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Research paper



Renewed talent management: more productive development teams with digitalization supported HR tools

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Abstract

In most companies and organizations, performance is related to talent management and skills to analyze what and why people are working on. However, many companies do fail to implement a long-term strategy for the performance enhancement activities, considering the talents they have recruited. In this article, we propose a tool for HR work, in context of talent management and how to utilize people skills and productivity analytics to improve team performance and related KPIs. A project data-based case study is illustrated, in which a set of devel-oper and content marketers were analyzed as core team members. In practice, the presented framework makes an important contribution to decision-making activities, where people analytics and proper software tools are used to build new novel knowledge into talent pool of the team. With the framework-based analysis, it is possible to analytically compare team members' performance and enhance the team's skill and structural development which means that we can employ analytics to find best performers and set their roles for more optimally working teams. Our research supports the concept of using the right framework can make a big positive difference in team analytics.

Keywords: *Company Culture; Competence Visualization; Digitalization; Human Resources; Performance; Skill; Talent Management; Team Analytics; Team Development.*

1. Introduction

Why do most HR departments fail? Why companies, with strong competitive advantage, get out of business? Even companies with a strong moat can lose their share, have challenges in trust issues [1], and face unexpected challenges, particularly, in markets with high level of innovation-based disruptions. On the other hand, some start-ups can do miracles by transforming and challenging current markets, take frontline in the technology front by utilizing newest promised of ICT and digitalization based solutions [2][108], despite the apparent lack in availability of resources and possible even an everyday ongoing fight to stay "up and alive".

In business life, good leadership defines many aspects in success [3] no matter if we talk about teams in sports or companies or any other form of human collaboration. E.g. why did Xerox miss a historic opportunity to disrupt a market, although they had at their laboratories, best products in market and leading technologies in hand? In one hand, fear, lack of open-mindedness, and also readiness to cannibalize current sales all have their effect to explain the results of complacency [4]. But on another, in business environments, good management and decision making have always supported successful business development activities [4], [106], but there are of course also some examples from unsuccessful ventures too [107]. In this challenge, lot of managers and leaders think they could utilize their experience and analytical skills to solve the issue, but by default, our thinking is somewhat biased. Our thinking is based on the information and knowledge we have selectively given in our lives, by the education we have received and socio-economic environment we have been living into. However, with right kind of frameworks and effective and neutral algorithms-based analytics, one can create a context for highly educated decision making, even in complex issues like in talent management [5]. Especially when it is the reality that the companies who build a culture around their own talents do achieve a competitive advantage over their peers [5]. And also, the development of new business models [109] will effect to the organizational culture [71][96], which then back connects to the people who work in the company. Plus, talented teams and managers has it easier to adapt to the continuously changing world [6], [9], especially as shown by the covid-19 pandemic, which is changing the rules of management, creating a new normal for teamwork and leadership [95].

In the competitive world we live in, talented managers have the upper hand with abilities and grit to decide what sort of directions to choose, when life throws then a curl bow [9]. Moreover, they understand people and products, so, in the long run, they match better to markets and can create unique business cultures [7], [8]. Most organizations with exceptional management have a concise framework, which the company employees can understand too [5], [10]. But, as the size of a company grows, it needs more than "just" good managers, to embed a framework into its structure [10-13]. Great managing is about release, not transformation, by creating the right context [14], [15]. And this is the situation where people analytics come in. Companies use analytics to improve their team management and boost performance [5], [10]. However, it would be worthy to note that, although many organizations use data analysis, they often stumble in continuous improving measurements [16].

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To start to tackle the previously mentioned challenges, our framework was built upon our experience in project management as well as by extensive literature review in talent management. Moreover, our data was extracted by a case study, in May 2019, in web development, illustrated in chapter 6, which was implemented by a team of five developers and marketers. However, our research approach constructs a model which is scalable in teams and structures. Additionally, our empirical research was used for validation test data generation for the conceptual framework. In practice, the validation of our framework addresses the following research questions:

1) With framework-based analysis, what new knowledge managers will be able to interpret from team performance?
2) How will framework-based analysis contribute to team members' role proposals to improve team performance?
3) In what length will it be feasible to use framework-based analysis for team development and team expansion purposes?

2. Environment & structure

One of the most promising from multiple management styles is individual – leadership by example – based on the work of [6-9]. Recall for a moment Steve Jobs, a man without technical background, but a brilliant eye in business ideologies, models, and concepts managed to 'build' extremely successful products, a company and one of the most valued brands (e.g. Apple, iPod, iPhone, iBook, iMac, etc.) in the world. Possibly, the answer lies in his vision and ability to attract the very best talents, to fulfil these visions. As a rule of thumb, business personalities can inspire, set the way, and build the right team for every project [5], [9], [15]. So, do they fail too? Of course, but best of them adapt too, improvise, and strongly believe in their knowledge-building skills [17], [18]. In short, it is like an evolutionary process [5], [17], [19], which never ends, when the world continues to change.

