

The Human Dynamics of IT Teams

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This article presents the results from a recent research study investigating the personality dynamics of information technology (IT) professionals and teams. Our research identified diverse needs within IT teams: strong needs for objectivity and individual contribution and independence, coupled with a desire for effective team relationships and cohesion. This article focuses on study results in more detail and highlights implications for IT leaders.

Much has been written about the importance of teams that gel among information technology (IT) professionals. For many, a gelled team symbolizes the power of team dynamics in today's complex and uncertain environment. Unfortunately, many IT leaders find this level of team connection and performance easier to envision than to achieve. Furthermore, the team-based vision does not always connect with the more commonly cited portrait of the IT worker – as a lone professional preferring to work independently and in relative isolation, as long as someone occasionally shoves pizza under the door.

This dichotomy of visions – a *gelled team versus a lone coder* – recently motivated the Defense Acquisition University to support a research study to examine the intricacies of IT dynamics at both the individual and team levels. This research study investigated the personality and team dynamics of 621 IT professionals working in 77 IT teams [1]. It assessed quantitative and qualitative variables related to IT demographics, personality, success factors, workplace satisfaction, retention factors, and communication patterns, resulting in a unique perspective on the IT individual and team.

Ultimately, the study confirmed the importance of human dynamics within IT teams but offered a new perspective on factors contributing to team success. The study concluded that IT professionals have a statistically different personality composition than the general population, and share unique perspectives on the effective working relationships that may lead to teams gelling. The following is a summary of key findings of the study.

Study Overview

Several IT writers (e.g., [2, 3, 4, 5]) have recognized the importance of personality characteristics on team performance and

success. We used three published instruments, introduced below, to quantify these personality characteristics among IT professionals. We also designed two additional surveys: one to gather information about each team and another to quantify team communication processes and patterns.

The Myers-Briggs Type Indicator Assessment

The Myers-Briggs Type Indicator™ (MBTI™) Assessment, built upon the theories of psychological type, was used to both describe IT personality dynamics and to contrast the distribution of IT personality types against the general population. The MBTI sorts an individual's personality preferences based upon four distinct dichotomies. Table 1 lists the preferences associated with each [6].

Four specific pairings of the MBTI preferences also result in four unique temperaments, which map well to the following specific behavioral styles [6]:

- **Sensing Judgers (SJ):** Stabilizers – preferring structure, order, accountability, reliance on existing systems, policies and procedures, and the proven way of doing things.
- **Intuitive Thinkers (NT):** Visionaries – preferring non-conformity, theory, conceptualization, independence, objective complexity, and change for the sake of change if it produces learning.
- **Intuitive Feelers (NF):** Catalysts –

preferring interpersonal support, relationships, possibilities for people, interaction, cooperation, imagination, and supportiveness.

- **Sensing Perceivers (SP):** Troubleshooters – preferring hands-on action and experimentation, practical solutions, variety and change, immediacy, flexibility, and adaptation.

Fundamental Interpersonal Relations Orientation-Behavior Survey

The Fundamental Interpersonal Relations Orientation-Behavior™ (FIRO-B™) Survey focuses upon interpersonal needs, and was used to investigate how IT professionals typically behave toward other people, and how they generally expect others to behave. The instrument assesses three scales along two dimensions, described in Table 2 (see page 16) [7].

Work Environment Scales

The Work Environment Scales (WES) broadens the view to the IT team level and reports information about the workplace *social climate* [8]. Ten WES scales assess worker satisfaction across a broad range of dynamics, grouped into three key categories (see Table 3 on page 16). The instrument assesses these along two parallel dimensions: perception of the *real* work environment (as things are), and perception of the *ideal* work environment (how the respondent imagines the perfect workplace to be).

