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TEAM-WORK TRAINING FOR SOFTWARE PEOPLE

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This paper reveals the importance of the team-work in the software area so as to persuade the human resource managers that this ability should be trained and professionally developed. The basic goals and principles of team-building are presented. An example, showing how a training program for software people can be established and implemented, is given. The possible use of the comparative analysis to facilitate the training activities is demonstrated.

1. Introduction. The real life software systems are large and sophisticated and can not be sole responsibility of independently working individuals. The successful software projects are team-work of employees with proper motivation, good performance and high satisfaction. The analysis of the dependency chain

needs → motivation → efforts → performance → rewards → satisfaction

reveals the evident impact of the well organized work in teams and draws our attention to the problems of team-building.

After introducing the basic definitions, our approach to team building has been described in Part 2. It comprises a process model, two useful techniques and a real life example to confirm its feasibility. Part 3 shows how the comparative analysis can be used in training activities. In Conclusion some ideas for further research are shared.

According to the recent human resource management theory, the ***team*** is a small group of people with complementary skills who are committed to a common purpose, set of performance goals and approach for which they hold themselves mutually accountable [1].

Team-building is an organized effort to improve team effectiveness. The objectives can be to define or clarify policies and goals, to review and refine procedures, to enhance the personal performance or to improve the management practices and communications.

The basic team-building concepts are drawn upon the athletic model. They include the assumptions that the performance must be continually critiqued and improved, that the team can not rest on past achievements but must constantly strive for greater teamness.

Team-building typically begins when the team leader realizes that there are blocks to team effectiveness, that improvement or change is desirable, and that help along those lines is wanted.

A very useful form of team-building is the "transition team build". Its purpose is to facilitate the entry of a new manager or team members into an on-going operation. Usually the manager wishes to learn more about member strengths and weaknesses, their

temperaments, possible interpersonal issues, the degree of teamness, which exists, the team's history, current operation goals, priorities and problems. Similarly, team members want to remove uncertainties about their new leader's management philosophy and style, personality and expectations. In the area of software development these transition situations can be observed at the beginning of each project with a new or restructured team, following a major reorganization, a merger or an acquisition or a severe staff cutbacks. The team-building can be triggered by new organizational requirements such as significantly added responsibilities (i.e. after ISO-900x certification), a change in mission or after starting some new programs such as cost reduction or quality improvement. A highly critical report resulting from communications, climate, or morale survey may also be an indicator of the need for team building.

One way to understand team-building better is to consider what it is not:

- It is not something that can be accomplished properly by every manager or team leader. The level of leader readiness is a key concept for successful team building.
- It is not likely to be successful if all the members of the group are not committed to the idea.
- It is not only for the work group "in trouble". All work groups can improve their effectiveness.
- It is not a one shot affair. The initial sessions must be supported by continuing follow-up meetings.
- It is not a panacea. It cannot overcome problems that relate to the larger system such as insufficient resources, an ineffective reward system, poor leadership, etc.
- It is not an easy task. Hard work, patience, a willingness to invest the necessary time, risk taking and experimentation are some of the ingredients of successful team-building.
- It typically is not something that can be done well without trained facilitator. The facilitator's role as catalyst, standard-setter, challenger, issue-raiser, processor and arbitrator is that makes things happen meaningfully.
- It is not a process that is intended to create dependence on the facilitator. In fact, the proof of facilitator effectiveness comes when the group no more needs him.

2. Our approach to team-building.

2.1. How to perform the team-building activities. We propose a process model for a systematic accomplishment of the team-building activities. It specifies the distinct stages involved from the design of a team-building program to its utilization. These stages are the following:

Preparation stage

During this stage the trainer has to create the work design comprising the main goals to be achieved, the techniques to be used and the most appropriate training place and duration. The design is a result from a careful ground study in the form of interviews or

questionnaire so as to gather data about the team's functioning. Data collection relates to work problems, process factors, interpersonal relationships and system impacts.

Implementation stage

Typically the initial team-building effort takes place for two or three days, away from the demands and routines of the office and close to the nature. Early team-building activities are designed to establish rapport, mutuality, trust and open lines of communication. As the program develops, the teams begin to look at their own functioning, goals policies, relationships and barriers to effectiveness.

Some typical training techniques as small group work, fishbowls, dyads, triads, instrumentation, role negotiation, brainstorming and feedback have been identified.

Follow-up stage

A successful team-building effort means a positive resolve to "do better" resulting in concrete action plans to meet the key problems head on. The indicators of the successful team-building process are the following:

- Roles are clearly defined.
- Goals are established by the team and are clear to everyone
- Policies have been established or revised
- Procedures have been set up to make operations efficient.
- A schedule is set up for continuing team-building sessions.
- Relations with the external groups are improved.
- Delegation is greater (deeper and more authentic).
- Group decision making is a norm.
- Costs and turnover have been reduced.
- Service to customers is better.
- Profitability is improved.
- New and better product and/or services are introduced.

