dynamic Cybernetic Team (DCT) model reflecting the state-of-the-art thinking and research on concepts and application of an evidence-building team model. Incorporated into the DCT model are the elements that give the direction, organizational strategy, contextual influences, organizational mission, and purpose and the action stages that relate to implementation and application of the elements of the team model in achieving team outcomes and sustaining success. In addition, emphasis includes knowledge generation and growth and development, both incorporated as a part of the model’s application. All of these components assure the establishment of an evidence-based framework for team performance and systematizing the achievement of outcomes, team performance evaluation, and team sustainability.

THEORETICAL AND CONCEPTUAL FOUNDATIONS FOR THE TEAM MODEL

While encapsulated in a whole range of names and processes, teams have a long history in the human experience. In his classic work Histories, Herodotus, the famous Greek historian, identified the tremendous sense of the Spartan teams and their team organization and how this focus on team action informed the leadership thinking and success of the greatest Persian ruler, Cyrus (580–529 BCE). While many generations have passed since that time, the basic concepts and elements of team have remained unchanged from Herodotus’ description of Spartan teams,
even though our understanding of teams and the external and internal forces that influence their effectiveness has deepened and grown dramatically, especially in the past 30 years.

The flow of work and the effectiveness of teams relate specifically to the synthesis of a number of internal and external dynamics that operate consistently to affect the function and process of teams. The question of the interface of external and internal elements affecting team process has generated out of a broad range of research, indicating a need to comprehend and apply group dynamics principles to assure team effectiveness.

The ability of the team to be able to generate competence from individuals and consolidate it into group effort is a critical core element of a good team. This issue of competence as a core element can also be extended to knowledge creation, management, and generation as a part of what the team does to advance its own competence, impact its work, and improve its outcomes. This knowledge-driven process is a cybernetic dynamic that continuously impacts team competence, work process/quality, and outcomes, and forms a framework for the DCT model.

No team process can operate independently of the context within which it functions. All teams respond to the environmental, social, technological, and management influences that create the specific context and format within which team action takes form, and to which team process must demonstrate responsiveness. These forces create the conditions and circumstances within which teams perform and have a direct influence on the elements of process in the team's exercise of its work. In addition to these external forces, there are internal processes that generate from team member behaviors, interactions, and relationships. All of these internal forces converge in the DCT model to create conditions that both affect and direct the team processes in a way that can be both facilitating and impeding.

The clinical team processes (process factors) form the active framework that both describe and define the team's processes. Each of these steps in the DCT model processes does not act independent of each other, but rather, reflect a continuum of intersections and stages acknowledging the complex of activities that make up the team flow. Each of the steps and stages in the DCT model reflects the fundamental core (mission, purpose, objectives, principles, relationships, and motivators), and all are indicators of the team's progress toward actualizing them and focusing them on the work of the team. None of them operate independent of each other, and all intersect with each other in the dynamic interface that reflects their interdependencies and the influence one has on the other. From phase 1 through phase 5 in the DCT model, the elements necessary to act and perform in a way that achieves expectations and outcomes are specifically delineated. In moving through the stages, the expectations for performance reflect team member's roles and connect them in the mosaic of activities that ultimately leads team members in concert to the achievement of desired results. The results get defined through the fulfillment of specific expectations or outcomes that reflect the desired level of performance, quality, and user satisfaction. Because this is a cybernetic process, it continually revolves around its stages (process factors) in a multidimensional dance of flow and intersection, advancing and improving team structure, relationships, performance, and outcomes.

Effective clinical teams operate at several levels of synthesis. Each of these elements of referencing and flow operates interdependently, requiring a solid goodness of fit with and between each of them in order to assure that they facilitate the action of teams rather than act as barriers to effective team performance. This application of complexity is important to a deeper understanding of the dynamic nature and fluid circumstances, positively influencing teamwork. This complex interface of structure, process, relationship, and action in the DCT model is continuously woven into a network of converging and intersecting forces and factors that both individually and collectively affect the team.
dynamics and impact its work. The application of complexity design and multidimensional modeling helps create a more comprehensive view of each and all of the elements making or breaking the delicate and fluid dynamic that is a team.

