

University of Economics in Prague
Faculty of International Relations

Diploma Thesis

2016

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Team Management 3.0

Virtual team management with gamified aspects

Diploma Thesis
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I solemnly swear, that the Diploma Thesis; Team Management 3.0; Virtual team management with gamified aspects was elaborated uniquely by me. All the used literature and additional sources of information have been cited in the References section.

Prague

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Acknowledgement

I would like to express my uttermost gratitude to Ms. Dana Zdražilová for her superior mentorship and inspiration in the course of composition of this paper.

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Introduction; gamified virtual team management

Today's world is facing an enormous population challenge. Apart from ageing and potential social disparities, the challenge that will be tackled in this paper is how to effectively manage the 7 billion people on the planet earth.

Although geographical distances are getting smaller and smaller thanks to advances in flying, managing a truly global team still remains to be a substantial challenge. An immense helping tool remains to be the information technology. However, it needs to be properly managed in order to extract its full potential. Furthermore, people as any other species like to be entertained, like to play games. Henceforth application of gaming onto people's management.

Hence, the purpose of this paper will be to examine the needs, aspects, particularities of a gamified management platform aimed at people's personalities and skills as well as feasibility analysis of such a business venture. The research methodology that will be adopted will include empirical as well as theoretical research.

The empirical research will include several approaches. Firstly, primary research will be carried out through interviews. These will consist of a combination of PAPI (Paper Aided Personal Interview), CAPI (Computer Aided Personal Interview), CATI (Computer Assisted Telephone Interview) through the usage of Skype. Furthermore, focus group and a distribution of questionnaires shall be adopted in order to absorb as much data as possible. Additionally, correlational research will be applied and it will aim to research the correlation between the usage of the software and the resulting increase in engagement. Since the correlational research cannot take in all the possible inputs, the True Experiment research in order to test the initial versions of the software will be implemented. In the pursuit of a True Experiment, several steps will need to be followed in order to accomplish reliable results. These include the selection of an Experimental Group which will be receiving adjusted inputs as well as different treatment than the Control Group which will be used to make comparisons with the Experimental Group. Additional factor will be an Independent Variable that will be manipulated to distinguish the variations in the behaviour. The dependant variable, on the other hand is the concept that is being examined, for this study, it will be the usage of the gamification software and its related aspects. Additional concept might be adopted in the testing phase, namely random assignment for the purposes of testing an outcome,

or a double blind approach where neither the subject, nor the experimenter are aware of what is being examined, this of course needs a secondary experimenter influencing the flow of events¹.

In addition to the primary research, secondary research will also be applied through screening the internet resources as well as books and additional sources.

A differentiated approach from the empirical one, theoretical will be used in the second section of this paper, i.e. in the feasibility analysis section, that will be examining whether the platform as such has a business potential. Analysis of the current situation and the existing platforms followed by synthesis of the collected inputs in order to create a synthesised platform build on the best aspects of each individual existing project.

The resulting outcome of this paper will thus be a creation and assessment of software simplifying managerial practices through gamification within a global team.

¹ Statistical methods, *Webster* [online], [quoted 2.5.2015],
<<http://www2.webster.edu/~woolfm/statmethods.html>>

I. Management 3.0

Historically, we can track 3 management epochs. The first one being associated with patriarchal societies where obedience and uttermost respect were the only attitudes of how to cope with management. Managers were exclusively the owners of a specific business. From these periods, we have not seen much development over the forthcoming centuries. The only meagre management approaches were associated with the Church or trading. Initial remarks about potential division of labour started to appear firstly with great minds, such as Adam Smith.

The second managerial historical stage is associated with the industrial revolution, where the role of manager started to be associated with overseeing a particular section of the manufacturing process within his or her factory. The primary tasks were coordination of employees as well as quality assurance. Some minor sparks of accounting started to spur. Furthermore, the focus shifted to optimising the predictability of the production process, the stress was on higher efficiency and standardisation. In this regard, works by Henry L. Gantt, Frederick Winslow Taylor or Herbert R. Townes gained firm ground and support. What also aided these efforts was the establishment of the first management school in the US, the Wharton school in 1881. Thus began wide-spread usage of management in the workplace.

The third managerial stage began when Max Weber and alike started to link statistics, psychology and other scientific methods with management. The third era puts an enormous emphasis on knowledge and places the uttermost importance on people as the primary creators of value. As Rita Gunther McGrath points, it is enormously concerned with empathy, both with regards to employees as well as in relation to customers². I believe, that we are currently in the third phase within the third managerial stage with the two prior ones being; initial and the second one marked by the prime use of IT. The third phase will however be marked by SW developments, Big Data aggregation and further application of the knowledge of human psyche and motivation within workplace. A truly developed global manager will need to possess knowledge of work in virtual teams, will need to master differences in human personalities and cultures as well as to be aware of how to motivate employees to achieve their best either individual or within established networks (teams), for instance by the application of gaming tools. Managers would need to be trained

² McGRATH, Rita. Management's Three Eras: A Brief History. Harvard Business Review. [online]. Jul-30-2014. [quoted 12.3.2015]. <<https://hbr.org/2014/07/managements-three-eras-a-brief-history/>>.

extensively to know all the above-mentioned attributes, yet due to time constraints, this option is rendered unfeasible. Managers have to be aided by SW and other supporting tools. However, the aim is not to fully roboticise people management, yet it is to develop supporting tools for managers that will expand their awareness about respective subordinates. Let's examine each attribute of management 3.0 more closely in the below lines.

1. Virtual team management

i. Description

A virtual team can be defined as a communion of independent, geographically and chronologically dispersed participants linked by information technology, sharing responsibility for outcomes of their joint efforts.

The above definition is on its own very well sounding, however what does it actually mean? What are the specific features shared by virtual teams and how do managers need to behave whilst overseeing a virtual team in order to unlock its full potential?

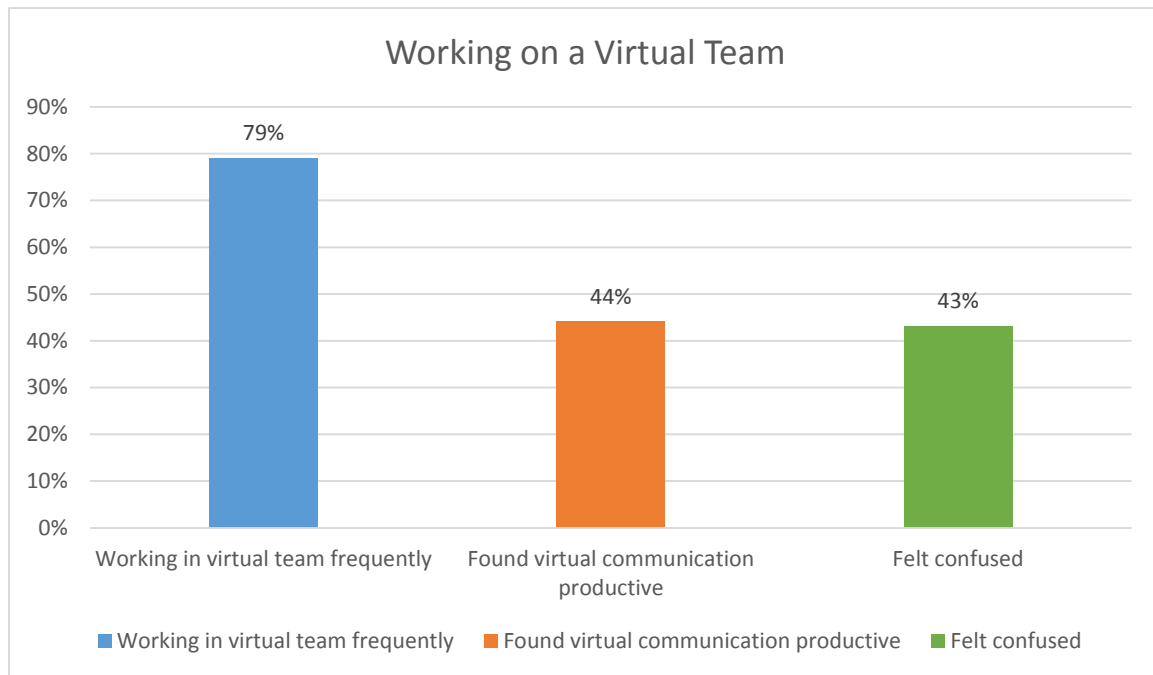
Some of the advantages of virtual teams include faster access to knowledges, reduction in communication and travel costs as well as increased employee satisfaction.

On the other hand, the advantages include the lack of social contact and visibility, potential feeling of isolation by individual team members. Additionally, due to the aforementioned lack of social contact, possible cultural misunderstandings might arise as well as potential animosities amongst team members, precisely due to the same culprit.

Generally, distance is the main factor behind inefficiencies in virtual teams. Distance can be perceived as an aggregate of physical, operational and affinity (personal connection) distance. Furthermore, in a recent Unify survey³ out of 79% of respondents who answered positively to a question of whether they work frequently on virtual teams mere 44% responded that they find work on virtual teams as productive as regular face-to-face work. In addition to that, 43% of knowledge workers find the array of communication technology at their disposal confusing.

³ A New Way to Work. Unify. [online]. 2015. [quoted 12.4.2015]. < http://www.unify.com/tr/~media/internet-2012/documents/nw2w/a_new_way_to_work_part_2_rules_of_engagement_for_a_virtual_world.pdf>. Page 7.

Chart 1; Working on a Virtual Team



Note. Based on own survey amongst current and past CEMS Student Board members.

According to the survey conducted amongst current Student Board⁴ members (November 2015), the main advantage and push for virtual team management, regardless of the above-mentioned

⁴ The CEMS Global Student Board operates as one of the main advisory bodies towards the whole apparatus of the CEMS Alliance (the Community of European Management Schools, in other words CEMS established in 1988 with the purpose of bringing up future global leaders).

The Student Board is composed of 29 Student Board Representatives, each representing its home school. The 29 individuals are divided into 6 teams. These include The Corporate Partners team, the MiM Relations team, the Marketing and Communications team, the Alumni Relations team, the CEMS Club Support team and the Global Sustainability team. Each of these teams contains between 4 to 5 members. Furthermore, the Student Board is managed by a Student Board President, Treasurer and the Secretary General who together form the Executive team. The Student Board President is also a member of the CEMS Executive Board as well as the General Assembly. Furthermore, the Student Board President participates in additional advisory committees, for instance the Globalisation Committee, the Academic Committee and others.

The author of this paper had the privilege to be a member of the Executive Board and a Student Board President for 2014-2015.

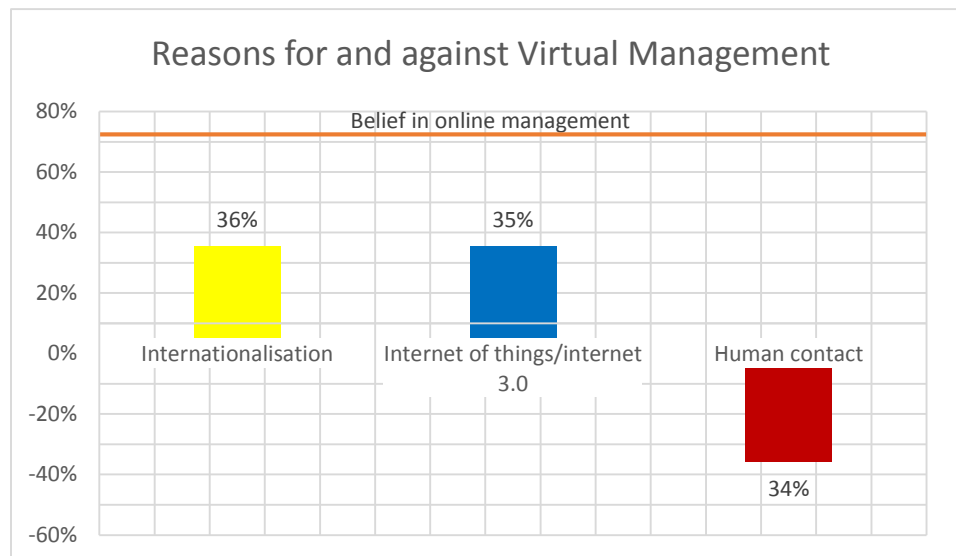
The national composition within the CEMS Student Board is currently as follows:

Table 1; Student Board nationality composition.

notions, is internationalization, i.e. globalization which is followed by the general notion shared by 35% of respondents that the Internet of Things, in this sense the idea of having a more wide-spread connectivity to the internet.

On the other hand, the majority of negatives associated with virtual team management were embedded in the lack of human contact. Overall, 72% of respondents expressed their positive belief in virtual team management.

Chart 2; Reasons for and against Virtual Management



Note. Based on own survey amongst current and past CEMS Student Board members.

Nationality	Number of SBRs	Nationality	Number of SBRs
German	4	Portuguese	1
Dutch	3	Irish	1
Czech	2	Norwegian	1
Hungarian	2	French	1
Canadian	1	Russian	1
Japanese	1	Turkish	1
Italian	1	Polish	1
Finnish	1	Chinese	1
Spanish	1	Singapore	1
Chilean	1	Hong Kong	1
Portuguese	1	Belgian	1

Note. Based on own survey amongst Student Board members, September 2015 batch.

ii. How to manage a Virtual Team

a. *Team-composition*

In the preceding lines, we established that virtual teams can be a substantial asset if the obstacles are overcome. How can be such thing achieved?

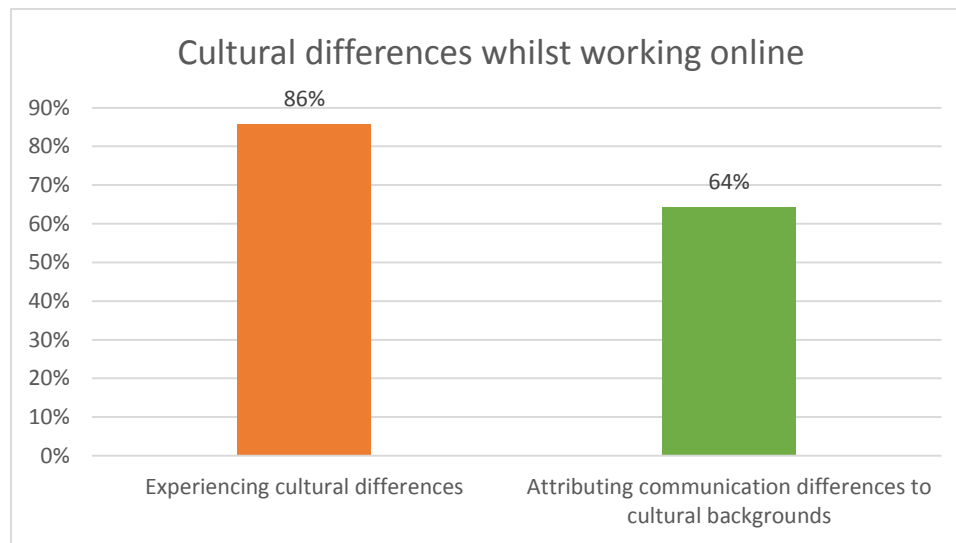
Apart from thorough training, the more common way is to choose the right people and build relationships within the virtual team. The qualities that managers and HR representatives shall be aiming at are perceived to be threefold;

- Behavioural
- Communication
- Cultural-awareness

The behavioural traits most suitable for work on virtual teams include; strong self-motivation, ability to perform independently, goal orientation, well organized workflow as well as the individuals need to be longing for flexibility.

The correct communication traits that virtual team members shall possess are for instance the ability to think out loud, to be thoroughly descriptive, to make a request when needed and most importantly the team members need to be able to listen to the others. Survey conducted amongst the current and past Student Board members links another crucially important quality of virtual team members (cultural-awareness) with its impact on communication traits. As can be seen in the chart, almost all the respondents have encountered cultural differences whilst working online. Out of them, 64% saw an impact on communication as a consequence of these cultural archetypes, hence the cultural-awareness traits being even more important for effective virtual team work.

Chart 3; Cultural differences whilst working online



Note. Based on own survey amongst current and past CEMS Student Board members.

The cultural-awareness traits that should be sought after with virtual team members are the openness to work in various time-zones⁵, sensitivity to cultural variations amongst team members, openness to learn and observe new information.

Besides personal traits the size of virtual teams matters too. The optimal size is generally perceived to reach 5, yet no more than 10 people.

b. Work-action recommendations

We have defined the selection criteria that may, *ceteris paribus*, achieve well-composed virtual teams. However selected members have been aligned with the objective to perform, therefore will the below lines focus on work ethics and work patterns that are needed whilst working virtually.

Virtual team members shall adopt the following work ethics;

⁵ Having call in 3 am CEST in the morning when your colleagues in Singapore come to work or at midnight CEST in order to accommodate colleagues in Hong Kong and Santiago de Chile.

Table 2; Virtual team member working recommendations

Team member general
Set personal space for work (if not working from office)
Set working hours
Link calendars with team members
Agree on used technology
Use online “Cafeteria“ to share common experiences, personal issues etc.

Team member specific
Do not browse personal email
Set working hours
Show other team members your surroundings to create personal rapport
Limit mute to its minimum since silence is the killer of good humour and sense of belonging (supposing that one is in a quiet environment)
Use online “Cafeteria“ to share common experiences, personal issues etc.
Clear task tracking and coordination

Manager; prequel phase
Set personal space for work (if not working from office)
Set working hours
Link calendars with team members
Agree on used technology
Setting ground rules for cooperation and communication: process, timelines, responsible persons, rules
Appoint a team’s conversation goer (person keeping the conversation vivid)
Develop means how to celebrate successes virtually (vouchers, videos)
Define ways how to spotlight team members virtually (virtual appraisal means)
Enable members to communicate informally in virtual “Cafeteria“

Manager; initiation phase
Setting ground rules for cooperation and communication: process, timelines, responsible persons, rules
Appoint a team’s conversation goer (person keeping the conversation vivid)

Constant and clear accessibility

Integrate team members effectively through sharing team history, team purpose and goals

Clearly define roles and responsibilities

Manager; recurring phase

Establish personal connection via IT means (avatars) or proper team introduction (Daily five-minute phone calls or video calls with each team member

Create a proactive professional relationship with each team member. Understand who they are, what their career is about, and how they will be able to help with whatever project challenges may arise, now and in the future

More proactively manage conflicts since these can escalate quickly in a virtual environment

Set personal development goals with each team member and also roadmaps how to achieve them

Have some face2face meetings in order to establish personal connection⁶

Constructive feedback and support

Note. Based on personal experience and “Why Virtual Teams Are Really Different and Six Lessons for Creating Successful Ones.”

⁶ Darleen Derosa and Richard Lepsinger found that virtual teams with 4 team development sessions or more in a year over-performed those without such sessions. Particularly, these sessions helped them develop and fine-tune their communication and interpersonal skills.

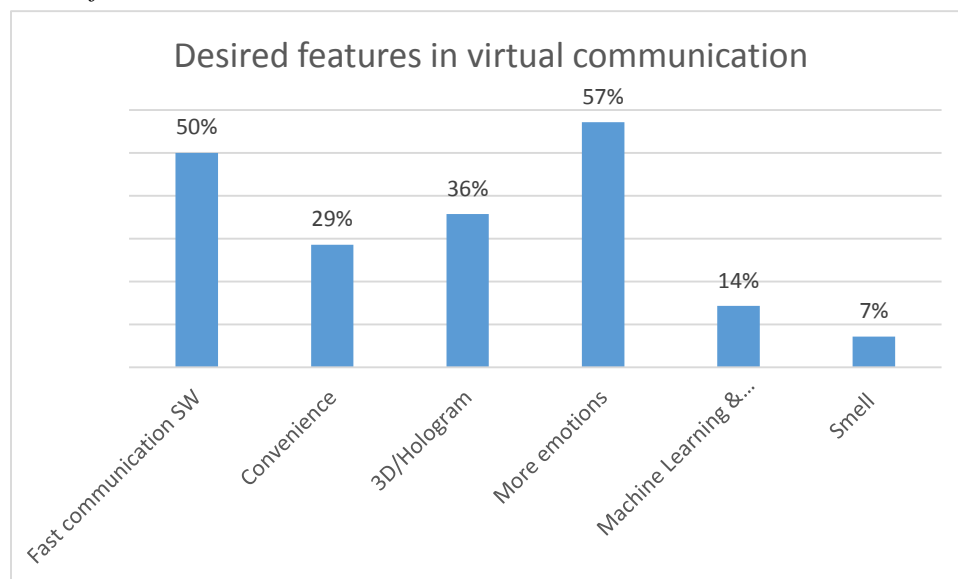
DEROSA, Darleen; LEPSINGER, Richard. Why Virtual Teams Are Really Different and Six Lessons for Creating Successful Ones. [online]. October 2011. [quoted 12.4.2015].

<<http://www.peoriamagazines.com/ibi/2011/oct/why-virtual-teams-really-are-different>>.

One of the features stipulated in the table was to agree jointly on the technology that shall serve as primary means of communication. According to the survey conducted on past and current Student Board members i.e. individuals with thorough virtual environment experience, people loathe for more emotions whilst working virtually. The second most frequent request was associated with the speed of connection and the SW used. Furthermore, users would appreciate elevated convenience of the used SW.

Respondents were asked also to express their future-oriented desires with regards to virtual work. All of these were either directly or indirectly associated with increasing the amount of emotions transmitted to individuals whilst in the virtual space, e.g. 3D/Hologram features or smell transmission. Further recommendations pointed to machine learning and adaptive features that shall gather data and assist SW users in efficient work process.

Chart 4; Desired features in virtual communication



Note. Based on own survey amongst current and past CEMS Student Board members.

Efficient email writing

Additional trait shared both by managers as well as by employees is email writing, proof-reading and reading. All these activities take a substantial amount of time. Specifically, it is estimated that

such activities take up to 28 percent of regular workweek⁷. Henceforth, learning the art of efficient email writing can be very beneficial since efficient emails aided by active social collaboration tools are expected to find extra 5-6 hours of time.

