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Division of Labor in Startups:

The effect of roles and personality traits on team effectiveness

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Why a work about division of labor and roles in startups' teams?

First of all, I would not fall into the classic mistake of definition, given the Italian tendency to define startups, as innovative business ideas which refer to technological sector of internet or information technology, by now this definition is outdated since there are a lot of companies operating in various sectors. Is clear that is not possible define as startup the opening of a grocery but, by reference to just mentioned sector, the creation of a brand for distribution of high quality food product like the one sold by grocery, either brick and mortar or online, clearly could be.

Basing on Italian normative definition, the startup must have "…as prevailing or exclusive corporate purpose, the development, production and commercialization of innovative or high tech products or services", however such definition alone is limiting for the research's aims of this work, we will refer also to another wider definition, the one provided by U.S. Small Business Administration, the US government agency in charge to "…maintain and strengthen the nation's economy by enabling the establishment and viability of small businesses…" which consider startups as a company that is typically technology oriented and has high growth potential.

We will use both definitions cited above: the Italian one for simplify the access to database for creating the sample to be studied; the American one for define, from a sociological point of view, the interaction of individual in a group for creating and develop an idea, with the final goal of growth of the idea, through the efforts of each individual component.

The work tends to emphasize how is needed this participation of the individual components as a joint effort for realizing the idea, considering the conception as a problem to be solved and the startup as a model of social group to solve it.

As in every situation in which a problem must be solved from a group, a division of labor emerge to ensure that such work is carried out in the best way: to lighten the workload distributing among the various components of group, for take full advantage of the skills of each of them and for maximize the efficiency and speed of work.

Division of labor

History

The division of labor is a fundamental characteristic in each type of society to be defined as such, without division of labor indeed a set of individuals would remain a set of individual, lacking the feature that differentiates it from the concept of society, the ability to reproduce and prospering.

Already in primitive Paleolithic's societies of hunters – gatherers, was present a primordial division of labor that allowed to perform the task needed to small nomadic groups of which were composed, for some sources (not well documented) women took care of gathering roots and fruits while men hunted. A clear example of how happen the social organization of these peoples, is evidenced today by the "untouched tribes" study.

Later in the Neolithic, with the advent of sedentary farming, this social organization is accentuated, is developed a partition of the activities among people increasingly complex and permanent. Such phenomenon is given essentially by the increasing of the stable surplus of alimentary goods and raw materials: stable society must not occupy primarily to produce food for subsistence of the community, crops are stable and this determines development of new techniques to improve their efficiency, so that the society can grow.

The tools for improve the crops, must be produced by members of community, at the beginning part-time but later, in larger communities, people specializing in the production of it. The more increases size of community the more is likely to happen a specialization in the production and an increase in the market (Smith).

Thus, in the cities begin the emergence of crafts, that is a full-time activity for which is needed a non-brief training and over time, through progressive differentiation, creating a wide range of craft and distinct commercial activities (carpentry, tannery, weaving).

Next to specialization by craft, in larger activities of public utility, happen a more complex division of labor, as example in the building works, the aqueducts and the shipyards. in all these cases, it is necessary coordinated work of many full-time workers with specialized tasks: They do not perform autonomously the realization of a single finished product to allocate it on market, but carry a small portion of larger work, with characteristics of

repeatability, ease of learning and hierarchical subordination. In this era is developed a division of labor as we know today: the breakdown of a complex objective into a series of contributory tasks.

What is the division of labor?

The division of labor is an essential process for which a complex objective is divided in a series of contributory tasks, allocated among individuals who must perform work.

In this first definition, we can underline the first two elements of division of labor, the task division and the task allocation. Task division is the partitioning of a project in many sub-tasks which can be grouped in clusters by two parameters: object based task division (or following other author's definitions, horizontal, divisional, heterogeneous) that is the aggregation of the tasks in terms of intermediate objects, quite distinct and having value also if not assembled with other objects; or activity based task division, where sub-tasks are grouped in base of similar activities not valuable alone. Subsequently, through task allocation, occur the allocation of this tasks to individual who can work it.

A representation of division of labor

In every situation is possible divide labor in different way, assuming that individuals have bounded rationality and do not possess information about the more effective way to breakdown tasks and allocate it, we must simplify to understand how do it.

Considering Tr as a task structure that represent the relationships among sub-tasks in a task structure matrix. Given bounded rationality this task structure can be perfect just for an omniscient agent who possess all information, in a just ideal world. In the real world, agents do not possess all information so they must work processing few of it giving an imperfect representation of the structure and generating a lot of matrices.

In the same way, let's considering Ta as a task structure matrix which shows the interdependence among sub-tasks clusters allocated to agents.

These matrices represent the division of labor which can pursue many ways as we have observed, so the question arises: what factors influences the choose among the different divisions of labor to apply? Many academics (note: Smith 1776, Lijonhufvud 1986 and 1995, Simon 1962) have identified as the main effective factor of influence the technological properties, rather other authors (note: Warglien, Raveendran, Puranam 2012) have considered also the individual and social factors.

Technological determinants

The advantages of activity based task division of labor and the transactive memory

Already in 1776 Smith identify three benefits of division of labor: 1) the improvement of worker's productivity, 2) the time saving avoiding switching task, 3) the development of new methods of work through specialization.

Mintzberg in 1979 reworks Smit's thesis, linking the three benefits at a common root, the repetition: for a given scale of production repetition is higher in activity based task division because the same task is at the base of several objects.

Simon in 1962 bringing back to this thesis also Smith's theories about market size, arguing that activity based division of labor favor skill building, since enlarging market scale, the gains from skill building increase.

Another advantage of the activity based division of labor is the ability to match individual's specialist skills with assigned task cluster. Furthermore joint assembly activities led to the so call "transactive memory" that is the capability to create a sharing knowledge inside of groups, creating a shared metamemory: the ability of each member to catch through its mnemonic systems, those within the group can have the knowledge applicable to resolution of a given problem (note: Daniel Wegner 1985). Such process is favored by constant recurrence of similar problem, so the knowledge of who is skilled at something among the members is beneficial for all the group.

Both the features mentioned above, skill building and skill matching are elements of gain from specialization, which provide more competitive advantage in choosing an activity based division of labor.

Advantages of object based task division

The need for joint work among agents is minimized by grouping tasks interdependently and by assignation of each cluster to a different agent, generating advantage by parallelism.

Parallelism reduce needs of coordination and, at the same time, focuses the attention of the assigned agent on production: coordination and production are two different tasks who must perform both suffer a diseconomy of scope. Thus, the object based division of labor allow agents to work independently and with more effectiveness.

Other advantage is to allow to make progress on several sub-tasks simultaneously, favoring time saving that is very important to meet strict deadlines. In addition, the object based division of labor favor a simplification in the cost measurement: finished object are easier to measure than activities, this allow to develop an advanced accounting system, in order to enable some sharp incentives such as output linked compensation.

How to choose between object based and activity based task division of labor

Discusses the benefits of both possible division of labor criteria, how can we figure out which method is the most suitable?

Simon (note of book: the science of artificial) propose as key technological variable to decide between object based and activity based division of labor, the "Decomposability" in other words the extent to which a task structure can be divided into several independent sub-tasks.

Simon point out that the perfect decomposability is quite rare in nature, as opposed to near-decomposability, which is very widespread. Right the properties of near-decomposability define the tension toward activity or object based division of labor.

To understand we need an example, considering to try an object based task division whit N tasks and that there are X sub-tasks which occur in more than one object based cluster.

Near-decomposability exists because N>X>0. If X is small, we will have high decomposability of the task structure so the gains from parallelism will outweigh the gains from specialization; if X is big, then the task structure will be weakly decomposable, this

means that gains from specialization will exceed gains from parallelism. We can conclude that when there are more gain from parallelism is more convenient use an object based task division, and if the gains from specialization are larger, is more convenient to use an activity based division of labor.

Cognitive and social determinants on division of labor

It is not always obvious recognize and quantify near decomposability to determine what will be the best choice about activity or object based division of labor, however this is not the only variable to be considered. Simon ascribes this to bounded rationality, assuming that all the organizations are composed by individuals with restricted cognitive abilities, with tendencies toward pro-social behavior for defining roles in a group. Furthermore, Ludwing Von Mises proposes the so called strong functionalistic assumption: if a chosen division of labor emerge because is an efficient equilibrium among several less efficient equilibria, then there are many possible less efficient solutions. Therefore, what are the other factors beyond technology to affect the emergence of specific division of labor?

Raveendran, Puranam e Warglien propose two answer to this question, one cognitive and the other social.

Analyzing the individual's psychology, we can reduce the division of the world through human mind, into two basic categories: the first order partition (natural) based on objects and their components as stand-alone objects, lexicalized (basing on Genter 1981) as concrete and proper nouns; the second order partition (relational) based on the relationship between the objects founded in first order partition, usually lexicalized with verbs and prepositions. By these considerations emerge the first answer to the question arose above: Object based task division is discovered more easily by those engaged in a process of division of labor (note: preposition 1)

The second consideration is related to the tendency of individuals to preserve a social structure once established. Literature propose various references to issue related with defense of boundaries, starting by the fact that group's components strengthen the boundaries (maintain and guard) during in-group out-group conflicts (Simmel 1955, Sherif

1966). Hogg and co-authors make a consideration about the definition of in-group out-group, they point out that only distinguish the two structure as in and out-group strength the links among group's members (in-group) also without conflicts. Festinger, Schacter and Back look at mere interaction among members as a glue that holds the group together, highlighting that the simple meetings create cohesion, sharing and sense of community, in addition the preservation of status-quo among these groups is strengthened when some external circumstances make more difficult the maintenance of characteristics valued subjectively valuable, these events are considered by group as threatening thus cause attempt of preservation of the current system of social relationships.

Given the evidence described above, there will then direct implication for the task allocation when members settle groups (if someone who work with a partner would continue work with the same partner as example, so they will divide tasks according to this) and other indirect consequences about task division given that the allocation of task clusters will be perform to allow the evidence wrote above.

From this point of view emerge the second proposal of Raveendran, Puranam and Warglien: if already formed groups are involved in the process of division of labor, for performing a new task, they will tend to carry out the division and allocation of tasks to preserve the existing structure of group.

About personality

Definition

Personality refers to individual differences in characteristic patterns of thinking, feeling and behaving. The study of personality focuses on two broad areas: One is understanding individual differences in particular personality characteristics, such as sociability or irritability. The other is understanding how the various parts of a person come together as a whole[1].

A fundamental of team formation processes is the personality of people involved in forming group, but we should to investigate before on what personality is, for better understand how affect the interests of this work.

There are a lot of fields in which personality is considered as research subject, for this reason there are a lot of definition of personality that make cloudy this issue. A Common definition look at personality as a set of individual differences, affected by the development of individual values, attitudes, memories, relationships, habits and skills.

History of personality theory

By definition, the theory of personality deals with differences between one person and another giving a unique framework about a single person but to a have a complete picture we must distinguish personality and temperament. This latter start a long time ago with Hippocrates theory of "four humors" that is a reworking of Anaximenes of Miletus's theory about four elements.

According to Anaximenes theory, the world is composed by air that is the fundament of everything, he explains the material mechanism of transformation of this element, through a process of rarefaction and condensation, into the other elements water, earth and fire. When air condenses, it becomes visible, as mist and then rain and other forms of precipitation. As the condensed air cools Anaximenes supposed that it went on to form earth and ultimately stones. In contrast, water evaporates into air, which ignites and

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[1] Official definition of American Psychological Association

produces flame when further rarefied. Anaximenes comes to this theory observing the phenomenon of the variation of the temperature of air that comes off the mouth, is different depending on the opening of it. With mouth slightly open the air comes out cold, with wide mouth comes out hot. In this way, he had demonstrated as the temperature was determined by the degree of condensation and rarefaction. All the world's transformations are therefore explained as transformations, because all the things that make up the universe are air in a different degree of density. The condensation thus produces cold, rarefaction hot; This is how were born the two fundamental opposites from which all things originate.

After a century in the V B.C. Empedocles gave substance to this theory arguing that the reality around us, characterized by mutability, is composed of immutable elements, which he named "roots." Each root has a pair of attributes: the fire is hot and dry; the water cold and wet; The earth cold and dry; the air warm and humid.

Hippocrates tried to apply this theory to human nature, defining the existence of four basic humors, or black bile, yellow bile, phlegm, and finally the blood. The land would correspond to the black bile (or Atrabile, in greek Melaine Chole) located in the spleen, the fire would correspond to the yellow bile (also called anger) that is based in the liver, the water to the flemma (or phlegm) that is based in the head, the air to the blood whose seat is the heart. To these correspond the four temperaments (sanguine, choleric, melancholic, phlegmatic), four elemental qualities (cold, hot, dry, wet), four seasons (spring, summer, autumn and winter) and four seasons of life (childhood, youth, maturity and old age). The good functioning of the body depends on the balance of the elements, defined eucrasia, while the prevalence of either cause disease or dyscrasia.