Table 1: Myers-Briggs Type Indicator Personality Scale Descriptions

	Scale Descriptions	
E/I: Energy Source	Extravert (E) Gain energy from outer world of people, action, and things.	Introvert (I) Gain energy from inner world of concepts and ideas.
S/N: Perceiving Function: "Data Gathering"	Sensor (S) First perceive the immediate, practical, real facts of experience. Collect here and now sensory information.	Intuitive (N) First perceive possibilities, patterns, and meanings of experience. Collect information through impressions.
T/F: Judging Function: "Decision Making"	Thinker (T) Objective decision making. Seek clarity by detaching from problem; cause-effect oriented.	Feeler (F) Subjective decision making. Seek harmony with inner values by going within problem.
J/P: Outer World Orientation	Judger (J) Show external world judging mental function. Prefer to live in a decisive, planned way.	Perceiver (P) Show external world perceiving mental function. Prefer to live in a spontaneous flexible way.

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	Inclusion	Control	Affection
Expressed	Extent to which you feel need to include others in activities.	Extent to which you feel need to exert control and influence.	Extent to which you feel need to express warmth and closeness.
Wanted	Extent to which you want others to include you in activities.	Extent to which you want to be in well-defined situations.	Extent to which you want warmth and closeness from others.

Table 2: FIRO-B Scale Descriptions

Now, we turn to the findings from the study.

The Diversity of IT Teams

Ten years ago, a development team consisted primarily of programmers. Today, the typical team includes a broad range of technical specialists – many of whom also play management roles. In our research, only 12 percent of IT professionals reported their role as programmer or developer [1]. Conversely, 32 percent of IT team members report their job as a *leader* or *manager*, indicating the practical need for a broader skill set beyond the technical realm.

What is the impact? IT teams that once shared a common technical base for building relationships are now coming together from separate specialties and backgrounds within their own field. This diversity can lead to profound opportunities for collaboration, or to miscommunication and stovepiped efforts if not managed effectively by the IT leader.

The force of technological change has also focused shared expertise at the team level. “So rapid are technological developments that the core is now the team, the only unit small enough to maintain its intellectual edge” [9]. Unfortunately, our research revealed that the average IT team has been together for only two years, and 45 percent of teams have been together a year or less [1].

The following are the implications for IT leaders:

- Carefully focus on the staffing process;

look for diverse *and* specialized technical skills sets and the ability to acclimate to and work within the new team.

- Foster active listening skills and critical thinking skills within your team; this is vital to effective communication among diverse specialists.
- Consider expanding training programs to include management and human dynamics skills; something not typically included in the technical curriculum.

The IT Personality and Behavioral Styles

Results from the MBTI Assessment and the FIRO-B revealed the following intriguing personality dynamics among IT professionals.

Objective Decision Makers

More than three quarters (77 percent) of our sample reported a preference for *thinking* decision-making, with only 23 percent preferring *feeling* decision-making. This is significantly higher than in the general population, where the split between these preferences is generally even. Thinkers, as they are termed, generally prefer logical, objective, impersonal decision-making, focused upon cause-effect relationships and the clarity that comes from objectivity (problem first, people second).

Lone Gun Professionals

Forty-one percent of the IT professionals surveyed reported being *introverted thinkers* (combination of introversion and thinking preferences), nearly twice the percentage in the general population. Introverted

thinkers often prefer a *lone-gun* approach to work, often avoiding teams, collaborative efforts, and the training that support such structures. This group is least likely to engage and connect interpersonally with others, and may avoid creating personal bridges of trust and openness with colleagues. This finding was supported with results from the FIRO-B, with more than half (55 percent) of the IT professionals reporting low, or highly selective, wanted inclusion scores (a low need to be included in the activities of others) [1].

Conflicting Behavioral Styles

The two most prevalent temperaments among IT professionals are the *intuitive thinking* (NT) and the *sensing/judging* (SJ) temperaments, accounting for 75 percent of the total group. These are represented at 27 percent and 48 percent in IT teams, respectively, compared with 13 percent and 39 percent in the general population.