Table 3; Efficient email writing checkbox

Efficient email writing checkbox	
Set an interesting subject stating deadlines	<input checked="" type="checkbox"/>
Summarise the most important issues in the top 3 lines so that email robots can read it	<input type="checkbox"/>
Adjust the tone and the structure according to the receiver	<input type="checkbox"/>
In relating to specific people use “@Jorge” so that the robots can pick up the name and highlight it for the readers.	<input type="checkbox"/>
Use specific time-setting format so that robots can pick-it up and add it to one’s calendar.	<input type="checkbox"/>
Provide as much information and data that the person needs to fulfill their task, do not overwhelm them with too much irrelevant data	<input type="checkbox"/>
Set automatic sending not to stress colleagues on Friday at 6pm unless necessary.	<input type="checkbox"/>
Use TO and CC accordingly (TO people should take actions whereas CC people just need to be aware of the discussion and do not need to take any further steps).	<input type="checkbox"/>
Include in your signature both personal and team items; Personal: your email, phone contact, your timezone. Team: link to a sharepoint site where all the important team materials are shared, team shared email address.	<input type="checkbox"/>
Proof-read your email.	<input type="checkbox"/>
Do not reply with one-word sentences so that the necessary space in the mailbox is not used up.	<input type="checkbox"/>

Note. Based on own experience and recommendations from colleagues.

⁷ CHUI, Michael; MANYIKA, James; BUGHIN, Jacques; DOBBS Richard; ROXBURGH, Charles; SARRAZIN, Hugo; SANDS, Geoffrey; WESTERGREN, Magdalena. The social economy: Unlocking value and productivity through social technologies. McKinsey Global Institute. [online]. July 2012. [quoted 12.6.2015]. <<http://www.mckinsey.com/industries/high-tech/our-insights/the-social-economy>>.

Efficient meeting

Another of the skills shared by all the team members is efficient meeting management. The basic practice that each meeting should be aligned with includes;

Table 4; Efficient meeting management checkbox

Efficient meeting management checkbox	
Specific agenda	<input checked="" type="checkbox"/>
Pre-defined discussion time per item	<input type="checkbox"/>
Assigned tasks beforehand using “@” function ⁸	<input type="checkbox"/>
Complex documents send in advance	<input type="checkbox"/>
Request for agenda approval function	<input type="checkbox"/>
Use virtual touch sheet to keep track who spoke about what	<input type="checkbox"/>
Rationally monitor speaking time	<input type="checkbox"/>
Take minutes by minute taking tool ⁹	<input type="checkbox"/>
Make implicit explicit	<input type="checkbox"/>

Note. Based on own experience and recommendations from colleagues.

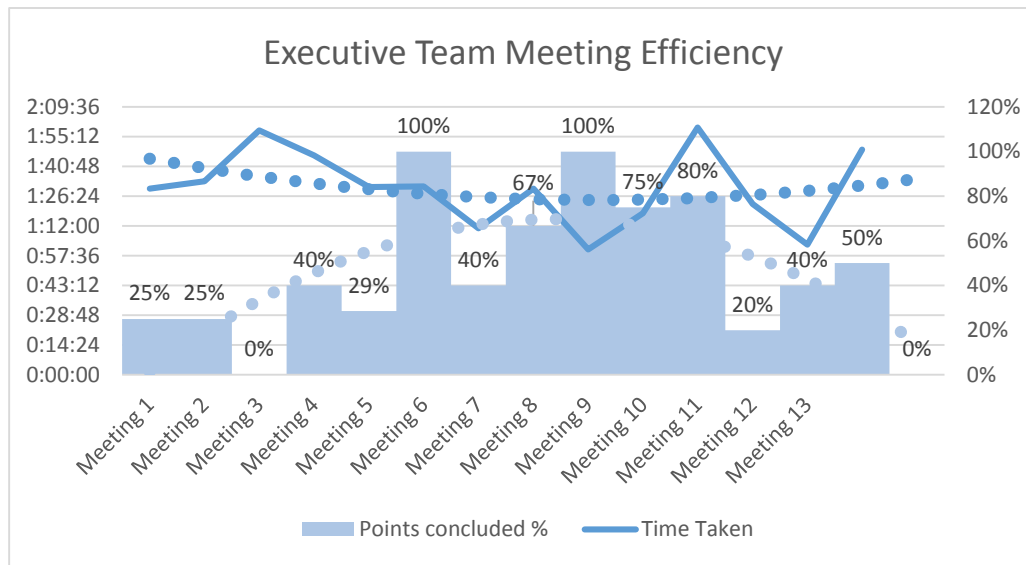
Similar approach was applied with the Executive Team in the Student Board. The Executive Team has 4 members with regular weekly meetings as well as irregular ad hoc meetings. The tool for communication used is 3-fold. It involves Skype or Google Hangouts for video calls, Podio management software for textual communication (excluding emails) and Google Drive for knowledge sharing. The efficient meeting metric was implemented during the 4th meeting and as can be seen from the chart, it had an immediate impact on the “Points concluded %¹⁰” metric. Furthermore, what this chart adheres to is the optimal meeting length, *ceteris paribus*. The optimal length, according to the “Points concluded %” metric is 1:27:36 when averaging the most productive meetings 8,9,10 and 11. Shorter or longer sessions resulted in being less productive.

⁸ The @ function is used to connect a simple textual name expression with an existing account holder with such name within an organisation.

⁹ Names, times, bullet points, common points aggregator in executive summary

¹⁰ Out of the items on the agenda, how many were actually resolved, not only spoken of.

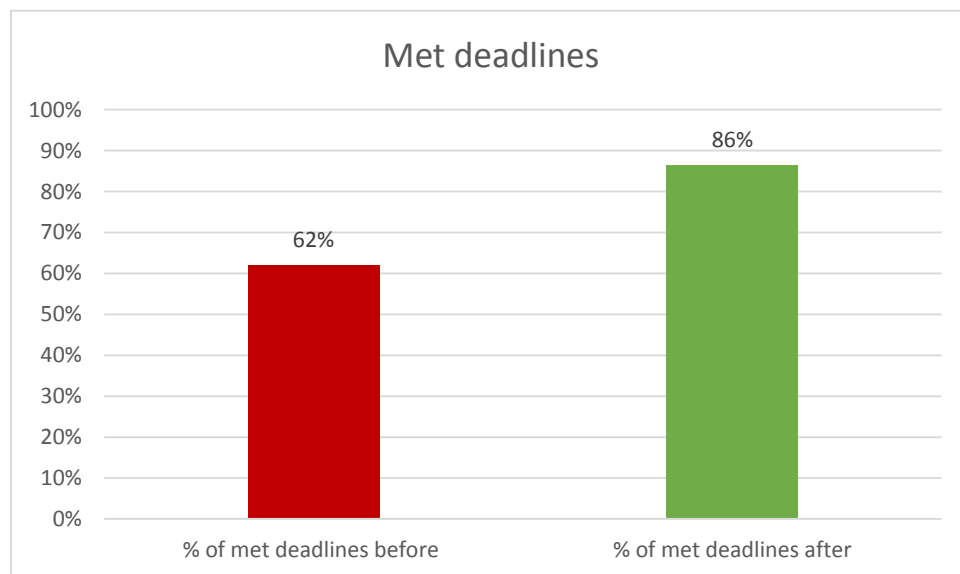
Graph 1; Executive Team Meeting Efficiency



Note. Based on own survey of three 3-member executive teams.

Furthermore, the efficient meeting approach and its section relating to task distribution and allocation via textual robots aided the improvement of met deadlines by increasing its completion rate from 62% up to 86% within 6 months.

Chart 5; Met deadlines



Note. Based on own survey amongst current and past CEMS Student Board members.

2. Management by personalities

A true manager 3.0 will be able to lead and inspire people not only upon decisions based on her or his gut, yet more importantly on the basis of scientific and empirical facts. With regards to team composition and individual team member analysis, managers can rely on several metrics. In the below lines, we will together examine the most frequently used metrics.

i. MBTI

The Myers-Briggs type indicator was first published in 1944 in *Myers-Briggs Type Indicator* handbook. It was only in 1956 when the commonly associated abbreviation MBTI started to be associated with the Myers-Briggs Type Indicator. The psychometric analysis is heavily derived from works of Carl Gustav Jung, specifically his 1921 published book *Psychologische Typen* or in later English translation *Psychological Types*. The metric is globally the most frequently used psychometric, however it is far from perfect as it suffers from many discrepancies. On the other hand, its simplicity and generally reliable results (according to the official MBTI materials, the accuracy is approximately 75%¹¹) make it the optimal solution for managers' use.

a. *MBTI Traits*

Carl Gustav Jung viewed personalities according to 4 traits; sensing, feeling, intuition and thinking. Similar 4² metric was adopted by Myers and Briggs. They developed a binomial metric derived directly from Jung's works. In addition to Jung, they devised the inverted metric as well as added extraversion.

The MBTI metric is structured according to how people behave, perceive, decide and act.

¹¹ MYERS, Isabel Briggs; McCauley, Mary H.. Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator (2nd ed.). Palo Alto, CA: Consulting Psychologist Press. ISBN 0-89106-027-8. (1985). [quoted 12.8.2015]. Page 52.

Table 5; MBTI Traits

Activity	+	-
Usage of energy and activity (Mind)	Extraversion	Introversion
Perception of information (Energy)	Sensing	Intuition
Decision making (Nature)	Thinking	Feeling
Interaction with outer environment (Tactics)	Judging	Perceiving

Note. Adapted from <http://similarminds.com/global5/g5-jung.html>¹²

One of the most looked down on features of MBTI is the self-assessment part when respondents answer respective questions on their own, hence the overall results is heavily dependent on their self-perception.

Let's examine each of the traits more closely;

Extraverted individuals enjoy communicating with other people, are expressive and feel comfortable in situation when they are in the center of attention. They recharge through communicating with other people. On the other hand introverted individuals adhere to quiet environments, smaller groups of people or prefer being alone thus may face challenges when meeting new people.

Sensing individuals observe the world through their senses and focus more on facts and observable things. They tend to handle facts and tangible features better as well as prefer staying realistic, not wondering what and when might happen. Intuitive individuals prefer ideas, abstract constructs, imagination i.e. they focus on the inner world, always immersed in their bubble of ideas and connections.

Thinking individuals rely on rationality and logical arguments, their actions and decisions are led by their head, not their heart. Inversely, feeling individuals listen to their hearts and base their

¹² Global 5 to Jung/MBTI/Kiersey Correlations. Similarminds.com. [online]. [quoted 12.9.2015]. <<http://similarminds.com/global5/g5-jung.html>>

decisions on what their gut tells them. They are also more whole-hearted and passionate in their actions since they believe that inner feelings should be shared with the outside world.

Judging individuals always have a plan which they stick to. It could be a list of places to visit or things to buy, regardless of the notion, they will always adhere to what it stipulates. They would rather have several plans rather than to act ad hoc. On the other hand, *perceiving* individuals decide upon their actions as opportunities arise. They prefer to be driven by what is interesting and what fulfills them. If a certain activity stops being compliant with these criteria, they instantly switch to or develop a replacing activity that will satisfy them.

Additional metric which is not mentioned above is division according to Assertive or Turbulent types which is derived from the Big Five psychometric (see below). This attribute divides individuals according to how they handle emotions and how susceptible they are to neuroticism (this is the term used by Big Five)

b. MBTI roles according to 16 personalities

The 16 personalities is arguably the most mainstream and well-known site at this moment based on MBTI's psychometric. Through relatable stories and graphics, they provide thorough insights into one's personality. The 16-personalities follows the traditional metric of 4 letters, e.g. ENTJ (extraversion, intuition, thinking, judging), however it also adds 2 simplified 4-level metrics, roles and strategies. Roles describe individuals according to how they think, whereas strategies reveal the ways how individuals interact with each other.

Table 6; MBTI Roles

Role	MBTI Traits	Description
Analyst	Intuitive&Thinking, Assertive&Turbulent	Excel in rational and strategical thinking. Are great scientists and politicians. Are strong-willed and passionate about rational causes.
Diplomat	Intuitive&Feeling, Assertive&Turbulent	Are empathetic, care about others' well-being, often seek win-win principle, are relatable. Sometimes may disregard rationality.
Sentinel	Sensing&Judging, Assertive&Turbulent	Adhere to rules and hierarchies, are hard-working, strong-willed and motivated. Excel in public sector or administration.
Explorer	Sensing&Perceiving, Assertive&Turbulent	Are brisk in solutions, creative in their actions, can develop new ways of how to use specific tools or how to motivate people. Excel in crises and fast-changing environments. ¹³

Note. Adapted from <http://www.16personalities.com/>.

¹³ 16 Personalities Premium Profile. 16 Personalities. [online]. [quoted 12.8.2015]. <<http://www.16personalities.com/>>. Pages 17-18.

Table 7; MBTI Strategies

Strategies	MBTI Traits	Description
Confident Individualism	Introverted, Assertive	Prefer working independently, rely on their skills, believe in self-fulfillment.
People Mastery	Extroverted, Assertive	Are natural speakers and people influencers, do feel at ease when relying on the others.
Constant Improvement	Introverted, Turbulent	Perfection is of the uttermost importance to them, their craft is their life, are motivated and success-driven.
Social Engagement	Extroverted, Turbulent	Success driven individuals attributing large importance to other people's views, are open to both negative and positive emotions. ¹⁴

Note. Adapted from <http://www.16personalities.com/>.

Similar strategy was applied with regard to Student Board as with the preceding tools. The outcomes of the MBTI-driven team allocation can be seen in the chart below. Team members were asked¹⁵ over the period of 6 months how they felt that their team was composed and compact. The results were compared with the same period a year ago in order to compare and contrast potential MBTI-driven allocation benefits.

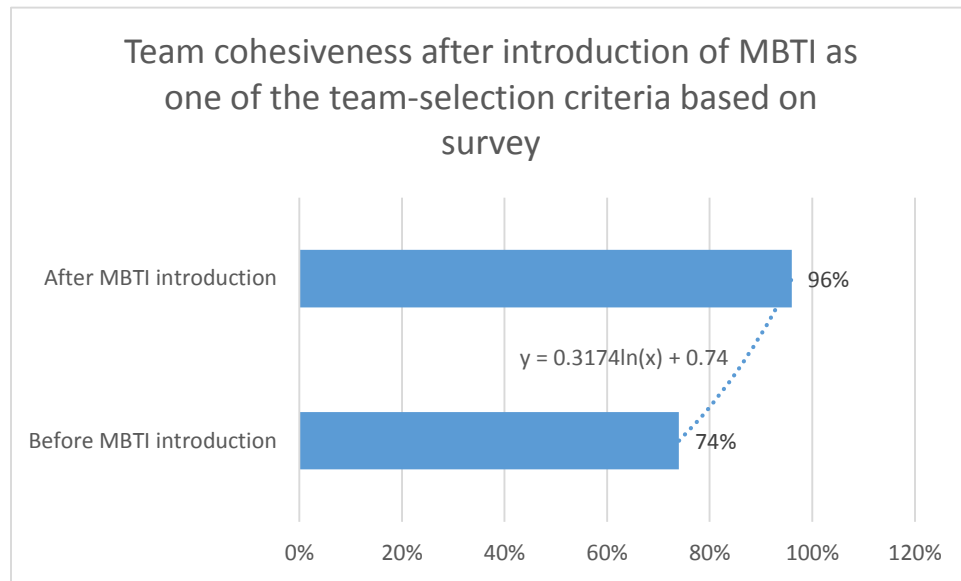
The outcomes are positive in that sense that the MBTI-driven allocation was successful since the happiness rate measured by team cohesiveness increased from 74% to 96%.

¹⁴ 16 Personalities Premium Profile. 16 Personalities. [online]. [quoted 12.8.2015]. <<http://www.16personalities.com/>>. Pages 18-20.

¹⁵ Questions from the survey:

1. How long have you been on this team?
2. How do you feel whilst working with other team members? (very satisfied | satisfied | unsatisfied)
3. Have you noticed an improvement during the past 6 months with regards to team cohesiveness? (Yes | No)
4. Please explain.

Graph 2; MBTI impact on Student Board



Note. Based on own survey amongst current and past CEMS Student Board members.

c. MBTI Working Tool

The purpose of the below table is to orientate oneself whilst dealing with other personalities. It is structured to help the person to get to know itself as well as to teach others how to deal with such person. It includes the Role as well as the Strategy classification. Furthermore, it focuses on highlighting strengths, opportunities, Weaknesses and Threats associated with a particular personality. Additionally, it showcases famous people of the same sort with the gender-relevant frequency of occurrence.

Table 8; MBTI Working Tool

Profile	Characteristics		Famous people	Gender occurrence frequency
INFP	Strengths Masters of written communication (warm and understanding) Responsive to symbols Idealism, mythical Take great care in other people and expect the same from the others Easily connect to the others Creative thanks to being able to read between the lines	Weaknesses Sometimes feeling misunderstood Are deeply hurt by conflict Can be impractical Can take many things too personally Dislike dealing with data	Johnny Depp Bjork Frodo Baggins	Male: 4% Female: 5-6%
	Opportunities Adhere to virtual world presence Prefer beauty, morality, virtue to utility, effectiveness and value Seek harmony Feeling good about themselves when they are helping the others As they mature, they become able to detach themselves from emotions	Threats It's crucial to find what motivates them Seek higher meaning as a motivation tool Too altruistic Unbalanced self-esteem Can become increasingly isolated from objective opinions		

ENTJ	Strengths Confident and charismatic Behave naturally Honest behaviour without being obnoxious Can improve any kind of system Strategic thinking Quick and versatile mind Efficient Strong-will	Weaknesses Do not pay enough attention to other people's feelings Any display of emotions is a sign of weakness Personal relations Do not respect rules and regulations Impatient Intolerant	Steve Jobs Bill Gates Al Gore Margaret Thatcher Jim Carrey	Male: 3-4% Female: 1-2%
	Opportunities Can convince anyone that an idea is brilliant Anything can be done Sheer willpower can overcome obstacles Excellent strategists Respect those who stand up to them Put rationality above everything else	Threats Dominant and persuasive style of negotiation Self-confidence can easily turn to arrogance Need to have support of other people to be truly efficient Handling emotions and creating personal connection Making sure that their behaviour is not perceived as condescending		

ISTP	Strengths Have a very good sense of humour Know how to use their energy efficiently Do well in areas requiring hands-on approach Brilliant in areas that require creativity, freedom and practicality (e.g. engineering) Are capable of absorbing a lot of information from the outside world Shine in crisis situations (EMTs, athletes, policemen, soldiers) Optimistic Bold Honest and direct Perceptive to the smallest changes in one's behaviour or surroundings Knowing how to prioritize	Weaknesses Can become stubborn when being criticized Do not express interest in other people's tasks Seek adrenaline Sometimes need a lot of "alone time" to recharge Are susceptible to getting bored Do not like commitments Reserved and mysterious Miss the bigger picture Might be impatient	Tom Cruise Simon Cowell Clint Eastwood Frank Zappa	Male: 8% Female: 2%
	Opportunities Are able to hide the spontaneous part of their personalities They excel in professions where they are given a chance to shine and to do something noble and good Can be very loyal	Threats Can be unpredictable Intrusion into their own personal lifestyle Can disobey rules Burdening their approach towards life with rules and taking away their personal space Might have difficulties in the academic environment		

ISTJ	Strengths Analyse their surroundings quite meticulously Are loyal and have a strong sense of duty (military, deputy directors, public service) Adhere to hierarchical structures Stable individuals Seek stable and full life Always keep a cool head Stick to rules under any sort of circumstances Very responsible Honest and direct	Weaknesses Will boycott things they do not see as relevant and important (stubborn) Have issues expressing their emotions Are easily irritated by other people's shortcomings and inefficiencies Do not listen to other people's feelings May blame themselves too harshly Judgmental Struggling with personal life	Andrew Johnson Herbert Hoover George H.W.Bush Adrian Monk	Male: 16-17% Female: 8-9%
	Opportunities Prefer facts Can be excellent auditors and analysts If certain data is correct, they will do anything to implement it Facts are always more important to them than sensitivity	Threats Can struggle with theory and opposing ideas Prefer doing things alone Are immensely thorough and reliant on facts, thus omitting feelings Can be perceived as cold and indifferent for favouring facts		

INFJ	Strengths Helping others take as a life mission Seeking the cause of a problem Stand a very firm ground on issues they believe in Will always aim for equality and balance Take great care in other persons' feelings	Weaknesses Can feel personally attacked when being objectively criticised	Jimmy Carter Mother Teresa Nelson Mandela	Male: <1% Female: <1%
	Opportunities Use some of their energy for their personal sake Have the ability to change the world for better	Threats Remember to take care of themselves The overflow of emotions can make them overreact		

ENTP	Strengths Are positively disruptive (devil's advocate) Quick-witted and original (politicians, orators) Are analytical Prefer complex ideas (thinking big) Are direct and honest Are socially tolerant	Weaknesses Lack practicality Rely on other people to function Do not see value in emotions Find it hard to focus Intolerant Dislike rules and hierarchies Can get easily bored Narrow-focused	Theodore Roosevelt David Spade Tom Hanks Alfred Hitchcock	Male: 4-5% Female:
	Opportunities Adhere to intellectual challenges Notice patterns where others cannot Enjoy brainstorming Can have a great sense of humour	Threats Are not that concerned about practical world applications (that makes them great academics) Are very polarised (bipolar world perception) Their inventive arguing style may cause harm in personal relationships Can easily hurt individuals (F types)		