In the ever changing business environment, success is based on good continuous development and successful decision making and talent management activities [17], [18], [19]. Managing talents and building relationships implies that we create emotional bonds for our common purpose. Also, we weight the impacts and benefits of different collaboration options available for us, to find the best possible operational and innovation practices [20] and point out companies to consider how they work with the process of generating new innovation seeds [23]. And then, we also consider team communication practices, as one of the most important procedure for team success [21]. Without good communication of skills and knowledge, plus shortcomings in the clarify a common direction for the company, team performance will struggle in their productivity goals and morale can start to drop/take a downhill plunge. In short, for business success, it is important to have a flair for business, science, technology and communication. As a result, no matter if we talk about innovation and brainstorming, or creativity and development, for the team the operational context and skills available for the work matter a lot [22], [23], [24].

With good management practices, we should effectively combine skills, know-how, common purpose, empathy, market-oriented thinking, and resources [25], [26]. Talent thrives in the right environment and, as history shows, when a talented team is against an immature market – the market tends to win. Implying that the environment and an open structure are more than critical for sustainable development [25], [27], and more important than raw talent [28], [29]. Plus, you also need to be able to focus on your core competencies, to be able to outsource non-core actions, be most productive in your own internal activities. One good example is the manufacturing industries and their supply chains, where outsourcing of transportation and logistics is a norm [30]. Companies outsource to have the opportunity to focus their talented people to the key core business actions. Therefore, if you are already able to outsource, you have the talented members of team ready to work with the core activities, how do you divide the work inside the organization, what would be the right framework for your talent management activities then [24], [31-33]?

3. Talent management framework for the talent management challenges

Even the term talent itself is hard to define highly explicitly and definitely even more challenging to manage in complex business world setting. Nevertheless, we can still create tools to help to be successful in this management challenge. In this context, the tool will help the organizations to build up their own company specific talent management framework for their talent management activities. Activities that would be linked to companies' values and standards according to the industry they belong to. Given the set challenge, in this study, we discuss how to improve team performance using a purpose build framework. Furthermore, demonstration data for the model will be revealed to explain how to apply and fine tune the ideology of framework-based talent management model in practical context. In the end, the goal of tool-based analytics is to enhance human driven judgement and decision making to reduce the previously mentioned bias one might have, based on the background of the decision-making person.

Our proposed conceptual is designed to adapt easily to variety of business sectors and we shall present how to use analytics to improve team development and decision making for human resources and management in companies aiming to enhance operations with digitally transformed HR processes [5], [33], [34]. The main issue in talent management is to evaluate team performance, giving the right feedback [35]. Companies and organizations, more than often, cannot create and employ the right metrics and goals to excel in team development [29], [36]. The presented framework works in this direction considering that most of the business fundamentals stay the same no matter the industry or even the epoch that we refer to. After presenting the theoretical background, the framework-based analysis will be visualized to explain how different basic concepts in framework model do relate to each other. Lastly, a case study-based dataset is illustrated and discussed to explain use case and practical implementation of the framework in different business life contexts.

To understand the dataset-based examples of the framework, the reader should first be familiar with the general element and ideological construct of the framework. Following part of the article will present the main framework elements (energy, timeframe, persons skills, ConCulture, links) and explain their meaning for the big picture of the talent management framework presented. These explanations are then used in follow up chapter four, which presents the whole framework itself.

3.1. Framework construct energy

In this study, the terminological construct Energy is used as a subjective measure of effort, on a scale of 1 to 10. The measurement is done for each member of a project, on each specific task they work with. Reason for measurement like this in the framework is the fact, that a common problem for many teams is the team effectiveness [35], [37], [38] and also the team and it's individuals learning curve. Commonly, leaders who can inspire, motivate, and engage, [39] [40] know how to grow a business, develop teams, and employ people's energy that comes from working together towards a shared goal [5], [41], but to be able to do that, one should have some measures of current and the changes in energy levels.

3.2. Framework construct timeframe

In this study, Time is a measure which stands for the time spent by each team member of a project on a specific task, on a scale of 1 to 10. Time is a highly valuable resource and as such a good decision-making focusing on time-based efficiency, is so valuable competence for organizations [5], [42]. Therefore, team development with flexibility, complementarity [43] and proper decision-making matter in performance and business development [36].