Interestingly, these two behavioral temperaments are those that tend to conflict most often. SJ groups may value established tried-and-true policies and procedures, proven standards, chain-of-command accountability, and respect for organizational tradition. These groups may see the NT’s as disrespectful of tradition, irreverent, and simply stirring up the pot by constantly reinventing the wheel.

NT groups may value systems that reward future-focused, innovative thinking, and loose structure with minimal formal procedures and policies. These groups may see the SJ’s as the ball-and-chain traditionalists who stifle creativity by their inability to think outside the box [10].

Implications

What are the impacts of these findings? IT professionals often prefer objective, impersonal dimensions of a problem, and may focus too heavily on the technical realm of the IT problem, neglecting user-based concerns. For example, some introverted thinkers fail to always consider the impacts of new systems on the people of the receiving organization, and may need reminders to connect on a personal level with key stakeholders.

Teaching teams about the differences

Table 3: Work Environment Scales Descriptions

Dimensions	Scales
Relationship	Involvement - Concern and commitment to job. Coworker Cohesion - Friendliness and supportiveness. Supervisor Support - Management supportiveness.
Personal Growth	Autonomy - Self-sufficiency; individual decision-making. Task Orientation - Planning, efficiency and task completion. Work Pressure - Work demands and pressure.
System Maintenance/Change	Clarity - Communication of policies and expectations. Managerial Control - Use of rules to keep control. Innovation - Emphasis on variety, change, new approaches. Physical Comfort - Pleasantness of physical environment.

that stem from NT and SJ temperaments can help leverage those differences for better balance. For example, a temperament-based perspective on the dotcom era suggests that an over-emphasis on loose structure and innovation (NT), without a balance of practical policy and procedure (SJ), may have contributed to the eventual failure of brilliant start-ups. Respecting both can mitigate this risk.

Understanding personality dynamics and control needs may provide useful insights in selling new IT initiatives to teams. For example, the acceptance of new IT process tools (such as the Capability Maturity Model®) is highly dependent on developer acceptance. A 1999 Software Engineering Institute research study found that IT process tool adoption can be linked to three key factors: perceived control over the work, perception of the new tool, and perception of the tool/process impacts [11].

These results also have important implications for the leader trying to build a team closely connected to its stakeholders. As the IT role shifts toward the team-based and user-driven nature of today's development environment, personnel may need to engage more with the *people side* of the preference equation to meet IT needs.

We can teach these skills. When IT leaders and professionals understand personality preferences and needs, they can use this to identify team strengths, potential blind spots, and potential interaction dynamics. A leader's first step is to first recognize, and then communicate the need for the *touchy-feely* dimension of the IT process – providing concrete objective evidence of the benefits gained from building strong interpersonal, communications, and team-based skills.

Perceptions of Success, the Ideal Team, and Team Needs Team Success and Turmoil

One of the key factors assessed during our research was manager and team member characterization of team success. Specifically, we asked managers and team members to (1) classify their team as successful or in turmoil, and (2) select three factors driving that rating. Interestingly, both managers and team members selected the same top three factors regardless of whether the team was called successful or in turmoil:

- **Work together effectively.** (Or do not work together effectively, for teams in turmoil.)
- **On-time delivery.** (Or do not deliver on time, for teams in turmoil.)
- **High quality services.** (Or do not deliver/provide high quality services,