INTJ	Strengths Knowledgeable across wide spectrum of areas (developed in early childhood) Confident Independent Decisive Do not necessarily seek spotlight Love dark humour Strategic Foreseeing Open-minded	Weaknesses Do not obey rules that make no sense to them Struggle with partner attraction (find mating and dating rituals irrational) Arrogant Judgemental Disregard highly structured environments	Vladimir Putin Paul Krugman Gregory House, House M.D. Rudy Giuliani	Male: 3.5%-4% Female: 0.5-1%
	Opportunities Tend to keep their opinions to themselves Expect everyone to make their own decisions without influencing them Everything needs to be “realisable” Are natural leaders, yet might tend to be the puppeteer making the main decisions behind curtains Usually work in science, strategy, project management, consulting but can be found also in other areas	Threats Some types find them either attractive or repelling Their skills need to be applied in areas where they can devise and improve some kind of system They will not accept an idea simply based on a person’s status Would struggle in structured environments where things are done in a “certain way” Might lose respect to someone without talent, be it even the top management Perfectionists Have tendency to overanalyze		

ESTJ	Strengths Adhere to order, tradition and stability Feel comfortable organising other people Rely on data Are structured and can master project management Tend to be managers Respect good work ethic Reliable and trustworthy Have a good sense of what is socially acceptable	Weaknesses Struggle with accepting a competing theory when they deeply believe the current one Do not listen very well to their own and others' feelings Do not cope well with emotionally charged situations Find it difficult to relax Maybe too stubborn	Andrew Jackson George W.Bush John D.Rockefeller	Male: 12-13% Female: 8-9%
	Opportunities Are active within organisations Defend family values Love responsibility and the associated power	Threats Are not afraid to show discomfort with someone underperforming May focus too much on their social status May disregard their personal needs for the sake of a project		

ISFP	Strengths Experimenting Coming up with innovative ideas Are able to set new trends Sensitive to other people's feelings Are goal driven Curious Passionate Open-minded	Weaknesses Unpredictable React badly to any form of criticism (due to low self-esteem) Do have issues with following a structured path Can get anxious easily Must have freedom	Ulysses S. Grant Bob Dylan Michael Jackson Donald Trump	Male: 6 Female: 10%
	Opportunities Their charm can easily dissuade their opponents (can pick-up the best compliment for a particular person) Live in the present, do not dwell on the past Can be competitive	Threats Resist all forms of control as they see it as limits to personal behaviour and perceive them as dull Need some time alone to recharge If their goal is self-centred, they can become very egoistic		

ISFJ	Strength Are very proactive Are loyal, committed and patient (are very good for academia, medicine or administrative tasks) Are accurate Adhere to hierarchical systems where they can be truly loyal to the authorities Remember many details Are very traditional Are very analytical Are emotionally very stable	Weaknesses Have an issue with showcasing their achievements Reluctant to change Can be overtly touchy Are humble and shy Are judgmental Can stick to their opinion (stubborn) Repress their feelings	Dr. Watson Robert E. Lee Elisabeth II.	Male: 7% Female: 18-19%
	Opportunities Are able to establish truly long-lasting relationships Can also select the right gifts for the right people Can overdo things Try to exceed others' expectations	Threats Need to be able to voice their concerns about workload Do not feel comfortable using their connections to advance their careers Would not break traditions even if it meant dire consequences		

INTP	Strengths Are able to spot the tiniest discrepancies in statements Vast backlog of knowledge Remain unbiased Curious and insightful individuals Are able to devise a unique solution to a problem Are perfect orators and debaters able to destroy anyone Can find connections between seemingly non-connected features	Weaknesses Cannot stand a routine work Can become defensive when their theories or beliefs are being questioned Restless fear of a possible failure Have troubles with romantic relationships at their early stage Find it difficult to explain their complex ideas to others Very private and not overtly confident	Rene Descartes Albert Einstein Tiger Woods Carl Jung James Madison	Male: 4-5% Female: 1-2%
	Opportunities Strong presence in the virtual world Do not mimic other people's behaviour Need to have the space to work on any kind of improvement Are likely to be open-minded	Threats Are not concerned with real-life impacts (mostly focused on theories) Can be often characterised as philosophers or dreamers Shy when meeting new people Do not consider emotions as logical arguments May feel lonely due to their personality type May be condescending Loathe rules and hierarchical environments		

ESTP	Strengths Sociable Active Can detect slightest changes in facial expressions or behaviour Are very observant Can be very inspiring and convincing Great people skills	Weaknesses Are direct Do not consider emotions as relevant Dislike theory and abstract thinking Impatient Struggle in schools in later grades	Ernest Hemingway Eddie Murphy Bruce Willis Jack Nicholson	Male:6% Female:2%
	Opportunities Are interested in present Prefer swift actions Can adopt other views as theirs very quickly Need to discover their talents in order to fully develop them	Threats Their lust for swift actions may lead to hasty decisions Perceive rules and regulations as mere suggestions Do not know how to enjoy themselves in worldly pleasures (some of them hence suffer from alcoholism or gambling) Focus too much on short-term		

ESFP	Strengths Are very popular Very aesthetical Are able to make other people feel good Are very observant, especially to emotions Creative Practical	Weaknesses Focus overtly on the present Easily distractable Poor planning skills Loathe for excitement	Marilyn Monroe Steve Irwin Kathy Lee Gifford	Male:5% Female:10%
	Opportunities Love being in the centre of attention Ad hoc solutions	Threats Tend to diverge from the pre-defined topic Tend to avoid conflicts Do avoid repetitive or analytical tasks Would rather ask the others for help rather than trying to understand it for themselves		

ENFP	Strengths Curious Empathetic Great communication skills Know how to relax Creative	Weaknesses Non-conformists Poor practical skills Focus too much on detail Dislike dealing with data	Robin Williams Sandra Bullock Robert Downey Jr.	Male: 5-6% Female: 9-10%
	Opportunities Tend to see the world from the idealistic perspective Are very perceptive Need to find their place in the world to shine	Threats May be quiet in an environment where their ideas are likely to be challenged Do not necessarily seek the leadership position May base their actions upon the perception of other people's behaviour Sometimes tend to over-enjoy themselves in earthly pleasures Tend to be individualistic		

ENFJ	Strengths Kind, loyal and altruistic Authentic Charismatic Intuitive Great imitators (know how to adjust behaviour) Reliable Decisive Respective to other views	Weaknesses Are sensitive and vulnerable to conflicts Take criticism personally Unbalanced self-esteem Strive for a cause Avoid difficult decisions Idealistic	Barack Obama Matthew McConaughey Tommy Lee Jones Ronald Raegan Abraham Maslow Sean Connery	Male: 1% Female: 4%
	Opportunities Tend to be influential Great combination of creativity and goal orientation Can be great leaders and mentors Are unstoppable when they commit to something	Threats May drift from one idea to the other May find too involved in other people's problems		

ESFJ	Strengths Altruistic and supportive Are very proactive Defend authority and law Are very social Are loyal and stable partners Are patient Strive for win-win situations Know how to connect people Are practical	Weaknesses Care about their physical appearance Care about their social status Find it hard to cope with criticism and conflict Need to feel appreciated for their over-work Struggle with improvisation	Bill Clinton Danny Glover Sarah Palin Monica (Friends)	Male: 7% Female: 16-17% ¹⁶
	Opportunities Seek career in areas where they can have a positive impact (medicine, academia) Seek a position of authority Are open to change (not necessarily sticking with the pre-defined rules)	Threats Need to feel appreciated and valued Tend to overdo things Might be less responsive to their environment Tend to take on too much workload		

Note. Adapted from <http://www.16personalities.com/>.

¹⁶ 16 Personalities Premium Profiles. 16 Personalities. [online]. [quoted 12.10.2015]. <<http://www.16personalities.com/>>.

d. Other 4x4 methodologies

Table 9; Other 4x4 methodologies

Date	Author	Artisan temperament	Guardian temperament	Idealist temperament	Rational temperament
590 BC	Ezekiel's four living creatures	lion (bold)	ox (sturdy)	man (independent)	eagle (far-seeing)
400 BC	Hippocrates' four humours	cheerful (blood)	somber (black bile)	enthusiastic (yellow bile)	calm (phlegm)
340 BC	Plato's four characters	Artistic (<i>iconic</i>)	sensible (<i>pistic</i>)	intuitive (<i>noetic</i>)	reasoning (<i>dianoetic</i>)
325 BC	Aristotle's four sources of happiness	sensual (<i>hedone</i>)	material (<i>propraietari</i>)	ethical (<i>ethikos</i>)	logical (<i>dialogike</i>)
185 AD	Irenaeus' four temperaments	spontaneous	historical	spiritual	scholarly
190	Galen's four temperaments	sanguine	melancholic	choleric	phlegmatic
1550	Paracelsus' four totem spirits	changeable salamanders	industrious gnomes	inspired nymphs	curious sylphs
1905	Adickes' four world views	innovative	traditional	doctrinaire	skeptical
1912	Dreikurs'/Adler's four mistaken goals	retaliation	service	recognition	power
1914	Spränger's four value attitudes	artistic	economic	religious	theoretic
1920	Kretschmer's four character styles	manic (hypomanic)	depressive	oversensitive (hyperesthetic)	insensitive (anesthetic)
1947	Fromm's four orientations	exploitative	hoarding	receptive	marketing

1958	Myers' Jungian types	SP (sensing&perceiving)	SJ (sensing&judging)	NF (intuitive&feeling)	NT (intuitive&thinking)
1978	Keirsey/Bates four temperaments (old)	Dionysian (artful)	Epimethean (dutiful)	Apollonian (soulful)	Promethean (technological)
1988	Keirsey's four temperaments	Artisan	Guardian	Idealist	Rational
2004	Gordon-Bull Nexus Model	Gamma	Beta	Delta	Alpha ¹⁷

Note. Taken from <http://www.rosenfels.org/Timeline.htm?format=desktop>.

ii. Big 5

Another approach towards personality analysis that is also widely used is the Big Five. With regards to the extended MBTI, i.e. including Assertiveness or Turbulent personalities, it can be assumed that the approach is relatively similar. The Big Five psychometric is divided into 5 dimensions, namely Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism/Emotional Stability. Major variations with the MBTI typology can be seen in the table below.

Table 10; MBTI vs Big 5 comparison

MBTI	Big 5
4-dimensions	5-dimensions
Binomial distribution scale	Normal distribution scale
16 types	Individual type
Based on C.G.Jung	Based on empirical observations ¹⁸

Note. Adapted from <http://news.fitability.com/core/item/page.aspx?s=17622.0.44.24>.

¹⁷ HANOTTE, Dean; BARTLETT, Rachel. A Polarity Timeline. The Paul Rosenfels Community. [online]. 2007. [quoted 12.11.2015]. <<http://www.rosenfels.org/Timeline.htm?format=desktop>>.

¹⁸ RANDALL, H. Lucius. Teh ABC's of establishing a good hiring process. Fitability. [online]. [quoted 1.5.2016]. <<http://news.fitability.com/core/item/page.aspx?s=17622.0.44.24>>.

The motivations for a new approach lie with the fact that C.G. Jung's approach was a theoretical one, solely based on his observations. The Big Five personality analysis, as it became later known is however based on Taxonomy, i.e. the notion that words used in a specific context reveal sections of human mind. Specifically it was found by Louis Thurstone in 1933 that certain words used to describe emotional states could be grouped into 5 macro groups. There was however still a long way for us to be able to speak about the Big Five since Thurstone has not clarified the structure. It was not until 1949 when Fiske¹⁹ discovered that Catell's 16 personalities (precursor to Myers and Briggs) could be grouped according to 5 traits. Tupes and Christal, later on in 1961 coined the specific terms of the Big Five traits as we know them nowadays. The main breakthrough was however achieved by Warren Norman²⁰ in 1963. He built on Tupes and Christal's works and launched them into scientific mainstream²¹.

Table 11; Big 5 trait description

Trait	Summary
Openness to Experience	Positive attitude towards work and discovering new things.
Conscientiousness	Individuals characterized by this word tend to be easy-going, achievement oriented, pragmatic and well structured.
Extraversion	Such individuals find meeting new people, presenting in public easy.
Agreeableness	Understandable, tactful individuals caring about empathy and compassion.

¹⁹ FISKE, D.W. Consistency of the factorial structures of personality ratings from different sources. *Journal of Abnormal Social Psychology*. (1949). [quoted 1.5.2016]. Pages 44, 329-344.

²⁰ NORMAN, W.T. Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*. (1963). [quoted 1.5.2016]. Pages 66, 574-583.

²¹ RANDALL, H. Lucius. Teh ABC's of establishing a good hiring process. *Fitability*. [online]. [quoted 1.5.2016]. <<http://news.fitability.com/core/item/page.aspx?s=17622.0.44.24>>.

Neuroticism/Emotional Stability	Individuals acting adversely under pressure and stressful situations as well demonstrating unpredictable behavioral traits.
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Note. Based on university lectures and author's knowledge of the subject.

One question might arise; why is the Big Five metric so important that it is included as an additional metric in this thesis? The reasoning lies with the already mentioned taxonomy aptitude of the Big Five psychometric which can be applied via textual analysis to any sort of composed text. There are several additional prerequisites that have to be fulfilled, yet we will look at these in more detail in later chapters.

The overall necessity for such psychometric analysis of employees or team members is twofold; Firstly, it enables managers to select the best individuals with regards to their capabilities²². For instance individuals with high levels of conscientiousness tend to outperform their peers, on the other hand, high conscientiousness levels do not bear fruits in artistically oriented jobs, where laissez-faire approach has to be adopted. Additional research shows for instance that individuals with positive scores of extraversion and agreeableness have a high probability to succeed in sales-oriented jobs²³. Secondly, and more importantly for the purposes of this paper, such analysis allows managers to compose the best teams where all skills and personalities are carefully balanced²⁴.

iii. Additional personality traits metrics

As was stipulated in the preceding lines, there are many additional metrics that build on or are based on Jung's or Norman's theory. The below Need theory was initially constructed for marketing purposes since it conditions the action of purchasing a specific item with customer's need for such action. Its usage was later extended to motivation at workplace, i.e. it aims at increasing employee satisfaction and consecutively performance through targeting their specific

²² In addition to cognitive-capabilities questionnaires.

²³ ROTHSTEIN, Mitchell G.; GOFFIN, Richard D.. The use of personality measures in personnel selection: What does current research support?. Human Resource Management Review (16) 155-180. [online]. 2006. [quoted 1.11.2016]. <http://www.skillview.info/uploads/1/5/9/9/15997296/the_use_ofpersonalitymeasures.pdf>. Page 160.

²⁴ From the author's personal experience, the most important job of a manager is to choose the right people for the right job. In this regard, application of these metrics fulfills precisely this requirement.

needs as the ultimate keys to motivation. It is also one of the metrics used by IBM's personality insights model²⁵.

Table 12; The Need metric

Need	People who score high...
Excitement	Seek excitement, incline to hedonistic lifestyle
Harmony	Seek equilibrium, mutual understanding and empathy
Curiosity	Seek new things, loathe for discovery
Ideal	Seek perfection, flawlessness and sense of community
Closeness	Seek the warmth of family fireplace and the loved ones
Self-expression	Seek the center of attention through standing out
Liberty	Seek personal space where they can grow and blossom
Love	Seek social interaction, both individual and collective, master the art of connecting people
Practicality	Seek efficiency, rationality, speed and logic
Stability	Seek proved and verified approaches to the outer world
Challenge	Seek overcoming obstacles and hardships
Structure	Seek hierarchy and structure with clear matrices

Note. Adapted from IBM personality-insights models

Building on the features that can motivate an individual, the Value theory attempts to classify individuals according to where they perceive that value is created in their lives.

Table 12; The Value metric

Value	People who score high...
Self-transcendence / Helping others	Care about well-being of everyone, bear altruistic characteristics.
Conservation / Tradition	Value order, tradition, hierarchy and long-lasting solutions.

²⁵ The Personality Insights models. IBM. [online]. [quoted 1.13.2016].
<<https://www.ibm.com/smarterplanet/us/en/ibmwatson/developercloud/doc/personality-insights/models.shtml>>.

Hedonism / Taking pleasure in life	Carpe Diem is their motto, enjoy every second of their lives.
Self-enhancement / Achieving success	Loathe for success and victory.
Open to change / Excitement	Value independence, discovery and experience.

Note. Adapted from IBM personality-insights models

II. Gamification

As the word itself hints, the process of gamification represents the process of applying gaming features onto everyday activities. Gamification predominantly targets areas where playing or experiencing gamified environment was a few years ago unthinkable. It focuses on areas such as education, recruitment, marketing research, investment, physical exercise, loyalty schemes and also people management. The process aims at engaging individuals to be more active, more responsive, more present on respective channels by activities ranging from collecting badges, developing personalised avatars, allowing the most successful individuals to purchase real-life items such as vouchers or a paid day-off.

Gamification as such aims at developing borderless²⁶ gaming experience for individuals throughout industries and activities. For our purposes will be crucial to understand key features as well as to focus on aspects that can be applied in management.

1. Origins

The forebears of modern gamification formed up only very recently. The initial steps of the term as we perceive it nowadays were coined only in 2003 by Nick Pelling²⁷. Later on in 2008, there was the first documented usage of “gamification” in popular media, specifically in a blog post by Bret Terrill. From this moment onwards, there was a strong upward spiral for gamification braised when Gartner, a market-research agency added gamification onto their 2011, yet more about that in below lines.

²⁶ Infinite games are such games that do not possess any known beginning, neither ending. Such games are initiated in order to be played continuously, or to bring in more players. The gist of an infinite game is that it keeps on being played for the sake of playing. Henceforth, the experience and the need of the game must be superior. The rules of the game must be adapted accordingly, so that there is not possible ending to the game. The philosopher behind this concept is James P. Carse, who discusses the notion in his book *Finite and Infinite Games*. CARSE, James P. *Finite and Infinite Games*. New York: Ballantine Books. ISBN 0-345-34184-8.

The term itself was first used in 2002 by Nick Pelling, an English programmer with degree in Mathematics and Philosophy.

MARCZEWSKI, Andrzej. *Gamification: A Simple Introduction* (1st ed.). April 2012. [quoted 1.12.2016]. ISBN 9781471798665. Page 3.

i. Concept

It pays to say that gamification has been with us for much longer than the past decade or so. The true beginnings of gamified aspects can be traced back to 18th century when army ranks began to be represented by badges and honours. Army officials could thus compete indirectly within their ranks for the social status that was associated with specific rankings. Furthermore, such rankings can be found with scouts, competing for special awards related to extraordinary accomplishments. Additional initiating example can be tracked to the Soviet era during which agricultural unions as well as towns and cities could compete with one another without any capitalistic stimuli, which was thoroughly supported by the then apparatchiks, as argued by Nelson 2012.

With regards to the gamification scope within business practices as we understand it nowadays, its inklings can be scattered in marketing history books. For instance, around 1896 marketers began selling stamps to retailers who were then motivating customers to return and purchase more.

The true advent however began in the 1970s. Specifically in 1973 when Charles Coonradt established a consulting business focusing on gamifying the work experience. He coined the area of expertise and his consultancy The Game of Work. His primary focus was to turn dreary quotidian tasks into an entertaining and engaging process in order to increase the USA productivity that was at that time slipping. His work was established on psychological research that was proving that people expend larger energy levels in sports rather than at work. The reasoning behind being that in sports, the feedback is constant. A player knows how he or she is doing and also the fields on which he or she shall work on in order to improve. On the other hand, at work the situation is completely opposite. A worker finds himself or herself in a vacuum, focusing predominantly on short-term tasks without any closer feedback on performance. In 1984, Charles wrote a book with the same title (The Game of Work²⁸) and today is perceived as the Grandfather of Gamification.

ii. Gamification and information technology

With more wide-spread rise of information technology in the 1980's we could see a shift in gaming and gamification. Namely, the important findings were related to game designs that had to be compliant with human psyche. Such Human-Computer Interaction interfaces were based on playfulness and responsiveness of game designs. The gathered experience and know-how led later on to application within non-gaming context (see below).

²⁸ Game of work. Game of Work. [online], [quoted 2.5.2015], <<http://www.gameofwork.com/>>.

Gaming design and playful user interfaces represented the initial step, however what makes games more intriguing and captivating is the possibility to compete with other individuals. In this regard, the first multi-user platform (MUD1²⁹) was developed in 1979 by Roy Trubshaw. The game enabled its users to experience varying outcomes depending on particular actions of other users. Thanks to these developments, amongst others, games started to be perceived in different lighting. A supporting example of the perception change is represented by a book denominated *What Makes Things Fun to Learn: A Study of Intrinsically Motivating Computer Games* by Thomas Malone³⁰, where he discusses the basic principles of a captivating learning process. He discusses the basic principles that games, be it sports, desk, card or any other type of games share and intends, successfully, to apply these findings onto the learning process. Thomas Malone was a great supporter and innovator of Game-Based Learning, a concept realising the finding that games can be used within wider context, for instance for learning purposes.

Building upon these findings, numerous initiatives and games spurred up. The main momentum associated with these concepts came in the first half of 2010's however several projects existed even before. Whilst naming the most successful ones, one must mention the Chore Wars. A game emulating the hugely popular World of Warcraft, however transferred to daily house-keeping activities. It enabled family members to gamify the somehow repulsive experience of cleaning up the house, thus motivating all household members to keep up with their duties. The website still exists nowadays³¹, although the design is outdated in comparison with current standards.

Commercially, in 2007 Bunchball developed Nitro, a software enabling companies to incorporate gaming characteristics into their existing collaboration software (Salesforce, SAP, Jive, NICE, Remedyforce³²). It has grown the spectrum of compatible software platforms since then and remained the leader amongst other gamification providers (Badgeville, Crunchbase).

Building on the rapport spurred up by Bunchball, Chore Wars and the like, the world of gamification was deeply enriched in 2009³³ by the entry of Foursquare, an application enabling people to collect badges and compete with other users of the application/website by “checking”

²⁹ Multi-User Dungeon

³⁰ MALONE, Thomas. *Things Fun to Learn: A Study of Intrinsically Motivating Computer Games*. 1980. Cognitive and Instructional Sciences Series CIS-7 (SSL-80-11). [online]. [quoted 2.6.2016]. <<http://cci.mit.edu/malone/tm%20study%20144.pdf>>.

³¹ Chorewars.com

³² Bunchbal products. Bunchball. [online]. [quoted 2.10. 2016]. <<https://www.bunchball.com/products/nitro>>.