3.3. Framework construct persons skills

In this study, we use Skills as a subjective measure to describe the persons talent level, on a scale of 1 to 10, for each team member working on the specific task. As skills do reflect to our behavioural and personality aspects, skills will connect to our readiness to share ideas, our work-related beliefs, and values we have [44], [47]. Lot of people have good talents, but true superior skills and talents are somewhat scarce [8]. It is said among techies and gigs that great engineers can be ten times more productive per hour than mediocre ones. However, team spirit is a significant contributor to team productivity too [28], [43], [47]. And in corporate life, the big question is if teamwork or talented individuals matter the most to organizations [45], or is a good and balanced team a better option? Considering what was just referenced, it should be clear that it is extremely hard to get super talents, but a lot easier to get good talents to your team. So one should consider what the company has resources for and build the talent management framework based on the personality of leaders, and the nature of skills of the individuals in questions [46], [48], [49].

3.4. Framework construct conculture

In this study the terminological construct ConCulture is a quantity measure for the group performance and its effectiveness. ConCulture is the sum of Energy, Time and Skill for those team members who share the same role/task at the project. ConCulture is a quantity which can show that culture matters in team or group performance. The phrase: 'Culture eats strategy for breakfast' was coined by management consultant Peter Drucker [50]. It is not only the background, experience, and orientation – it is organizational identity. The point here is to realize as early as possible that people behave according to their beliefs and thoughts as much as to their environment [51]. Individuals and firms commonly try to imitate their peers and adapt somehow to their surrounding environment [52], [53]. Some of them are active agents, while others are not. Nevertheless, the main point is to discover and allow all talents to flourish [54], [55]. The same rule applies to culture - it will shape the raw material that everyone has in his 'genes' [54].

3.5. Framework construct links

Building successful teams is hard and to be successful in it, it takes more than an HR department and good managers alone [56], [57]. Links is at the heart of team building. Links are generated when two groups of team members with different or complementary skills are employed for a shared implementation of a project. By Link, we mean a team member that belongs to two groups or subgroups with different skills, and acts as a 'middleman'. The term middleman represents a team member who can communicate and work with two or more subgroups with different skills in a group/team. For example, a developer who is able to communicate with the creative team members is a middleman who connects developers with the creative subgroup. Commonly, middlemen have managerial skills. Therefore, Links represent middlemen that connect two or more parties because of their ability to bring together people who speak different 'languages'. Energy, Time, Skills, and ConCulture [57], [58] matter – however, we may have everything else in a perfect combination but if we miss interdisciplinarity, i.e. Links, we cannot succeed in terms of growth, productivity, and innovation, as a team [43], [44]. Great achievements in business and science are not achieved by mixing up the ingredients [45], [46]. It is not a simple sum that generates great outcomes [56], [57], [58]. Great products are the result of quality links which are building dynamic relationships [59], [60].

4. Framework

Based on the previously mentioned terminology and construct elements, plus the research work done to find efficient ways to map the talents and task in teams, authors propose a conceptual framework for talent management and team development. Here a 'framework' is a guideline for business and team development. The framework is a construct with following ideological elements [61]:

- It is a model used to interpret the causational relationship between the variables.
- It presents the logic upon which the research process unfolds.
- It contains interconnected abstract ideas and their functional relationships.
- It uses specific ideas and concepts for the development of a research framework.
- It is constructed on abstract ideas that are the main variables of a research study.
- It encourages the development of an applicable theory used by practitioners.

Our purpose is to use this framework for people analytics and as a tool to offer new novel knowledge building option in field of talent management [5]. The framework can also be used as an evaluation tool, for team performance and management efforts. Our framework uses five variables by developing a measurable form. We focus on teamwork characteristics and performers' features as effort, effectiveness, capacity, efficiency, and interconnection. In Table 1, we present the variables that we employ in our model, which are derived from the constructs that we described in the previous chapter – Energy, Time, Skills, ConCulture and Links.

Table 1: Framework Factors

Framework Variables	Description
Energy	Energy is a subjective measure of effort for each team member on a scale of 1 to 10 for a specific role/task.
Time	Estimated time, measured on a scale of 1 to 10, that each team member devotes to a specific role/task.
Skills	Skills is a subjective measure of talent level, on a scale of 1 to 10, for each team member with a specific role matched with a task.
ConCulture	ConCulture represents a quantity which stands for the sum of Energy, Time, and Skills for team members who have a shared role/task. We can use this factor to measure group performance and effectiveness.
Links	Links are generated when two groups/subgroups of team members with different skills are employed for the implementation of a project. Links are the factor that allows a team to 'grow' and deal with more challenging projects.