Besides being an etiologic theory of disease, the humoral theory is also a theory of personality: the predisposition to the excess of one of the four humors define a character, temperament and together a physical constitution called complexion:

- The melancholy, with excess of black bile, is thin, weak, pale, Miser, sad;
- The choleric, with excess of yellow bile, is thin, dry, have beautiful color, irritable, touchy, clever, generous and Superb;
- The phlegmatic, with excess phlegm, is blessed, slow, lazy, peaceful and talented;

- The sanguineous, with excess blood, Ruddy, jovial, cheerful, greedy and addicted to a playful sexuality.

The infinite possibilities that the elements have to be combined with each other is the source of countless characters found in human nature. The humors, are subject to prevail or to diminish depending on the time of day, the seasons and stages of life. Blood, for example, prevails in spring, yellow bile in summer, phlegm and black bile in autumn and winter.

In the II century A.C. Galen expanded the humoral theory Through scientific studies Based on the dissection of animals and observation of corpses (dead for example in battle). He argued That fundamental principle of life was pneuma (air, breath, spirit), corresponding to the blood. Therefore the heart, being the seat, had to be the seat of life and the Spirit (what later will be called soul). Reflecting on the black bile stated that the separation of this in the body, the '' melancholic humor '', can cause melancholy, anthrax or elephantiasis. This was an attempt of Galen to bring order into the Hippocratic theories, using Hippocratic medicine in a kind of scientific method (in his work "De Elementis secundum Hippocratem" he describe the system of the four humors) by observation of vivisection of animals and dissection of corpses, he made a great literary production so that his studies were never refuted before Vesalius studies (De humani corporis fabrica 1543).

Personality vs temperament

As in Hippocrates and Galen the origin of the temperaments is given by various blend of humors thus the expression of subjective variability is in relation with the humors, in the current psychology the term temperament (etymologically derived from the Latin tempĕro, ie "mix") is used to indicate a mixture of innate Personality Aspects. This being innate, create a great difference between temperament and personality, producing a debate of researchers of temperament and researchers of personality, if whether or not biologically-based differences define a concept of temperament or a part of personality. Observing a pre-cultural individuals (animals and young infants) not yet in contact with their similar and so not influenced by socio-cultural factors, researchers associate temperament with a biochemical systems (as sex, age and mental illness) and personality with sociological

factors such as socialization, however Personality is not stable over the course of a lifetime, but it changes much more quickly during childhood, so personality constructs in children are referred to as temperament and temperament is regarded as the precursor to personality. The EAS (emotionality, activity, and sociability) model is used to assess temperament in children. This model measures levels of emotionality, activity, sociability, and shyness in children. In conclusion scientists state that temperament interact with social and cultural factors but cannot be controlled by these. Furthermore modern theories suggests that temperament is composed by twelve components all based on ensemble interaction between neurotransmitters.[2]

The five-factors model and big five

As we stated before for temperament, personality is a set of individual differences between individuals, that are affected by the development of: values, attitudes, personal memories, social relationships, habits, and skills. Following the Five Factors Model (FFM), Personality is usually broken into components called the Big Five personality traits, this theory developed by McCrae and Costa is among the models based on a nomothetic approach to the study of personality, one of the most shared and tested both theoretically and empirically. The theory suggests five broad dimensions used by psychologists to describe the human personality and psyche which are: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (or emotional instability), beneath each proposed global factor, a number of correlated and more specific primary factors are claimed (For example, extraversion is said to include such related qualities as gregariousness, assertiveness, excitement seeking, warmth, activity, and positive emotions).

The five factor model (FFM), is a model based on common language descriptors of personality (lexical hypothesis)[3], this means that these five dimensions were identified

[2]Irina Trofimova, Trevor W. Robbins, Temperament and arousal systems: A new synthesis of differential psychology and functional neurochemistry, Neuroscience & Biobehavioral Reviews, Volume 64, May 2016, Pages 382-402.
[3] Goldberg, L. R. (1993). "The structure of phenotypic personality traits". American Psychologist. 48: 26–34. Costa, P.T. Jr. & McCrae, R.R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) manual. Odessa, FL: Psychological Assessment Resources.

from psycho-lexical studies, according to which man has codified in verbal form, all the significant experiences for the community including, in this case, words that refer to individual differences: : The 5 dimensions listed, then, correspond to frequently used macro-categories, in language, to describe the differences between individuals. These descriptors are grouped together using a statistical technique called factor analysis (i.e. this model is not based on experiments) following the factorial approach proposed by Hans Eysenck, which identifies the dimensions characterizing individual differences through factorial statistics analysis.

History of the method

Today, the theory of the Big Five is considered the most useful for explaining the Individual variability between subjects. The term Big Five has been used for the first time by Goldberg (1981), although it was Norman (1963) to initiate a detailed work on the five factors of personality.

But the story began a long time before in 1884, with Sir Francis Galton who was the first person known to have investigated the hypothesis that it is possible to derive a comprehensive taxonomy of human personality traits by sampling language: the lexical hypothesis.

> *I tried to gain an idea of the number of the more conspicuous aspects of the character by counting in an appropriate dictionary the words used to express them... I examined many pages of its index here and there as samples of the whole, and estimated that it contained fully one thousand words expressive of character, each of which has a separate shade of meaning, while each shares a large part of its meaning with some of the rest.*
>
> *— Francis Galton, Measurement of Character, 1884*

After over two decades English-language scholars continued his work. In 1910 study by G. E. Partridge found approximately 750 English adjectives used to describe mental states, whereas a 1926 study of Webster's New International Dictionary by M. L. Perkins provided an estimate of 3.000 such terms. Similar to this latter work, Gordon Allport and Henry S.

Odbert used Webster's New International Dictionary as their source, by which they list approximately 400.000 words, then identified 17.953 unique terms used to describe personality or behavior. Using their list of terms, Allport and Odbert separated these into four categories or "columns", in order to classifying English-language terms with the use of psychological principles.

In 1940, Raymond Cattell kept the adjectives, and excluding synonyms he reduced the total to 171. Cattell used several techniques including the new statistical technique of common factor analysis applied to the English-language trait lexicon to elucidate the major underlying dimensions within the normal personality sphere. This method takes as its starting point the matrix of inter-correlations between these variables in an attempt to uncover the underlying source traits of human personality. He produced a self-report instrument for clustering the personality traits he found from the adjectives, which he called the Sixteen Personality Factor Questionnaire.

Based on a subset of only 20 of the 36 dimensions that Cattell had originally discovered, Ernest Tupes and Raymond Christal declared to have found just five broad factors which they labeled: "surgency", "agreeableness", "dependability", "emotional stability", and "culture". Warren Norman subsequently relabeled "dependability" as "conscientiousness".

After about two decades, in 1980s, instead of trying to predict single instances of behavior, considered as unreliable, researchers discovered that they could predict patterns of behavior by aggregating large numbers of observations. Thus, correlations between personality and behavior increased. In a 1980 during a Symposium presentation at the meeting of the Western Psychological Association, in Honolulu, Lewis Goldberg, Naomi Takemoto-Chock, Andrew Comrey, and John M. Digman, examined the available personality instruments.[4] This event was followed by broad acceptance of the five-factor model by the whole of community of researchers during the 1980s. As example, this method was closely followed by the NEO five-factor personality inventory, published by Costa and McCrae in 1985, but with some differences: Costa and McCrae's "OCEAN model" is based on factor analyzes of questionnaires. It is hierarchical, In That the five factors are

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[4] Goldberg, L. R. (1980, May). Some ruminations about the structure of individual differences: Developing a common lexicon for the major characteristics of human personality Paper presented at the meeting of the Western Psychological Association, Honolulu, HI.

derived from factor analyzes of lower-order level. Goldberg's "Big Five," by contrast, are based primarily on factor analyzes of adjectives and are not hierarchical, but circular.

The Five Factors

So, emerged the Big Five ("any model for structuring individual differences will have to encompass at some level something like these 'Big Five' dimensions")[5]. According to this theory, there are five big personality factors which Represent the convergence point or a rework of the theories of the traits till then exposed. The model asserts that five basic factors describe most personality traits, researchers have used the model to predict individual differences in innumerous settings: clinical (reviewed in Costa, 1991), industrial and organizational (e.g., Barrick & Mount, 1991, 1996; Barry & Stewart, 1997; Mount & Barrick, 1995), counseling (McCrae & Costa, 1991), and more.

The five dimensions, correspond to the macro-categories most used to describe the differences between individuals: Neuroticism, Openness to Experience, Extraversion, Agreeableness, and Conscientiousness.

Here a list of the Big Five according to a generally accepted theory of factor analytic research:

> **Extraversion**. (outgoing/energetic vs. solitary/reserved) The positive pole of this factor is represented by positive emotionality and sociability, where the negative is represented by introversion, that is the tendency to "to be totally hooked" more from their internal world from the external one. Energy, positive emotions, assertiveness, sociability and the tendency to seek stimulation in the company of others, and talkativeness.
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> **Agreeableness**. (friendly/compassionate vs. analytical/detached) The positive pole of this factor is represented by kindness, altruism and cooperativeness; the negative pole by hostility, callousness and indifference. A tendency to be benevolent and

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[5] Costa PT Jr, & McCrae RR. (1992). NEO PI-R professional manual, p. 159. Odessa, FL: Psychological Assessment Resources, Inc.

cooperative rather than dubious and hostile towards others. It is also a measure of individual trusting and helpful nature, and whether a person is generally moderate or not.

Conscientiousness. (efficient/organized vs. easy-going/careless) This factor contains in its positive pole adjectives that refer to the diligence, perseverance and reliability, and the self-discipline and, as a negative pole, carelessness, inconstancy, untrustworthiness. A tendency to be organized and reliable, show self-discipline, act dutifully, aim for achievement, and prefer planned rather than spontaneous behavior.

Neuroticism. (sensitive/nervous vs. secure/confident) vulnerability, insecurity and emotional instability represent the positive pole of this factor. The opposite pole is represented by the emotional stability, by the dominance and security. The tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, and vulnerability.

Opening to the Experience. (inventive/curious vs. consistent/cautious) The positive pole of this factor is represented by creativity, originality and unconventionality. The opposite pole is instead identified by the closure to the experience, that is, the conformism and lack of creativity and originality. Openness reflects the degree of intellectual curiosity, creativity and a tendency for novelty and variety. It is also described as the extent to which one's is imaginative or independent, and characterize a personal preference for a variety of activities over a strict routine.

As wrote above there are a lot of questionnaires developed for measuring the Big Five, a particularly well developed questionnaire is the NEO Personality Inventory Revised (NEO-PI-R) developed by McCrae and Costa as an upgrade of the NEO Personality Inventory (NEO-PI) developed in 1985.

Previously, in the first version, the model presented just three factors: Neuroticism, Extraversion and Openness (from here the acronym N.E.O.) in a subsequent version they added the factors of Agreeableness and Conscientiousness to conform to the five-factor model.

Facets

Big was meant to refer to the finding that each factor subsumes a large number of more specific traits, in addition Costa and McCrae divided every factor into narrower facets. Facets are specific components which build the broad big five factors, for each factor there are six facets.

Here the Complete list of the facets developed by McCrae and Costa:

1. **Neuroticism:**
   a. Anxiety
   b. Anger
   c. Depression
   d. Self-Consciousness
   e. Immoderation
   f. Vulnerability

2. **Extraversion (E):**
   a. Friendliness
   b. Gregariousness
   c. Assertiveness
   d. Activity level
   e. Excitement seeking
   f. Cheerfullness

3. **Openness to experience**
   a. Immagination
   b. Artistic Interests
   c. Emotionality
   d. Adventurousness
   e. Intellect
   f. Liberalism

4. **Agreeableness**
   a. Trust
   b. Morality
   c. Altruism
   d. Cooperation

e. Modesty

        f. Sympathy

    5. **Conscientiousness**

        a. Self efficacy

        b. Orderliness

        c. Dutifulness

        d. Achievement Striving

        e. Self discipline

        f. Cautiousness

Facets capture traits that would describe who gain an high score in each factor, each facet is measured by other eight definitions called items, that are short sentences which describe a real situation, The term 'item' is used because test questions are not actually questions; they are statements on questionnaires that allow respondents to indicate level of agreement, using a Likert scale expressing a positive and negative attitude with respect to a specific object. Thus, in total the questionnaire is composed by 240 items (5 factors * 6 facets * 8 items) and when the test is administered, the subjects must indicate a degree of acceptance or refusal of each item in base of five-point rating scale. The result rating scales are then compared with other data sources, questionnaire administered to peers or spouses in order to assess validity and reliability.

Differences and Similarity among different theory and tests

The five domains are often referred to as "The Big Five" or "The Five-Factor Model" (FFM) as a synonyms, but are not. While many nonprofessionals outside the field of personality psychology or newcomers have heard of the five major personality factors, not everyone realizes that the Big Five and the Five Factor Model derive from two historically separate research programs, and are based on entirely different kinds of data. The five factors were first identified from factor analyses of individual trait words (such as such as talkative, kind, responsible, calm, and imaginative) found in the dictionary. Since the trait words came from our ordinary language (lexicon), this program of research is often called the lexical research tradition (already analyzed). Later, researchers who were aware of the five factors

identified by lexical research decided to construct personality questionnaires based on those five factors.