³³ Foursquare History. Foursquare. [online]. [quoted 2.10. 2016]. <<https://foursquare.com/user/history>>.

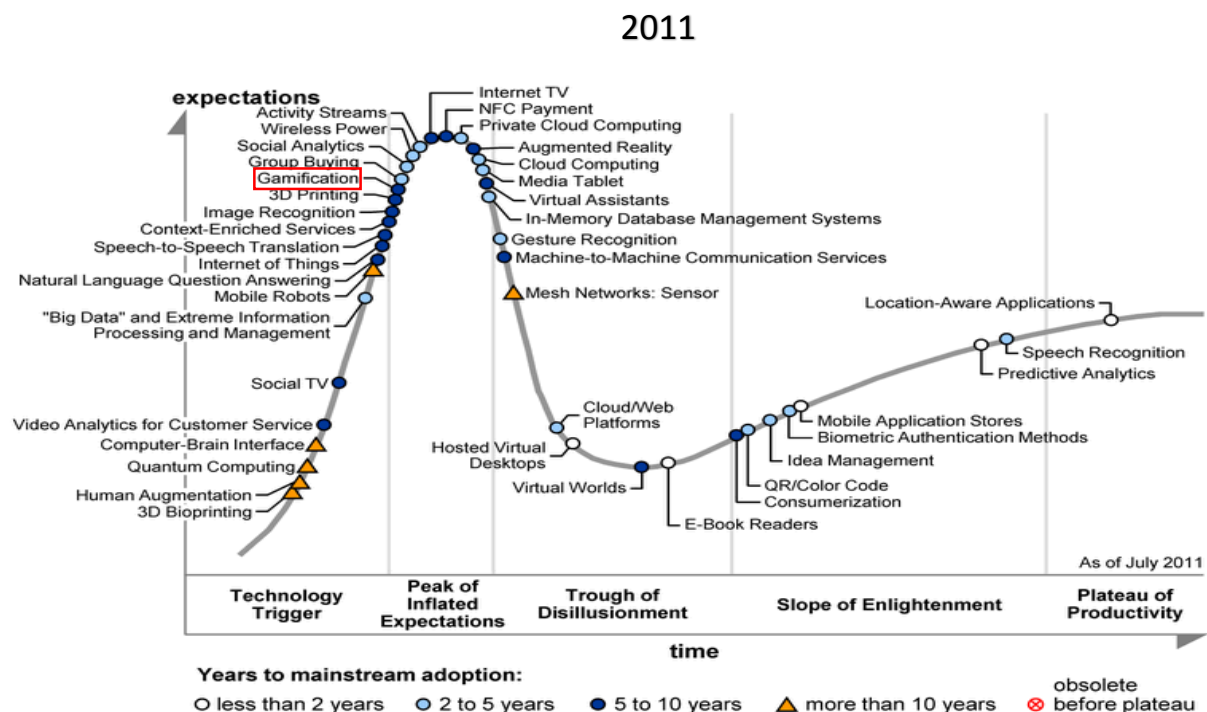
into varying places. Foursquare was an instant success thanks to its social interaction and sense of achievement. Although Foursquare later on scrapped the gamified scheme, its current status can be surely accredited to this approach.

The above mentioned potential wider application of gamification started to spur slowly around 2010 also. The Quest to Learn initiative opened a completely gamified class for 6-graders, for instance³⁴. All these efforts, platforms and initiatives created an incredible hype around gamification, supported by festivals and conventions (e.g. San Francisco 2010), yet the status has changed over the past few years, as the next section will explain.

iii. Gamification today & in the future

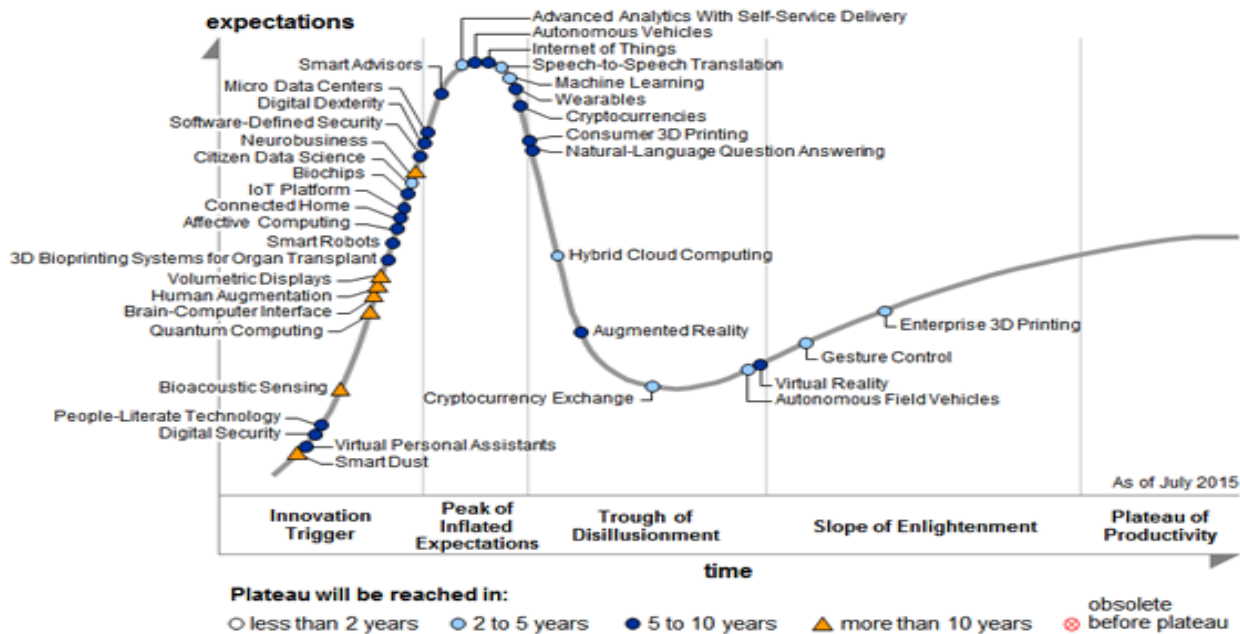
The above lines masterfully demonstrate the tumultuous history revolving around gamification. It is obvious that gamification has been with us for several decades, however it has secured its spotlight only recently. The true establishment within the superstar territory was marked in 2011 when Gartner, a market research consultancy, added the term “Gamification” in its Hype cycle.

Graphic 1; Gartner Hype Cycle 2011 vs. 2015



³⁴ A Brief History of Gamification: Part I – The Origin. Education & Learning 2.0. [online]. Mar-07-2014. [quoted 2.10. 2016]. <<http://edulearning2.blogspot.de/2014/03/a-brief-history-of-gamification-part-i.html>>.

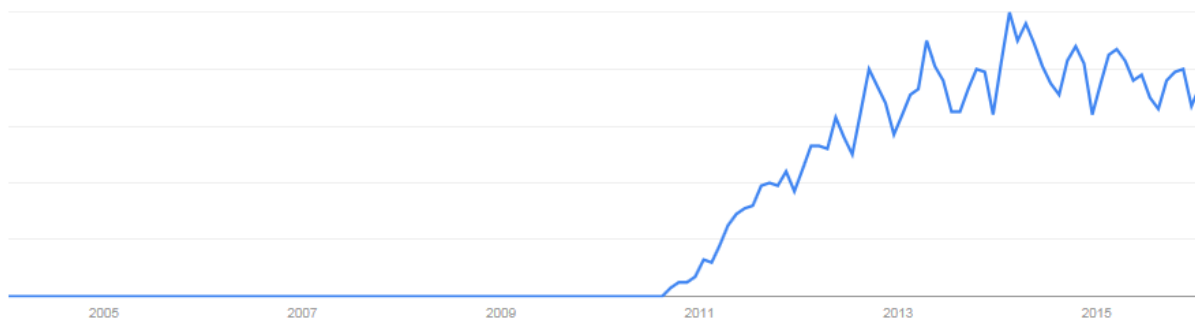
2015



Note. Gartner's Hype Cycle for Emerging Technologies³⁵

If we look at the past year, we unfortunately won't find the term amongst the most prominent ones. This is in line with Google Trends function, demonstrating the frequency of individual searches of a specific term. Here we can observe slight downward trend starting in 2014.

Graph 3; Google Gamification search frequency



Note. Adapted from Google Trends; Gamification

³⁵ Hype Cycle for Emerging Technologies, 2011. Gartner. [online]. 2011. [quoted 2.5.2016]. <<http://www.gartner.com/newsroom/id/1763814>>.
Hype Cycle for Emerging Technologies, 2015. Gartner. [online]. 2015. [quoted 2.5.2016]. <<http://www.gartner.com/newsroom/id/3114217>>.

Furthermore, it is also interesting to examine the regional dispersion of searches. Rationally, since gamification is deeply enshrined in information technology, the most prominent technology hubs would be leading the polls.

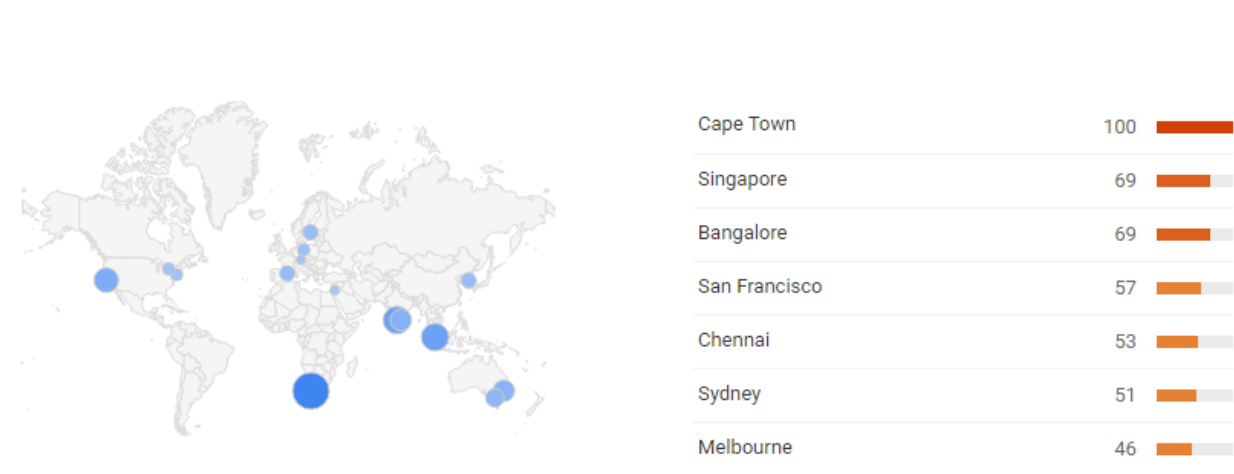
It is partly so, however what can be deduced is that gamification is searched the most in rich economies with young populations with innovative characters. Hence the leaders Singapore and South Africa. The city division supports the notion that gamification will be associated with tech-hubs, therefore Bangalore, San Francisco, Sydney or Chennai figure amongst the leaders in this poll.

Graph 4; Google Gamification geographical search frequency



Note. Adapted from Google Trends; Gamification

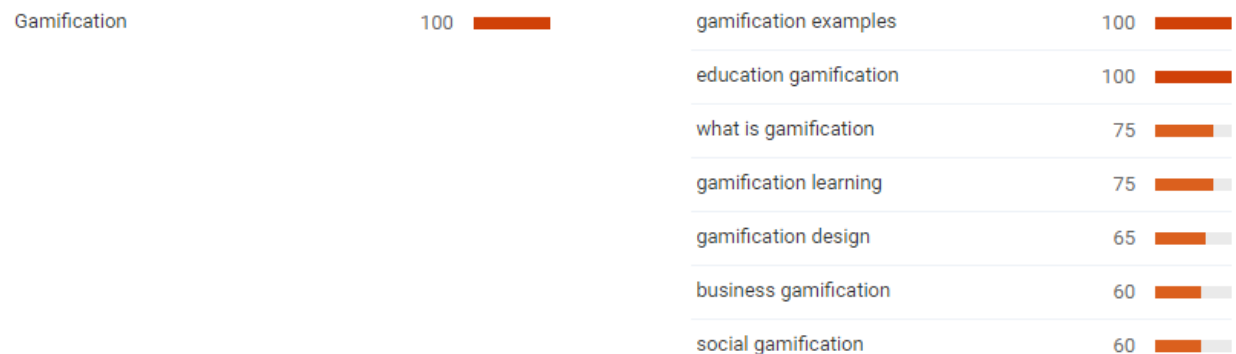
Graph 5; Google Gamification city search frequency



Note. Adapted from Google Trends; Gamification

For the purposes of this paper would be the most beneficial if the most frequently global searched terms included items as “gamification management,” “business gamification,” “team gamification,” or “workplace gamification.”

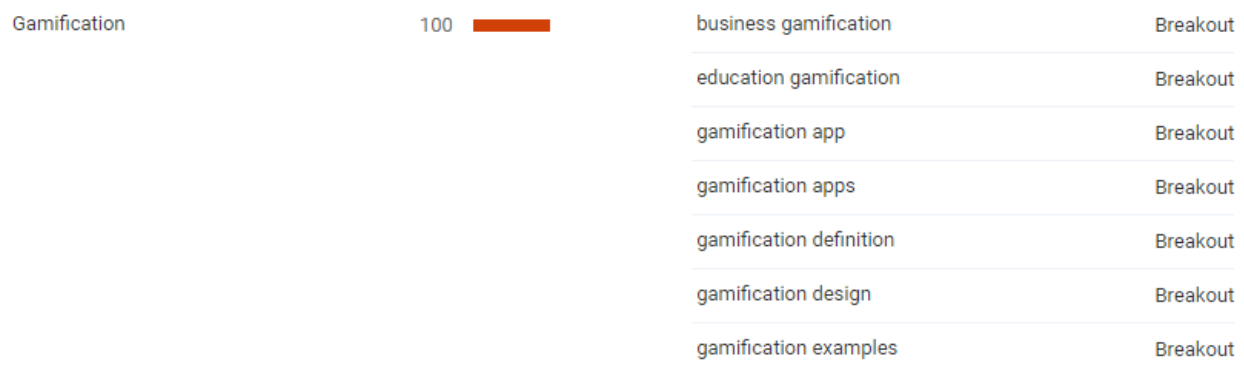
Graph 6; Google Gamification most frequently searched terms



Note. Adapted from Google Trends; Gamification

The results nevertheless demonstrate that the most frequently searched gamification-related terms delve within the education territory. On the positive side, this might allude that the business/team gamification is still an untapped territory, hence posing as a potential competitive advantage. Which is supported by the top rising searches which include these terms.

Graph 7; Google Gamification most frequently searched terms breakout table³⁶



Note. Adapted from Google Trends; Gamification

³⁶ Google Trends; Gamification. Google. [online]. [quoted 1.15.2016]. <<http://www.google.com/trends/explore#q=gamification>>.

The future of gamification hence depends on the quality and success of gamification applications³⁷ as well as its wider acceptance which shall be supported by the already mentioned quality (circulus vitiosus).

2. The need for gamification

i. Changing workforce

The current and up-and-coming workforce is rapidly changing the way how big corporates conduct their business. The generation from 1980's onwards (see below) is bringing with them many habits from smartphones, tablets and PCs, gadgets they were using in their childhood. Furthermore, the current workforce is suffering from "Chinese corporate illness," i.e. workers' disenchantment with corporate culture. According to McKinsey Global Institute, "only 15% of employees have a high emotional connection to their company, 61% a weak and 24% none at all. Furthermore, 70% of business transformation efforts fail due to lack of engagement³⁸. "If workers do not feel any relationships towards the company they are vying for, it might lead to lower productivity levels since (according to the results published in the Journal of Labour Economics³⁹) happier people are about 12% more productive.

ii. Immunity towards convenient motivational methods

Due to inventions, knowledge or entertainment that we can cherish nowadays, we (generation Y) are suffering from short attention span, impatience and neediness with regards to appraisal and recognition. We have got used to traditional stick-carrot approaches and we need to be challenged

³⁷ Gartner predicts that 80% of gamification applications are expected to fail due to poor design.

Gartner Says by 2014, 80 Percent of Current Gamified Applications Will Fail to Meet Business Objectives Primarily Due to Poor Design. Gartner. [online]. Nov-27-2012. [quoted 1.15.2016]. <<http://www.gartner.com/newsroom/id/2251015>>.

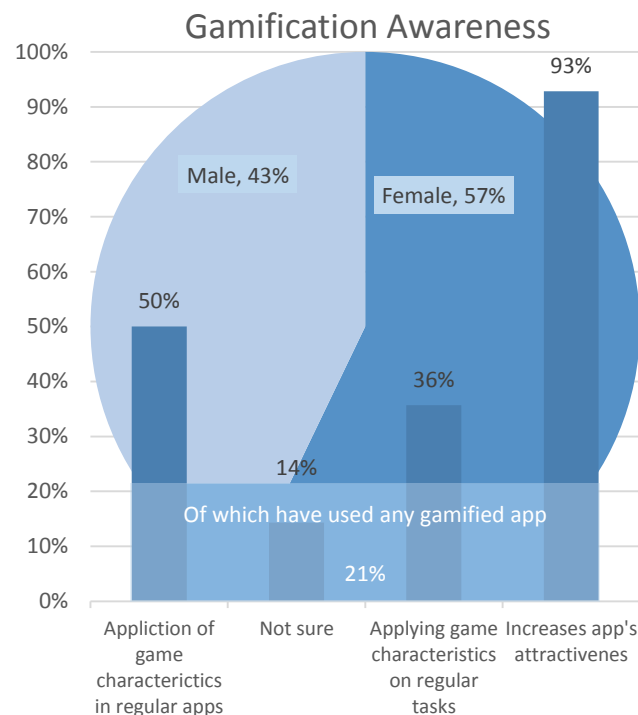
³⁸ Gartner Reveals Top Predictions for IT Organizations and Users for 2013 and Beyond. Gartner. [online]. Oct-24-2012. [quoted 1.15.2016]. <<http://www.gartner.com/newsroom/id/2211115>>.

³⁹ The results are based on four different experiments that employed a variety of tactics on a total of 713 subjects at The University of Warwick.

OSWALD, Andrew J.; PROTO, Eugenio; SGROI, Daniel. Happiness and Productivity. University of Warwick, UK, and IZA Bonn, Germany. [online]. Feb-10-2014. [quoted 1.25.2016]. <<http://www2.warwick.ac.uk/fac/soc/economics/staff/academic/proto/workingpapers/happinessproductivity.pdf>>.

much more thoroughly. We thus render managers' job incredibly difficult. In this regard, new methods have to be adopted by the current and upcoming leaders in order to extract the full potential of the generation Y. Gamification is the optimal solution since it is much harder to see through, i.e. people shall follow the rules blindly as well as it is still not that well known, as the below graph based on a survey amongst 1500 samples of the generation Y demonstrates.

Graph 8; Gamification Awareness



Note. Based on own survey amongst current and past CEMS Student Board members.

The graph demonstrates that a mere 21% of respondents have experienced using a gamified app. Furthermore, respondents were asked to describe what gamification stands for. On this front, the results were rather positive since 50% answered that it stands for the application of gaming characteristics on regular apps. Additional 36% described gamification as the process of applying gaming characteristics on regular tasks, i.e. not information technology application. Generally, 93% agreed on the fact that gamification increases an app's attractiveness, which opens a window of opportunity for the purposes of this paper.

3. Gamification Analysis

i. Key aspects of gamification; scientific analysis

There are multiple areas that must be considered whilst assessing the gamification impact from a scientific point of view.

Firstly, Psychology; the most important element is Behaviorism, formed by concepts around external stimulation/extrinsic motivation (rewards/punishments). The theories representing this approach include;

- Classical conditioning - Pavlov's dogs
- Operant conditioning - Skinner's box
- Fixed vs. variable reward schedules⁴⁰

Secondly, from the Neuroscience' perspective comes the explanation for cerebral processes occurring in one's brain. Concretely, the chemical substance playing the lead role is Dopamine. It is the pleasure-inducing chemical stimulant that is produced when something pleasurable happens to us. What is crucial for gamification is that Dopamine can be produced also via Classical conditioning, i.e. we do not necessarily need to attain a certain pleasure-sustaining goal/object, yet a mere arousal of such object is what will lead to Dopamine production. This is especially powerful with regards to conducting an activity merely for the sake of a vision of receiving these Dopamines.

Thirdly, Motivation Science forms a contre-point towards Behaviourism with its focus on intrinsic motivation as the primary element of an individual's activities.

- Daniel Pink's *Drive* explain's why some individuals with comparable abilities and background perform better than their peers⁴¹
- Csikszentmihalyi's *Flow* and Kohn's "crowding out" effect⁴²

⁴⁰ Conditioning and Learning. Fullerton. [online]. [quoted 2.8.2016].
<<http://psych.fullerton.edu/rlippa/psych101/outline2.htm>>.

⁴¹ "'Drive' Not Always Explained By Rewards". CONAN, Neal. *Talk of the Nation*. NPR. Jan-04-2010. [online]. [quoted 1.20.2016]. Transcript. < <http://www.npr.org/templates/story/story.php?storyId=122221202>>.

⁴² OSTERLOH, Margit; FREY, Bruno S.. Motivation, Knowledge Transfer, and Organizational Forms. *Organization Science*, Vol. 11, No. 5. (Sep. - Oct., 2000), pp. 538-550. Jstor. [online]. [quoted 1.19.2016]. < https://www.uzh.ch/iou/orga/ssl-dir/wiki/.../Osterloh_Frey_2000.pdf >. Page 539.

Lastly, from the empirical standpoint (Sociological as well as Psychological), individuals have a tendency towards conducting a certain activity simply because they are used to it or someone they consider successful or worth copying is demonstrating given set of behaviour. This is when the Habit Science comes into place.

- Duhigg' Power of Habit⁴³
- Patteron's Influence⁴⁴

ii. Key aspects of gamification; empirical analysis I; gamification shared attributes

There are multiple features that make gamification addictive. Some of the most influential ones include the pursuit of achievement by individuals. It is represented by the possibility to attain awards (badges, prizes, virtual money) as well as to obtain a certain virtual social status.