We use Energy for decision making, team roles, and team performance. Generally, high performers with experience need less effort to complete a project, while the same happens with teams under effective leadership [15], [62], [63]. Time is an asset, quite often, poorly appreciated. As a rule of thumb, well-functioning teams are time efficient even if we scale the team from a handful of members to a big organization. Skills are an important factor in our model. Each task in a project implementation needs specific skills and participants will get different roles according to their performance.
Culture is hard to be expressed completely in a quantitative manner, however, using ConCulture as variable can improve team performance [64]. It is important to note that the ConCulture variable can be used in scaling from an individual to a team, a small company, or an organization. However, when implemented into a practical case, this approach is relative, and always project or case depended. One question is how the ConCulture, as a sum, is to be analyzed from the data. For example, if the ConCulture indicator for the team is steady or even slightly decreasing, although team works gradually on more and more difficult projects, would imply that this team is a high-performance group.
In life terms, Links among team members exist in two forms, emotionally and technically, while trust, which affects team performance [35], acts as a catalyst for them. In our model, Links are the connection between two performers or two groups of team members with different skills. For example, the connection between a group of developers and a group of designers is a Link. In managerial terms, the performer (middleman) who forms the node between the two groups is the person who has an advanced role in managing people with different backgrounds. So, Links would generate data that, at the right framework, could make human capital investment and human resources operations way more efficient [50], [51], [52].

5. Model visualization

Storytelling and visualization are important aspects of business, especially for new concepts. To introduce the relationship between different variables in the framework, authors shall present different visualization analysis, for ConCulture, Energy, Time, and Skills in the model. In Figure 1, we present ConCulture as the area of a circle which consists of all the other three factors, as mentioned before, ConCulture should be seen as a sum of the other three. We may try a thought experiment – imagine a performer who works on the same task, his/her skill is constantly improving, and the Grey area is growing. However, the total area of the circle, the ConCulture, might stay the same if the person needs proportionally less Energy and Time for that task, under evaluation. The same could be for a group of performers. So, for similar projects, we would prefer to see a steady ConCulture with a growing Grey area (Talent level). Moreover, a team with exceptional performers would present a steady ConCulture, although their projects would get more and more difficult. But a ConCulture with a growing Blue and/or Orange area could indicate some warning signs that the team manager should probably take a look into. Therefore, we could compare ConCultures for similar projects or tasks for team development in groups and teams to identify where to put the development efforts.

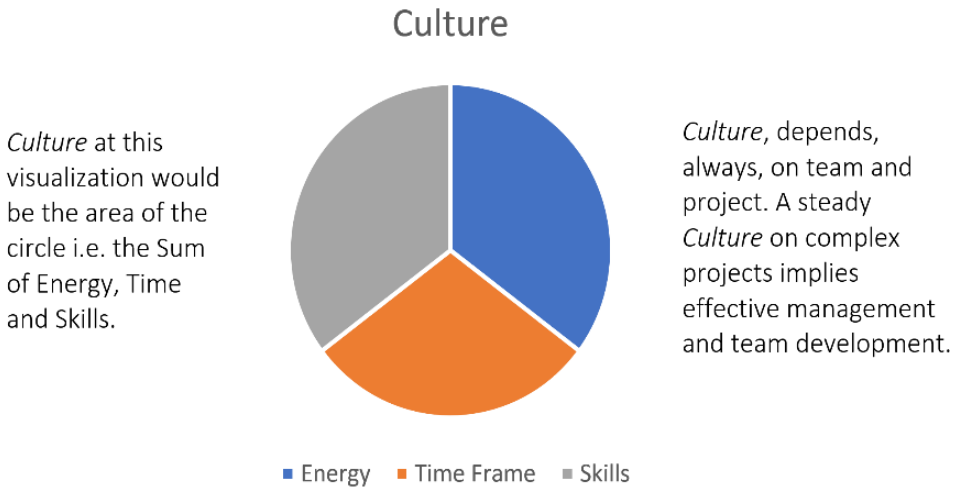


Fig. 1: ConCulture in Framework.

Links, as we mentioned, are the most important aspect of team growth and development. Also, as a variable, Links will provide additional 'dimension' for the visualization, as Figure 2 shows. In practice, we add a slice for each group of performers that have a skill in common. So, team development would be presented by a cylinder with as many layers as the skills needed for a project implementation. At that type of cylinder, we could set the slice with the biggest ConCulture, i.e. more Energy, Time, and Skills, at the base, followed by the next smaller slice. In that case, we could observe the team or the group or even the performer who has, probably, the biggest contribution to the project. The concept of Links could also have an organizational approach, meaning that instead of performers and/or groups, Links could represent departments in a big organization. However, this topic is an object of future research. In our case, projects and teams with many Links imply an interdisciplinary approach that is one of the most valuable factors, if not the most valuable, in innovation and brainstorming [58], [65], [66], [67].