According to our process model these indicators should be analyzed at least twice: at the end of the training and after a reasonable period of time.

2.2. Team-work training approaches. We are going to present two methods, applied by us to a number of training sessions in different organizations. These sessions gave us the possibility not only to develop the corresponding training programs but to examine their feasibility and efficiency as well.

A. OutDoor Adventure Training (ODAT)

The OutDoor Adventure Training is focused on a step-by-step development and quality improvement of the company teams performance. All such programs are designed to reach rapid, profound and lasting changes in the attitudes and performance of individuals, groups and organizations.

This technique is appropriate as:

- A complete training program for team-building and for improvement of team functioning;
- An element of an in-house training on other subject;
- A part of a company event – meeting, conference, company day, etc.

In our OutDoor Adventure Training programs we apply the most innovative outdoor techniques and methods, based on the inductive learning approach. The training activities, tailored to the needs of each group, involve participants in a multi-sensorial learning process which can reinforce and stress the importance of and need for team-work. The programs are designed not to encourage competition between team members, but to stimulate cooperation and development of a common spirit and synergy constantly aimed at achieving corporate goals and improving business outcomes.

The outdoor activities are combined with indoor sessions for analysis and share of opinions and experience, which help participants to get to know each other and to encourage the exchange of personal feedback.

The expected outcome:

- Assists the staff members' better integration to the company culture and mission;
- Unites the team in finding common decisions, develops a sense of cooperativeness and trust between team members;
- Stimulates a creative approach in solving problems;
- Gives opportunity to experiment in improvement of the in-company communication;
- Strengthens motivation of the participants, gives inspiration, enthusiasm and positive energy;
- Increases self-confidence as well as trust in both oneself and others;
- Reduces the psychological distances between colleagues;
- Learns new and more effective organizational behaviors;
- Builds a strong team spirit.

The OutDoor Adventure Training programs should be designed and conducted by experienced training consultants with psychological background and expertise in the field of group training.

Training comprises the following consecutive steps:

a) *Definition of objectives*

The consultants start the pre-session with an initial training needs analysis carried out together with some members of the client's organization. Based on the gained information they draw up a detailed program so as the participants can be trained on predefined goals.

b) *Basic rule: Personal experience is the best teacher*

We believe that people learn best by doing things. If they are involved in a real process of discussion and solving problems, they can transfer the accumulated experience directly into practice after the training.

c) *Reflection and analysis*

The reflection over experience and emotions the participants have just been involved in helps them to consolidate understanding and to improve skills. The consultants guide participants to put into practice the insights they have just gained and thus to achieve their personal improvement goals.

d) *Transfer the experience into everyday professional life*

Through the use of specifically designed metaphors and games, the participants are involved in situations and emotions similar to their everyday workplace or relationships with colleagues and clients. This allows them to experiment in a "protect" environment of training and apply their creativity to make decisions.

e) *Follow-up*

The focus of the follow-up session is to assess the results and skills developed during the training and to provide ongoing guidance and support if additional needs for further training appear.

B. Group Dynamic Training

Group dynamic training can be considered as a complementary to ODAT. It is a specific training method based on the group experience. It aims to provide optimal development of employees potential and their long-term involvement with the organization's goals and mission. Training is not limited to the presentation of schemes, behavior models and ready-to-use rules. Valuable in this type of training is the development of long-term sense for the interaction process in its different aspects, development of effective interaction and function skills in standard as well as in unfamiliar situations. Trainer's task is to facilitate the participants to reach and rationalize the things that they intuitively know and to develop and improve the abilities that they already use.

The success of the Group Dynamic Training is based on the following principles:

- Active participation in the deduction of the principles and techniques for effective functioning that ensures long lasting acquired knowledge;
- Development of skills through experimenting in practical cases and role simulations shot by video camera;
- Opportunity for self-analysis, feed-back from the participants, sharing, discussions, brain-storming;
- Team of two trainers that makes possible more thorough and complete comprehension of the group, ensures double resource of competence and defines model for effective communication and interaction;
- Intensive interaction between the participants and trainers during the training;
- Adaptation of the training program to the additional group needs revealed during the training;
- Atmosphere of partnership, support, encouraging of the initiative, trust, cooperation and safety;

- Moderately dosed humor, game situations, unloading, "adventures". All these energize the group and add to the benefits of the training a sense of pleasant and unforgettable experience;

2.3. An example

To show the usefulness of these methods for software people we will consider a real-life example. The personnel manager of a software company analyzes the overall performance and productivity level and has been disappointed to find out that there is a need for employees' competence increase. He wants his employees not only to stay with the company but to do rapid, imaginative work that will keep the company ahead of its competitors.

During the ***preparation stage*** the number and the content of the participating teams, the duration and the training place have been determined. For the aims of training a team of 10–15 members is optimal. The duration of the training can vary depending on the requirements of the client, the identified needs and the training topic. Most favorable work conditions are set when the participants are detached from their common environment – at a calm and cozy place, predisposing to relaxation, energizing and unlocking the personal potential.