Another important element is transparent virtual career path which can be measured by a clear metric. This permits the individuals to be aware of how much effort needs to be exerted in order to be successful.

Such transparency on the other hand supports strong competition amongst the participating individuals. The competitive spirit needs to be institutionalised via Rankings permitting the participating individuals to track their and the progress of their competitors.

Such a connection establishes a social aspect that is further strengthened by the use of personalised avatars who can be dressed and personalized by individual users.

All these features create a sense of virtual reality that captures players and does not allow the players to part with the gaming environment through reminders, unexpected bonuses, rewards for daily participation amongst other features.

The most frequent key gamification aspects are summarised in the table below.

⁴³ DUHIGG, Charles. The Power of Habit: Why We Do What We Do in Life and Business. Random House. ISBN: 978-1400069286 . [online]. Feb-01-2012. [quoted 1.20.2016]. <https://www.goodreads.com/reader/20807-the-power-of-habit?return_to=%2Fbook%2Fshow%2F12609433-the-power-of-habit>. Pages 275-286.

⁴⁴ GRENNY, Joseph; PATTERSON, Kerry; MAXFIELD, David; MACMILLAN, Ron; SWITZLET, Al. Influencer: The New Science of Leading Change, Second Edition. McGraw-Hill. ISBN: 0071808868. [online]. 2013. [quoted 1.20.2016]. <<http://www.amazon.com/exec/obidos/ASIN/B00BPO7710/thbosh-20/>>.

Table 13; Gamification elements basics

	Meaning	Empowerment	Social Influence	Unpredictability	Avoidance	Scarcity	Ownership	Achievement
Gamification Characteristics	Narrative	Milestone unlock	Group quest	Easter Eggs	Progress lost	Countdown	Avatar	Points
	Elitism	Chain combos	Gifting	Visual storytelling	Fear of Missing Out	Prize pacing	Virtual goods	Badges
	Humanity hero	Instant feedback	Friending	Oracle Effect	Expiry date	Fixed intervals	Mentoring	High-Five
	Higher meaning	Boosters	Bragging	Mini Quests	Game of chance	Barriers	Recruitment	Badges (Achievement Symbols)
	Beginners luck	Choice perception	Mentorship	Mischief		Elitism	Protection	Level-Up
	Destiny's child	Group quest	Thank You Economy			Impatience	Build from scratch	Boss Fight
	Co-creator	Gifting					Learning Curve	Leaderboard
		Friending					Monitoring	Fixed-action results

Note. Adapted from Yu-Kai Chow's Complete Gamification Analysis⁴⁵

⁴⁵ CHOU, Yu-Kai. Octalysis: Complete Gamification Framework. Yukaichou. [online]. [quoted 2.20.2016].<http://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/#.VsCO_fkrKCg>.

iii. Key aspects of gamification; empirical analysis II

In the above lines, we have stipulated that the increasing disenchantment of workers with the corporate culture poses a potential risk to individual businesses. Nevertheless, the corporate culture would not be of any issue if a worker's daily bread shared the characteristics of a game. Managers need to fathom a simple task allocation. The major differentiation with regards to the design of a regular task allocation and a task allocated via gamification means is that the gamified approach is designed already with a human mindset defining them as the end users. On the other hand, regular applications or tasks are designed upon function-based design that follows more computational behaviour.

Table 14; Game-Work comparison

	Game	Work
Tasks	repetitive, but fun	repetitive and dull
Feedback	constantly	once a year
Goals	clear	contradictory, vague
Path to mastery	clear	unclear
Rules	clear, transparent	unclear, in-transparent
Information	right amount at the right time	too much and not enough
Failure	expected, spectacular	forbidden, punished
Status of users	transparent, timely	hidden
Promotion	meritocracy	kiss-up-o-cracy
Collaboration	yes	yes
Speed/risk	high	low
Autonomy	high	mid to low
Narrative	yes	only if you are lucky
Obstacles	on purpose	accidental

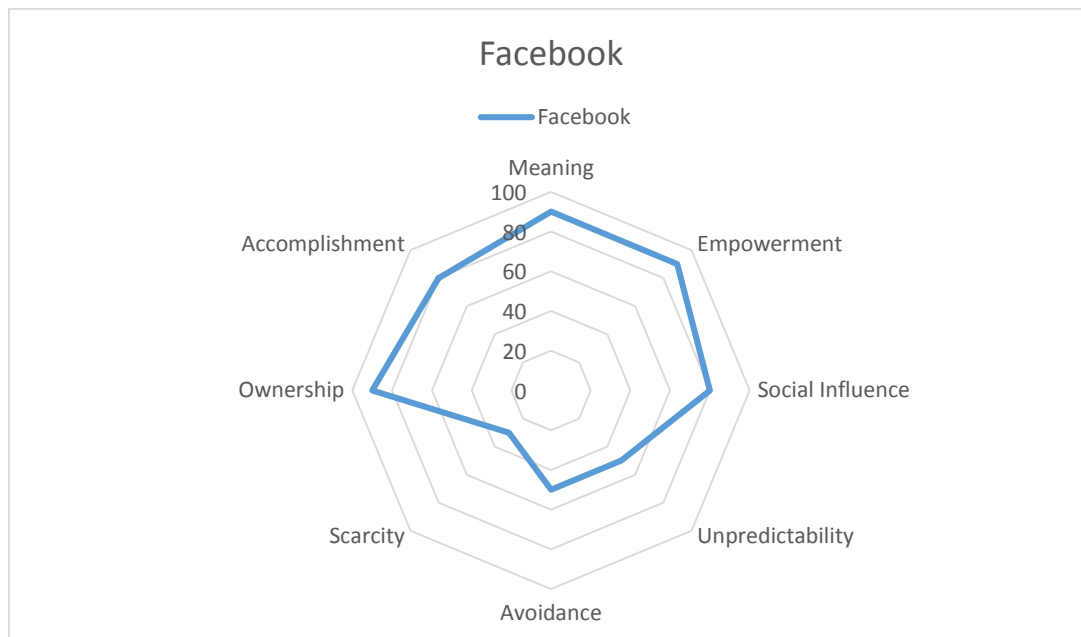
Note. Adapted from Mario Herger's Enterprise Gamification⁴⁶

⁴⁶ HERGER, Mario. Enterprise Gamification: Engaging people by letting them have fun. IEEE USA. [online]. [quoted 2.21.2016]. <http://www.ieeeusa.org/careers/webinars/2013/files/Enterprise_Gamification_1-page.pdf>. Page 5.

iv. Key aspects of gamification; empirical analysis III; global platforms scrutinised

Let's examine if some of the most successful global platforms share some of the above mentioned gamification aspects. Facebook pertains in the top half of the radar chart. This alludes to an elevated social interaction for participants. On the other hand, it reduces the unknown. Similar attributes can be associated also with the World of Warcraft which functions too as a social network, yet with a direct game target.

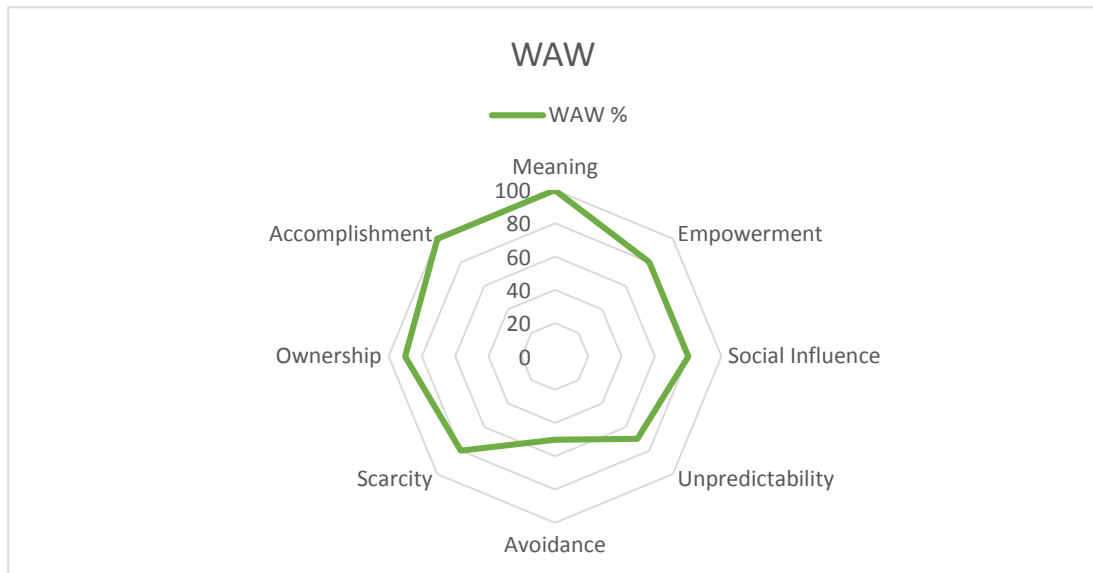
Graph 9; Facebook gamification analysis



Note. Adapted from Yu-Kai Chow's Octalysis

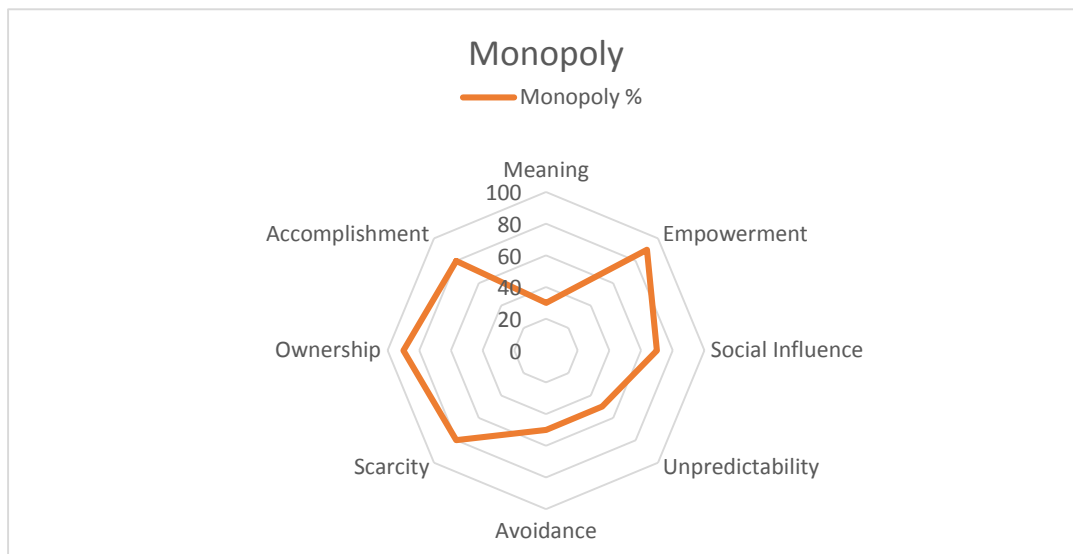
On the other hand, professionally-associated platforms (Linkedin or Monopoly) are having a shared "U" shape of the Radar chart.

Graph 9; WAW gamification analysis⁴⁷



Note. Adapted from Yu-Kai Chow's Octalysis

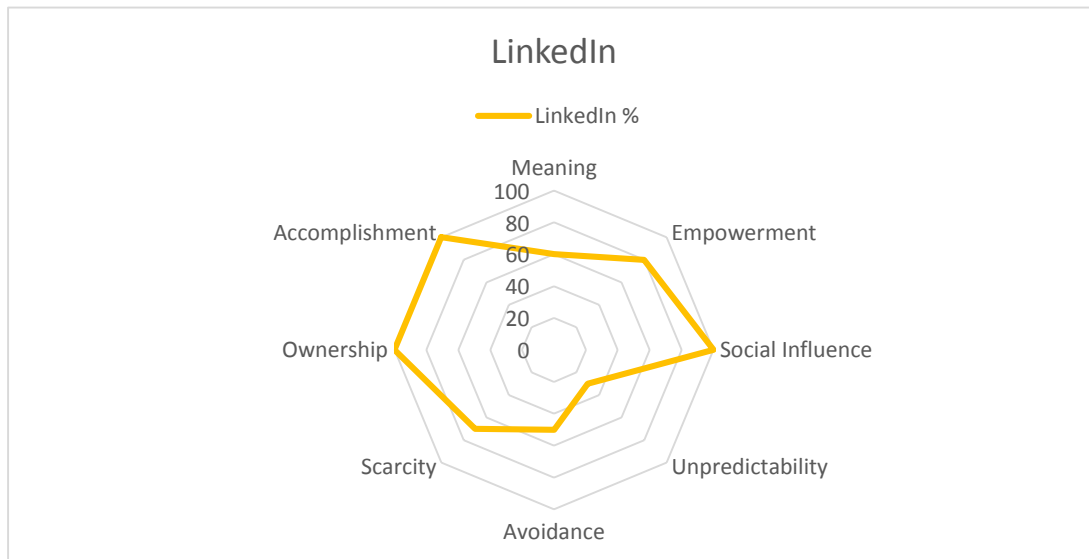
Graph 10; Monopoly gamification analysis



Note. Adapted from Yu-Kai Chow's Octalysis

⁴⁷ CHOU, Yu-Kai. Octalysis: Complete Gamification Framework. Yukaichou. [online]. [quoted 2.20.2016].<http://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/#.VsCO_fkrKCg>.

Graph 11; LinkedIn gamification analysis



Note. Adapted from Yu-Kai Chow's Octalysis

v. Key aspects of gamification; empirical analysis IV; gamification in practice/examples

We have examined key gamification aspects from the scientific perspective, as well as from the empirical perspective. We have also defined differences between regular task allocation in contrast with allocation via gamification means. Let's recoup these insights to understand several successful cases of gamification application. Applying this approach to the wide-gamification scope would however prove to be rather misleading and voluminous, hence the scope will be divided into several subsections, each containing examples of such real world application. The subsections include Pure Gamification, Game-like, Serious Games, Simulators, Behavioural Mechanics and Pre-Gamification.

Pure gamification

Global business players have long before realized the attractiveness of gamification. Successful examples include cross-industry experience ranging from sports to public services. One of the early global adopters of gamification as part of their product portfolio was Nike with the Nike+ activity measuring app that focused on improving one's physical health by tracking their movement during the

exercise phase via a chip in Nike shoes.

Later on, with the deployment of smartphones, this technology translated into an app allowing the users to compete with one another on social sites.



Note. Nike Plus tracking system⁴⁸

Game-like



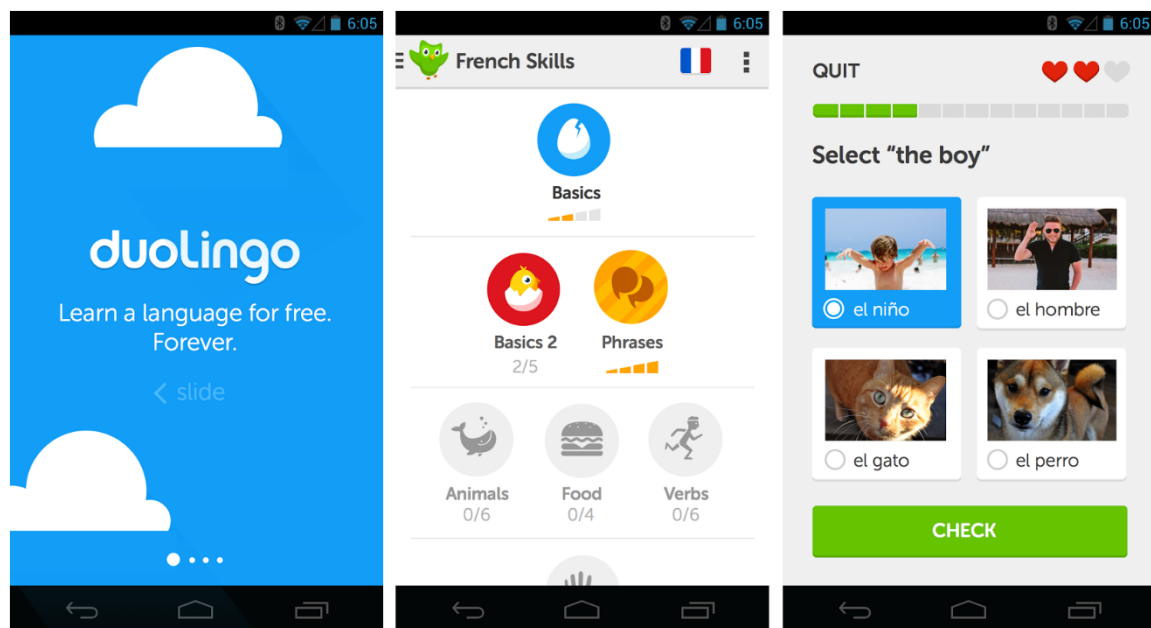
Note. Zombie Run tracking system⁴⁹

Another example involves a similar physical activity tracking app that was designed to bear gaming characteristics from the very beginning. It is a worldwide phenomenon released in 2012; Zombies Run. It is an application translating individual into a virtual environment (via an avatar) where they have to run a given number of kilometres per day in order to save

⁴⁸ Nike Plus track your daily runs. Viewed 1.23.2016. <<https://futurevision.rga.com/wp-content/uploads/2011/06/nike-plus-track-your-daily-runs.jpeg>>.

themselves and the others from Zombie attacks. Users are challenged daily via secret missions aiming to increase their activity.

Following example shares similar characteristics as the previous two examples, however targets mental training. It is an app focusing on language training, Duolingo. It combines gaming characteristics of stamina, life (number of faults that can be committed), missions, accomplishments, awards, meaning and a pre-set goal. To a certain extent, it could be perceived as Tamagochi merged with Language training, since the utter aim is to grow a healthy owl.



Note. Duolingo language learning app⁵⁰

⁴⁹ *Zombies, Run!*. Viewed 1.23.2016. <http://media.tumblr.com/tumblr_mbffet97v01rvclu2.jpg>.

⁵⁰ *Duolingo screenshots*. Viewed 1.23.2016. <http://blog.teamtreehouse.com/wp-content/uploads/2014/07/duolingo_screenshots.png>.

Serious games

The following group has practical education as its primary goal. The aim is to develop a safe testing environment for its users to develop and test a certain set of skills. Examples include Cold Stone Creamery Scoop it Up. A game focusing on giving the exact same portion to all customers in order to reduce wastage and cost. The added benefit of this game is that it went on sale to global appstores, thus turning itself into an additional revenue stream for Cold Stone Creamery.



Note. Cold Stone Creamery learning app⁵¹

Simulation games



Note. Full Spectrum Warrior⁵²

Games from this group include training simulators for soldiers aimed at establishing behavioural patterns in stable environment before being deployed to battle. The aim is to create such an environment that will be as close to reality as possible. An example is Counter Strike or Full Spectrum Warrior. Many of the games belonging to this group are however not for public since they are developed exclusively for the end customer, e.g. pilots, soldiers, doctors.

⁵¹ Cold Stone Scoop it Up screenshot. Viewed 1.23.2016.
<http://img.gamefaqs.net/screens/d/c/6/gfs_142406_2_6.jpg>.

Behavioural mechanics

Furthermore, gamification does not necessarily need to be virtual-based. Many gamification examples involve real-life tangible experience. For instance, researchers in Stockholm planted tactile planks on regular stairs next to escalators in order to increase the number of people walking



up the stairs. The number of people using actual stairs rose by 66% in comparison with regular staircase usage.

*Note. Piano staircase in Sweden*⁵³

Similar examples include a scratching mat in the shape of DJ's vinyl at the entrance of a shop connected to speakers, trash can with a sound effect which resembles a very deep throw, or a bottle/can recycling machine in the form of lottery that awards free drinks to randomly selected recyclers. In 2011, VW organised a competition in Sweden named "The Fun Theory"⁵⁴ which was aimed at finding the best gamification real-life example. The 1st place went to a concept of urban speed-camera which was resembling Las-Vegas-like neon lights and was showing a simple



*Note. Speed driving lottery*⁵⁵

⁵² pc-51402-61384173468. Viewed 1.23.2016. <<http://www.theisozone.com/images/screens/pc-51402-61384173468.jpg>>.

⁵³ Piano staircase in Sweden. Viewed 1.24.2016. <<https://s-media-cache-ak0.pinimg.com/736x/d4/36/f1/d436f12435f065703fd8c5dba97cd60f.jpg>>

⁵⁴ Fun Theory. Volkswagen. [online]. [quoted 1.24.2016]. <<https://funtheory.com>>.

“Thumbs-up” or “Thumbs-down” if you complied with the speed-limit or if you surpassed it. However, the really interesting part is that drivers who are driving according to the speed limit enter into lottery which is being paid from the fines paid by those driving over the speed limit.



One of the most well-known examples of gamification from the sustainable perspective remains to be the eco-system on Toyota Prius or Ford Fusion amongst others. The system awards users by enabling a virtual plant to grow and blossom if they do drive carefully, i.e. with a light foot.

Note. Energy saving driving mode.⁵⁶

Future applications

Were all the above-discussed issues solved and overcome, gamification has an unlimited potential to improve our experience and learning process in all aspects of our lives. Be it simple training processes at work, transportation or even the process of learning a new password. Further application include healthcare, construction or cooking.

4. Gamification approach applied

How to manage change: in order to truly implement gamification, a sought after behavioral change needs to exist. For this, change management knowledge is deeply needed.

i. Changing behavior

Enterprises or teams wishing to alter individuals' behavior shall initiate their efforts by assessing the current behavioral patterns and the reasons for them in order to truly fathom the deepest parts

⁵⁵ *Swedish camera pays drivers to slow down.* Viewed 1.24.2016. <<http://www.wired.com/2010/12/swedish-speed-camera-pays-drivers-to-slow-down/>>.

⁵⁶ *Autopia Ford Fusion Hypermile III.* Viewed 1.25.2016.