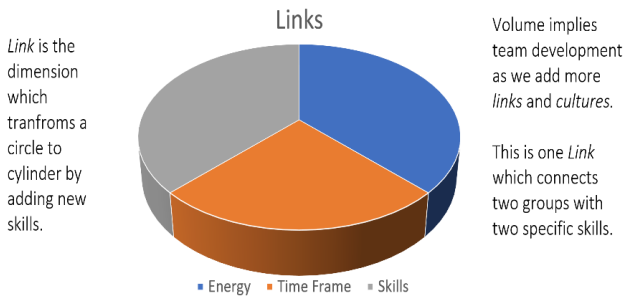


Fig. 2: Links as New Dimension.

6. Illustration of the framework

This framework could be an important reference to every organization, especially for those with R&D aspirations. One of the most significant aspects of business is to maximize the value of resources, especially human resources [5]. As we know, team performance, innovative thinking, and consequently management, define business dynamics [23], [49], [68]. Meanwhile, implementing a framework to work as a process needs data and a robust model analysis that is the main point in analytics.
As we mentioned, for the implementation of each project, we need Energy and Time, combined with the right Skills. All of them come together in the form of ConCulture. And finally, for promising projects, we should develop Links among different skills, fields, and even more within departments and/or sectors. We must think of people analytics as a Lego construction or a matrix that may not be a strict mathematical structure. In Figure 3 we present a 3D matrix. Each cell is represented by a small cube. Also, vertical cells form a single column, while the horizontal ones form a single row. Moreover, arrays with the same color present team members with the same skill. Therefore, in Figure 3, we have a team with 3 skills, depicted by the green, yellow and red cells, while each block represents a unique skill (coding, copywriting, and design in this case). Furthermore, every single column represents a team member.

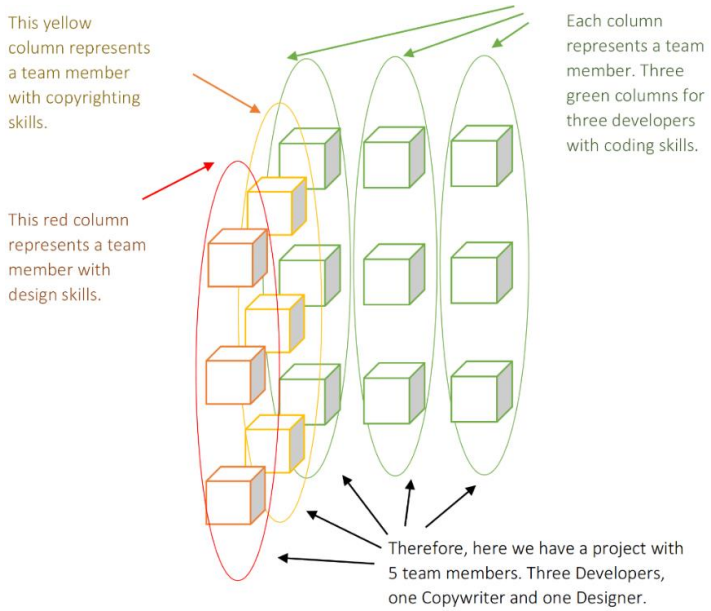


Fig. 3: Talent Management as a Matrix.

In Figure 4, we show that each horizontal layer represents a basic factor of our framework at the same order, Energy, Time, and Skill. Consequently, we can create a simple database for each team and project to analyse their performance in time.

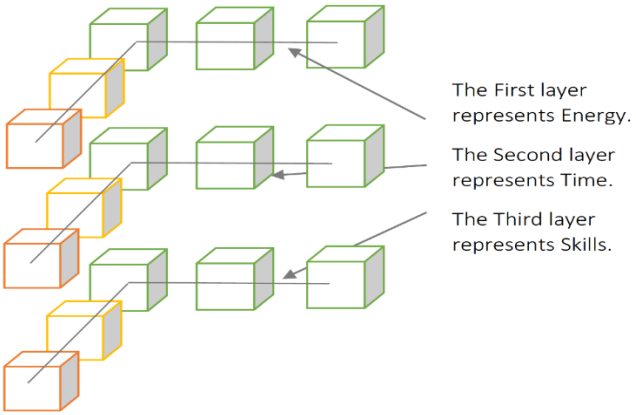


Fig. 4: Layers of Basic Framework Factors.