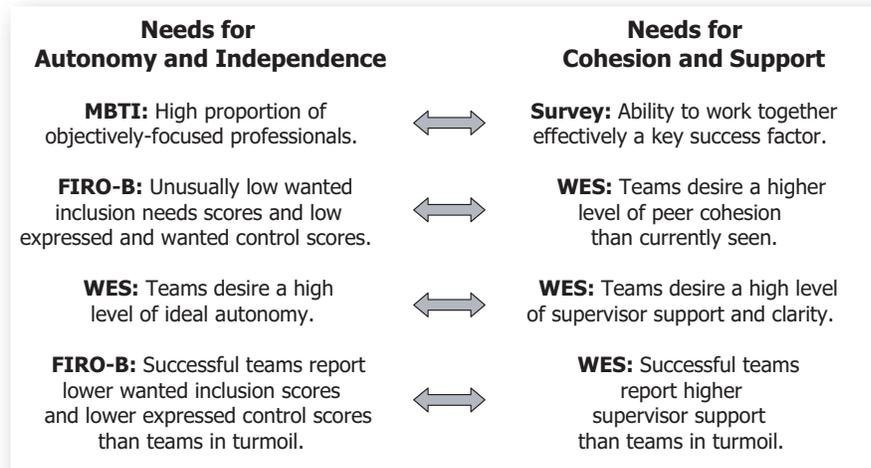


Figure 1: *Potentially Contradictory IT Team Needs*

for teams in turmoil.)

These points deserve discussion. First, consider what is missing! Although meets and exceeds client/user requirements were available as factors for both managers and team members, these factors were not among the top five in either group. Consider this omission given the industry's growing emphasis on user involvement and the continuing struggle that IT projects experience with requirements creep and management!

Second, two of the key factors – time and quality – can be assigned metrics, making them easier to define and manage. Third, *working together effectively*, is harder to systematize and requires the team to ask, "What does working together effectively mean to us?" Ultimately, given the link between working together effectively and success, IT leaders who have asked this question may have taken an important first step to improving IT project performance.

The Real and the Ideal Work Environment

The link between working together effectively and team success was also reflected in the WES results. Our data reported that IT professionals have many consensus on what the *ideal* environment could be than on what the *real* environment is. This was particularly marked for variables related to team involvement and dedication, emphasis on innovation, and degree of supervisor support.

Many IT leaders have found the WES useful for initiating discussions about team improvement – if we know where we want to be (the ideal team), we have a starting point.

Understanding IT Team Needs

Figure 1 brings these findings together,

reporting the interesting tension within IT teams: a desire for autonomy and independence, coupled with a desire for peer cohesion and support, i.e., "the team can gel, as long as I can work by myself."

Implications

Our study findings reveal an important question for IT leaders: How do we best support teams that clearly value effective team relationships, while also fulfilling strong needs related to objectivity, individual contribution, and independence?

First, recall our findings about the IT personality. As previously described, the high representation of thinkers and introverted thinkers, with collectively low inclusion needs, suggests a general team orientation toward independent activity and objective decision making. In fact, a common philosophy among those with these preferences is, "side by side is binding." This suggests that, for these individuals, when a group is dedicated toward a shared vision, high levels of team face time are not a prerequisite for success. With these types of teams, effective IT leaders often serve their team best through roadblock removal – provide the teams with the right tools, communicate the mission, and check to see that the barriers to effectiveness are removed.

In reality, many managers respond to team challenges by implementing control mechanisms. In fact, most improvement models are designed with the goals of controlling process so that it can be tracked, documented, and managed. Our research suggests that this regulation comes at a cost. Most IT professionals report low control scores on the FIRO-B, and want more personal autonomy (i.e., individual decision-making and self-sufficiency) than currently experienced.

Furthermore, teams with low needs for external control, led by a manager with high control needs, are more likely to report themselves as in turmoil.

Conversely, IT professionals report wanting a significantly higher level of clarity in their work than currently experienced. This means that they want to know what to expect, and want policies to be more explicitly communicated than they currently are.

Leaders understanding the tensions between control, clarity, and support stay focused upon providing a roadmap for the IT team, without dictating how to drive. This requires recognizing the fine line between *delineating* the road forward (describing all of its roadblocks and speed traps), and *directing* the team on how to drive in order to avoid them.