<http://www.wired.com/images_blogs/autopia/2009/04/autopia-ford-fusion-hypermile-iii.jpg>.

of behavioral patterns. These actions shall then propel managers to develop truly effective gamification platforms tackling precisely behavioral changes.

In order to achieve the uttermost success, managers wishing to implement a certain change process shall target difficult issues to gain a sufficient interest from the individuals. Such campaigns should be targeting younger, more tech-savvy audience that was brought up on modern game systems⁵⁷.

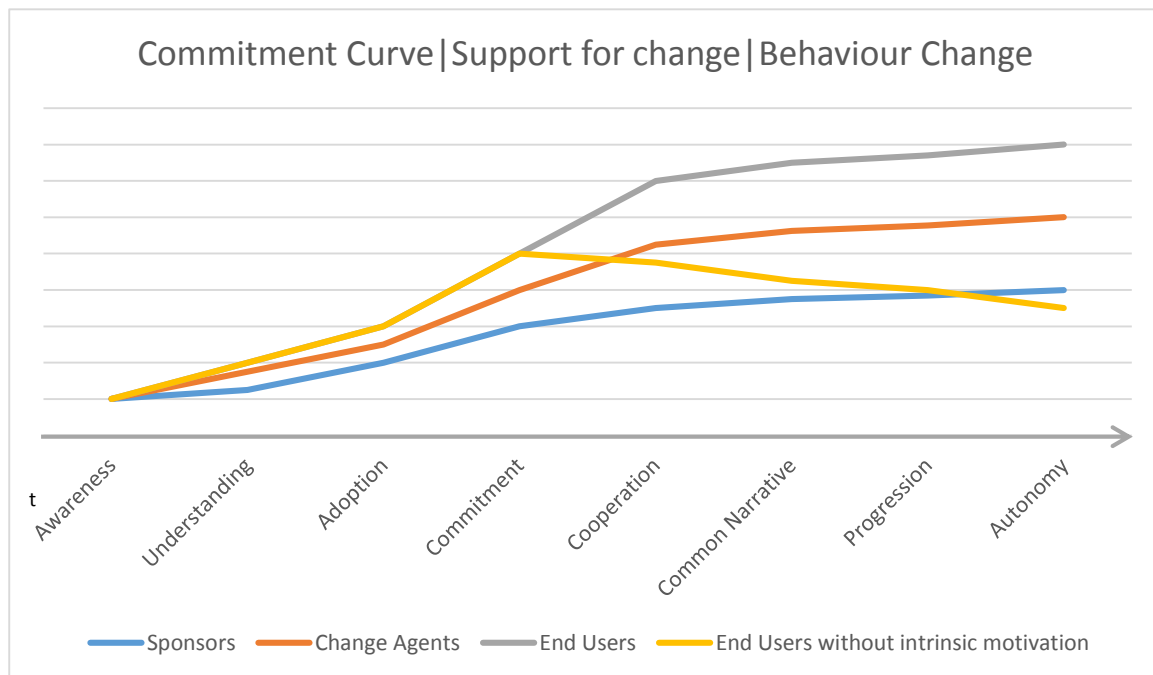
The Generation Y is the representative body that these campaigns shall be targeting. The specifics of the Generation Y are that it grew up already with Smartphones and other handheld electronic devices, hence was exposed to the gamified environments from the early age. These persons have a very delicate attention span that can be very weary. Furthermore, they loathe for constant stimulation and personal recognition. Given that the period when a substantial portion of global workforce will be formed by these employees (born between 1980 and 2000) is approaching rapidly, important measures have to be adopted.

a. Change management process

An undesired behavioural pattern is of the uttermost necessity for a successful change management implementation. However, in order to implement such scheme, change management practice needs to be present with the responsible project manager.

⁵⁷ A miraculous setting with respect to the optimal target audience are Asian countries where the proliferation of gaming (frequent players) in the culture is reaching more than 60% of the population. Furthermore, the Asian gaming market is expected to double in the next 3 years.

Graph 12; Commitment curve, support for change, behaviour change curve



Note. Adapted from “The Eight Stages of Building Commitment”⁵⁸

The initial and the end stage are the most important for project success. The initial phase is crucial because it is key to gain awareness within the whole enterprise. It is aimed at large audiences across the many departments or countries. The following stages gradually decrease the size of the target audience in exchange for strengthened and intensified approach towards end audience.

The whole cycle is ending with the final stage which is important for the conversion process of extrinsic behavior patterns into intrinsic behavior patterns.

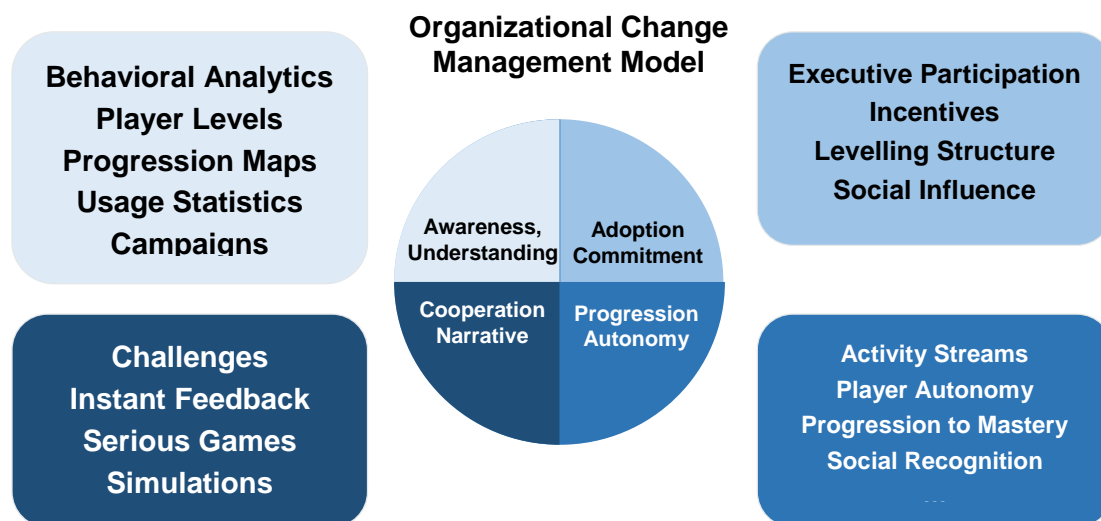
Throughout the implementation, the target audience undergoes several stages of support for change; Awareness, Understanding, Adoption, Commitment, Cooperation, Common Narrative, Progression and Autonomy.

Let’s examine what occurs in each of these stages. In the Awareness stage, the campaign describing the change being implemented is launched company-wide in order to attract as much

⁵⁸ CONNER, Daryl. The Eight Stages of Building Commitment. Connerpartner.com. [online]. Mar-24-2012. [quoted 1.27.2016]. <<http://www.connerpartners.com/blog-posts-containing-downloadable-tools/the-eight-stages-of-building-commitment>>

attention as possible. Understanding is based on behavioral analytics, progression maps, usage statistics and ongoing campaign explaining in depth the peculiarities of a specific change. Adoption is the primary version when some members of the target group begin to fully understand the need for change and the process of attaining it. The Adoption is achieved through challenges, feedback, simulations or instant feedback. Commitment comes after the leadership begins to openly participate in a certain scheme that creates a certain Common Narrative and cult that people can relate to. Cooperation follows suit with organic cooperation growth following afterwards. Progression and Autonomy are associated with the ownership of a specific project that people grow to have after going through all the stages. From this perspective, social recognition is amongst the strongest influential factors.

Graphic 2; Organization Change Management Model



Note. Adapted from Werisk's Change Management⁵⁹

ii. Gamification research; Implementation Process

Such a change management process was applied within the CEMS Student Board. The project was focusing on a thorough implementation of an internal social collaboration and project management

⁵⁹ Change management. Werisk. [online]. Mar-24-2012. [quoted 1.27.2016]. <<http://www.werisk.it/en/change-management/>>

site, Podio⁶⁰. The tasks emulated the 8-level scale of gamification aspects, starting with meaning, empowerment, social influence, unpredictability, avoidance, scarcity, ownership and accomplishment.

Table 15; Gamification of Podio re-introduction to Student Board

Gamification aspect	Podio to SB implementation
<i>Meaning</i>	Importance to the SB. Stressing the benefits of positive impact on future generations thanks to knowledge transfer. Introducing the scheme as a pure game.
<i>Empowerment</i>	Users were independent and could make an impact by sharing, contributing, changing the face of Podio.
<i>Social Influence</i>	Social site, the ability to observe others' actions and to compete with the peers as well as to make an impact on the others.
<i>Unpredictability</i>	Each week was different, participants did not know what to expect, as well as others were welcome to join in throughout the whole scheme.
<i>Avoidance</i>	Since the participants did not know what will be the next challenge and these challenges were announced exclusively on Podio, it was creating a sense of fear of missing out. Furthermore, the challenges had a limited time-frame that was creating the feeling of an expiry date.

⁶⁰ Podio description: Podio supplies a web-based platform for organizing team communication, business processes, data and content in project management workspaces. Users can also select business "apps" from an online app store or build their own according to project needs.

TAKAHASHI, Dean. Podio launches a work app builder and business store. VentureBeat. [online]. Mar-24-2012. [quoted 1.27.2016]. <<http://venturebeat.com/2011/03/24/podio-launches-a-work-app-builder-and-business-app-store/>>.

<i>Scarcity</i>	Scarcity was intensified by the implemented countdown as well as the unique opportunity to become winners.
<i>Ownership</i>	The campaign was oriented at single users as well as on teams, hence ownership was secured.
<i>Accomplishment</i>	At the end, the feeling of contributing to a greater good, being acknowledged for one's tasks by earning a badge (for each task, a participant could earn one task-specific badge) that one could pin to hers/his profile picture and ultimately by winning the main prize (branded hoodie + workshop by McKinsey) were motivating the people sufficiently to participate.

Note. Gamification approach applied on Podio software within Student Board

The project lasted for 8 weeks and was divided into two stages. The first stage lasted the 3 weeks and was focused on the introduction into the scheme as well as the reintroduction to the software (which has been in place for several years already). It was conveying the meaning of the overall scheme to the audience. The communication included emails, posts, interviews with the leadership as well as briefings to managers who were supposed to pass the information onto respective subordinates. Throughout the scheme, the Executive Team was leading by example by fulfilling the tasks and posting/bragging about them on Podio.

The second phase started in the second week and was comprising the actual game with the respective tasks. The tasks were designed in such a way so that they would be captivating from two angles; firstly they should be revealing the full functionality of Podio, secondly they should be informative or helpful from the nature of the information or actions undertaken.

Furthermore, the deadline for each task lasted a week and was propelled by 3 reminders set periodically within the week, i.e. Sunday night; 1st announcement, Wednesday; 1st reminder, Friday; 2nd reminder.

The first task was structured with the aim to lure in as many participants as possible. It was easy, informative and entertaining. This was then mirrored in the participation volume too.

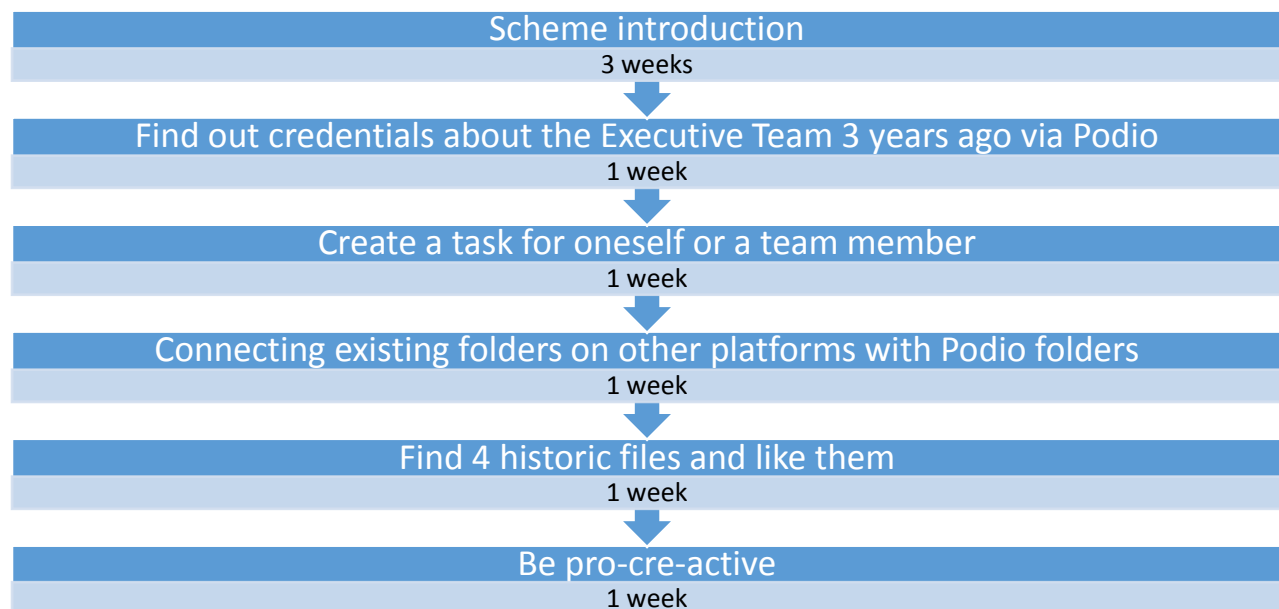
The second task was slightly more difficult, yet much more rewarding. Participants were supposed to create tasks either for themselves or for their team-members and enable notifications so that they could be updated instantly if someone made any progress. They were also asked to link their existing calendars with Podio.

The third task required an individual to link their existing work-related folders with Podio or to upload work-related documents in its final version to Podio also. It served as a precursor for the 4th task.

The fourth task was building on the preceding ones, with the aspect of trying to teach the participants the true power of Podio, knowledge sharing. The players were asked to look-up a specific material from 3 years ago that was highlighting the then strategy and accomplishments.

The final task was left fully to the players since they were asked to be as creative or active, hence cre-active with regards to their actions on Podio in general.

a. Captivating tasks overview

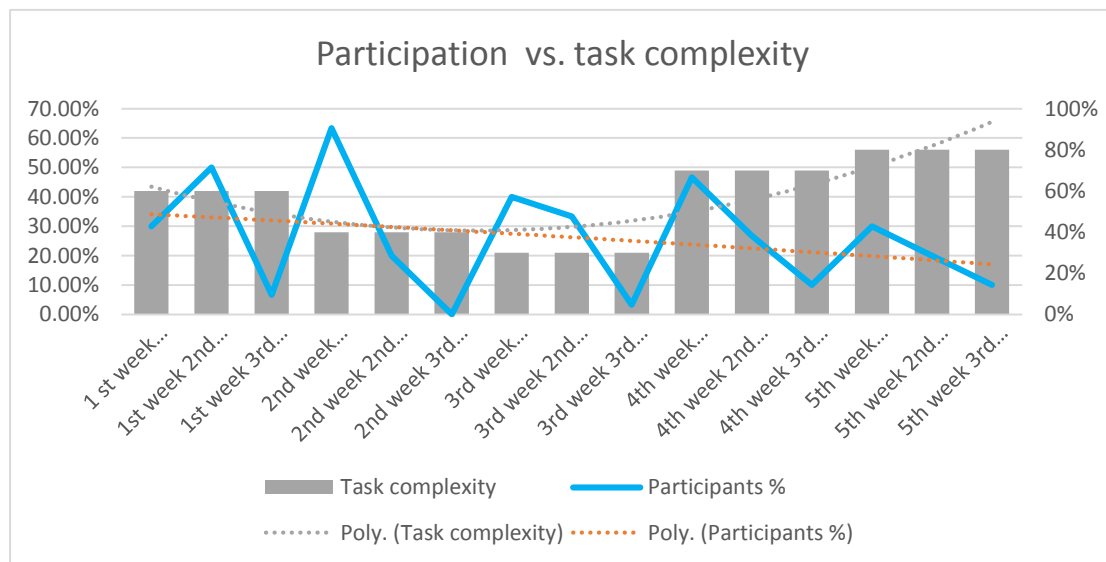


Note. Gamification captivating tasks division

b. Gamification Results Summary

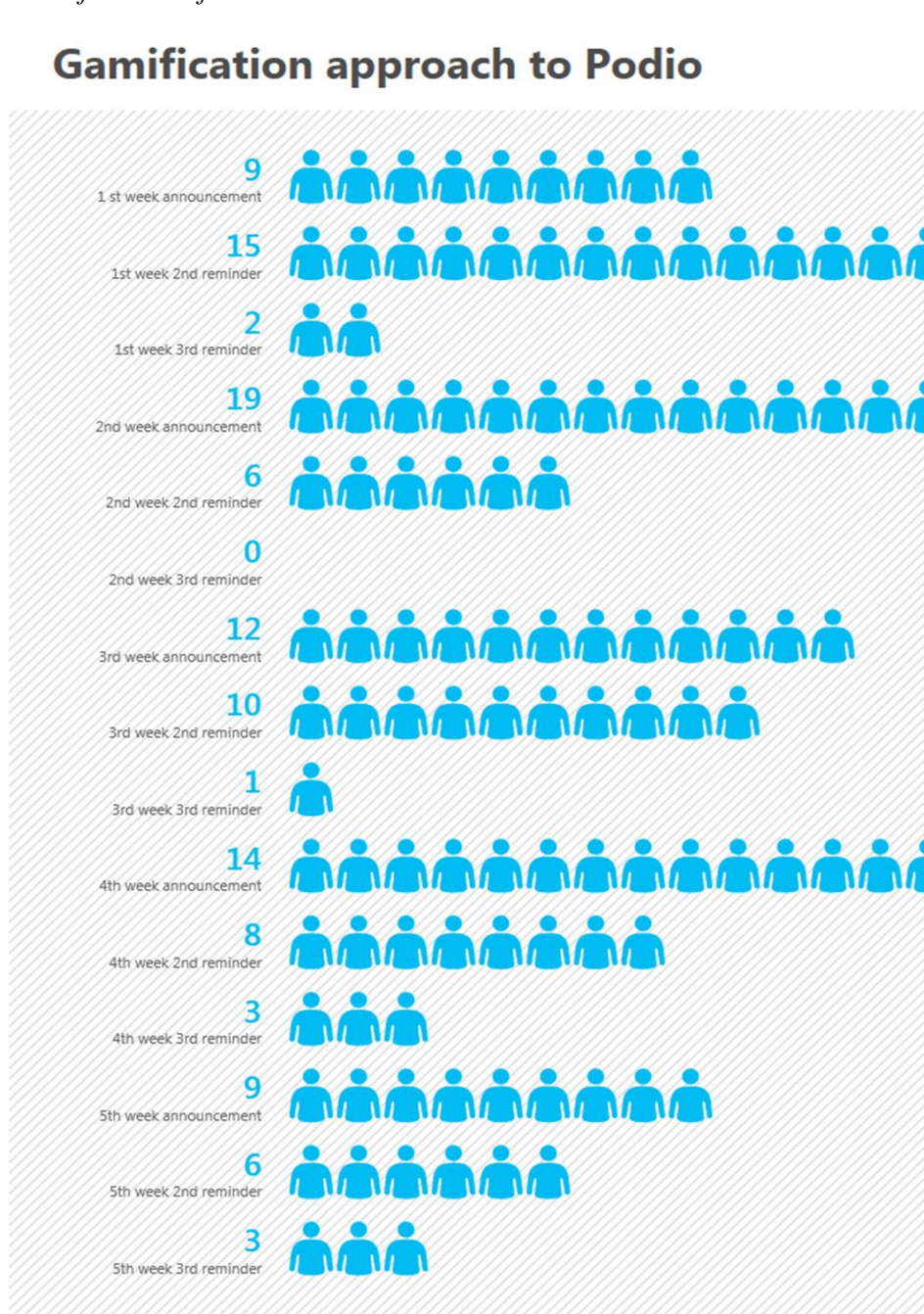
The scheme was implemented On January the 4th 2016 since the period between November till April tends to be rather unproductive due to absence of a meeting. However, the initial introductory phase lasted, as was mentioned above for 3 weeks and was initiated already in December 2015. The first three weeks were supposed to market the scheme to the users as well as to increase awareness about Podio as such. Altogether 3 people were responsible for the execution; Marketing Lead was preparing the communication strategy comprising posts, direct mail as well as materials to Team Leaders. The Knowledge Management Team Lead and another member from the same team were responsible for monitoring the activity on Podio and for assigning scores and respective badges to people who completed a certain challenge. The badge technology was implemented via Citrix (the company owning Podio) upon request from the Knowledge Management Team.

Graph 13; Podio re-introduction to Student Board task efficiency



Note. Based on own survey amongst current CEMS Student Board members.

Graphic 3; Gamification of Podio re-introduction



Note. Based on own survey amongst current CEMS Student Board members.

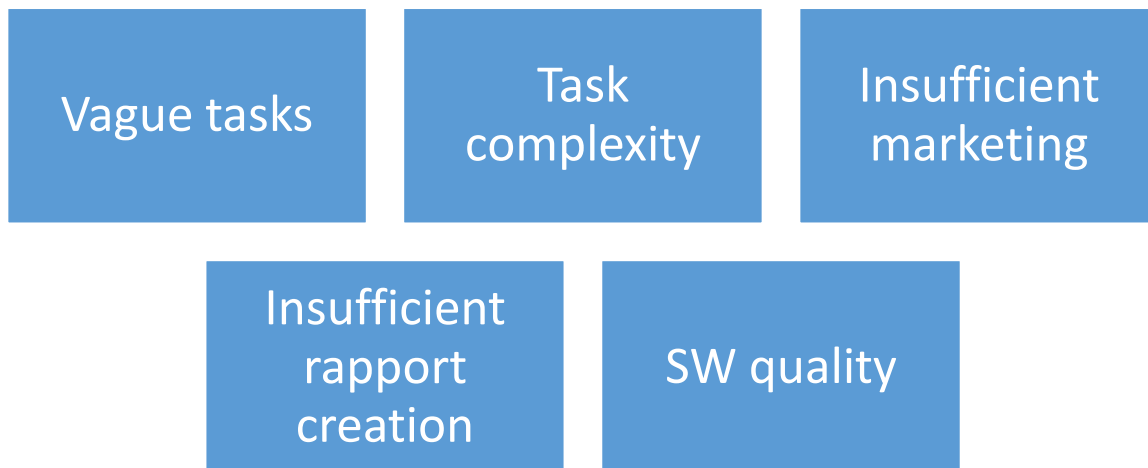
What can be devised from the graph is an inverse relationship between the task complexity/vagueness and the level of participation. In other words, the more specific and more simple the task, the more people participated in the gamification scheme. This alludes to a potential improvement of individual tasks during the next badge of releases.

c. Pros and Cons of the strategy

What needs to be highlighted as the most crucial factor is that the results of the scheme do not mirror long-term benefits. The scheme needs to be an ongoing effort for all new-joiners in order to establish equal knowledge level. Second most important factor is that the gamification scheme will ultimately reveal whether the issue was lying with the people or with the software itself. Such assessment will be viable in approximately 6 months when two badges of new-joiners will have rotated in the Student Board.