As wrote before the first who argue about lexical hypothesis was Gordon Allport, who began with cataloguing of 18.000 traits words, then Raymond Cattell cut the list and introduced factor analysis. He found that personality structure was hierarchical, with both primary and secondary stratum level traits. At the primary level, the 16PF measures 16 primary trait constructs, with a version of the Big Five secondary traits at the secondary level. The third era of the lexical hypothesis happened with two Air Force researchers, Tupes and Christal, who reanalyzed Cattell's data and added some new data with different methods, which always led to five factors. Luckily, although the research was obscure, Warren Norman at University of Michigan learned of this work, replicated the result and published them. He labeled the five factors Extroversion/Surgency, Agreeableness, Conscientiousness, Emotional Stability, and Culture. Norman's ORI colleague, Lew Goldberg, continued to replicate his findings with different methods and sets of trait words, always finding the same factors, although he labeled the fifth factor Intellect instead of Culture.

On the other hand, the parallel history of personality questionnaires began with a common author, Raymond Cattell who constructed the 16 Personality Factor Questionnaire (16PF) that is a self-report personality test developed over several decades of empirical research (with Maurice Tatsuoka and Herbert Eber).

After that, Paul T. Costa, Jr. and Robert R. McCrae, analyzed the items of 16 personality factors of Cattell and found that might be reduced to three factors: Neuroticism, Extraversion, Openness to experience. They argued strongly for use of structured questionnaires, and criticized the reliability of projective tests (The Rorschach Inkblot Test, The Thematic Apperception Test [TAT]) and clinical interviews, which they considered unsystematic and prone to biases, so they constructed their own original personality inventory to measure these three domains of personality that they called the NEO Personality Inventory (NEO PI, 1992). Later, influenced by a talk of Lewis Goldberg at a symposium arranged by Jack Digman, they added the agreeableness and Conscientiousness measure and renamed Their instrument the NEO PI-R (R is for Revised).

Costa and McCrae began to work on their instrument, in order to find correlation between NEO PI-R and the other personality questionnaires till then used, thus Demonstrated That substantially all of the scales in existing personality questionnaires are related to the five factors in the NEO PI-R. in their work, they call it the Five Factor Model (FFM), stated that extraversion, agreeableness, conscientiousness, Neuroticism, and openness to experience are the five fundamental factors underlying personality.

The differences between the Big Five factors and the factors of the FFM are not so strong. Some evidence shows that NEO PI R scale agree with other Big Five instruments such as Goldberg's adjective inventories. The first four factors are nearly identical (Emotional Stability is simply the opposite of Neuroticism) But there are also differences in facets or conceptualization of some factor. The greatest difference lies in the fifth factor: instead of Intellect which measures a tendency toward intelligence and an intellectual style, Costa and McCrae use Openness to Experience which measures creativity, imagination, and an interest in trying new things, considering Goldberg's view too narrow.

About Startups

Startups in Italy

There are several possible definitions of startups. The most widely recognized meaning, is attributed to Steve Blank, a Silicon Valley serial entrepreneur and bestsellers' author as "The Startup Owner's Manual". He defined startups as: new business that has a significant amount of innovation and that is configured to grow quickly according to a business model scalable and repeatable. Specifically, the startup can be innovative both as regards the business model itself, that for the level of innovation of its products or services. the adjective "scalable" means a business that can increase its size, and thus its customers and its business volume, in exponential way without a proportional use of resources. business model "replicable" means a model that can be repeated in different places and at different times without being revolutionized and only making small changes. Currently the Italian meaning is adequate to this international definition, initially were defined startup, only the high technology companies, active in the web or in digital, in a broad sense. Later, the term was extended to new innovative companies also operating in manufacturing.

Italian framework and normative

At the end of December 2016, the number of innovative startups entered in a special section of the Register of Companies pursuant to Decree Law 179/2012 amounted to 6.745, an increase of 382 units compared to the end of September (+ 6%). Startups represent 0.42% of the million and a half of capital companies active in Italy (at the end of September, the incidence of the phenomenon was 0.4%, in June 0.38%). These data are particularly significant, taking into account that with the entry in its fourth year of operation in December 2016, the discipline on innovative startups saw the expiry of a large number of companies for reached the limit age, The Decreto Crescita 2.0, in fact, had planned a transitional regime of a maximum duration of four years to firms set up before it came into force.

The total amount of share capital is 351,2 million euros, an average of 52.100 euros per company). the average share slightly decrease from the third trimester of 2016, of 1,27%, while for the whole of limited companies the decrease was of 1,77.

As regards to distribution by sectors, the 70,56% of the startup provides services to companies, the 19,45% operates in the sectors of industry excluding construction, while the 4.31% operate in commerce. The first two sectors are further divided respectively in: production software and computer consultancy 30.41%, R & D 14.37%, activities of the information services 8,18% for what concern services; manufacture of computer, electronic and optical products 3.65%, Machinery 3.48%; manufacture of electrical equipment 2,13% for what concern industry. In particular, it is interesting to observe how the 25,55% of the Italian companies whose economic activity is classified with the ATECO code 2007 "Research and Development" are innovative startups; Also relevant is the share of startup companies among the companies of software production services (7.99%).

Looking at the composition of societies, the innovative startups with youth prevalence are in 1538, the 22,80% of the total, an amount more than three times higher than that found among all corporations (7.09%). Startups in which is present at least one young are 2571 (38,12% of the total, compared with a ratio of 13,53% considering the totality of Italian corporations).

about geographical distribution in absolute value, Lombardia is the region where are located the highest number of innovative startups: 1516 equal to 22,48% of the national total. Follows Emilia-Romagna with 770 (11,42%), Lazio with 662 (9,81%), Veneto with 539 (7,99%) and Campania, the first region of southern Italy with 431 (6.39 %). In the bottom of the list there are Basilicata with 44, Molise with 27 and Valle d'Aosta with 17 innovative startups.

Milan is still the province in which it is established the highest number of innovative startups consolidated at 1040, equal to 15.42% of the national total. Followed by Roma with 572 (8.48%), Torino with 301 (4.46%), and Naples, that with 209 (3.10%) surpasses Bologna, which drops to 188 (2.79%). All other provinces which are among the top ten, Modena, Padua, Florence, Trento and Bari, exceed 100 units.

In terms of employment at the end of September 2016 the total number of employees amounted to 9169, an increase of 127 units compared to the end of June of the same year: the percentage increase is much lower than the previous quarter (+ 1.4% against + 10. 36%).This results in a decrease in the average number of employees for innovative startups:

3.40, against 3.49 in June. However, to report, as at the end of December 2015 the average number of employees was still lower than the median value 3. Remains unchanged: at least half of the innovative startups with employees it employs at most 2. At the end of 2016 were 27 003 members of the 6580 innovative startups with at least one shareholder (+1381 compared to 25 622 recorded at the end September in 6.217 innovative startups). It can be hypothesized that members are directly involved in an enterprise. On average, every innovative startup has 4,10 members, with a median value of 3; These data are higher than those of the complex of limited companies (mean: 2.58; median: 2).

at September 30, 2016, the total number of partners and employees involved in the Italian innovative startups amounts to 34 791 units. Only a year before they were 24.028: therefore, the annual increase was 44.79%.

Basing on Italian normative definition, the startup must have "…as prevailing or exclusive corporate purpose, the development, production and commercialization of innovative or high tech products or services". Article. 25 of Law Decree 18 October 2012, n. 179 entitled " Ulteriori misure urgenti per la crescita del Paese" (Further urgent measures for the growth of the country), converted with amendments by Law 17 December 2012 n. 22subsequently modified by Decree Law n. 76/2013 in force since June 28, 2013 and the Decree Law n. Converted into Law No. 3/2015. 33/2015 in force since 26.03.2015, defines the innovative start-up as a limited company, also established as a cooperative, under Italian law, or Societas Europea, whose shares are not listed on a regulated market or on a multilateral trading facility. It includes, therefore, both the srl (including new form of simplified srl or reduced capital), either the spa, the sapa, or cooperative societies.

A company to be defined start-up must possess the following requirements:

- the majority of the share capital and voting rights in the ordinary assembly of shareholders must be held by natural person at the time of the constitution and for the next 24 months; (Requirement suppressed by Decree Law no. 76/2013)
- the company must be incorporated, and work by no more than 60 month (amended by D.L. 3/2015)
- It is resident in Italy in accordance with art. 73 of the Decree of the President of the Republic December 22, 1986, n. 917, or in one of the EU Member States or in States

party to the Agreement on the European Economic Area, as long as have a production office or a branch in Italy (amended by Decree Law 3/2015)

- the total value of annual production in the second year of activity, must not exceed 5 million euro
- must not distribute or having distributed profits
- It must have as its sole or principal corporate purpose, development, production and marketing of innovative products or services with high technological value
- It must not have been formed as a result of a merger, corporate division or as a result of the sale of company or business unit.

In addition, the start-up must meet at least one of the following criteria:

a) incur expenditure in research and development at a level equal to or higher than 20% of the higher of the cost and the value of production (reduced to 15% with d. l. n. 76/2013)

b) employ highly qualified personnel for at least a third of its workforce, i.e. as a percentage equal to or greater than two-thirds of overall workforce with a master's degree in accordance with art. 4 of d.m. n. 270/2004 (so integrated with d.l. no. 76/2013)

c) be the owner or custodian or a licensee of at least one industrial property relating to an industrial invention, biotechnological invention, topography of semiconductor product, or a plant variety, or is the holder of the rights relating to a computer program, recorded in the Special Public Register for Computer Programs, provided that such deprivation are directly related to the corporate purpose and activity of enterprise. (As integrated d.l. no. 76/2013).

It is established a special section of the Register of the enterprises with compulsory membership for innovative start-ups and incubators certificates in order to take advantage of the benefits introduced by the regulations and at the same time ensuring maximum publicity and transparency.

During 2014[6] there were a large amount of investments in startups, in Europe. The total amount was 6.64 billion dollars, compared to United States which invested 38 billion, so the ratio is almost one to six, but the growth rate is still hopeful.

The web site Startup Hubs Europe, it's a database that take account of the startups all over Europe, with the official agreement with European Commission. Considering 20 cities (basing on the boundaries defined by NUTS: Nomenclature of territorial units for statistics), then eliminating that companies which exceed the turnover of 20 million, to eliminate the larger corporations, this system it's a complete tool which give an insight for understand what is the condition of startups world in Europe.

By looking in depth at these different ecosystems the analysis and research has identified a number of important findings in relation to the scale, nature and integration of the startup ecosystems within Europe. Despite the incomplete data set the Dynamic Mapping process identified nearly 300,000 startup businesses that are less than five years old. These young businesses employed 1.1 million people, had a combined revenue of €87 billion and have raised nearly €10 billion in investment. These businesses are creating jobs and opportunities and at the same time helping to enhance European competitiveness, drive innovation and foster entrepreneurship. In facts, including also the other companies, older than 5 years, the number becomes awesome: 830.254 companies, 428 billion revenues, 4.54 million people employed and a total funding of 36 billion.

Startup's teams

How should be an effective team

Teams are universal and fundamental elements in modern organizations[7] for increasing worker satisfaction and, by consequence, productivity. Teams are made for combine the efforts of individual contributors in synergic way, in order to reach the goals of organization, but sometimes create process losses and inefficiency[8]. Many entrepreneurs

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[6] Last year recorded by Startup Hubs Europe
[7] Devine, D. J., Clayton, L. D., Philips, J. L., Dunford, B. B., & Melner, S. B. (1999). Teams in organizations: Prevalence, characteristics, and effectiveness. Small Group Research, 30, 678–711.
[8] Steiner, I. D. (1972). Group process and productivity. New York: Academic Press

start businesses as members of teams these provide the potential for more resources such as human capital, time, money, and useful social contacts. However, teams do not always produce favorable outcomes. Team based startups involve costs and risks that solitary startups do not, such as disagreements, scheduling difficulties, communication problems, managing trust among members, and difficulty staying on task. As in every company, the purpose of profit maximization, forces to fulfill a need of customers, this impose to work on such matter to discover new needs and elaborate business strategy to reach that customer, on the other hand there is also another need for understand who will perform some operative activities to produce the product or services to sell, and given the nature of startup as a new company often not yet productive, these tasks could correspond.

Considering startup as "...*a company working to solve a problem where the solution is not obvious and success is not guaranteed*"[9], the activity that every startup must undertake are essentially three, develop product and new technologies, design the product and distribute it, thus every team is needed at least of three founders:

1. someone who understands how to build technologies, systems and products to solve problems;

2. someone who understands, why this problem exists, what it takes to correct them and how to shape the experience: the human factors behind those problems.

3. someone who understands how to reach, talk and sell to the people whose problems are being solved, and keep finding more of them, through a strong business strategy.

usually few people have all these three skills, and even if they come close, they are rarely in perfect balance.