Observing IT Teams at Work Building a Robot

Although most study data were gathered using self-report instruments, we also observed each participating team's communication patterns and process in a simulated development environment. Specifically, each team was given a Lego Mindstorm Robot Kit and these specifications: "Construct a robot that moves around the dark circle within 30 seconds, stops, reverses direction, and goes around the dark circle in the opposite direction, also within 30 seconds. You have 25 minutes. Creativity and elegance of design count."

This task poses a specific team challenge, for it is nearly impossible to build an automated solution in the time allotted. To be successful, the team must explore the terms *robot* and *moves around*. If the team agreed that the robot could be non-automated (since we did not give them a better definition) and manually moved any object around the circle and back, they generally considered themselves successful. If they assumed the term robot meant automated, they were unable to complete the process.

Here are the key findings from the robot exercise, and their connection to the WES instrument:

Table 4: *Practical Questions for IT Leaders*

- What data do you find most compelling when solving a problem? What might be left out?
- Are problems or people more important in your decision-making? How does this impact your problem-solving and your relationships with stakeholders?
- How important is it to be included in others' activities? What is the impact of either over- or under-including others in your work?
- Over whom do you exercise control? Who do you allow to control you? To what effect?
- Which is more important to you: orderly goal achievement, or passion and innovation? How could both coexist?

- Half of the teams never questioned the definition of the term robot, and proceeded with the assumption that a robot must be automated – an interesting commentary on requirements analysis!
- Teams were highly task-oriented, with approximately 85 percent of team behaviors oriented toward providing information, suggesting solutions, and task problem solving. Far less time was spent in maintenance behaviors such as encouraging others, offering words of support, building harmony, and compromising.
- Teams identifying a non-automated robot solution (50 percent) reported higher innovation scores (measuring openness to new approaches) on the WES than teams that did not.
- Teams successfully implementing a non-automated solution (24 percent of teams) reported lower managerial control scores (measuring extent to which manager controls team activity) on the WES than teams that did not.

Implications

Generally, teams quickly saw parallels between their daily work and their robot effort, leading to fruitful discussion about team dynamics, critical thinking, communication pathways, and requirements management. For example, teams with a strong task-focused approach to requirements elicitation recognized that they often do not engage in interpersonal, collaborative elicitation approaches that may be more effective with users. As a second example, teams discussing baseline assumptions about the term robot often raised the question, "What hidden assumptions aren't being discussed in our team?" The robot exercise can be a powerful tool for leaders wanting to spark discussion about these dynamics.

Conclusions

Today's IT professionals are no longer solely technical specialists; they are also educators, facilitators, and consultants working as teams with end users to solve business needs. Amid these new roles, IT teams are under increasing pressure to create and deliver products and services that are on time, within budget, and of high quality. This reality leads to the key concluding points from our research.

First, successful IT leaders know how to communicate effectively, manage conflict, and influence others. Because IT is an inherently group-oriented activity, leveraging interpersonal skills is a critical success factor in achieving specific goals. Our research shows that relationship management skills, not always taught in technically

focused environments, need to be highlighted as a key capability in today's IT toolset.

Second, IT leaders need insight into their own cognitive preferences and interpersonal needs. Personal style impacts both job performance and effectiveness with others. Understanding this and knowing preferences and team needs is an important first step in exercising managerial strengths and blind spots.

Third, successful IT leaders use both self-awareness and an awareness of others' preferences to maximize team performance. Leveraging interpersonal connections and deploying relationship management skills appropriately are critical in maximizing the utilization of team resources. Table 4 offers some practical questions for IT leaders.

In closing, our research has shown that tools and models from the field of organization development – applied strategically and practically with IT teams – yield benefits that enhance both the process and product of technical work.¹ We use these lessons in our own work with development teams and continue to see the power of this approach on team effectiveness, productivity, and satisfaction. ♦

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Note

1. This research project generated significant data related to IT team dynamics, retention factors, and success. Readers interested in learning about the study can contact the authors for more information or detail.

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