The issues that might be worked on throughout the scheme, i.e. during the next releases are seen below. The third crucially important notion is that the tasks embedded in the scheme shall be solving one's problems. Even more, the tasks shall be solving one's problems that the individual is not even aware of.

Graphic 4; Challenging issue of the applied strategy



Note. Based on own survey amongst current CEMS Student Board members.

III. Application

The reason why all the various management approaches, personality analysis metrics and gamification traits were mentioned in the above lines is that the ultimate goal of this paper is to design and assess an application that will streamline managers' decision-making process of team-member allocation. This section is divided into 2 main parts focusing on the analysis of existing personality-assessing tools and the development of the application itself.

1. Existing SW

i. Textual Personality Analysis

a. *LIWC*

In 1993, James Pennebaker developed Linguistic Inquiry and Word Count (LIWC) programme developed to track frequencies of words belonging to the same semantical group, i.e. positive emotions, family, health etc. This enabled in-depth study of semantical patterns in textual objects. Upon examining blogs in the pre-social media era, Gill (2004)⁶¹ concluded that personality is truly projected through language in computer-mediated environment.

The LIWC is however limited to groupings of individual semantical categories, hence Margaret L.Kern et.al. developed an approach that enables the researches to analyse individual words, emoticons and misspellings which consecutively leads to more precise assessment of personality type. It is an open-ended approach that permits the research of specific contextual connections amongst words. Additionally, their approach uses phrases instead of individual words which are automatically identified.

Kern et.al. built on the aforementioned software a 3-way approach towards personality assessment through contextual analysis on social media. The first part is *Feature Extraction*, followed by *Correlational Analysis* and consecutively by *Visualisation*. The 2 most prominent steps for the analysis are *Feature Extraction* and *Correlational Analysis* of the findings. *Visualisation* was added by Kern merely to simplify the

⁶¹ GILL, Kathy E.. How can we measure the influence of the blogosphere?. University of Washington. [online]. [quoted 1.20.2016]. <http://faculty.washington.edu/kegill/pub/gill_blogosphere_www2004.pdf>.

During Feature Extraction, a textual block is divided into separate words or n-grams (composites of n-words e.g. 2-4 words). For instance “die for” is seen as 2 word n-gram instead of 2 separate words. Only the most common n-grams used by at least 1% of the examined respondents during the study by Kern were used.), informative phrases (Happy Birthday, Good Morning) and emoticons (:D, <3, etc.). These are then compared with the 100 most frequent examples representing given personality trait through *Correlational Analysis* in order to establish the given personality trait.

Table 16; General table of expressions used by MBTI

Extraversion		Agreeableness		Conscientiousness		Emotional Stability		Openness to Experience	
High	Low	High	Low	High	Low	High Neuroticism	Low Neuroticism	High	Low
Party	Anime	Grateful	Kill	Work	Pokemon	Depression	Team	Soul	Wat
Girls	Computer	Family	Punch	Success	Youtube	Lonely	Game	Dreams	Ur
Can't Wait	Manga	Well-being	Knife	Busy	Chill-out	Kill	Success	Universe	2Day
Excited	Pokemon	Friends	Drunk	Success	FTW	Swear-words	Blessed	Music	Misspellings
Chilling	Emoticons (><)	Wonderful	I hate	Awesome	Emoticons	Scared	Beach	Writing	Emoticons
Blast	Reading	Lakers	Racist	Blessed	Bored	Headache	Sports	Zombie	Game
Excited	Japanese	Basketball	Idiots	Pray	Dead	Stupid	Praise	Universe	Acronyms

Note. Partially based on Cppblogcentral⁶²

⁶² RAINS, Catherine. Words or phrases that best describe each MBTI type. [online]. [quoted 1.20.2016]. <<http://www.cppblogcentral.com/education-blog/blog-directory-words-or-phrases-that-best-describe-each-mbti-type-2/>>

b. IBM LIWC

IBM applied a slightly different approach towards the LIWC-based assessment⁶³. It is more directed at market research in order to aid companies to fulfill their potential by knowing fully their audience/target market. Nevertheless, the gathered data from the IBM research can be very well applied for our purposes.

The personality metrics used by IBM expand the Big 5 personality assessment used by Kern et.al. with two additional metrics; Need and Value.

The Need metric with 12 respective categories describing the motivation for an individual's actions by varying root causes of one's need. The categories include; excitement, harmony, curiosity, ideal, closeness, self-expression, liberty, love, practicality, stability, challenge, structure.

In a similar manner, the Value metric allocates one's personality according to a 5-dimensional approach slightly mirroring the Big 5 personality traits. These include; self-transcendence/helping others, conservation/tradition, hedonism/taking pleasure in life, self-enhancement/achieving success and openness to change/excitement. For more detailed description please see above.

On top of developing the software, IBM conducts also surveys verifying the correctness and implications of its findings. One of IBM studies found for instance, that targeting users with the top 10% score in High Openness to Experience and Low Neuroticism resulted in increased CTR⁶⁴ on a specific campaign from 6.8% to 11.3%⁶⁵. It can be thus assumed that choosing these individuals as communication representatives for individual teams would increase the response rate as well as communication effectiveness. Furthermore, people scoring high in Conscientiousness and Low in Openness to Experience are by 40% more responsive to coupons in the retail environment, hence assuming that these individuals might be more responsive to gamification incentives. Additional

⁶³ Generally, it tokenizes the input text and links it with respective LIWC dictionaries, thus producing assessment results.

⁶⁴ Click-Through Rate

⁶⁵ The science behind the Personality Insights service. IBM. [online]. [quoted 2.1.2016]. <<https://www.ibm.com/smarterplanet/us/en/ibmwatson/developercloud/doc/personality-insights/science.shtml>>.

studies by Gill and Oberlander in 2002⁶⁶ and Mairesse et al. in 2007⁶⁷ found intriguing connections between the language specificity used and propensity to Neuroticism. It is to say that the more specific language, e.g. “beige black-laced moccasins” in comparison with “brown shoes,” the higher the probability of such person sharing some Neuroticism characteristics.

From the perspective of correct results and applicability for management purposes, we firstly need to establish whether the results from the IBM Personality Insights service are relevant and accurate. IBM has carried out 2 surveys focusing on Twitter users, the second, more recent one produced positive results. The survey was structured in such a way that the users were asked to fill out personality trait questionnaire after which the results were compared with the outcomes of the Personality Insight service. For the Big 5 metric, scores correlated strongly with “p-value < 0.05 and correlation coefficient between 0.07 and 0.21” for each user. For the needs metric, strong correlation was perceived too with “p value < 0.05 and correlation coefficient between 0.01 and 0.20⁶⁸” for 90% of users. These findings indirectly confirm that findings from such virtual assessments resemble real-life behavioral patterns.

c. Textual Personality Analysis; Email Analysis

Generally speaking, emails tend to grasp the majority of manager’s time, which might be used more efficiently. Emails contain large volumes of information of which the majority remains to be disregarded. However, with the help of tools like Crystal (crystalknows.com), managers can adjust the tone and the extent of information according to the personality of each individual recipient.

Such analysis, on a lower scale, can however be done individually by each of us simply by observing and remembering how do our colleagues or friends compose emails.

For instance, meticulously typo-free emails are a sign of conscientiousness, perfectionism, and obsession. On the other hand, grammatical or syntax errors point to lower IQ or education. Other

⁶⁶ GILL, Alastair J.; BROCKMANN, Carsten; OBERLANDER, Jon. Perceptions of Alignment and Personality in Generated Dialogue. University of Surrey & University of Edinburgh. [online]. 2002. [quoted 2.13.2016]. <<http://www.aclweb.org/anthology/W12-1508>>.

⁶⁷ MAIRESSE, Francois et.al.. Using Linguistic Cues for the Automatic Recognition of Personality in Conversation and Text. Journal of Intelligence Research. [online]. [quoted 2.13.2016]. <http://www.dmi.unict.it/~faro/tesi/personality_recognition/PR2.pdf>.

⁶⁸ The science behind the Personality Insights service. IBM. [online]. [quoted 2.1.2016]. <<https://www.ibm.com/smarterplanet/us/en/ibmwatson/developercloud/doc/personality-insights/science.shtml>>.

symbols or expressions (smileys, interjections) adhere to friendliness or immaturity (in serious emails).

The length of the emails shows energy and thoroughness of the sender, yet also pointing to a certain degree of neediness and disorganization. Disorganised emails reflect potential psychopathic tendencies or creativity. Instant answers reflect impulsivity and low self-control. Late responses show disinterest, and no responses “signal passive-aggressive disdain.”⁶⁹

Table 17; Textual email analysis

Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Open to experience
Emails starting with “Hi”	Sending emails close to the deadline	Detailed emails	Changing sign-offs	Whimsical and entertaining emails
Signature stating “Cheers” for instance	Polite and respectful	Responding as soon as possible	Changing tone in an email	Reflective quotation in the sign-off
Enthusiastic tone	Tendency to be positive	No typos		Not using capital letters
Suggesting a phone-call or meeting in person		Providing instructions		Not using abbreviations
Revealing inner thoughts		Detailed descriptions		Short and concise emails
		Suggesting plans		Typos and rush decisions

Note. Adapted from Psychologytoday.com⁷⁰

⁶⁹ CHAMORRO-PREMUZIC, Tomas. What Your Email Style Reveals About Your Personality. Fast Company. [online]. Jun-04-2014. [quoted 2.14.2016]. < <http://www.fastcompany.com/3031362/work-smart/what-your-email-style-reveals-about-your-personality>>.

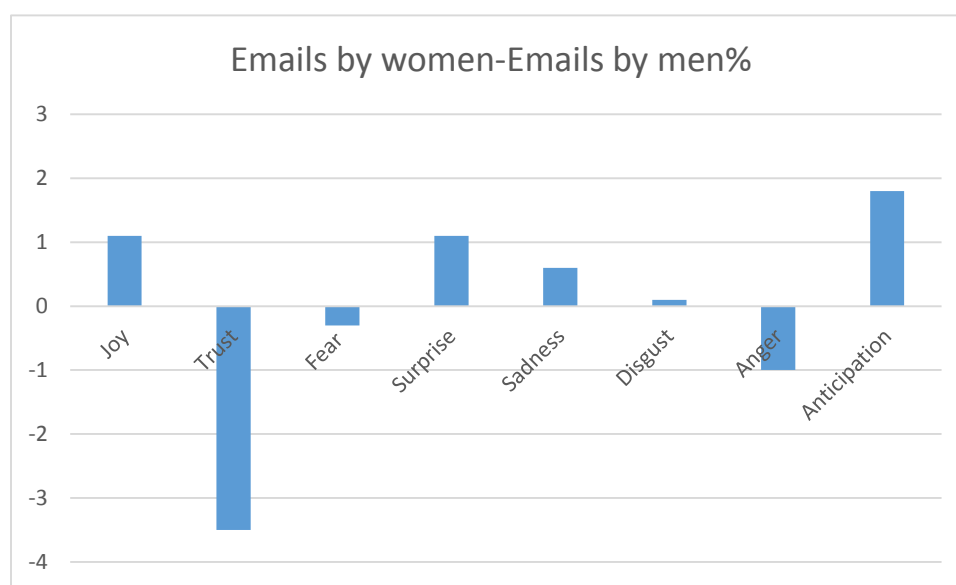
⁷⁰ KRAUSS WHITBOURNE, Susan. Using the Big 5 to Diagnose Your Email Personality Psychology Today. [online]. Jul-25-2011. [quoted 2.14.2016]. <<https://www.psychologytoday.com/blog/fulfillment-any-age/201107/using-the-big-5-diagnose-your-email-personality>>.

Further usage of email analysis lies with defining one's gender. When for instance communicating with a colleague whose name is not entirely gender-specific, such analysis can aid to avoid potential misunderstandings.

Variations can be found when comparing the tone of messages send by individual gender. In this respect we can examine the below bar chart where the 0 line represents a situation when both sexes have a rather similar usage frequency. Furthermore, the positive zone is occupied by female senders whilst the negative zone is delimited for male senders.

The major differentiating features are found with women who adhere to expressing joy, surprise and anticipation related words. On the other hand, men overscore women in expressions associated with trust, fear and anger.

Chart 6; Email by women-emails by men



Note. Adapted from The Physics arXiv Blog⁷¹

⁷¹ Data Mining Reveals the Emotional Differences in Emails Written by Men and Women. The Physics arXiv Blog. [online]. Jul-25-2011. [quoted 2.14.2016]. <<https://medium.com/the-physics-arxiv-blog/data-mining-reveals-the-emotional-differences-in-emails-written-by-men-and-women-e7dbd9d6a518#.irtr6fps6>>

d. Written Text Personality Analysis; Graphology

Alongside with personality assessment metrics were being developed other means of distributing people into subgroups. These included strange approaches based on skull size or the colour of a persons' retina. Other, more rational approaches were targeting one's handwriting. In this respect, it forms a relatively reliable and consistent source of information about one's personality. With regards to handwriting analysis, there are generally 9 main categories that shall be reviewed whilst examining one's handwriting. These include the size, revealing one's ability to focus on small details or the ability to see the bigger picture. The slant, demonstrating one's relationship with rationality and emotions. The pressure, showcasing an individual's zest. The 3 lines division, pointing to one's traits within the empirical or the philosophical world. The baseline showing the emotional stability of an individual. The spacing between letters and diacritics showing the level of self-confidence. The spacing between words demonstrating one's role within society. The sharpness of letters m,n and r revealing one's intelligence and dim-wittedness. And lastly the speed of one's handwriting which needs to be connected with the above criteria in order to produce reliable results.

A sub-group of handwriting that requires specific attention is the signature analysis. Generally speaking, same rules as to regular handwriting analysis apply. However, if substantial deviations from the norm are found it might point to the fact that the individual is trying to conceive something or is trying to picture oneself in a new light.

Table 18; Graphology analysis

Step	Task	Outcomes
1	Pressure	Heavy pressure=vitality and success Light=Avoid draining situation
2	Slant	Right=heart over mind Left=concealing emotions Straight=mind over heart
3	Baseline	Upward=optimism Downward= pessimism, tiredness Straight= tense, overdisciplined Wavy=emotional rollercoaster

4	Size	Big= inability to concentrate on small tasks, need to have more tasks for shorter time Small=able to see the tiniest details, prefer to work alone
5	3 zones of letters and diacritics	Upper= creativity, intellectual thinker Middle=day to day issues Bottom= physical and material drives, practical imagination
6	Spacing between letters and diacritics	Average=comfortable with oneself, at ease, Together=low self-esteem, prefer to be part of a group, Separated= prefer one's space, Irregular=confusion, mix up Omitted diacritics=seeing bigger picture, lower attention to detail
7	Spacing between words	Average=comfortable contact with others, Together=part of a group, Separated=problems dealing with others, avoid people's contact
8	Sharpness	Includes letters: m,n,r Sharp= intelligent Rounded=slower methodical thinkers, think things over, creative Flat=deceptive and hiding something, lacking communication skills
9	Speed	Fast=spontaneous, impatient, ambitious, aggressive, negligent, quick thinkers, accident prone Slow=lack of ambition and determination, they are often ostentatious or lack mental capacity

Note. Based on author's knowledge

Limitations

Limitations include culturally and age-related differences in expressing oneself. Although, it could be assumed that within a certain age group, the culturally-aware individuals tend to communicate with similar expressive techniques, nevertheless there are differences that need to be taken into account.

Gender plays its specific role too, especially with regards to emotional stability that is represented, according to Kern more with the male audience. Furthermore, both sexes adapt their communication when used with the opposite gender. Generally it can be assumed that women use more positive words when communicating with other women whereas men use “anticipatory language when writing to women, such as “prepare” or “hope””⁷².

Further issue is associated with the nature of assessment, being self-assessment, i.e. we are painting the picture ourselves. On the other hand, the similar obstacle is an embedded factor of MBTI assessment too. Additional challenge lies with the efforts necessary to extract the posts from social media. In this respect, build-in apps on social media permit the extraction rather automatically provided that the user agrees with sharing such data with the app provider. Nevertheless, certain threshold needs to be met in order to produce reliable results, according to IBM. Their Personality Insight service requires minimally 3500 words to produce meaningful results. The count can be reduced, yet it has been proven that carrying out the analysis with fewer than 100 words can produce sampling error surpassing 50%. Conversely, producing sample of 25,000 words can reduce the sampling error to mere 10%⁷³.

2. Carlito management software

i. Philosophy

With the generation Z we are continuously moving towards a project-based work setup. This poses many opportunities, however it also creates numerous challenges, especially exerted on managers. From my experience, the major task of a manager in relation with his or her teams is to choose the

⁷² CONDLIFFE, Jamie. What your email style says about your personality. New Scientist. [online]. Sep-27-2013. [quoted 2.15.2016]. <<https://www.newscientist.com/article/dn24286-what-your-email-style-says-about-your-personality/>>.

⁷³ The science behind the Personality Insights service. IBM. [online]. [quoted 2.1.2016]. <<https://www.ibm.com/smarterplanet/us/en/ibmwatson/developercloud/doc/personality-insights/science.shtml>>.

right people for the right job. Given the ever expanding pool of candidates to choose from, this proves to be increasingly challenging.

In this respect, managers will be unable to get to know thoroughly all team members via traditional methods. Because of this, managers will seek available resources of aggregated condensed information about their colleagues in order to make the right decision. The application will thus aim to provide managers with as much information as possible in order to do the right job in a playful, gamified way.

However, a crucial aspect needs to be kept in mind. That being that one thing is to allocate a person, yet the second and potentially even more important thing is to incorporate a new team member properly onto a team⁷⁴.

ii. Specific features

The ultimate goal that the application should be achieving is to compose the most efficiently balanced team. In this regard, the application will be only the last step behind the database that will be forming the ultimate engine of the management software.

The data can be divided into 2 main sections;

⁷⁴ In order to ensure that proper onboarding has been carried out, several steps shall be fulfilled. Firstly, whilst onboarding a new team member a sufficient time should be spend with the individual regardless of all the gathered data. The time should be dedicated to describing team history, rules or peculiarities. Furthermore, the time should be allocated to introducing the newly incoming team member to other team members or potential fcontacts. The initial phase should however serve primarily as a connection-creating opportunity.

Secondly, a newly onboarded colleague should get a buddy who will help him or her to get started as efficiently as possible. The buddy will also aid to integrate social circles more easily.

After a few weeks, a check-up with the new team member should be carried out in order to verify that everything is running smoothly and that he or she are happy with what they are doing. The check-up should be conducted through a series of questions focusing on testing knowledge and satisfaction of the new colleague.

A similar check-up should be done inversely with more experienced employees. They should be asked about the specific fit of the new employee, whether he or she fits accordingly into the culture and atmosphere.

BROWN, Andrew. Sink or Swim: Getting Your New Team Members "On Board". LinkedIn-Pulse. [online]. Jul-21-2014. [quoted 2.13.2016]. <<https://www.linkedin.com/pulse/20140721191614-38153721-sink-or-swim-getting-your-new-team-members-on-board>>.

Referential data, forming the constant background with all the MBTI, Big 5 and graphology metrics. Such data will be used as a guideline for the software to analyse and allocate individual team members. Referential data will be represented by Personalities Compatibility Match, NRC Emoticon Lexicon in Email Context (141820 terms and expressions), Big 5 Dictionary, MBTI naming convention, Team Specifics Metric and others (see Appendix).

Transactional data, representing individual team members scores. These will be unique to individual team members. The collection of these inputs will be continuous and will have 3 stages as can be seen in the table below.

Table 19; Input collection in stages

Stage	Input collection details
Pre	Purpose of the team (input by manager)
	Entrance personality analysis (Team Members and Managers) conducted via (MBTI, Gallup's Clifton Strengths Finder or other tools)
	Gathered and needed skills (experience, soft skills)
Ongoing	Email and conversation analysis over time
	Feedback collection and analysis through questionnaires
Post	Team performance analysis
	Manager's performance analysis

Note. Based on author's research

The initial transactional input whilst forming the team will be coming from the manager who shall specify the nature of the team. Since the team purpose can influence the compatibility of people on such teams, this input is crucial for the success of the allocation procedure. Generally speaking, there are several teams that can be distinguished according to their nature and team-member compatibility.

These include;

- Brainstorming
- Maintenance (SW, product, transport)
- Workflow
- Development
- Audit/controlling
- Administrative
- Delivery (supply, transport, SW)
- Executive

Out of these, Brainstorming, Audit and Executive teams might be, under certain circumstances, producing better results if the personalities had diametrically differing personalities. The reasoning being that such opposing views of the surrounding world will enable the team to come up, spot or direct in utterly new ways.