This is the reason why, even are hired people with the best skills often they are not compatible with each other and fail to achieve the common objective, an example is football market campaign in which purchases are basing on personal skills of players which should be perfect but actually doesn't work in terms of objective reached.

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[9] Neil Blumenthal, cofounder and co-CEO of Warby Parker

The main types of role

There are limited research results that show what are the actual process by which individual contribution combine to form and interact with team-level constructs because the combination processes are inherently multilevel, this means that individual inputs must aggregate and emerge in order to influence collective actions and outcomes, so need a multilevel approach for being understand.

Among the two level, the concept of role, could be useful to explore the links of individual and team-level characteristics. A role is a set of behaviors interrelated with repetitive activities of other team members and personal characteristics in a particular setting. In other words, **roles** are pattern of individual behaviors given by interaction with other members, the aggregation of all of these roles collectively or **role configuration**, lead to a stable pattern of group process[10]. The analysis of individual roles as link with team performances, could be used for a better setting of team's components. In fact, many research in this area shown how inclusion or exclusion of some individuals in a group, influence team processes and outcomes, but not necessarily higher level performance at individua level led to higher level performance at collective level. The influence of any team member on collective processes depends on other team members[11]. An analysis of role formulation (individual-level) combined with role effect's analysis at team-level provide a multilevel perspective[12]

Main roles (Benne and Sheats categorization)

A universally accepted taxonomy of roles inside a team does not exist[13], although many researchers develop different methods for identify roles, none of these is supported by

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[10] Katz D. Kahn RL. (1978). The social Psychology of organizations (2nd ed.). New York: Wiley.
[11] Stewart GL. (2003). Toward an understanding of the multilevel role of personality in teams.
 In Barrick MR, Ryan AM (eds.), Personality and work: Reconsidering the role of personality in organizations (pp. 183-204). San Francisco: Jossey-Bass.
[12] Stewart G. L., Fulmer I. S., Barrick M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. Personnel Psychology, 58, 343-365.
[13] Stewart G. L., Fulmer I. S., Barrick M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. Personnel Psychology, 58, 343-365.

empirical evidence except for Bales'[14] roles categorizations, that distinguish just two categories of roles: **task roles** and **Social roles[15]**. Before analyzing Bales Categorization, that is the higher order factor for other categorizations[16], we must investigate how a group is composed and identify roles. Although is not empirical we will use Benne and Sheats categorization[17]. Kenneth Benne and Paul Sheats were two influential researchers of group behavior who wrote an important article titled "Functional roles of group members". In this work, they defined 26 different roles that can be played by one or more people within a group that allow Identifying both positive and negative group behavior roles.

Benne and Sheats defined three categories of group roles: task roles, personal and social roles, and dysfunctional or individualistic roles.

Task Roles

These are the roles related with getting the work done. They represent the different roles needed to take a project from initial conception through to action. These are things that team need to be completed along the path from getting a project started all the way through completion step by step.

Personal and Social Roles

The interpersonal relationships within the group concern with its success or failure as any other single element. When people harmonize as part of a team, and respect each other, the results of a project are likely going to be much better. It isn't always easy to get a group of people to work together toward a common goal especially if are putted together for not

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[14] Bales RF, Slater PE. (1955). Role differentiation in small decision making groups. In Parsons T., Bales RF. (Eds.). The family, socialization, and interaction process (pp. 259-306). Glencoe, IL: Free Press.
[15] In a latest version of his theory, Bales expanded it through introduction of three dualistic, categories: Friendliness Vs Unfriendliness; Acceptance Vs Non-acceptance of authority (approximately attributable to general categories elaborated previously i.e. Social and Task roles) and Dominance Vs Submissiveness.
[16] Blumberg HH. (2001). The common ground of natural language and social interaction in personality description. Journal of Research in Personality, 35, 289-312
[17] Benne KD, Sheats P. (1948). Functional roles of group members, Journal of social issues, 42 (2), 41-49.

long time or temporarily. These roles contribute to the positive functioning of the group in terms of social relationships.

Dysfunctional and Individualistic Roles

Dysfunctional roles are those that don't serve any positive purpose and furthermore increase the dissatisfaction of the group. These roles disrupt group progress and weaken its cohesion.

In each one of this three categories, there are several roles which describe a typology of individual group member who is supposed to act as a predictable scheme. These roles are the following:

Inside the **task roles** set there are:

Initiator / Contributor - who proposes original ideas or suggests different ways of approaching issues or group objectives. This people starts discussions and leads groups into new unexplored area.

Information Seeker – asks for clarification of observations in terms of factual adequacy. investigate for expert information or facts relevant to the problem. Determines lack of information and eventually what needs to be found before advancing forward.

Information giver - contributes with factual information to the group. It is seen as an authority in the field and disclose his experience as appropriate.

Opinion Seeker – Asks for clarification of the values, attitudes, and opinions of group members. Checks to make sure that everyone gives his different point of view

Opinion Giver – Expresses his own opinions and beliefs about the problems discussed. Often affirms opinions in terms of what the group "should" do.

Elaborator – Takes ideas proposed by other people and contributes on them with examples, relevant details and data. Consider also the consequences of proposed ideas and actions.

Coordinator – Identifies and explains to other members the relationships between ideas. May put together few different ideas and make them cohesive.

Orienter - Provides a summary of what was done, detects when the group has changed direction, and suggests how to get back on target previous. Reviews and clarifies the group's position

Evaluator/Critic – Assesses proposals against a predetermined standard. Assesses the rationality of proposals and looks at whether it is based on facts and feasible as a solution.

Energizer – Focuses the group's energy on forward movement. Challenges and stimulates the group to take more action.

Procedural Technician – eases group discussion by taking logistical proposals concern to where meetings have to take place and what supplies are needed for each meeting.

Recorder – Record ideas and write everything about what's happened at each meeting. Acts as the secretary.

For what concern Personal and social roles division, the types are:

Encourager – Affirms, supports, and praises the efforts of other group members. shows warmth and provides a positive mind set in meetings.

Harmonizer – Find ways to reduce tension by using humor or providing further explanations. Conciliates differences between other group members.

Compromiser – Offers to change his position for the benefit of team. He is willing to yield position or meet others at half way, do not allows his ego to interfere in discussions among group.

Gatekeeper/Expediter – Is a judge of the flow of communication. Makes sure that every member can express himself by encouraging the shy members to contribute with their ideas. Limits who have a dominant attitude in the conversation and may suggest rules or standards for ensure everyone gets a chance to speak.

Observer/Commentator – Provides feedback to the group about everything is functioning. Often considered when a group wants to set, assess, or change its processes.

Follower – Accepts others decisions even though he has not contributed to decision or expressed own ideas. Is seen as a listener not a contributor.

In the last category, there are these eight roles:

Aggressor – Makes personal attacks by detracts and insult the team fellows, may state that other's ideas are not valuable, in order to decrease another member's position.

Blocker – Opposes every idea proposed by other members and refuses to make personal suggestions, creates stall and block the possibility to move forward.

Recognition Seeker – Uses group meetings to attract attention to himself. Is boastful and flaunts past accomplishments or tells irrelevant stories thatput him in a positive light. Often makes something foolish to attract attention like crazy acts, making excess noise, or directing member's attention away from the task.

Self-Confessor – Uses the meetings as place to divulge personal feelings and problems. Tries to insert these comments as apparently relevant. Often relates group actions to his personal life, stressing that things happened to him in personal life.

Disrupter/Playboy or Playgirl - Distracts other people with jokes, pranks, or reading material unrelated with work. Do not care about the group and its goals and generally expressed their lack of caring. They may simply become more cynical in their decisions, actively disrupting the decision-making process through careless behavior.

Dominator – thinks that possess the truth. Frequently wants to prevail and tries to control conversations and dictate what other members should do. Often exaggerate stating that they know the situation better than others and own the best solutions.

Help Seeker – seek the support of others actively looking for sympathy through expressions of insecurity, confusion or deprecating himself as unable to contribute.

Special Interest Pleader - they think they know and suggest, What others have to think and feel. Avoids admit their own biases or opinions by using a stereotypical position instead. Expressing prejudice and blame toward all those behaviors that contradict his needs.

Another variable that Benne and Sheats provide in their work is the stage of life of the team. They stated that the composition of team can vary with the evolution of topics covered and so with the increasing degree of maturity of groups, the roles required can vary depending at what time of its life cycle is the group. And it's useful to consider how team is developing and how task vary when reviewing group's roles.

Benne and Sheats just list and classify roles for clarify the typology of potential members without give any suggestion for compose a group with right people as members, but these archetypes aid to understand what are the basis for forecast behaviors of components and eventually correct it. Another important result of this classification is related with this work purpose, the possibility to relate every archetype with a set of personality traits in order to understand how personality traits influence the behavior of each component.

Roles and Five Factors Model Correlation (Bales and Slater)

As we stated before, a team role structure depends on equilibrium between what role is needed and roles of other members, so for trying to forecast this structure is necessary a measure of what are the roles of members and what are the variables characterizing each role. We already identify these variable as personality traits and Five Factor Model, the characteristic of this latter imposes a wide range analysis given the nature of five factors as a wide range categorization, thinking about the 240 items for behavior's description synthesized into 5 factors, we have an idea of how broad is the range of analysis.

For this objective of synthesis, we could use the three sets of roles proposed by Benne and Sheats (Task, Personal and Social, Dysfunctional and Individualistic roles), but the fact that these doesn't have an empirical demonstration led scholars[18] to choose another classification the ones of Bales and Slater.

A benefit in using this broad categorization is the similarity in width between Bales and Slater method, task and social roles, and the Five Factor Model: personality traits and

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[18] Stewart G. L., Fulmer I. S., Barrick M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. Personnel Psychology, 58, 343-365.

relationships have been shown to be strongest when predictors and criteria have similar bandwidth[19].

This theory considers that in each group where is needed an interdependent coordination for reaching a goal, there are some activities, the so-called **task acts**, which are fundamental for achieving the goal and on the other side, **Social acts** are needed for mediate the possibility of conflict inside a group.

When any acts are performed, generate social-emotional problems because the idea must be selected at expenses of another and when a person engaged in task acts, another component of the group is denied to do the same. Bales and Slater states that interdependent coordination require an inequality of participation in task acts[20]. The person engaged in task acts is the primary source of ideas thus of changes: this impose to the others a shift in their behavior and ideas to accomplish the task. Then the task leader becomes the victim of the hostility in the group.

The reason argued by Bales and Slater for this are three: the first is a psychoanalytic theory states that there is a tendency to transfer negative attitude toward authority, against everyone who highs his status or achieve prominence; the second theory is about the fact that people who reach the lead by finding solutions, generally threaten some value held by other members of his group; the last theory is that there is a difficult in contribution in a small group without talking excessively, this surplus of talking is considered as hurtful by other members who desire to talk.

Given is role of task leader, who perform task acts is not likely to find a solution for these tensions, but is needed a figure in the group for mitigate tension among members, is here that happen the differentiation between social roles and task roles.

We can imagine that this differentiation take place because of differences in persons, task demanded or cultural differences, however Bales and Slater states that, this differences depends on fundamental social processes, common to every social system.

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[19] Ones DZ, Viswesvaran C. (1996). Bandwidth-fidelity dilemma in personality measurement for personnel selection. Journal of Organizational Behavior, 17, 609-626.

[20] Burke, P. (1967). The Development of Task and Social-Emotional Role Differentiation. Sociometry, 30(4), 379-392. doi:10.2307/2786183

Describing more deeply what are the categories theorized by Bales and Sheats, the **Task roles** are that roles associated with work accomplishment and problem solving, for the two researchers are the members of group who participate to the goal completion through, inputs of knowledge and skills and work diligently for reaching goals[21].

On the other hand, there are the **Social Roles** which represent cooperation and social behavior. Who act in this category favor group solidarity, encouragement of team members and conflict mediation. Their main purpose is to satisfy the social needs of fellows and emotional needs[22].

Not numerous studies were conducted following the method of crossing data of Five Factors Model, with a role's measure dimension, just Blumberg (2001) evaluated this relationship using an empirical method. He used a self-reported data from 217 psychology students for assessing the correlation between Five Factors and roles of Bales and Slater.

Task roles, was found to be correlated with Agreeableness and Conscientiousness in a positive relation. The social roles, was related with Agreeableness, Extraversion and Conscientiousness in a positive way but are negatively correlated with Neuroticism.

Clarifying this concept, Social roles are acted by people who want to cooperate with others, struggle for equality, creating group solidarity, FFM traits associated with cooperative and generous behavior are: Agreeableness and Neuroticism, respectively in a positive and negative correlation, so we will find that these two traits are correlated with Social Roles. Despite Extraversion is related with social interaction, it is associated with status-seeking, so not necessarily altruistic behavior, is thus difficult to consider it as measure of social roles component.