INFLUENCES AFFECTING A WORKING TEAM MODEL

The team’s knowledge creation process as depicted in Figure 1 is the dynamic synthesis of its social structures, participants, goals, technology, and environments; each element interacts and influences the other elements that comprise the organization. In his germinal work on organizational structures, Leavitt explicates the analytical framework found in Figure 2. To understand how the team functions in creating knowledge, its primary purpose, one must understand how each element of the framework interacts with the other elements in an interdependent dance. Leavitt’s framework has stood the test of time and it prescribes the backbone of the DCT model.

The Leavitt framework, along with its 6 factors, consists of the essential environmental and organizational influences, the external and internal forces, and pushing and pulling at the seams of the team as it operates under its open system paradigm. All 6 factors contribute process depth to achieve an effectively balanced team that shares data and knowledge both ways across its transparent boundaries. The team’s social structure consists of its “normative, cultural-cognitive, and behavioral structures of a social group.” The participants are the members within the team organization who seek to achieve the goals of the organization because of either internal or external inducements to achieve learning by creating knowledge. The goals of the team are concepts for achieving its visionary end state (knowledge creation); goals guide the progress assessments for the team. Technology includes the empowering, enabling tools hardware, software applications, and knowledge skills that facilitate the transformation of resources into products. The team collectively and symbiotically adapts to its “physical, technological, cultural, and social environment.”

The team core structure

The team core structure is based on the model of Nonaka and Nishiguchi comprising the following elements: Socialization, Externalization, Internalization, and Combination. Together, these categories provide a process for “knowledge transformation.” This process is the dynamic structure that hosts the other elements of the DCT model. Socialization and combination are directed more toward the team and customer interactions, whereby “… customers (patients) get and maintain their agreement on the request they make to the performers.” These possible interactions are keys in ensuring that customer (patient) needs are being met.

This process of the DCT model can be seen as the fulcrum between customer (patient) relationship and the dynamics of the learning and knowledge-generating concept. The DCT model incorporates this process into its cooperative learning concept in terms of the team individuals, not merely exchanging information but transforming the information into knowledge and sharing it among themselves and, when applicable, with customers (patients).

Team core elements

The DCT model’s philosophy is to deliver beyond patient expectations while generating knowledge in a cooperative setting (Fig 3). Barnard first introduced the concept of a cooperative system with “…his notion of including both internal equilibrium and external adjustment.” He had the vision that “Cooperation within formal organizations afforded possibilities for expanding the powers of the group beyond what the individual could accomplish alone.” Barnard also introduced the concept of considering
Figure 1. Dynamic Cybernetic Team model.
teams as a group of individuals who have differentiated needs and aspirations. He believed that "...efficiency was the result of individual efficiencies...efficiency was the degree to which individual motives were satisfied, and only the individual could determine whether or not this condition was being met."\(^{19}(p267)\)

The DCT model endeavors to maximize its team potential by focusing on individual team members and creating a cooperative environment.

The elements in the team core can be seen as the bonding material that holds it all together. The purpose of the team and the mission needs to be clearly defined and contextualized so that the individuals understand not only their task but also how it fits into the big picture. This further establishes the evidentiary relationship between clinical work and the purposes identified as driving it.

**Purpose and mission**

The *purpose and mission* of the team are critical as they set the stage for the other supporting core elements. The purpose and mission create the vision that needs to be precise and relevant to the clinical strategy and aligned with the patients’ needs. Hamel and Prahalad guard against undifferentiated mission statements, “A strategic intent should offer clinical workers the enticing spectacle of a new destination, or at least new routes to well-known destinations.”\(^{20}(p145)\) Therefore, a clear roadmap of the purpose and mission should be presented while highlighting the uniqueness or specificity of the path chosen and its applicability to practice.

**Meaning and motivation**

*Meaning and motivation* are derived from an understanding on the part of the team of its mission, and the vision, with clearly defined expectations. Senge states, “Visions are exhilarating. They create the spark, the excitement that lifts an organization out of the mundane.”\(^{21}(p208)\) In the clinical environment,
motivation finds its source in meaning and in care. An understanding of what motivates team members is required on the part of the leader. In the DCT model, it is assumed that Maslow’s first 2 basic hierarchical needs, physiological and safety, are met and that the team members are striving for the higher needs that include esteem and self-actualization.\textsuperscript{19(p281)} Hamel and Prahalad state: “Employees are unlikely to rise to a particular challenge if they don’t believe they will benefit proportionately from the organization’s success. For challenges to take root, an atmosphere of ‘shared pain, shared gain’ must prevail.”\textsuperscript{20(p157)} Consequently, motivational factors need to be clarified and responsibility must be shared both at the team and organizational levels.

