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## Innovative Virtual Teams on Demand: HBDI-based paradigm

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### Abstract

Teams are the building block of organizations. The objective of this paper is to virtually construct three types of teams: innovative, knowledge, and quality based on Herrmann Brain Dominance Instrument (HBDI) profile scores. These scores measure how people process information and provide measurement of the strength of the four quadrants of the brain each having different characteristics. These types of teams require different composition of team members using their profile scores in order to achieve their respective aims. Innovative teams deal with the whole organizations as a one unit and may question all underlying assumption; knowledge teams span multiple functions; quality teams addressed issues in a silo function. A prototype is developed to construct teams from an actual data base of employee profiles in a developing nation. A user may request one of the three types of teams, state duration in time, and displays the selected members with their respective profile scores of the four quadrants. The teams formed maybe used in software development teams as well as business plan teams. These team constructs should foster and nurture innovative idea generation and maintain the competitive advantage of global organizations.

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*Keywords:* Virtual teams on demand, HBDI, whole brain concept, innovation, innovative teams, knowledge teams, quality teams

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### 1. Introduction

In support of the premises of this paper, an analysis of virtual teams' literature over 10 years suggested the following opportunities for future studies in virtual teams: team adaptation, creativities, and wellbeing of team members [1]. A study of a finance team revealed two statistics: 0% of team members were considered innovative, and 0% of team members were considered good relationship members. Authors concluded that the team faced

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troubles in performing their assigned duties [2]. The same authors analyzed another team with 86% of team members were considered good relationship builders and found that the team did not accomplished their tasks neither. Their paper specially addresses this issue in communication within the group. In one of the interviews conducted by Welder [3], the CEO of TechSmith stated “As younger workers progress higher in their careers, they are setting the standard for communication in a workplace and they are leading with a preference for visual communication.” The report by Gartner Group [4] recommended the development of new social tools for team management.

Previous research on virtual teams’ composition and interaction focus on cultural differences [5, 6]. These studies use cross- cultural phenomena and models to provide some answers to problems found in managing cross cultural teams. In the transcript associated with a Prezi presentation, the author in [7] developed a plan to study virtual team’s effectiveness in relationship to quality monument in software teams. The transcript highlights among 7 basic types of virtual team’s research problems: talented employee may be located globally, need for complex IT infrastructure, and increasing flattening of the organization resulting in globally dispersed capable human resources. A survey of literature on virtual teams [8] concluded that in order for virtual team to be successful organizations must adopt an effective mechanism for capturing and internalizing knowledge and information in the company.

The approach adopted in this paper relies on the profile scores of the Herrmann Brain Dominance Instrument (HBDI) ([www.hbdi.com](http://www.hbdi.com)). The test was performed on-the-job employee for a major industrial company in the Gulf region, with actual names replace with fictitious names. The ensuing section presents the theoretical foundation including the necessary foundation on HBDI and team types, and verification of HBDI processes against Google teams research conclusions. The next section details the specifications of the system, and the third section contains screen shots of a prototype implementation of the system. The final section includes conclusions and future research.

## **2. Theoretical background**

### *2.1. HBDI foundation*

HBDI profiles are useful for (<http://facilitating-success.com/our-profiling-toolkit/profiling-360s/hbdi/>): Developing ‘Whole Brain’ thinking, Communication, Project management, Creativity training, Change management, Explore workplace preferences, understanding elements of a Corporate Culture, Team building, Decision making, and Problem solving. As to the complete test results, “the HBDI Profile package includes a full color profile, accompanying interpretation booklet that explain the profile and scores in detail, and a discussion of the implications (these) results have for business and personal life.” The following types of HBDI assessments available: Individual profiles, Team/Work Group profiles, Pair or Partner profiles, Organizational and departmental profiles (<http://www.standupstandoutinc.com/whole-brain-thinking-assessment.html>).

HBDI divides the brain into four quadrants measuring thinking preferences and brain dominance, unlike the traditional left and right brain types. The four quadrants are termed A, B, C, and D, starting from the upper left-hand corner. The following figure demonstrates the characteristics of the four quadrats. The person strong in the A quadrant (Q) is a mathematically oriented mind, the B Q mind is with managerial orientation, the C Q person is strong in interpersonal communication, and finally, the D Q is the innovative and visionary person. The profile score for the 4 quadrants are measured diagonally from low preference to very strong preference, and the score ranges between 8 and 138.