Task roles, engage problem solving, reaching goals and accomplish work. the team members categorized as task roles are addicted to work, focus on achievement and motivated by task completion, these characteristics are typical of Conscientiousness, so positively related with task roles. On the other hand, the independence of judgement, the high level of imagination and the unconventional thinking, that is Openness to experience,

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[21] -Forsyth DR. (1990). Group Dynamics (2nd ed.). Pacific Grove, CA: Brooks/Cole.
  -Gladstein D. (1984). A model of task group effectiveness. Administrative Science Quarterly, 29, 499-517
[22] -Forsyth DR. (1990). Group Dynamics (2nd ed.). Pacific Grove, CA: Brooks/Cole.
  -Gladstein D. (1984). A model of task group effectiveness. Administrative Science Quarterly, 29, 499-517

are negatively related with task roles and at the same time also the anxious tendency of Neuroticism are negatively related.

Group Dynamics

"the whole is greater than the sum of its parts"

Starting from the definition of a group as a "set of more things or persons, distinct from one another, but joined together so as to form a whole"[23], we can understand the main characteristic of group, that is an entity which have some elements not understandable by individual analysis but by studying the whole, following Wertheimer the properties of any parts are determined by the inherent structural law of the total[24].

The study of group dynamic, is so long because each individual is a part of group, whether in family or at work, every situation is characterized by the aggregation of humans as "social animals", the dynamics that bond together people are certain and no one can understand how components act divergently depending on the fact that are alone or in group, however during the early years of research on group processes, many psychologists rejected the existence of group phenomena, sharing the opinion that groups did not exist as scientifically valid entities, groups' actions were nothing more than those of its members considered separately. Starting from two sides the one psychological, the other sociological, the study of group dynamic is not old like the demand why group relationship is so strong, however, Wilhelm Wundt among 1800 and 1900, has begun the study on some phenomena, not describable as individual, but necessarily related to collectivity, such as language, customs and religions.

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[23] Fabietti U. Olivetti Manoukian F. (1994). Gruppi. Enciclopedia delle scienze sociali. Treccani, Istituto della enciclopedia italiana fondato da Giovanni Traccani.

[24] Westheimer, G. (1999). "Gestalt theory reconfigured: Max Wertheimer's anticipation of recent developments in visual neuroscience". Perception. 28 (1): 5–15.

Influenced by Wundt, Emile Durkheim thought that social phenomena must be analyzed with a holistic view, not individually but as parts of a whole, in the same way as in the case of biological study of a living organism.

Finally in '40 of the 19th century Kurt Lewin coined the term group dynamics: he theorized that when a group is established it becomes a unified system with emerged qualities that cannot be understood by evaluating members individually. Lewin was the founder of the Center for Group Dynamics, at Massachusetts Institute of technology in 1945 where he studied how his theory could be applicable to the real-world.

Another pillar research about group was Bruce Tuckman who contribute to this topic founding in 1965 the so called "Tuckman's Stages for a group" or four stage model, in which he listed some physiological stages occur during life and operativity of every group. These phases are: Forming, Storming, Norming and performing. Forming stage occur when the team meets and learns about the opportunities and challenges, and then agrees on goals and work on the tasks. The stage of Storming occurs when the barriers are fallen and emerge the different personality among group's members *"participants form opinions about the character and integrity of the other participants and feel compelled to voice these opinions if they find someone shirking responsibility or attempting to dominate"*. Members must resolve disagreements and personality conflicts before the team can passed out this stage. The third step is Norming, in which are developed trust and productivity, team members begin to work not for their self but toward a common goal, all team members feels duty and have the ambition to work for the success of the team. The last stage is called performing, is a sort of maturity of the group in which members are aware of their ability as group, are autonomous in acts and making decisions processes.

The Tuckman's four stages are the bases for Intragroup dynamic, a set of norms, roles and relations developed during group life path which include: group formation, social identity of members, group cohesion, group structure and the influence of individual on whole behavior, that are the basis for understanding groups and how performance are affected by these dynamics.

Group Dynamics are a set of behavior and psychological processes that happen into social groups or between social groups affected by environmental, personal or leadership factors.

Thinking for example military, religious or political groups or work and sports team, which have a set of established values that define the mere essence of group, and are legitimate only inside the group and among its members, these roots, although sometime anomalous if seen from outside, are critical for group functioning and contribute to its efficiency.

At the beginning of group there are individuals alone, so what is the trigger for allow the formation of the group, is the starting point for understand the first step of groups' dynamics.

Certainly, there will be some psychological attraction between individuals who then will become part of the group, but there is different theory to explain the reason why this happen. The social cohesion approach suggest that group formation start from connection of interpersonal attraction. On the other side, the social identity approach suggests that cohesion among members is given by the perception of individuals, who will become members of group, to share some social categorization with the other members, then but only after this cohesion in social category, interpersonal attraction boost connections among individuals. Furthermore, in this latter hypothesis is underlying the in-group vs out-group conflict, which involves the identification with group's members and the rivalry against who don't belong to this. Thus, through interaction, individuals begin to elaborate norms, roles and attitude as a group and, by consequence, are internalize to influence group behavior.

Naturally once a group is formed, there will be a multiplicity of people and ideas, by consequence, a multiplicity of identity to be coordinated. This coordination generates the group identity, not only as sum of different identity but also, so there will be two identity that emerge in each group member: personal identity and social identity. The personal identity is the individual personality, qualities, belief and characteristics, the idiosyncratic things that make a person unique, while the social identity concern with membership, and group culture and delineate the general characteristics that define the group and differentiate it from other groups. As a part of a group, individuals develop an identity that imply necessarily a comparison between his group and the other, tending toward not objective point of view emphasizing just the positive qualities[25]. This allow to create a self-

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[25] Ingroup Bias

esteem as a group and strengthens social identity, satisfying the natural need to belong. The sense of belonging is not univocal, is clear that during person's life, there are a lot of groups, so how can cohabits the different social identity is another issue: for sociologist in fact, there are several qualitatively distinct parts of social identity, that materialize in different way, such as political identity, religious identity or ethnic identity[26]. Individuals have natural tendency to take part to groups since the dawn of humanity, the reason is evolutionary, to ensure that their genes were preserved the early humans needed to live together in order to survive because enlarging the circle of people, availability of scarce resource increase due to sharing in a mutual way[27]. On the other hand, the natural tendency to preserve genetic heritage is also egoistic instinct.

This is the starting point of the optimal distinctiveness theory which states that the evolutionary need to belong to a group take the form of a desire to be similar to others, at the same time, humans need to differentiate their self. Thus, a need for inclusion, that inclination to belonging which motivate the participation to groups, is in opposition with the need for differentiation. Increasing membership to a group, the need for inclusion is satisfied but the need for differentiation is activated; at the same time, while inclusiveness decrease, the need for differentiation is deactivated and need for inclusion activated. Is a system of compensation, such that lacking one factor there is a need for this so that if there is an abundance of inclusiveness, by compensation will increase the need of differentiation and vice versa, in a logic of balance between the two desires. Optimal identities are those that satisfy the need for inclusion within the in-group and simultaneously serve the need for differentiation through distinctions between the in-group and out-group[28]. Individuals seeks to satisfy both their needs by define their self with "optimally distinctive" social identities, refusing identities more inclusive or more differentiated.

The connections between group's members and with group as whole are not considered to be casual or spontaneous. Over time this connection were studied because was

[26] Tajfel, H., Billig, M., Bundy, R. P. & Flament, C. (1971). Social categorization and intergroup behaviour. European Journal of Social Psychology, Vol. 1, Issue 2, 149-178

[27] Brewer, MB.(2004). Taking the Social Origins of Human Nature Seriously: Toward a More Imperialist Social Psychology. Personality and Social Psychology Review.

[28] Leonardelli GJ, Pickett CL, Brewer MB. (2010). Optimal Distinctiveness Theory: A Framework for Social Identity, Social Cognition, and Intergroup Relations. Advances in Experimental Social Psychology, Vol. 43. Elsevier

considered as most important for groups' characteristics, in facts many studies reported a connection between group cohesiveness and group performance. Social scientists have explained the phenomenon of group cohesiveness in different ways: the theories suggested about connections among group members develops from a heightened sense of belonging, teamwork, interpersonal and group-level attraction. One of the most popular attempt to describe cohesion's dynamics was conducted by Emile Durkeheim, who describe two form of solidarity, the mechanical and organic one, which create a sense of collective conscious and sense of community. Group cohesion, as a scientifically studied property of groups, is commonly associated with Kurt Lewin and his student, Leon Festinger. Lewin define group cohesion as a willingness of individual to stay bonded together in a group, hi states that cohesiveness is the raison d'etre of group, that without does not exist. Festinger and his colleague adds that cohesiveness is "the total field of force which act on members to remain in the group" later they modified the term in "attraction to the group" for describing the forces acting on individual to remain in the group. Other researchers give his contribution to this subject developing the concept of cohesiveness, the Albert Carron's hierarchical model and a lot of bi-dimensional models (vertical vs horizontal cohesion; task vs social cohesion; belongingness and morale; personal vs Social attraction).

About Subjective groups Dynamics

On the opposite side of group cohesion, there are some dynamics that contribute to create disaggregation, these kinds of behavior contribute to create a sub-group of social rejected members who are treated as outgroup[29]. Then arise the subjective group dynamics that is the study of how people respond to deviant individuals within groups in a context involving comparisons between their ingroup and an outgroup.

Historical and sociological studies underlying how misalignment between group belief led to detection and punishment of deviant members[30]. The ingroup belief are based on perception of individuals have about their fellow ingroup members and the alienation of deviant members contribute to define behaviors and beliefs of group, delimiting sub-

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[29] The so called Black Sheep Effect.
[30] witch hunting or political purges

groups of members in base of their level of conformity to in-group norms. According to subjective group dynamics theory, people discredit in-group outcasts, the so-called deviant, on a par with out-group members because being discordant with group identity, they give a bad image of group and threaten social identity.

We could think that the first target of this "purges" will be the new entrant because they have not yet absorbed the group culture and the social identity, as the army's freshmen undergoing hazing, but actually, the most targeted subject is the full member[31]. The new members indeed must prove themselves and the full members to be accepted and have less responsibility, on the other hand full members, already accepted, have more responsibility in goals achieving, so they are more subject to fail on fulfill group expectations and are more prone to marginalization.

It has been proving that, new members tend to recognize themselves in the ideals of the group, also if are not already involved in. At the same time, full members (and new members once they acquire the status of full membership) tend to have an increasing negative judging about group, but other research states that people tend to have two different belief about group activities, the one private, the other public: if it is discordant, people tend to show just the public one, that agrees with the group identity. This behavior is carried out to avoid the risk of marginalization.

Social psychology states that the opinions held by other people within groups can easily affect the way members make judgments and decisions, how well they perform tasks, and how they form attitudes and opinions. Other people always influences individual behavior, both in positive or negative[32] ways: this property is useful in different contest, such as work, sports or politics for setting a work environment or groups, the dynamics within these groups can have powerful effects on the way people share resources, who they vote for or against, and what choices they make. Some studies have found that in presence of other the productivity and rapidity of work increase, however performance decrease while other make distraction and conflict.

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[31] Marques J, Abrams D, Paez D, Martinez-Taboada C (1998). The role of categorization and in-group norms in judgments of groups and their members. Journal of Personality and Social Psychology, Vol 75(4), Oct 1998, 976-988
[32] Think about Nazi German.

Group Structure

Group structure is an internal framework that define members' relations to one another, it includes some concepts usually related with it such as: roles, norms, values, communication patterns and status. Analyzing the various field of group structure, we can have a wide definition of what is a group and how does it work.

Roles delineate a tendency of behavior, contribution and interrelation with others, which can be assigned formally or, more frequently, defined with the process of role differentiation, which indicates the degree of specialization of each group member in a specialized function[33].   A primary differentiation in roles could be between, task roles, relationship roles and individual roles: task roles are generally related with the task individual must perform to achieve goals, these individuals are focused on objectives of group, and enabling work that members do. Some examples of task roles are: coordinator, recorder, critic or technician.

Elements of group that perform relational (also known as social-emotional) are that roles performed to fulfill the need of interpersonal relationships, emotions and socialization. These roles are: encourager, harmonizer, compromiser.

All of these roles listed before, are put into a framework of rules, written or unwritten which specify how act in a certain situation that are the norms. It prescribes how to behave following appropriate value, in social situation. Rules provide direction and motivation to group and organize the social interactions. Norms are gradually adopted and are formed through interactions among group members, furthermore group develop it's own set of norms that members must respect and learn while join the group.

There are different kind of norms: prescriptive norms, describe what member should do, the socially appropriate way to respond in a social situation.

Proscriptive norms, says what should not do.

Descriptive norms, that is what people usually do.

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[33] high level of differentiation corresponds to a narrowly specialized function.

And injunctive norms, that describe behaviors that people ought to do.

Clearly there are some pattern which define the correlation between diverse figures and roles into the group, these are defined by intermember relations that represent the connections among group members. The linkages and social network into the group can be present at different levels and there are two measures to take into account for this kind of examination: group density, shows the linkages between all the members in terms of numbers, that is the quantity of linkages, for understanding the degree of connection among group members (how many members are linked to each other). The degree of centrality measure the number of ties between members, it is an index of quality of connection between members, a member can be more central than another so will have more linkages vis-à-vis another that is marginal. The degree of centrality let understand the roles played by each member, a member who has a social relational role, will have more linkages within group, so could be a go-between and can aid communication.