**Commitment and competence**

*Commitment* is not something that can be commanded into play. It is elicited and earned. Finding the source of what can elicit commitment from individuals is the responsibility of the leader. As Senge points out, “Shared visions compel courage so naturally that people don’t even realize the extent of their courage. Courage is simply doing whatever is needed in pursuit of the vision.”\textsuperscript{21(p208)} Consequently, by rallying individuals around a common belief and goal, motivation and commitment become natural byproducts. Inamori goes further when addressing the subject of commitment by describing “…the will of a person committed to a larger purpose as a ‘cry from the soul which has been shaken and awakened.’”\textsuperscript{21(p172)} Perhaps, not all team visions can be made that compelling, but the point is that commitment, and motivation, is sourced through the essence of individuals and the leader needs to reach his or her team as individuals. In clinical practice, it is easy to lose this connection to personal motivation. The leader works to keep caregivers connected to their personal vision and purpose and to be motivated by applying those values to patient care.

It is assumed that members selected for the teams have been screened and demonstrate appropriate professional competence. However, should problems arise, the fluidity and cooperative structure of the DCT model will enable team members to support those experiencing difficulty.

**Team learning**

The work and completion of the task, as described in this team core, leads to a learning experience. Senge states, “People with a high level of personal mastery live in a continual learning mode. They never ‘arrive.’”\textsuperscript{21(p142)} This describes the spirit of the DCT model—to support the growth of team members by giving them the tools and direction. This creates a learning experience. The next step consists in harvesting the generated knowledge, assimilating it, and reinvesting it back into the team and the company in general.

**Team performance and outcomes**

*Team performance* is an outcome of the 5 process factors and the team core dynamics. It includes an evaluation process that will be explored in the next assignment. The quality of the outcomes, or deliverable, is dependent upon the team performance. The *outcomes* must meet the predefined customer/patient needs. The deliverable must not only be on target in meeting the goals but also be timely and represent excellence in order to go beyond the patient’s expectations (Fig 4). Evidence requires a strong interface and valid relationship between the process elements that both achieve and sustain clinical outcomes.

**PROCESS FACTORS**

**Process factor 1: Goals**

This process factor refers to the early understanding of team members to the team’s goals and the extent to which these goals direct the behavior of different team members in order to achieve the desired results. Militello et al\textsuperscript{22} identified 3 essential aspects to envisioning goals: (1) the ability of the team to identify its goals; (2) the ability of the team to ensure that all its members share
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Figure 4. Performance-outcome elements.

the same goals; and (3) the degree to which these shared understanding of goals contains a workable temporal element.

Process factor 2: Competence

Competence depends on the skills of team members in acquiring and interpreting information; making choices concerning to whom acquired information is to be communicated, as well as communicating accurately and completely; making decisions concerning ways to cope with unusual or unanticipated situations; and executing actions deriving from such decisions—all performed at high levels of proficiency and coordination. Margerison in her study of the skills needed for teams identified 9 team competencies that are necessary to produce high level of performance. These competencies are (1) Advising, which relates mainly to gathering and reporting information and the levels of team members giving advice to each other and the people outside their teams; (2) Innovating, which relates with the level of creating and experimenting with new ideas; (3) Promoting, which deals mainly with exploring and presenting opportunities and influencing others; (4) Developing, which assesses and tests new approaches and ensures that systems and products are well developed; (5) Organizing, through which the team arranges how things work using a systematic approach; (6) Producing, through which the team makes and delivers output by internal and external team linking; (7) Inspecting, through which the team controls and audits the working system ensuring high quality and effective process; (8) Maintaining, in which the team upholds and safeguards the standards and processes; and (9) Linking, through which the team coordinates and integrates with others. Each team, in order to succeed, requires its members to collectively cover all areas.