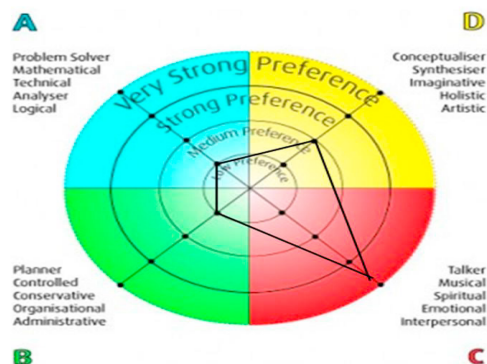


Fig 1: Basic characteristics of the four quadrants of the brain according to HBDI.

Individuals may be a single, double, triple, or quadruple dominant profile. The above figure shows one single dominant C quadrants. Rather than populating the figure with the other dominant type, reader could imagine the shape to the other three dominant styles. The results of the extensive test reveal other types of information. Just for privity, the right two-quadrants (C and D) is called “right mode”, the left two-quadrants (A and B) is called “left mode”, the top two-quadrants (A and D) is called “cerebral mode”, and bottom two-quadrants (B and D) is called “limbic mode.” Then the results assign a percentage out of 100 distributed between the left (55%) and right (45%) modes, and the same to the top (65%) and lower (35%) modes. These percentages indicate the strength of an individual’s orientation towards the opposing halves of the brain. At this stage, the study will not use the details of the HBDI report; it will concentrate on the profile scores for each quadrant in selecting team of members.

## 2.2. Team types

In this study, the authors identify three types of teams: at the lowest hierarchical organizational level, quality teams tackle process improvement in a silo functional department with the objective of improving performance and reduce time and cost, such as enhancing customer care, and implementing a new leaves and absences system. Knowledge teams, at the middle level of the organizational hierarchy, deals with multidisciplinary teams spanning over two or more functions, such as improve the effectiveness of debt collection with cooperation between the accounting and marketing departments, and installing a new security software that affects many departments. Finally, innovative teams at the highest level of the organization addressed problems related to whole organization and questions organizational assumptions at its roots, such as developing new business governance policies, and adopting new innovative programming paradigm such as Agile Methods. This later approach was advocated by authors in [9] using HBDI paradigm.

## 2.3. Verifying HBDI processes against Google team research

Google conducted extensive research on its team management and performance and concluded by listing 5 critical success factors [10]. The following discussion presents the five factors and corresponding links to HBDI four brain quadrants characteristics.

- Psychological safety: Can we take risks on this team without feeling insecure or embarrassed? The sources of such insecurity and embarrassment may twig from two sources: team management practices, and peer intra-team pressure. In HBDI processes, we provide two mechanisms to offset such pressure: Team leadership rotation, and active role of C Q member in ameliorating peer pressure
- Dependability: Can we count on each other to do high quality work on time? Each team member should actively contribute based on the quadrant representing personality thinking and information processes. This will lead to collective integrating efforts leading to quality of work: the whole is better than the sum of each member.
- Structure & clarity: Are goals, roles, and execution plans on our team clear? This factor is mainly dealt with by members having Q A & B thinking preferences
- Meaning of work: Are we working on something that is personally important for each of us? Throughout team deliberations, each team member should express their views on how ideas under discussion have a meaning for each of them and how that will affect the organization. Team leader rotation among A B C D would encourage members to highlight in more detailed manner during their leadership time.
- Impact of work: Do we fundamentally believe that the work we're doing matters? While each member should be able to link meaning to impact, members belonging to Q D & C plays the major role in doing so. To deal with cultural differences, language, accent, personal politics, time variations, power distance and other culture-related models, global dynamic organizations adopting virtual team strategy for managing the organization should not be allowed to have these factors to interplay with group meeting dynamics. Perhaps developing a policy statement related to virtual team meetings should assist teams to be all on the same framework of reference. The main objective of such policy is to emphasize that team members are already employed and as such each is competent in his field, and the selection is based on how their brain process and represent ideas and thoughts.