As norms set a framework in which group can work, the core and the guidelines for groups are the values, goals or ideas part of the culture of group. Can be written or not as norms and define some rally point for members (in some case could be also dysfunctional, is the example of conformity)

Another important level in group structure is the status differential, a relative difference in status among member, acquired over time which gave authority and credibility to members. It establishes a certain hierarchical scale into group, because members higher in status will be consider more effective and often reference point for group's operations. Usually, status aid also to set some practical decisions such as the amount of pay of each member. Status is determined by a wide variety of characteristics and factors that may be: specific status characteristics, that are related as example to task specific characteristics as experience, who is more expert in such specific task will gain higher status; on the other hand, diffuse status characteristics, such as age, race or ethnicity.

Communication Patterns

Another important issue in group is related with the flow of information through the structure. Communication patterns are structures in which communication flows in an organization. They are the communication links in work teams according to the

organizational structures. Within each group there is a multitude of information flowing from the source to the other group members, communication patterns govern this flowing, the patterns are related to work performance and who is responsible towards whom or who talks to whom. It also relates to satisfaction of group members and decision making process. It could be widely differentiated in centralized or decentralize: the first, centralized flow, consist in a central node which produce the information, that then flows to all group members. This method allows standardization of information and restrict the free flow of information that became more controllable however, may constrain creativity. The decentralized flow, create easiness in f sharing information, that can be sourced by every member of group and not only by the head, it is a more flexible pattern but on the other and could be less accurate and less fast then centralized. Another concrete risk in this method is the great volume of information generated, that is difficult to manage.

The first who explore this subject was Harold J. Leavitt, who conducted an experiment for describing the flow of communication among members of five people's groups, placed in different shapes cubicles with slots six switches to exchange information. He identified five communication patterns: Circle, Chain, Wheel, Y and Network.

In **Circle pattern**, the sender (Group Leader) can communicate with the receivers (group members) who presents next to him. others group members can't receive the sender's message directly, they can receive messages from the other group members only by members next in a hierarchical process in which the marginal members must communicate just with their superior, not directly with leader. In this communication pattern, lower level staffs do not get a chance to criticize anything to the upper level. They do not have a role in decision making process. If any person sends any message, it transits through all members of the group, this implies a much greater use of time for the transmission of the message.

In **Chain pattern**, the same problems were appearing as like a circle pattern, all members cannot communicate with the leader of the group. The worst part in the pattern is the last member receives the modified messages from the leader. In this case the leader can't find whether the last member receives the correct information or not because there is no feedback to identify the message distortion.

Y pattern of communication is more complicated as there are different sub-groups within a group: there is a single leader, in the center controlling 3 subgroups. Here, like mentioned in circle and chain communication patterns, there is a chain of command within the sub-group. The lowest level of each sub-group communicates with the members senior to them. They communicate it with their seniors. Then, that member communicates it with the leader. The group is separated into three and the group members can communicate with the other members group through leader only.

In **Wheel (or star) pattern**, one of the best pattern while compare to other three. The leader has direct contact with all the group members and there are no communication problems, time issue and Prompt and simultaneous feedback is also encouraged in the communication pattern. The disadvantage is that all group's members can't connect with each other.

The last and more complex pattern of communication take inspiration by bureaucratic organization communications structures. In these organizations, communication structures take the form of a **network pattern**, as it is non-symmetric network of people with social relations. Their job roles are interlinked. Communication in networks can be prescriptive, rules given from leader to other members, or descriptive like case reports given by members to leaders. Network is a communication pattern in which anyone can communicate with anyone else as their needs and requirements. In network, communication differs due to physical proximity and organizational structures.

It was demonstrated that wheel and Y are faster than chain and circle. The wheel structure, present the least number of errors and also the use fewer messages. Members of circle have the most satisfaction and enjoyment. More centralized structures have better performance because of the distance between nodes to the center and distributed processing unit. The research shows that for autonomous and self-managed teams, wheel pattern of communication is better.

Data Measures and Analysis

Summarizing what is needed for our analysis, it's necessary understand for each team: how many members there are, what is the personality of each member and what are the roles played by each member. These factors can be analyzed by diverse instruments some of which recognized as more effective than others.

Categorization of roles

Many authors have conducted research on this subject, we already cited Benne and Sheat, but also Bales or Belbin have dealt with this issue, writers such as Woodcock (1989), Margerison and McCann (1990), Davis et al. (1992), Parker (1990) and Spencer and Pruss (1992) focused their works on team roles and how these affected team performances. These studies suggested that team performance was a function of the number and type of roles team members played, driven by external world constraints. Personality traits, on the other hand, were internally driven and relatively stable over time and across situations. These traits affected behavioral patterns in predictable ways (Pervin, 1989) and, in varying degrees, become part of role definition as well.

The methods of Benne and Sheat and Bales have already been exposed, so we will have deepened Belbin's method. This approach is considered as a gold standard in defining roles and improve group results[34]. Belbin identified nine team roles and categorized these into three groups: Action Oriented, People Oriented, and Thought Oriented. Each team role is associated with typical behavior and interpersonal strengths. Belbin also defined characteristic weaknesses that tend to accompany each team role, these are areas to be aware of and potentially improve. The roles defined by Belbin are the following:

1. **Action Oriented Roles:**

   - **Shaper (SH)** Challenges the team to improve
   - **Implementer (IMP)** Puts ideas into action.
   - **Completer-Finisher (CF)** Ensures thorough, timely completion.

2. **People Oriented Roles**

   - **Coordinator (CO)** Acts as a chairperson.

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[34] Belbin[R] Official Web Site -http://www.belbin.com/-

- **Team Worker (TW)** Encourages cooperation.
- **Resource Investigator (RI)** Explores outside opportunities.

3. **Thought Oriented Roles**

- **Plant (PL)** Presents new ideas and approaches.
- **Monitor-Evaluator (ME)** Analyzes the options.
- **Specialist (SP)** Provides specialized skills.

these characteristics emerged naturally and had to be spread or amongst team members to be high performing. Belbin believed that a management team of six persons was ideal for working on complex problems. This meant that each team member would have to take on more than one of the nine role characteristics. Researchers made comparisons of other established theoretical models with Belbin's Team Role Self Perception Inventory, these comparisons have produced only ambiguous support for the construct validity of Belbin's model[35].

Although the Belbin's model is assumed to be a gold standard in evaluation and development of group's role, a universally accepted taxonomy of team member roles does not exist, maybe because the Belbin's method is not supported by an empirical base. The only empirical supported categorization, is the "task and social categories" of Bales, that furthermore, is a representation of a higher order factor for another roles categorization.[36] For these reasons, we will use the Bales Categorization, in the latest version of SYMLOG, as a starting point for analysis in definition of roles of our sample.

SYMLOG: how to measure a role into the groups

For purpose of this research, is useful studying the correlation between personality and roles and then how labor is divided, we have to analyze what are the roles into a concrete group of people, such the team is. A useful method was elaborated by Bales in 1970.

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[35] Anderson, N. and Sleap, S. (2004), 'An evaluation of gender differences on the Belbin Team Role Self-Perception Inventory', Journal of Occupational and Organizational Psychology, 77, 3, 429-437
[36] Blumberg HH. (2001). The common ground of natural language and social interaction in personality description. Journal of Research in Personality, 35, 289-312

After various research in that field, **Robert F. Bales** in 1970 established a method for evaluating personality and group dynamics which is called **SYMLOG** System. It is consistent of a set of practical methods for measure behavior and values into the groups and in some cases, give the instruments for changing that. Is an integrated system which use a computer program for elaborating the gathered data in order to produce a graphic display and written reports, this reports shows how individual look at their fellows and how their sees him, and offer some suggestion for improve team wellness and work. A similar report, based on the average score of each member is reported to the whole group, practically is a method in which each rater complete twenty-six items for every member of organization

This System is used to improve satisfaction and productivity of the groups and indicate specific approaches for encourage changes in various member's performance. The method always take into account multiple observers for improve its reliability and validity.

The SYMLOG Include several functions for its various purposes: assessment of teamwork, leadership potential for selection and training, means for improve composition of groups and teamwork, leadership training and training for educators in broad sense (teacher, coaches, therapists. In actual fact as defined by Bales self in 1985, "*SYMLOG is a new field theory because is a comprehensive integration of findings and theories from psychology, social psychology, and sociology*" it takes account of the fact that every behavior must be insert in a context of interaction of influence, so must be understood the context in: personal, interpersonal, group and external situation. This is needed because of understanding the patterns of behavior. ("*The measurement procedures of SYMLOG are designed to measure the behavior patterns, the value and their larger context*")

The characteristics of SYMLOG are synthesized in his name that is an acronym of the words Systematic, Multiple Level, Observation of Groups.

Is Systematic because is a method developed in over forty years by Bales and his team at Harvard University, including a conceptual framework fundamental, comprehensive and well structured. Established through use by business teams and organizations all over the world. It provides way for measure different markers and consider a complete set of variables involved in team member's behavior.

Is Multiple Level method because allow the measurement of various aspects or level of individual behavior both verbal and non-verbal. Enable also the measure of psychological aspects as perceptions, attitudes, values and concepts. The method allows to obtain an integrate understanding of: internal dynamics, relationships among members, the overall tendencies of group dynamic and the effect of organizational culture.

Observation of group is the purpose that is more interesting for the present work because is related with the personality of group members and on how these affect the behavior of fellows for the reaching of common objective, It is carried by measuring rating frequencies of happening of this behavior and values among group.

The more useful result of data gathering is called "Field Diagram" that is a diagram in which are synthesized the behaviors of every group component, basing on the bipolar three scale provided by Bales, which measure certain *"bipolar behavior characteristics":* Dominance Vs Submissiveness; Friendliness Vs Unfriendliness; Acceptance of authority Vs Non-acceptance.

Diagrams are simple and composed by 2 several elements: *"Dimensions"* crossing the area of the sheet, and the so called "images", Dimensions are scales used as coordinates in which scores are plotted in order to define Images. Score is calculated in base on how many times individual shows a behavior or an aspect object of measure, then is pointed out on the scale the dimension of this behavior; the images are based on the average measures advised by different people examined. Each rater complete twenty-six items for every member of organization. Given Dimensions bipolarism, at the two poles of each dimension will be an opposite measure, then at the center, conjunction point of Dimensions' axes will be zero. As seen before the characteristics are 3, so since with Dimension we can measure just two attributes that are Friendliness\Unfriendliness and Acceptance\Non-acceptance of authority. For measure the third dimension and so assess the Dominance tendency, we will use the Images, which indicates Dominance factor through the representation of circle, the larger is the circle the stronger is the dominance of member of the group assessed.

Field Diagrams Works as maps, in which members of organizations analyzed are placed into, in base of rating taken with the circle form.

Various measures of SYMLOG

Dominance versus Submissiveness: as we already said is shown by the circle size, the more Is larger the more Dominance is expressed by the individual rated, thus in the Field Diagram the larger Image represent the member of group rated as the more dominant, that express, in base of the others considerations, prominence, status, power and personal influence. At the opposite side (as we said above the scales are bipolar) there are the smaller circles, which represent individuals considered as submissive, they are timid, bashful, shy, forceless.

Dominant members are generally regarded as such because shows high participation, extraversion and high tendency to impose their point of view to other members, they often obtain that their ideas are developed. On the opposite side the submissive members are seen as quiet, passive and introverted.

Friendliness versus Unfriendliness: Images of unfriendly people are shown in the right side of the diagram they are cooperative, egalitarian and protective of other members. On the other side, the left one, there are the unfriendly people, who are perceived as self-interest and self-protective, self-centered and individualistic.

Acceptance and Non-acceptance of authority (Task Oriented Roles): the word authority may be associated with a figure of power as a boss or a leader, but here in the SYMLOG is considered in a broad sense, it refers to a group environments in which there are (organized or not) social restraints and constraints, legitimate by consensus of members. Some examples of authority are group norms, work demands, rules, norms, ethics and morality and clearly also persons appointed to cover the authority positions. This concept is so changeful so is expected to be adapted to specific type of group or setting. As example, values of accepting the task orientation established by authority, versus rejection of the task orientation established by authority is a definition more fitted on workgroups. This authority is well accepted by some people, and rejected or disputed by others. When there are several layers of authority that could conflict with each other, individuals may be agree with one but disagree with another, so in this case is possible to specific in rating instruction what is the source of authority rated, however exist a simplifying factor, that is a trait or general tendency to accept or reject authority, this measure is usually the base of this kind of measures.

The starting point: Rating Questions

When the members of team are asked to make a rating using the twenty-six items, they have to answer to precisely formulated rating question posed at the top of the rating form. This question specifies what is the object of measure, in a standard rating the question is related with the actual behavior of group members: "*In general, what kind of values does this person show in behavior?*"[37] For other kind of measures, there are other questions to respond, as example is possible rate the ideal behaviors or also other concepts like wish, rejection, expectations, ore more effective leadership, these measures provide an instrument to improve group's effectiveness, indicating what will be the direction asked for better perform, from other members point of view.