We use a simple example for a project on web development in which we've used the following three skills: coding, copywriting, and design. This team consists of 5 persons i.e. 5 single columns, one for design with red color, one for copywriting with yellow, and three for coding with green. We have also used a scale from 1 to 10 to show how much of each member's Energy and Time (1st and 2nd layer respectively), we are going to use for the implementation of this project. Each team member, as an individual performer, has ten units of Energy and Time. Additionally, we have scored the capacity of each member on his skill with a scale from 1 to 10 (3rd layer). Therefore, Figure 5 shows this matrix filled with numbers from 1 to 10. For instance, reading the green row at the 3rd layer (score skill for three developers) we conclude that our most skillful developer is at the right, at the green cube with a score of 9. However, he will devote the least time to this project, as the green cube with 2 units of Time shows, and even less of his energy, as the green cube with 1 unit of Energy shows. In Figure 5, we can also see the labels for our skills on that specific project. An interesting column is also the green one at the left side of the green block which represents one of the developers with units of Energy: 7, Time: 5, and score of Coding: 5. It represents the least skillful developer, Coding: 5, but he will devote much of his Time: 5, on this project, and even more of his Energy: 7. Additionally, he is the Link between the developers – green block of cells – and the creative members of the team, the Copywriter at the yellow column, and the Designer at the red column. Therefore, he will play the most important role in this project implying that he will manage the team to meet the challenges in communication, as well as the technical aspects of this web application.

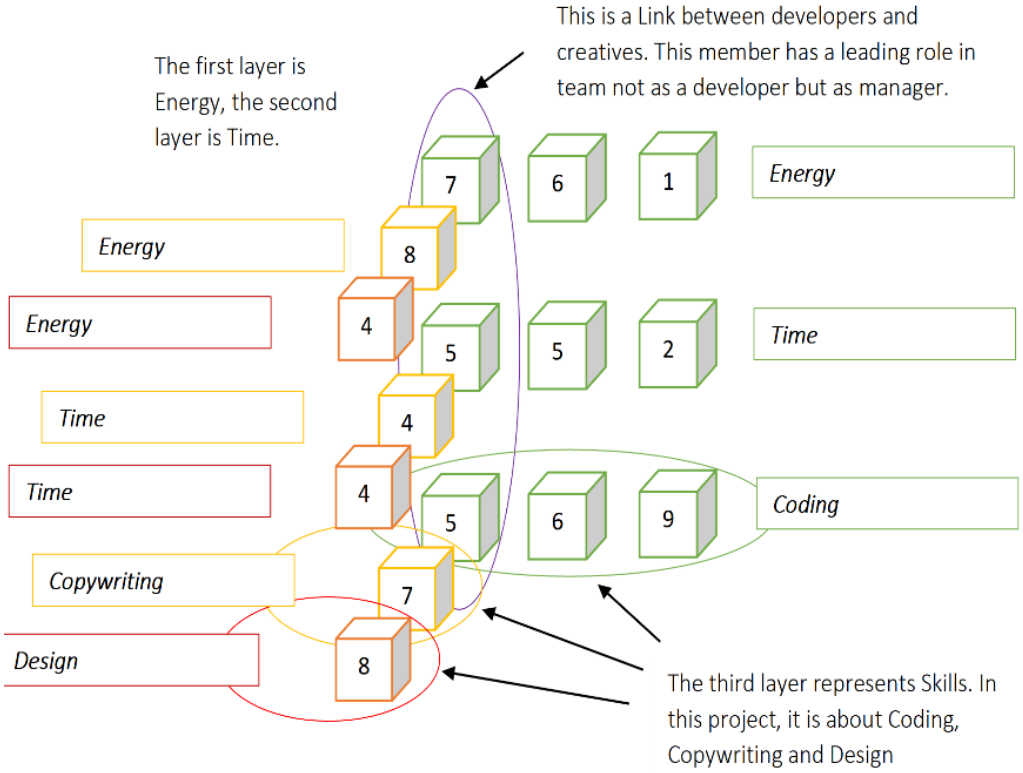


Fig. 5: Talent Management with Analytics.

Another interesting point at this matrix is to compare the Energy: 4 of the Designer at the red column, with the Energy: 8 of the Copywriter at the yellow column. The Copywriter seems to need double effort in comparison to the Designer, but not double time – both are marked at the same Time: 4. That means we have an experienced Copywriter who must create a lot of content for this business in a short period. By the way, none of our team members will devote the total of his time to this project. Even the person who has the responsibility of management, the first green column at the left, will devote half of his available Time: 5. Implying that all members will also work on another project.