### 3. System specifications

The system is modeled using two types of specifications: Overall functional specifications to guide our future research, and the prototype specifications with UML artifacts and screen snapshots for the purpose of displaying the major functional requirement of the prototyped system, namely team formation.

#### 3.1. Overall specifications

The proposed system should have the following functional requirements:

1. Team formation based on team type and corresponding member possessing relevant profile scores.
2. Management report giving the status of profile scores after each team formation and providing an alert when the number of employees in a particular quadrant profile score reaches a critical level. The critical level will be decided by top management depending on the size of the database and team requests frequency. The system will also provide alerts on teams exceeding the time duration requested for the team.
3. Store team evaluations from each member of the team.
4. Post-mortem activities which include developing a database of team's evaluations, idea generated and lessoned learned to form the foundation for an intranet knowledge management system.
5. Parametric specifications for profile scores which divides the scores into three classes: High: 95 and higher, Medium: 75 and less than 95, and Low for less than 75. In addition, the following table shows suggested team composition using the three classes.

Table 1: Profile scores assignments to team type based on the rank of profile scores classes (the list of ranks in order or priority)

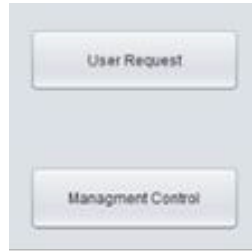
Team type	D	C	B	A
Innovative	H M	H M	M H	M H
Knowledge	M H	M H	M	M
Quality	L M	L M	H M	H M

Once a team member is selected based on his H, M, or L profile score, the other quadrants become irrelevant. However, in some cases a member may combine two quadrants with H H or H M profile scores.

### 3.2. Prototype specifications

1. System artifacts. Two artifacts are generated for team selection: The sequence diagram, and the Entity relationship diagram and the. These are listed in Appendix A.1 and A.2, respectively.

2. The main menu. The main menu displays two options: team selection and management control, as shown in the next screen snapshot.

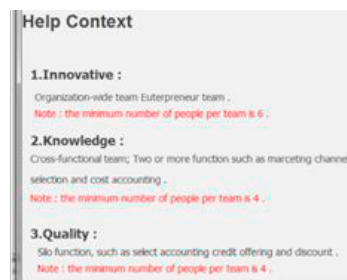
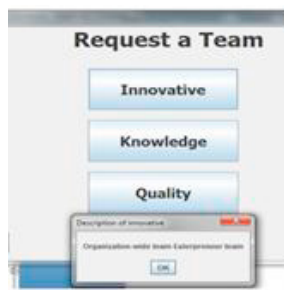


3. Management report. A management report will be generated after each selection displaying the status of the four quadrants' profile scores higher than 95. The left screen snapshot below shows statistics for the number of each quadrant with high profiles scores of more than 95 to give an indication on current status effect on the next team selection. For example, a low number of employees in the high level of Q D may hinder the formation of innovation teams. The screen snapshot on the right below shows an updated statistic after several executions of team requests.