The question for measure the ideal behavior for a member in particular is simply: *"In general, what kind of values would be ideal for this person to show in order to be most effective"* that could be useful for correct some behaviors or changing its.

There are also other kind of questions for measure personal own behaviors or expectations, in order to find the right way for changing and so improve the group effectiveness. The method use wish, reject and expect questions that are respectively like these: "*In general, what kinds of values do you wish to show in your own behavior, whether or not you are actually able to do so?*"; "*In general, what kinds of values do you tend to reject, either in yourself or in others?*"; "*In general, what kinds of values do you expect others will rate you as showing in your behavior?*".

The last kind of rating question is for measure the past experience or observation of members for capture the various facets of expected leadership, member, team or particular role effectiveness: *"In general, what kinds of values does the most effective leader*[38] *of a task oriented team you have known show in behavior?"*

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[37] the self is always include among the persons rated.
[38] or member, or team or particular role

Why SYMLOG

Previously we argue that a broad categorization of roles is fundamental to improve the correspondence between roles categorization and the personality traits based on Big Five model, so according to this statement, narrow the bandwidth of the categories introducing a third one, may make analysis less accurate.

The reason why we used the categories in SYMLOG is connected with a specific intention, related with the purpose of work: although the general categories (Social and Task roles) are connectable with SYMLOG's Friendliness and Acceptance of Authority, are not enough to demonstrate the hypothesis that the ability of the less dominant people are not adequately exploited by the group because it does not emerge, because crushed by the dominant members.

The use of a Dominance measure in our analysis allow to investigate also this facet of the problem.

Personality inventory

On the other side of analysis, we need to measure personality traits of group members. Also in this field, there are several measurement models of traits: the 16PF (16 Personality Factor Questionnaire), the GZTS (Guilford Zimmerman temperament survey), the EPQ (Eysenck Personality Questionnaire), the PSC (Comrey Personality Scales), CPI (California Personality Inventory). These theories are all based on the big five personality traits derived from lexical hypothesis established by Lewis Goldberg (which in turn reworked the theory of Warren Norman).

Basing on the theory of the big Five McCrae and Costa proposed a personality questionnaire in order to measure personality of individuals and stated that personality follows the same categories founded by Goldberg in lexical hypothesis so is possible measure it with some inventories methods, they called NEO-P (1992) and later, in a revised version (which include Agreeableness and Conscientiousness scale) NEO-P-R. Costa and McCrae then associated their NEO PI-R with other major personality questionnaires and proved that all of the scales in existing personality questionnaires are linked to the five

factors in the NEO PI-R. Their THEORY, which they call the Five Factor Model (FFM), is that Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience are the five basic factors that underlie personality. The differences between the Big Five factors and the factors of the FFM are not so strong. The first four factors are approximately identical (Emotional Stability is just the opposite of Neuroticism). The greatest difference lies in the fifth factor, where Intellect measures a tendency toward intelligence and an intellectual style, while Openness to Experience measures creativity, imagination, and an interest in trying new things.

Through the FFM McCrae and Costa settled the gold standard in personality inventories, so the NEO-P-R, (arrived at its third version as NEO-P-3) is the most widely used personality inventory in the world, and recognized as the most valuable questionnaire for personality measurement in all the field of application, such as clinical, organizational or corporate.

For our analysis, would have been perfect but present two characteristics that make it not suitable for the purpose of this work and difficult to use in it.

Firstly, the NEO PI-R has been criticized because of its market-oriented, proprietary nature, and also who writes felt it was not right to favor this commercial orientation, since there is an alternative "open source" provided by 'IPIP, cheaper and fair, as well as authoritative (the promoter is Goldberg, the father of the Big Five) and participatory.

Secondly, the NEO-P-R is a very accurate test, but is composed by too much items, 300 ca thus it would have been impossible administer to a voluntary sample (also with a short test I experimented a reticence in complete the test). Also for this issue the IPIP has been the answer.

The International Personality Item Pool

Defined by the authors self as "A Scientific Collaboratory for the Development of Advanced Measures of Personality and Other Individual Differences", the IPIP is a collective study about personality traits, made by the gathering of diverse tests, items or instrument for personality measurement, which is freely available and continuously developed by all the participators of it.

Goldberg self[39], describe the need for an open source instrument to renew and unlock the system of personality inventories: he said that since 1917, year of publication of Woodworth's Personal Data Sheet (PDS), usually taken to be the earliest personality instrument, the narrow bandwidth instruments are almost available for improving through research, journals or students dissertation. On the other hand, the broad bandwidth instruments are proprietary and not simply available, if not with a payment of hefty fees. This causes a progressive obsolescence of these methods that gradually loses its effectiveness, although they maintain a certain fame (given by reputation of its authors as in the case of NEO-P-R).

The IPIP website is an international effort to develop and continually improve a set of personality inventories, whose items are in the public domain, and whose scales can be used for both scientific and commercial purposes. It is not investigated by a single scholar, but the international scientific community has access to the whole of research. By pooling the findings, the users should be able to elaborate instruments over the next decade that make our present tools like ancient relics.

The scale used

Given the multitude of tools presents on IPIP web site, we must choose something one that fit more closely with our needs of shortness and reliability. Almost all the inventories, including NEO-P-R, has a respective shorter version, with a coefficient of reliability acceptable, since IPIP present a lot of these instruments, we found the best alternative in the 50 items scale.

Was asked examinees to answer the following questions, based on a Likert scale, indicating whether the item proposed, were: 1. very inaccurate, 2. Moderately inaccurate, 3. Neither accurate nor inaccurate, 4. moderately accurate, or 5. Very Accurate:

1. I am the life of the party.

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[39] Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), Personality Psychology in Europe, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The International Personality Item Pool and the future of public-domain personality measures. Journal of Research in Personality, 40, 84-96.

2.	I feel little concern for others.
3.	I am always prepared.
4.	I get stressed out easily.
5.	I have a rich vocabulary.
6.	I don't talk a lot.
7.	I am interested in people.
8.	I leave my belongings around.
9.	I am relaxed most of the time.
10.	I have difficulty understanding abstract ideas.
11.	I feel comfortable around people.
12.	I insult people.
13.	I pay attention to details.
14.	I worry about things.
15.	I have a vivid imagination.
16.	I keep in the background.
17.	I sympathize with others' feelings.
18.	I make a mess of things.
19.	I seldom feel blue.
20.	I am not interested in abstract ideas.
21.	I start conversations.
22.	I am not interested in other people's problems.
23.	I get chores done right away.
24.	I am easily disturbed.
25.	I have excellent ideas.
26.	I have little to say.
27.	I have a soft heart.
28.	I often forget to put things back in their proper place.
29.	I get upset easily.
30.	I do not have a good imagination.
31.	I talk to a lot of different people at parties.

32.	I am not really interested in others.
33.	I like order.
34.	I change my mood a lot.
35.	I am quick to understand things.
36.	I don't like to draw attention to myself.
37.	I take time out for others.
38.	I shirk my duties.
39.	I have frequent mood swings.
40.	I use difficult words.
41.	I don't mind being the center of attention.
42.	I feel others' emotions.
43.	I follow a schedule.
44.	I get irritated easily.
45.	I spend time reflecting on things.
46.	I am quiet around strangers.
47.	I make people feel at ease.
48.	I am exacting in my work.
49.	I often feel blue.
50.	I am full of ideas.

Measurement and conclusions

After the conclusion of personality tests and the identification of roles, we collected a series of data that must be confronted in order to confirm or deny the hypothesis that personality traits influence the acquisition of role into a group by a member, and the hypothesis that the capabilities of less dominant individuals are under exploited simply because they cannot play the most important roles.

The sample is composed by 6 startups teams at all levels of development, already operating or in an embryonic stage (the founders team is already formed but in a preliminary stage of foundation).

The single individual involved in the research are 18 belonging to the age range 20-35 years (the youngest is 22 years old, the oldest is 35).

To every individual has been administered a test consisting of two parts, a self-evaluation with a personality test based on the 50 items questionnaire of IPIP and a test for the evaluation of the other group members, based on the 26 items questionnaire of SYMLOG.

In order to simplify the analysis and above all the administering, questionnaires were sent by email to individuals (by means of some representatives of the group), or administered in the presence of the writer, who acted as administrator.

There were more difficult in finding teams willing to collaborate, most of whom did not carry out the investigation because of the length of the test (even though I tried to reduce it to a minimum). On the other side the advantage of limited sample is that I follow personally the administering of the test, so that it is more reliable and I could observe and offer advice on how to take the test in the correct manner. Although it may seem banal, many of the people in the sample, asking for clarification during the test run.

The results were processed using spreadsheets (excel) for each member, then aggregated in another spreadsheet to show group result.

With the data, have been set graphs to simplify the calculation, a bubble chart for what concerns roles, taking a cue from SYMLOG method, bar chart regarding the personality questionnaire.

To test the two hypotheses, the one about personality sphere, the other about roles sphere, were performed the following measurements: as regards the personality questionnaire, the average of all the measurements has been calculated, for each single trait, has been selected to indicate the "neuroticism" stretch as negative because in our area of analysis, results to be always unfavorable both in relation with social roles or in relation to task roles[40].

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

The same thing was done to quantify the roles. Since the items are calculated using 3 dualistic dimensions: Dominance / submissiveness, friendliness / unfriendliness and Task orientation (respect of authority) / negative task orientation (unrespect of authority), the average of test results to opposite poles, has been added to define a dimension on a line whose center is zero, it is then used this measure as a starting point for assign a positive or negative score to each of the parameters.

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

The social roles are measured through Friendliness/Unfriendliness parameter. Are supposed to be related with cooperative behavior, pursuit of equality and building group solidarity. The traits representative of these behaviors are positively related with Agreeableness and Extraversion, negatively with Neuroticism. On the other hand, Task roles, measured through task orientation measure, are related positively with conscientiousness and negatively with Neuroticism and Openness to Experience, which is

[40] Costa PT, McCrae RR. (1992). Revised NEO personality inventory (NEO-P-R) and NEO five-factor inventory (NEO FFI) professional manual. Odessa, FL: Psychological Assessment Resource, Inc.

Barrick MR, Mitchell TR, Stewart GL. (2003). Situational and motivational influence on trait-behavior relationships. In Barrick MR, Ryan AM (Eds.), Personality and work: Reconsidering the role of personality in organizations (pp. 60-82). San Francisco: Jossey-Bass.

characterized by high level of independence and unconventional thinking not compatible with leadership and interdependence of group.

Relations between Personality traits and Roles

For confirm the hypothesis that personality traits and roles are linked, we must confront some measure of personality inventory with the other tested about roles.

 The results are synthesized in the tables below:

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4
	Negative correlation with Task Roles				Positive correlation with Task Roles				Positive corelation wih social roles									

Firstly, a comparison between social roles and Agreeableness:

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

In this case the evidence seems to confirm the hypothesis, just the group 2 seems to be the opposite than should be. Going deeply the member 4 of group 4 seems to be anomalous compared with their fellows. Not so many surprises the hypothesis is considered confirmed, Agreeableness and Social roles are related for the most of sample.

The second dimension, Extraversion compared with Social roles should presented a positive correlation:

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

In this case, the survey does not seem to confirm the hypothesis, the first two groups appear to match the hypothesis but the remaining are: G3 is opposite, despite in the first measurement had shown a perfect correlation. In G4, the one with the best score on extraversion seems to be as less appreciated by the group in social terms.

This happen maybe because Extraversion capturing social interactions but its associated with status seeking relative to other, thus they do not necessarily some altruistic or helping acts that comprise the social roles[41] The third measure, is the negative correlation between Social roles and Neuroticism:

[41] Barrick MR, Stewart GL, Piotrowski M. (2002). Personality and job performance: test of the mediating effects of motivation among sales representatives. Journal of applied Psychology, 87, 43-51.

Lucas RE, Diener E, Grob A, Suh EM, Shao L. (2000). Cross-cultural evidence for the fundamental features of extraversion. J Pers Soc Psychol. 2000 Sep;79(3):452-68.

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

as regards the Neuroticism, the group 1 seems to take a correct behavior. Group 2, as also in the above examples does not present a negative correspondence not confirming the hypothesis. The groups 3, 4 and 5 are ok, this can make suppose that the hypothesis is confirmed in part, given that also the group 6 comprises of not negatively correlated results.

Let see now to the task roles and their positive correlation with Consciousness:

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

the correlation assumptions do not seem to be confirmed at all given that only the member 3 in Group 1 behaves as it should, together to m1, m2 and m3 of the group 4. Group 5, confirm the rule in a almost neutral manner, and the group 6 confirms in part the correlation except for the members 3 and 4.

For what is it concern the negative correlation with Openness to experience, the hypothesis seems to be respected.

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

Only G5 group and G6 partially (just M3) do not confirm the hypothesis about negative correlation between Openness to Experience and Task oriented roles, that seems to be confirmed in the other comparisons.