Process factor 3: Resources

This process factor deals with the extent to which team members conceive of their team as an independent unit and operate as such while engaged in the different tasks. Militello et al. identified 4 dimensions for achieving this independence: (1) Defining Roles, Functions, Resources, where each team member understands the task responsibility and roles of every member and the resources required by the team for performing its functions; (2) Engaging All Members, in which team members get actively involved in the team's activity, take responsibility, and encourage other members to get involved; (3) Compensating and Coaching, which deals with the shift of team resources to cover for areas outside their team roles or responsibilities by stepping outside their functions to help the team reach its goals (compensating) or when the experienced team members offer direction to less experienced to bring them to greater level of individual proficiency (coaching); and (4) Interpersonal Aspects, which refers to the conflicting or harmonious styles of the team members.
Figure 5. Team process factors.

**Process factors 4 and 5: Work demands and results**

These process factors refer to a team’s ability to observe its performance processes to reach the highest performance levels of productivity. The assignment of specific tasks to team members according to their areas of competency and preferences creates confidence and stability within the team. Doorewaard et al. mentioned 4 dimensions to team self-management to achieve the best results: (1) **Monitoring**, where the team continuously observes its performance and looks for signs of effective behavior for building on it and ineffective behavior to adjust accordingly; (2) **Adjusting**, which is the ability of the team to adjust its strategies to cope with the different internal and external changes affecting its work; (3) **Detecting Gaps and Inconsistencies**, which refers to the ability of the team to discover and fill gaps in the team’s information base and assumptions, and to recognize and handle inconsistencies or contradictions that might be present; and (4) **Time Management**, where the team is conscious of meeting the goals before deadlines by sequencing tasks and subtasks in such a way that output from one task acts as an input of another (Fig 5).

**TEAM ORGANIZATIONAL AND PARTICIPANT INFLUENCES**

As the DCT model is utilized, the dynamics of its use are influenced by organizational and participant influences. The view the organization has of teams, the value placed on teams, the structural support for teams, and the organizational culture has a great impact on how teams function, and ultimately the team’s success. According to Thompson et al., “When teams are properly used in organizations and when the organization’s internal climate is one that is consistent with a team approach, the results have been largely positive.”

Likewise, participants also influence the dynamics of the model and the success of teams. Historically, the American culture is based on the values of individualism. With clinical integration, evidence-based practice, pay for performance, and clinical restructuring, interdisciplinary and multifocal clinical teams are becoming more of the norm in healthcare and are seen as one way of leveraging organizational strengths to offset these new service challenges. Participants influence the team dynamic as a result of how they feel as a part of the team. The process factors of the DCT model greatly reflect the
participant’s influence. As participants become more confident in their abilities, purpose, and support for teaming, their influence on the process increasingly becomes positive.

CONCLUSION

In the spirit of Vaill’s white water perception influencing the clinical environment, one of continuous disruption, the DCT model presents a process-grounded system that is open and flexible in order to anticipate and meet the challenges of tomorrow’s ever-changing clinical environment. Influenced by Vaill’s philosophy of “learning as a way of being,” the DCT model enables the generation of knowledge that flows through feedback loops, creating a continuous cybernetic energy that keeps the practice environment dynamic and fosters a proactive attitude to continuous clinical transformation in team members. The soul of the model endeavors to support the well-being and growth of evidence-driven clinical practice.

This team model will need a special type of clinical leadership. Drucker in addressing the necessary qualities for tomorrow’s successful leaders, compares such individuals to opera conductors: “You have your stars and you can’t give them orders; you have the supporting cast and the orchestra; you have the people who work behind the scenes; and you have your audience.” Each section has different needs and processes. What holds the orchestra together, says Drucker, is that everyone has the same score. Increasingly, in assuring evidence-based teams, the leader assures they are composed of individuals who make different yet identifiable contributions with clearly defined practice roles while interfacing with external forces and other teams contributing to the achievement of evidence-based clinical goals. In using the DCT model, the clinical leader affirms the use of a specific systematic framework that consistently leads to achieving valid clinical outcomes while keeping the focus on the score, or the vision. Evidence-based practice will require the leader to use more integrated, synthesis-based approaches like the DCT model presented here as a way of fully addressing the requisite purpose-driven, relational, process-linked, performance-based format for building and using evidence-based approaches for sustaining excellence in patient care.

REFERENCES