Wrapping up, we could extract some quick conclusions. The team member with the highest score in coding will provide mostly guidance and mentoring, implying that his time spent on this project will be short. Therefore, we refer to a small-scale technical project, where the management of the whole project will be done by the developer who is related to the copywriter and designer. In this example we did not mention or measure ConCulture. Recall that in the description of our framework, we have said that ConCulture is the area of the 'circle' formed by Energy, Time, and Skills. That was a pictorial way to see the 'culture' of a team. In a word, a team with a culture of growth [56], [57] means that they can undertake challenging projects using less of their Energy and Time. Therefore, in our future research, we could compare teams – represented by matrices – on different projects and vice versa (i.e. projects with different teams). Moreover, we could follow the development of a team on projects that require the same skills. Additionally, we could test the performance of our team in different environments and, even more, on changing roles but not necessarily team members. For instance, on our project that we studied earlier, we could change the «manager» role but, the team, as far as it concerns its members, will stay the same.

Consequently, there is a lot of room for research in talent management and team development, even more so, if researchers use people analytics effectively. For small-scale projects in the same field, we study and compare their analytics. We can also compare ConCultures and Links. Additionally, we can compare the quality of our products and services with our analytics on team performance. Furthermore, we should conclude by comparing different projects with different tools and technologies, as well as the development of a team and its performance in terms of time, productivity, creativity, and collaboration.

In the following chapter, we present different approaches to management in practice. It would be important to note that the framework that we just described has nothing to do with hierarchy. That is why the team building approach is the most effective for teamwork, once you get it right.

7. Different approaches for applying the framework to practical context

7.1. Bottom-up approach

This one is supposed to be an approach that encourages innovation [63], [69]. It is known that many organizations and companies allow their employees to have free time for creativity and brainstorming [63]. However, free time does not always imply innovative thinking [69] – first, you need to choose suitable personalities for that kind of job. However, the question for this kind of approach remains. Who is going to evaluate these ideas, categorize them and, finally, decide which one could contribute to the R&D of the company? Successful R&Ds build the foundations for the next breakthrough in institutions and companies [70]. Here is the catch, management needs critical thinking and the ability to think both into context and out of the box.

7.2. Top-down approach

This is the traditional, old-school approach that still works and is being employed by most businesses and organizations. Particularly for those who cannot find ways to eliminate bureaucracy, a top-down approach is inevitable. However, as great investors say, bureaucracy is equivalent to cancer for businesses. Sooner or later, bureaucratic organizations fall victims to their weaknesses that are lack of communication [97], transparency, and management based on merit. In innovative companies, best ideas win [72]. This type of approach is not for high-growth companies that never lose their flair to innovation [73]. It resembles more to control systems and hierarchies like governmental bodies and organizations.

7.3. Team building approach

This approach is effective once a team has been shaped. When it works, it is by far the most productive and creative method. The hard part is to figure out how should teams be formed. People generally believe in teamwork, but they all have a different approach to this. And, as business history shows, well-functioning teams are the best predictors of success [49]. Venture capitalists who have survived for decades know better [48]. Also, the same goes for education. For example, in hackathons, many studies have found that the best-balanced teams with heterogeneous people tend to generate more innovative solutions than all the other teams [74], [75]. The hard thing in teamwork is to find the right balance between individuals and team members [76], [77]. Slipping to one extreme means that it is not feasible to form a team anymore. Where the other side implies that personality and expression are being suppressed [28], [45]. Therefore, team building is a form of highly trained art. Businessmen and managers, who know how to build Links, are usually also quite talented in reading human behavior. They can interpret the way people interact with each other. Because pulling hard is worthless if you are not pulling in the same direction. At last, team members will form a team aligned with the organization's goals [78]. Assuming, of course, that those goals are well defined otherwise the whole venture will go astray [79].

8. Discussion - conclusions

There is an increasing interest in the academic world and within the practitioners for talent management [24]. However, most of the academic literature focuses only on theory building and does not touch applications with measurable results for talent management and team building [33]. Although, the approach at a conceptual level is important to define a new field [61], the applied knowledge is critical to management and everyday decision-making [54]. This study presents a talent management approach that aspires to be validated by results and experimental data in real world case studies. With the framework and practical data-based validation, we aim to contribute to talent management research by proposing this framework as novel approach as digitalization tool in HR practices, to support daily human resources management work. At the same time, we want to open the discussion for talent management products and applications which could boost up the management and governance in next level. The road ahead in performance management lies in a simple, intuitive analytics framework based on meritocracy and performance [5]. Constant feedback coming from multiple sources with exceptional and frequent coaching at scale is at the very fundamentals of talent management [10], [35] and one of these sources is the topic specific scientific research.