The last measures to be compared are Neuroticism and Task orientation:

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
OPENESS	-4	10	-9	10	1	8	4	8	-3	1	10	0	-10	-2	0	-7	-9	0
NEUROT	-4	9	0	-7	-11	13	-3	13	-1	-11	-7	3	9	-7	-2	0	-5	3
CONSC	-2	7	-6	-2	3	10	-8	10	3	3	-2	3	-2	0	-2	-8	-3	3
AGREEA	4	-3	-1	-3	3	-7	-5	-7	9	3	-3	4	-4	-3	4	15	-3	4
EXTRAV	6	-1	0	-2	-3	-2	-9	-2	4	-3	-2	6	3	8	6	-8	10	-4

	G1			G2			G3		G4				G5		G6			
	M1	M2	M3	M1	M2	M3	M1	M2	M1	M2	M3	M4	M1	M2	M1	M2	M3	M4
DOMINAN	0,7	1	1,3	1	2	3,3	2,5	1	-2,5	4,8	3,8	1	1	0,5	2	1,5	-15	-1,8
Friendline	0,7	0	3,7	1	-3	-0,3	1	-1,5	0,5	1,3	0,5	-1	-3	0	-1,5	5	-1,3	1,5
Task orien	1	0,7	0,7	1,7	1,7	1	3	0,5	0	2,5	0	-0,3	-2	-0,5	-3,5	-0,8	-4,3	0

The hypothesis of negative correlation is confirmed for all the groups, but not for the G6 group in which only member 6 respect the condition.

In general, all the conditions seem to be respected, except for the comparison between Conscientiousness and Task roles, and the comparison between Extraversion and Social roles.

These discrepancies may be due to the narrowness of the sample used, or the inaccuracy of some subjects examined during the test. Both these reasons could be reliable, but in particular the second seems to be confirmed by a wide range analysis considering all the hypothesis of correlation between Personality traits and Roles: in facts for what is concern the Social roles, G4 and G2 don't confirm the hypothesis of correlation with all the three

traits analyzed; in Task roles analysis, instead, only few measures are in opposition with the hypothesis but are not repeatedly shown by the same groups or members.

References

- Anderson, N. and Sleap, S. (2004), 'An evaluation of gender differences on the Belbin Team Role Self-Perception Inventory', Journal of Occupational and Organizational Psychology, 77, 3, 429-437

- Bales RF, Slater PE. (1955). Role differentiation in small decision making groups. In Parsons T., Bales RF. (Eds.). The family, socialization, and interaction process (pp. 259-306). Glencoe, IL: Free Press

- Barrick MR, Mitchell TR, Stewart GL. (2003). Situational and motivational influence on trait-behavior relationships. In Barrick MR, Ryan AM (Eds.), Personality and work: Reconsidering the role of personality in organizations (pp. 60-82). San Francisco: Jossey-Bass.

- Barrick MR, Stewart GL, Piotrowski M. (2002). Personality and job performance: test of the mediating effects of motivation among sales representatives. Journal of applied Psychology, 87, 43-51

- Beal, Cohen, Burke, Mc Lendon (2003); Cohesion and performance in groups: a meta-analytic clarification of construct relations; Journal of applied psychology.

- Benne KD, Sheats P. (1948). Functional roles of group members, Journal of social issues, 42 (2), 41-49.

- Blumberg HH. (2001). The common ground of natural language and social interaction in personality description. Journal of Research in Personality, 35, 289-312

- Blumberg HH. (2001). The common ground of natural language and social interaction in personality description. Journal of Research in Personality, 35, 289-312

- Brewer, MB.(2004). Taking the Social Origins of Human Nature Seriously: Toward a More Imperialist Social Psychology. Personality and Social Psychology Review.

- Burke, P. (1967). The Development of Task and Social-Emotional Role Differentiation. Sociometry, 30(4), 379-392.

- Contini (1984); Dimensioni di impresa, divisione del lavoro e ampiezza del mercato; Moneta e credito (vol.37, 148).

- Costa PT Jr, & McCrae RR. (1992). NEO PI-R professional manual, p. 159. Odessa, FL: Psychological Assessment Resources, Inc.

- Costa PT, McCrae RR. (1992). Revised NEO personality inventory (NEO-P-R) and NEO five-factor inventory (NEO FFI) professional manual. Odessa, FL: Psychological Assessment Resource, Inc.

- Costa, P.T. Jr. & McCrae, R.R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) manual. Odessa, FL: Psychological Assessment Resources.

- Devine, D. J., Clayton, L. D., Philips, J. L., Dunford, B. B., & Melner, S. B. (1999). Teams in organizations: Prevalence, characteristics, and effectiveness. Small Group Research, 30, 678–711.

- Fabietti U. Olivetti Manoukian F. (1994). Gruppi. Enciclopedia delle scienze sociali. Treccani, Istituto della enciclopedia italiana fondato da Giovanni Traccani.

- Forsyth DR. (1990). Group Dynamics (2nd ed.). Pacific Grove, CA: Brooks/Cole.

- Frigotto, Narduzzo (2015); Sbiancare il cigno nero? Strategie e competenze manageriali per riconoscere il nuovo; Sinergie, Italian journal of management.

- Gavetti, Warglien (2007); Recognizing the new: a multi agent model of analogy in strategic decision-making; Strategy unit working paper.

- Gladstein D. (1984). A model of task group effectiveness. Administrative Science Quarterly, 29, 499-517

- Goldberg, L. R. (1980, May). Some ruminations about the structure of individual differences: Developing a common lexicon for the major characteristics of human personality Paper presented at the meeting of the Western Psychological Association, Honolulu, HI.

- Goldberg, L. R. (1993). "The structure of phenotypic personality traits". American Psychologist. 48: 26–34.

- Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), Personality Psychology in Europe, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press

- Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The International Personality Item Pool and the future of public-domain personality measures. Journal of Research in Personality, 40, 84-96.

- In Barrick MR, Ryan AM (eds.), Personality and work: Reconsidering the role of personality in organizations (pp. 183-204). San Francisco: Jossey-Bass.

- Kaneklin (2010); Il gruppo in teoria e in pratica; Raffaello Cortina Editore.

- Katz D. Kahn RL. (1978). The social Psychology of organizations (2nd ed.). New York: Wiley.

- Kozloski, Bell (2013); Work groups and teams in organizations: review update; Handbook of psychology (vol. 12 Industrial and organizational psychology 2nd ed. pp. 412 – 469).

- Leonardelli GJ, Pickett CL, Brewer MB. (2010). Optimal Distinctiveness Theory: A Framework for Social Identity, Social Cognition, and Intergroup Relations. Advances in Experimental Social Psychology, Vol. 43. Elsevier

- Lucas RE, Diener E, Grob A, Suh EM, Shao L. (2000). Cross-cultural evidence for the fundamental features of extraversion. J Pers Soc Psychol. 2000 Sep;79(3):452-68.

- Marques J, Abrams D, Paez D, Martinez-Taboada C (1998). The role of categorization and in-group norms in judgments of groups and their members. Journal of Personality and Social Psychology, Vol 75(4), Oct 1998, 976-988

- Ones DZ, Viswesvaran C. (1996). Bandwidth-fidelity dilemma in personality measurement for personnel selection. Journal of Organizational Behavior, 17, 609-626.

- Raveendran, Puranam, Warglien (2015); Object salience in the division of labor: experimental evidence; Management science (vol. 67, 7).

- Roccas, Sagiv, Schwartz, Knafo (2002); The big five personality factors and personal value; Personality and social psychology bulletin (vol. 28, 6 pp. 789 - 801).

- Salvati (1993); Divisione del lavoro; enciclopedia delle scienze sociali, ist. Enciclopedia Treccani.

- Simon (1962); The architecture of complexity; proceedings of the American Philosophical Society (vol. 106, 6 pp. 467 – 482).

- Smith, Mark K. (2008) 'Robert Freed Bales, group observation and interaction processes', the encyclopaedia of informal education.

- Steiner, I. D. (1972). Group process and productivity. New York: Academic Press

- Stewart G. L., Fulmer I. S., Barrick M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. Personnel Psychology, 58, 343-365.

- Stewart G. L., Fulmer I. S., Barrick M. R. (2005). An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes. Personnel Psychology, 58, 343-365.

- Stewart GL. (2003). Toward an understanding of the multilevel role of personality in teams. In Barrick MR, Ryan AM (eds.), Personality and work: Reconsidering the role of personality in organizations (pp. 183-204). San Francisco: Jossey-Bass.

- Stewart, Barrick (2000) Team structure and performance: assessing the mediating role of intrateam process and the moderating role of task type; The academy of management journal (vol. 43 ,2 pp. 135 – 148).

- Stewart, Fulmer, Barrick (2005); An exploration of member roles as a multilevel linking mechanism for individual traits and team outcomes; Personnel psychology (vol. 58 pp. 343 – 365).

- Tajfel, H., Billig, M., Bundy, R. P. & Flament, C. (1971). Social categorization and intergroup behaviour. European Journal of Social Psychology, Vol. 1, Issue 2, 149-178

- Trofimova I, Robbins TW (2016). Temperament and arousal systems: A new synthesis of differential psychology and functional neurochemistry, Neuroscience & Biobehavioral Reviews, Volume 64, May 2016, Pages 382-402.

- Wasserman (2013); The founder's dilemma: anticipating and avoiding pitfalls that can sink a startup; Princeton University press.

- Westheimer, G. (1999). "Gestalt theory reconfigured: Max Wertheimer's anticipation of recent developments in visual neuroscience". Perception. 28 (1): 5–15.

- Zhang (2016); organizational structure and process – An analysis in decision-making; Concordia University, School of graduate studies.

Websites

·   blog.growthfounders.com; tips for hiring the right people for your startup.
·   www.economyup.it (food, 50 startup per capire come cambia il business del cibo)
·   www.entrepreneur.com (these 4 personalities make up your startup "dream team")
·   www.forbes.com (Cracking the code of innovation)
·   www.igi-global.com (Near decomposability)
·   www.incubatorenapoliest.it (Consigli utili per startup, come gestire le prime assunzioni e creare un team di successo)
·   www.sba.gov (about SBA, Mission)
·   www.treccani.it (Divisione del lavoro)
·   Encyclopedia of psychology Alan E. Kazdin, PhD
·   http://2012books.lardbucket.org/books/an-introduction-to-organizational-communication/s11-04-group-communication-roles.html
·   http://argomenti.ilsole24ore.com/parolechiave/definizione-ruoli.html
·   http://blog.startupitalia.eu/70793-20141203-guida-legale-per-startup-2-cosa-sono-i-patti-parasociali-e-perche-sono-indispensabili
·   http://communicationtheory.org/patterns-of-communication/
·   http://ipip.ori.org/
·   http://ipip.ori.org/
·   http://personality-testing.info/tests/IPIP-BFFM/1.php
·   http://qi.hogrefe.it/rivista/il-neo-pi-3/
·   http://startup.registroimprese.it/
·   http://www.accademia-lancisiana.it/galeno.htm
·   http://www.apa.org/topics/personality/ definition of personality
·   http://www.economyup.it/glossario/4298_startup---definizione.htm
·   http://www.fe.camcom.it/attivitaistituzionali/registro-imprese/start-up/start-up
·   http://www.hogrefe.it/catalogo/test/adulti/neo-pi-3-neo-personality-inventory-3/
·   http://www.ilsole24ore.com/art/tecnologie/2016-02-02/europa-piu-attraente-ma-california-e-lontana-101125.shtml?uuid=ACWkGwLC&refresh_ce=1

· http://www.imlearning.it/belbin/
· http://www.personalityresearch.org/bigfive/goldberg.html
· http://www.risorseumanehr.com/blog-hr/dalla-mappatura-dei-ruoli-alla-valutazione-del-personale
· http://www.sigmaassessmentsystems.com/wp-content/uploads/2015/02/NEO-PI-3-BRB-Sample-Report.pdf
· http://www.sjdm.org/dmidi/NEO-FFI.html
· http://www.startuphubs.eu/#
· http://www.stateofmind.it/2016/02/big-five-personalita/
· http://www.sviluppoeconomico.gov.it/images/stories/documenti/layout_startup _summary_bis.pdf (libro bianco saggi)
· http://www.thecloudcube.com/i-9-ruoli-di-belbin-e-i-loro-talenti/
· https://en.wikipedia.org/wiki/Saul_Klein
· https://www.appi.org/products/structured-clinical-interview-for-dsm-5-scid-5
· https://www.businesstopia.net/communication/communication-patterns
· https://www.mindtools.com/pages/article/newLDR_83.htm
· https://www.mindtools.com/pages/article/newTMM_85.htm
· https://www.quora.com/What-is-the-perfect-startup-team
· https://www.verywell.com/structured-clinical-interview-2510532
. http://www.free-management-ebooks.com/faqld/leadmodels-08.htm
· en.wikipedia.org:
1. Bruce Tuckman
2. Daniel Wegner
3. Group dynamics # Intragroup dynamics
4. Group cohesiveness
5. Lean startup
6. Metamemory
7. Startup company
8. Steve Blank
9. Transactive memory