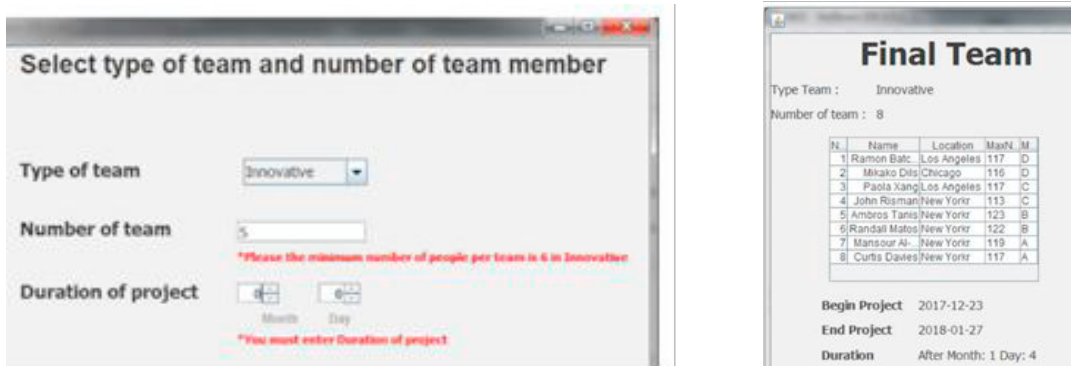
Class	Number
A	44
B	47
C	22
D	32

Class	Number
A	25
B	28
C	6
D	11

4. Team selection. User are prompted with a screen requesting them to select one of the three types of teams as used in this study, as shown on the left screen snapshot below. Also, the system displays help messages for each particular field. The next screen snapshot shows the help messages for each type of teams, as demonstrated by the screen below on the left.



Once users select a team type, a screen appears requesting to type the size of the team and durations in months and days, as shown in the screen snapshot below. The predetermined sizes of team types of innovative, knowledge, and quality are 6, 4, and 4; respectively. Users are given two iterations before the user approves a particular team selected by the system, as shown in the next screen snapshot of the left. Once the system’s recommendation is approved, related entities in the database are updated and the link between teams and members is created with beginning and ending date. User will give the duration in months and days, then the system will compute the ending date with the assumption that the team will start the same day it is requested. Ground work for team objectives must be done off-line before filing the request. Subsequent to the database update, the system finally displays the official team members as approved with its duration, as demonstrated in the next screen snapshot on the right.



In this particular case, the request for innovation team has a size of 8.

The following figure demonstrates three sample formations for the three team types using the minimum number of team size for each team type. Each black circle in a quadrant represents a member and corresponding quadrant strength.

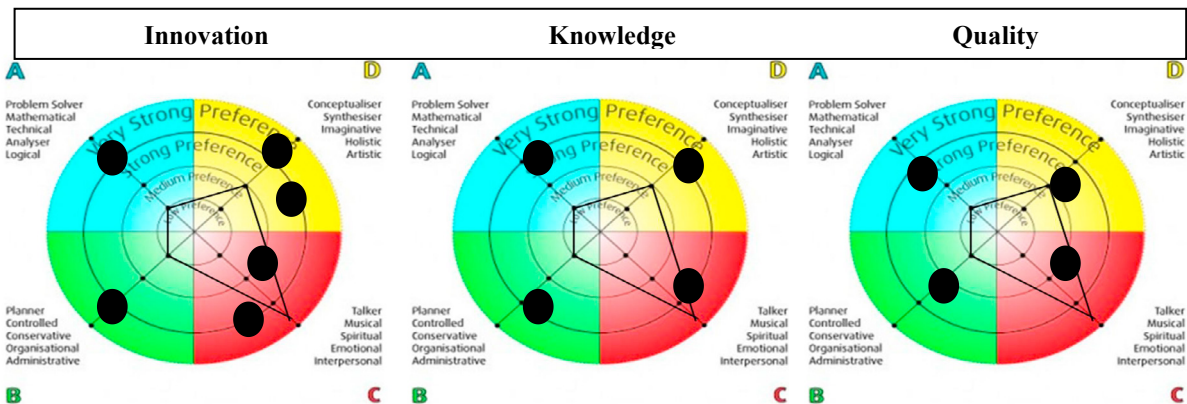


Fig 2: Sample team composition based on team types. (Note: Each dark circle represent a member and corresponding quadrant strength)