It is important to note that building a team with A-level performers should also be judged by A-level performers [31], [55]. And it is even more challenging considering that growing companies look for talents and high performers who would grow into their culture [10], [27]. Therefore, talent management should not only focus on how to build a team, but also on how to choose and nurture talented people to unleash their potential [56], [57]. And this is not a fact just for businesses and their talent building needs. The same goes e.g. for athletes and sports connection, up to the newest trends like eSports [80]. As an analogy, eSports teams want similar personalities to enhance a team's performance. They want people to push towards the same goals, share ideologies, have a "team spirit" and team culture. And finally, like any sports team managers, people in charge love to nurture talented players' skills towards new levels to help the whole team to unleash their full potential.

New innovations are generated by people and they most often come to light through idea and knowledge sharing, all around different industrial and research sectors [81], [82]. As innovation and minds with new ideas do not just come to life out of thin air [83], we have focused on most essential capital companies have, the human capital and the related talent management activities [5], [83], [84]. That is the reason why we need Links for team development as the talent management should always be interdisciplinary work. Also, we need to focus on our core specialties, cultural strengths, and competencies, building links and networks with other high performers. Being able to build teams over company limits, come across opportunities for different collaborative planning, shared forecasting, and in industrial context also related replenishment activities too [85], which as over the company boarders activity, shall need even more demanding team management efforts.

From business point of view, the analytics and management frameworks intertwine together in nowadays' economy. We need a reliable source of data, a dynamic model to analyze them, and a framework(s) which improves our understanding of our business and its internal operations. Future research should focus on people analytics with connection to large management related datasets and over organization limits reaching collaborative teams. We live in a probabilistic world where everything is possible in markets – no risk management would suggest some of the best entrepreneurial bets in history. Finding where the next bet should be, teaming up with collaborative minds, and synchronizing our efforts with the tide are the fundamentals of innovation [86], [87], [88].

Nowadays, virtual teams are very common in software development and digital services, partly as a result of historical development, but also partly because of covid-19 pandemic. Geographically distributed teams are named as 'virtual' teams but, in practice, these work groups are not 'virtual' at all because many of them work daily providing solutions and services to businesses and individuals [89]. Moreover, team diversity can be highly valuable for work groups because it connects people with different backgrounds, providing feedback and networking opportunities [66], [67]. As research shows, although virtual teams could be more complicated from a managerial point of view, diversity can improve the overall problem-solving capacity of a group [65]. On the other side, dispersion can hurt performance [90] because dispersed teams without e-leadership fail to perform important processes and reach their potential as a work group [91]. Therefore, management has a critical role at the organizational structure of a virtual team's network, and not only human managers but artificial agents (AAs) too [92], [93], [94]. All in all, best practices in talent management is constantly changing due to digital transformation of our society.

9. Future research

Based on our findings, we suggest follow-up studies that focus on developing larger scale team studies and methods on how to map Links between different partners and large-scale networks with software and visualization tools. Also, the impact of technical performance measurement and the global digitalization and work motivation in industry 4.0 times [87], should be cross studied with the performance too. As general operations as well as IT tasks are seeing automatization and robotization [99-105] in wide scale in many different areas of business life, also HR should look new novel solutions and performance from automatization. In practice, as teams and companies grow, they collaborate with other groups, teams, departments, and businesses. At the same time the need new tools for their HR activities and talent profiling [99]. Therefore, in the proposed team performance mapping framework, a new dynamic structure is built for "primary" and "secondary" Links because partnerships and collaborators could extend far beyond the core group of performers, meaning that linked groups may create even more Links. That is an interesting topic for further research – how Links are related to innovation and business development. Not just in the number of Links but the type, the quality, and the distribution of them. In a way, our description of Links is also the 'adjacent possible', implying that networks underlie innovation. In a word, our proposal in talent management framework could extend in two related directions; in team development and innovation, considering that a multidisciplinary approach is a key to growth [56], [89].

ConCulture could be one of the most important metrics for team performance and development. In our framework, it is a relative metric that can be employed to study teams in projects on different levels of complexity or how teams perform in projects at the same complexity as they acquire more experience in their field. Studying teams for large periods provides us with datasets to analyze their ConCulture maxima and minima. For example, entry-level professionals or newly formed teams spend much of their Energy and Time on relatively simple projects. But of course, there are exceptions, e.g. High-performance teams created to work on vaccines for Covid-19. Additionally, teams with bad communication spend, also, much of their Energy and Time on project implementation, but they present higher individual scores on Skills. On the other hand, talented performers within a team that matures in time will show a pattern of gradually shrinking ConCulture because their skills in project implementation may have topped but, effective teamwork slowly reduces Energy and Time. Lastly, we could compare two teams being at the same level of Skills and working on similar projects – should their energies differ significantly, could be a sign of a team with strong potential. Meaning that teams that spend relatively few units of Energy, while all other factors are held constant, may handle more complex tasks or projects which demand analytical skills and creativity.

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