In our case the trainer takes the responsibility for gathering and analysis of the primary information after which the goals have been defined: to work on decision making process and internal communications. The key difficulties and the implemented highlights form the design of the training program have been identified through conversations and inquiry forms. In order to ensure the maximum effect from the training, the appropriate place for the event has been selected.

The ***implementation stage*** involves four sessions. The first "ice breaking" session is aimed to encourage development of deeper interpersonal relationships and to increase the level of trust among the participants. The second session is a video-taped meeting for decision making in a critical situation. The team has to find the solution by a consensus, under very strong constraints for resources (under time pressure and self-organized discussion). The third session follows the Out Door Adventure Training approach – the team should perform a real task, demonstrating creativity, fast reactions, mutual support, cooperation and high team spirit. The fourth session is an analysis of the video-taped discussion and game. With the help of the trainer the participants have been led to derive their own conclusions about the style of communication during the discussion, establishment of criteria for recognizing the best solution, role distribution in the game, etc.

The ***follow-up stage*** comprises evaluation at four different levels:

- participant's satisfaction after the training;
- knowledge acquisition and individual development;
- changed traits and attitudes;
- changed organization structures, policies and style of work.

After the training an expert report containing analysis and recommendations has been prepared. Using the feed-back forms for training assessment makes possible to study the overall training effect and to identify additional needs for future training sessions.

3. Comparative analysis during team-work training. For more systematic training we decided to apply a method for reasonable choice and its supporting software tool [3]. Next follows a brief description of the method and an example of its application.

Comparative analysis is a study of the quality content of a set of homogeneous objects and their mutual comparison so as to select the best, to rank them (establishing a preference order) or to classify each object to one of the predefined quality categories.

Two main participants have been recognized: the ***Analyst***, responsible for all aspects of CA implementation, and a ***CA customer***. Depending on the customer's position, the problem and the moment of its consideration, a ***case*** should be opened to determine the context of the desired comparative analysis.

Each case is described by the following elements:

$$\text{case} = \{ \text{View, Goal, Object, Competitors, Task, Level}\},$$

where:

The ***View*** describes the customer's role and the perspective from which the comparative analysis will be performed.

The **Goal** expresses the customer's intentions in the CA accomplishment.

The **Object** represents the item under consideration. For this object a hierarchical quality model should be created, describing the customer's view to the analyzed object quality content.

According to the goal, the **Competitors** – the instances of the objects to be compared should be selected.

The CA **Task** can be Selection, Ranking, Classification or any combination of them.

The depth **Level** defines the overall complexity of the CA and depends on the importance of the problem under consideration and on the resources needed for CA implementation.

Generally speaking, the comparative analysis and the corresponding ranking tool can be applied to any decision making situation with an appropriate definition of the goal, characteristics hierarchy and the set of objects to be compared.

As an example we developed a case for *evaluation of the individual behaviors, concerning team-work.*

The **Goal** is to assess the effect of training on the relations of the participants.

The selected **Factors** are: Openness, Trust, Spontaneity, Mutuality, Sharing, Caring and Risk-taking.

For each factor a number of criteria, divided in three groups (emotional, behavioral and rational) have been defined and estimated by a questionnaire.

A number of experiments have been planned. For each participant the above factors can be evaluated three times: before training, at the end of training and after an appropriate period of time. The results will give the possibility to observe the individual achievements of each participant and to obtain the ranking of all participants according their profiles.

Next the self-evaluation can be compared with the team leader's objective observations. This approach allows not only to analyze the results from two different points of view but to find out the level of self-awareness as well.

The comparative analysis can be useful during the different training stages for some other tasks as selection of the participants to be trained; definition of the scope of the

training – in which areas (communication, decision making, delegation, planning, coaching and career development) the management practices should be improved; which personal traits will be evaluated after training, etc. When a case is constructed, it can be used several times with minor changes in object models and in the set of competitors.

4. Conclusion. For software people with their heightened sense of individualism and heterogeneous responsibilities, teams must be built and facilitated. People have to learn how to work in teams and their organization should support training, retraining and skill upgrading. The approach to these activities should be professional – systematic and tool-supported so as to guarantee the success and the continuous quality improvement.

The future work can be to develop a long term training program, bearing in mind some specific for the software companies factors as the applied software process (team or personal) or the usage of new agile methods.

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ОБУЧЕНИЕ НА СОФТУЕРНИ СПЕЦИАЛИСТИ ЗА РАБОТА В ЕКИП

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Статията разкрива важността на екипната работа за софтуерните специалисти и необходимостта от систематично обучение. Представени са целите, принципите и методите за изграждане на екипност. Разгледан е пример за тренинг в софтуерна компания. Показана е възможността за използване на сравнителен анализ в определени ситуации по време на обучението.