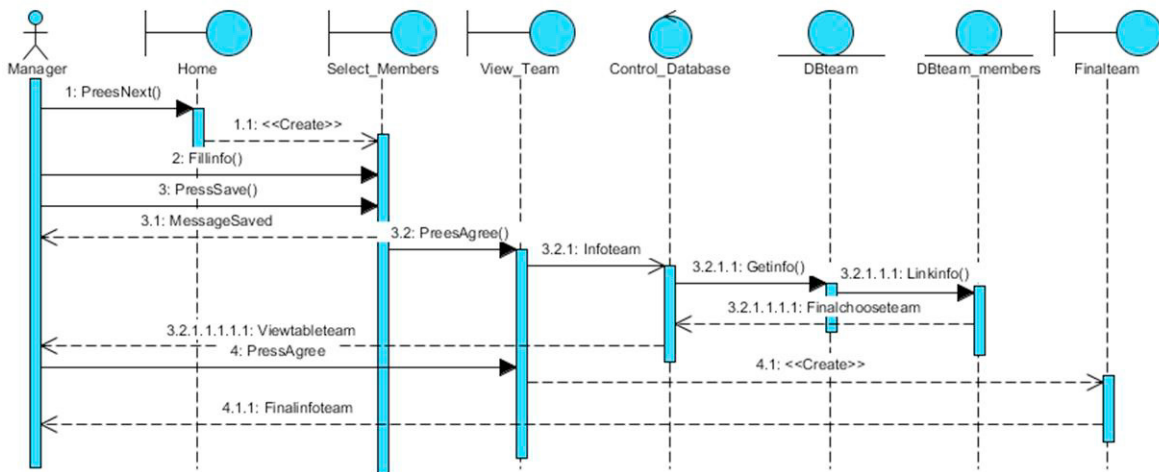
### 5. Conclusions

Virtual teams are becoming an integral construct for managing global dynamic organizations. While prior research concentrated on the effect of cultural differences among team members on team performance, this paper concentrates on thinking and information processing traits of team members. The paper used one commonly known measurement termed HBDI. Not all teams are created equal and not all perform the same tasks. Therefore, the

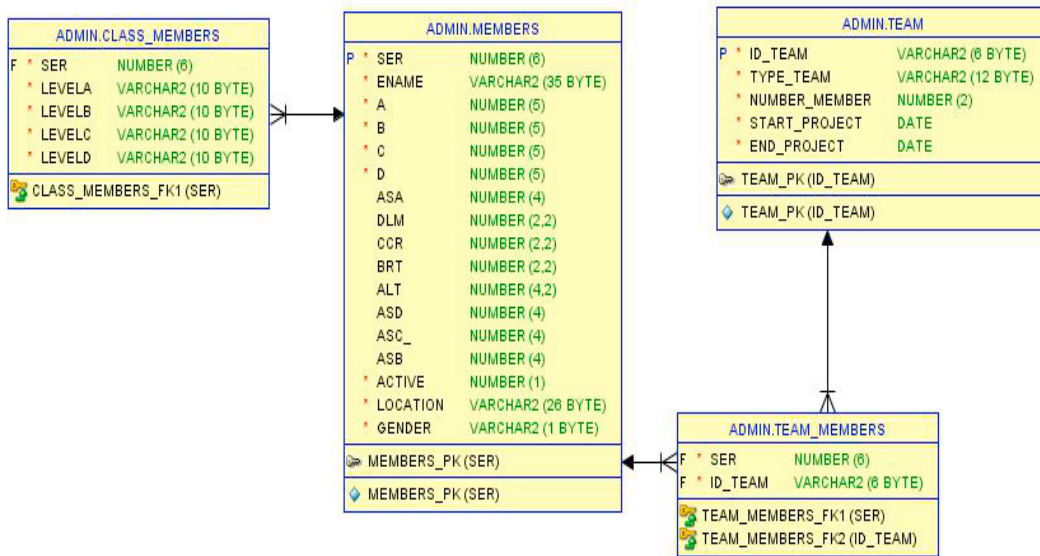
paper identified three types of teams each having a particular domain for its operation: innovative, knowledge, and quality. This distinction allows organization to capitalize on its intellectual capital based on thinking styles. At the lower organization level, teams must have capitalized on employee whose goal and task oriented in quality teams (Q A & B). However, as we move higher the organization, organizations must stress the use of employee who are visionary and capable of delivering the message to other members of the team and play the facilitator role (Q D and C). Overall the objective is to create balanced teams in all four quadrants as it relates to team type. The paper proposes team leader rotation to assist in team management and operations. In fact, such rotation may take care of some of the problems created by cultural diversity as well. Our future research will expand the prototype to team evaluation, and the creation of appropriate knowledge management system, as well implement the complete system eventually.

**Appendix A. Prototype system artifacts**

*A.1. Sequence diagram*



*A.2. Entity relationship diagram*





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