The second input is coming specifically from individual team members upon completion of respective personality questionnaires. This is ultimately the main decisive point for the application to allocate an individual. Everything has its reasoning in the fact that some personalities have better understanding for working with some other specific personalities. In order to achieve team efficiency, it is in the interest of all to find out about the matching personality types. There are several approaches towards personality match. The simplest one being opposite match, build on the notion that opposites attract each other. This can be however extended to a wider application through primary or secondary cognitive function division where personality types are given a varying priority upon their cognitive functions (There are 4 pairs of cognitive function tandem function Ne ↔ Si, Se ↔ Ni, Te ↔ Fi, Fe ↔ Ti, according to Keirsey)⁷⁵. It is important to mention that such personality matching involves managers too. However, the algorithm is set as that managers need to match only on a bipolar basis, i.e. if a team has the majority of extraverted

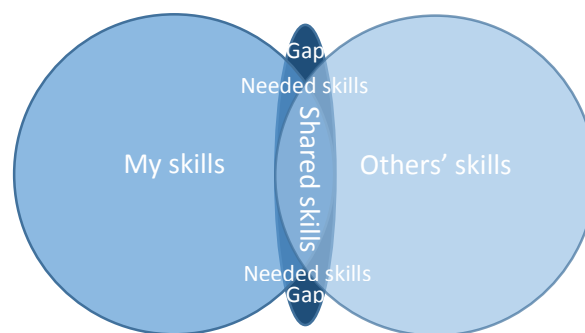
⁷⁵ Ne=Extrovert, Intuition↔Si=Introvert, Sensing. Se=Extrovert, Sensing↔Ni=Introvert, Intuition. Te=Extrovert, Thinking↔Fi=Introvert, Feeling. Fe=Extrovert, Feeling↔Ti=Introvert, Thinking.

Compatibility for Myers Briggs Type Part 2. [online]. Apr-17-2009. [quoted 2.12.2016]. Blog. <<http://pstypes.blogspot.de/2009/04/myers-briggs-compatibility-part-2.html>>.

individuals an intraverted manager would find it more difficult to manage the team. This applies to other characteristics (Sensing, Thinking, Feeling, Intuition, Judging, Perceiving).

The third input trait is embedded either by individual users themselves or by their colleagues. It is also weighted by the number of confirmations from other team members. It concerns gathered experience either within or outside the company. In order to match the needs of a manager with the available resources, several conditions regarding skills have to be met. There are 3 major groups of skills; an individual's complementary skills, shared skills amongst team members and other team members' complementary skills. The aim is to reduce the skills gap, i.e. those skills that a team lacks as well as to diminish shared skills in order to avoid skills overlap. Hence, the algorithm searches for specific and general skills that will create the smallest overlaps and will avoid skill gaps. These specifications are input by a manager.

Graphic 5; Skills optimal distribution



Note. Based on author's research

The ongoing set of inputs includes the automatic personality analysis through email texts as well as social media. Employees need to give their explicit content to enable the application to access their textual history as well as activity feed. Data is not stored, it is merely analysed yet the sought after personality traits results are stored and applied for the overall personality analysis. Additional set of ongoing inputs concerns feedback forms generated automatically by the application. Forms focus on team member and manager compatibility as well efficiency and performance. The feedback section is immensely important since it enables the application to learn and improve itself. It also provides valid feedback to managers who can indirectly access it through their dashboard. Specifically, the feedback forms focus on

Team performance analysis

- Questionnaires
- Met deadlines
- Peer review questionnaires
- Managers questionnaires
- Team email analysis
- Looking for emotionally coloured words

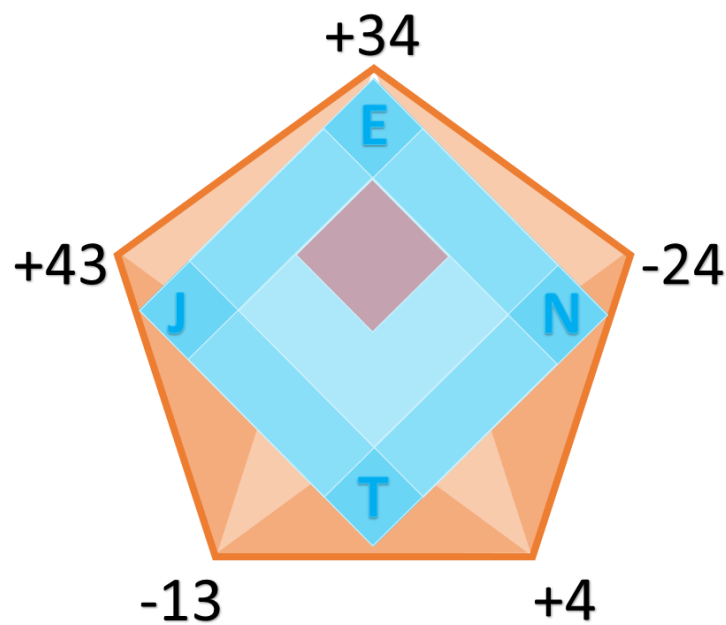
Manager's performance analysis

- Team efficiency
- Comparison with peers
- Peer evaluation
- Team evaluation of the manager

iii. Functional design

a. *Trait Diamond*

Functional design 1; Trait Diamond



Note. Based on author's research

The cornerstone of the application is its ability to assess an individual's personality through the above mentioned tools. The outcome is a pentagon with a square in its centre. The pentagon represents the Big 5 trait characteristic, whereas the smaller square adheres to the MBTI metric. An additional metric is represented by the red square that can turn either blue or red and signifies the gender. The algorithms are set in such a way that upon uploading all the necessary inputs into the system, it will allow certain personalities to adjoin whilst forbidding others.

b. Personal Dashboard

Functional design 2; Personal Dashboard, skill set

The dashboard features a circular profile picture of a man, Karel Kotoun, with an orange border. Below the photo is the name 'KAREL KOTOUN' and a double-headed arrow. To the right, there are two sections: 'SPECIALISED SKILLS' (blue header) and 'SOFT SKILLS' (green header). Each section contains a table with columns for Skill name, Level, and two status columns represented by symbols (a cursive 'S' and an ampersand '&').

Skill name	Level	<i>S</i>	&
SAAS	3	<input checked="" type="checkbox"/>	
Insurance Risk	4		<input checked="" type="checkbox"/>
Strategy	5		<input checked="" type="checkbox"/>

ADD NEW SKILLS # MORE SKILLS

Skill name	Level	<i>S</i>	&
Management	3	<input checked="" type="checkbox"/>	
Mentoring	4		<input checked="" type="checkbox"/>
Leadership	5		<input checked="" type="checkbox"/>

ADD NEW SKILLS # MORE SKILLS

Note. Based on author's research

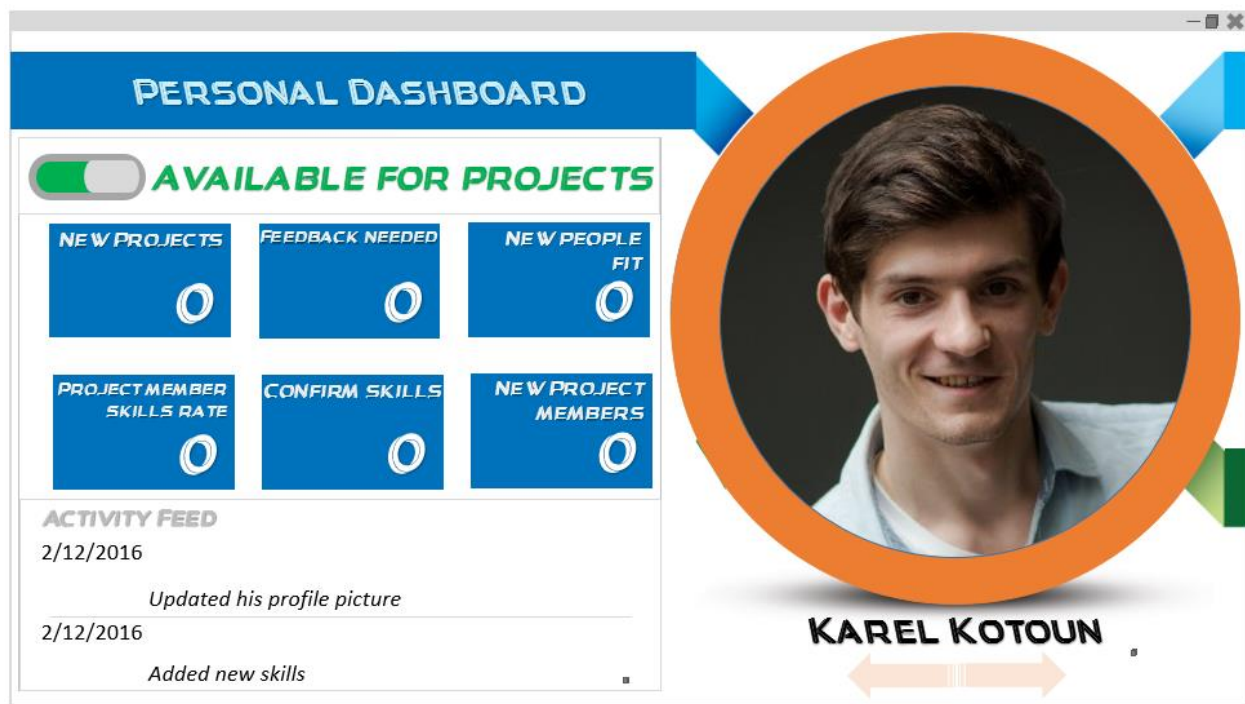
The personal dashboard serves as the input tool for individual team members. It allows individuals to add specialised or soft skills as well as to earn badges of expert (represented by the glasses symbol) and aspirer (represented by the & symbol).

Functional design 3; Personal Dashboard, skill input pop-up

The small buttons at the bottom parts of each section allow users to see the full set of skills within each section. The design is also adjusted to touch screen devices since users can slide through (as arrows below the avatar's face show) to the other section.

The above graphic shows the process of inputting one's skills set. It also enables an individual to add collaborators which will ultimately add these skills into their skill library.

Functional design 4; Personal Dashboard, feedback, feed and availability

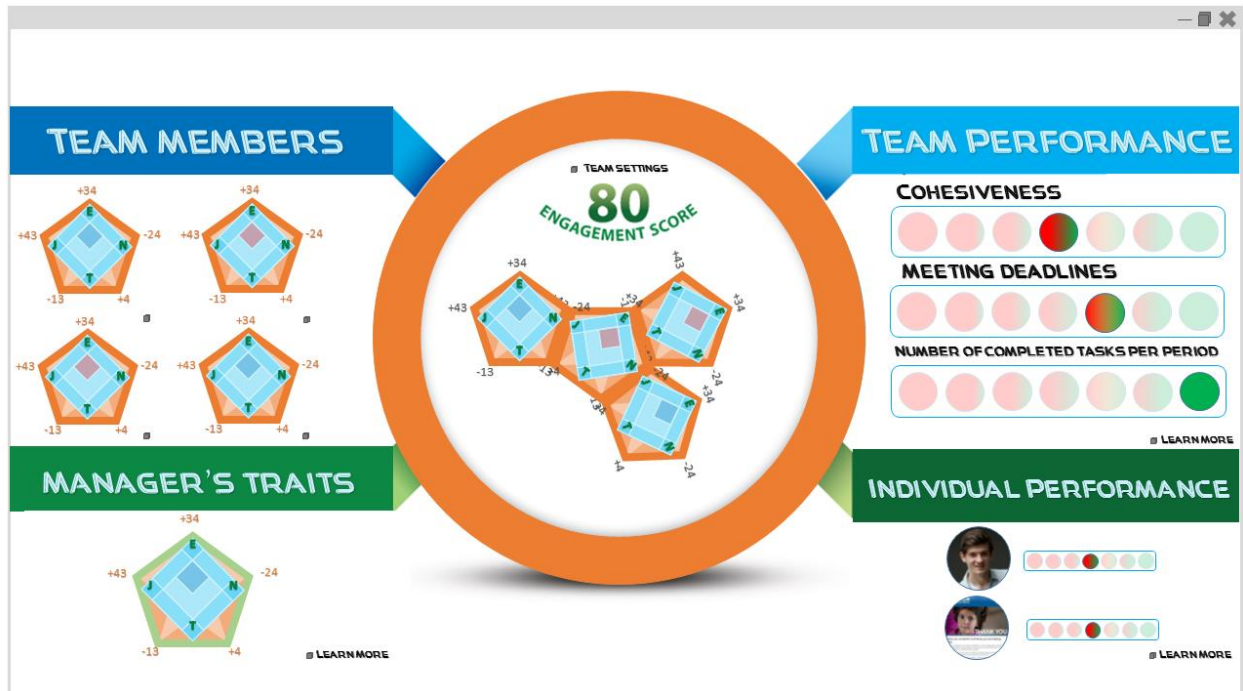


Note. Based on author's research

As has been mentioned above, the design enables sliding through action onto this section. Here, individuals can adjust their current availability for projects. However, more importantly it serves as the place for feedback input. It also shows one's activity feed in order to monitor who made changes to one's profile or what an individual did. Again, the small buttons enable expansion to see the full list since the algorithm is set to demonstrate only the most recent activities. The expansion button underneath the avatar allows users to adjust the picture as well as their short bio. It also enables users to upload a set of pictures in order to enable other team members to get to know them more via virtual means.

c. Managerial Dashboard

Functional design 5; Managerial Dashboard



Note. Based on author's research

The ultimate focus of the application is to compose an efficiently balanced team. For this purpose the Managerial Dashboard is the right tool to use. After uploading all inputs about individual team members as well as the specifics about the sought after team, a manager can compose the team in a gamified way that enables him or her to see instantly the expected qualities of that particular team under given circumstances. The moulding field enables a manager to add together team members, yet it only enables those that match each other. In order to avoid matching on a personal basis, the personality traits are differentiated only according to men and women, although rights can be granted in advance to see the names behind these individuals. The full description how to deal with such individual is then passed onto the manager after the team has been composed.

Furthermore, the application enables a manager to verify his or her compatibility with the team. The compatibility is much less rigid since there is a limited number of managers. Henceforth, the manager pentagon will turn red to demonstrate its incompatibility only if for example the majority of individuals represent shared characteristics of one of the MBTI traits (for instance the majority are extroverts).

Additionally, the Managerial Dashboard serves as a tool to highlight an individual's performance if the team has been running for some time. This is the only opportunity how to see specific names. As was mentioned above, no specific names are available with regards to team construction, unless specific rights are granted. After clicking the "Learn More" button, it will also demonstrate other team members' performance as well as a tool which skills and qualities to recommend the concerned individual to focus on. The evaluations are based on peer reviews and personality trait algorithms.

The application will also be installed in manager's email and will provide him or her with suggestions how to compose an email directed to a specific person upon this person's personality. Furthermore, it will serve as a toolkit how to talk and communicate with particular individual in the real world also.

iv. Direct competition

At the moment there are several products on offer that range in quality and specificity of available tools. The closest competitor is called Crystal (crystalknows.com) and is focusing on the idea to examine one's personality through the analysis of social media and one's emails as well as to provide an individual with hints how to compose an email. The application is based on an online tool with Google Chrome plug-in which then examines one's mailbox as well as Facebook, LinkedIn and Twitter feeds.

Another competitor that resembles similar characteristics is called TeamFit. It is a project-management tool based on skills and feedback from colleagues. It somehow joins LinkedIn with internal project-assigning tools in a gamified way that enables participants to gain badges and additional varying accolades.

Nevertheless, these small start-ups have a similar product, yet the major competitors will be the established market players that vary in the product they offer. There are 2 major project management groups; one focusing on people and the other one focusing on sales. Some of these include gamified concepts, the others do not. The list of major competitors can be seen below.

Table 20; Direct competitors to Carlito management software

Name	Focus	Useable on other platforms
Crystal	Personality analysis	Online, Google Chrome
TeamFit	Skill-based gamified project management	Online, Google Chrome
IBM	Personality analysis	IBM-run applications, high degree of personalisation
Bunchball	Employee performance	Salesforce, Remedyforce, Jive, NICE, SAP Jam
Badgeville	Employee performance, customer loyalty	Yammer, SharePoint, Jive, IBM connections
RedCrittter tracker	Project management	html
Arcaris/playvox	Sales performance	Five9, 8x8, Zendesk, Avaya, Salesforce
Proof	Project management	iOS, Android

Note. Based on author's research

3. Feasibility analysis

After the creation of the software, an additional, immensely important assessment is the feasibility analysis of the overall business plan. It is assessing the options of raising funds, sizing of the market and the overall profitability. The following quantifiable structure will be applied in order to gain the most objective results possible. Each of the sections is ranked on a 10-point ambivalent scale, finally producing feasibility score.

Table 21; Target market

Ratings:	Market Economics
9	Are potential customers currently in a buying mood?
2	Are firms similar to the proposed business making money?
5	Is there a compelling need for a new firm in the industry (with the combination of these offerings)?
16	Total

Table 22; Industry attractiveness

Ratings:	Industry
10	...large and growing
4	...important to the customer.
10	...fairly young rather than older and more mature.
2	...high rather than low operating margins.
2	...not crowded.
28	Total

Table 23; Management prowess

Ratings:	Management Prowess
10	Passion for the business idea
10	Prior entrepreneurial experience
10	Depth of professional and social network
30	Total

Table 24; Financial feasibility

Before delving into the quantitative assessment, the overall projection of costs and revenue forecasted for the next three years is be adopted in order to quantify the business opportunity.

Ratings:	Financial Feasibility
9	Steady and rapid growth in sales during the first year
8	High percentage of recurring revenue-- meaning that once you win a client, the client will provide a recurring sources of revenue
8	Ability to forecast income and expenses with a reasonable degree of accuracy
0	Profitability will be reached within one year
25	Total

Total target market size	Number of likely customers per year	Sales target in the 2nd year	Revenue target in the 2nd year	Expenses per sale	Revenue per unit in the 2nd year
\$5bn	1000	250	Ultimate package: $\$58,800 = (\$49 * 12 * 100)$ Regular Package: $\$21,000 = (\$35 * 12 * 50)$ Basic Package: $\$22,800 = (\$19 * 12 * 100)$ Total=102,600	$\$102,000 = 1700 * 5 * 12$	\$2.4

It is crucial to mention that the expected sales target within the first 4 years of existence is to reach 70% of the likely customers, i.e. approximately 700, hence ceteris paribus reaching profit of \$185,280.

Table 25; Resource sufficiency

Ratings:	Resource Sufficiency
10	Office space
10	Lab space, manufacturing space, or space to launch service business
5	Key management employees (now or in the future)
5	Key support personnel (now or in the future)
10	Key equipment needed to operate the business (computers, machinery, delivery vehicles)
6	Ability to obtain intellectual property protection on key aspects of business.
5	Proximity to similar firms
10	Proximity to key suppliers
2	Proximity to key customers
63	Total

Note. Based on author's research

The maximum score from the assessment is 230. The Carlito Management software was able to reach 162, hence achieving feasibility of 70% which can be considered as reasonably feasible. The highest score was reached in management prowess and resource sufficiency, hence pointing to the external factors as a potential threat. These will be thus the focus of the coming months.

Findings

This paper had two major goals; to learn from findings about gamification in order to be able to apply it and to examine personality assessment and its management application through software. In the midst of the composition of the paper, several crucial findings have been encountered. Upon these findings derived from the primary and secondary research, two important issues can be deduced.

Firstly, virtual teams will increase in number and its importance to currently existing businesses. It can be expected that 40% of the workforce will be members of a stable virtual team by 2017. This does not however mean that 40%⁷⁶ of workers will work exclusively virtually. It adheres to the fact that many of us have already experienced work on a virtual team without even knowing it. Such a dramatic change poses elevated pressure on managers as well as workers themselves in order to produce the best results since cooperation and worker cohesion is slightly differentiated on virtual teams.

Secondly, managerial practice is at the brink of its next revolution. Given the fact that managers need to work with ever-increasing volumes of data which they have to process, soon the quantity will become unbearable. Managers will thus have two options; either to leave their position or to accommodate the change. Since physically it will be rather impossible, other means will have to be sought after. This is where Big Data management software comes in place. From my experience, the most important task of a manager is to choose the right people for the right job and the right team. In this regard, knowing all the employees, be it new or current in such a way that efficient and rational decisions can be made is an immense challenge for managers. They thus leave these tasks to Human Resources department or spend on them a very limited time. Such behaviour can be averted if employee data are effectively used for employees' benefit through software like Carlito Management Software.

Furthermore, managers will also have to learn how to cope with and learn from Generation Z. Since regular motivational practices based on promotion and benefits are very commonplace,

⁷⁶ Based on a survey of Accenture Central Europe B.V. consulting employees.

attracting the best talent will be asking for additional perks. Such perks are not however remuneration based, and because of this are more difficult to fathom for the big corporations. On the basis of the findings in this paper, Generation Z is thinking differently within problem-solving boundaries. They are very competitive, social and do adhere to project ownership. In this respect, managers will need to master the art of gamification in order to extract the full potential from individuals as well as to attract the best talent.

Gamified elements do relate to managers themselves too. That is why the Carlito Management Software is not merely a SAP table, yet it allows its users to play and to visualise the collected data in a humanly manner.

It is then a brilliant time to live in thanks to the opportunities that the management revolution brings. The outcome should be that we will know each other better, we will go to work happier and will have better results as well as that we will have many virtual colleagues all over the world.

List of abbreviations

3D	3 Dimensions
CAPI	Computer Aided Personal Interview
CATI	Computer Assisted Telephone Interview
CC	Carbon Copy
CTR	Click Through Rate
DJ	Disc-Jockey
ENIAC	Electronic Numerical Integrator And Computer
ET	Executive Team
GDrive	Google Drive
HR	Human Resources
IQ	Intelligence Quotient
IT	Information Technology
LIWC	Linguistic-Inquiry Word Count
MBTI	Myers-Briggs Type Indicator
MiM	Master of International Management
MUD	Multi User Dungeon
NRC	National Research Council
PAPI	Paper Aided Personal Interview
SB	Student Board
SBR	Student Board Representative
SW	Software
US	United States
VW	Volkswagen
WAW	World of Warcraft

Appendix

Table 26; NRC Emotion Lexicon Sample

NRC Emotion Lexicon Sample		
Word	Emotion	Sentiment
aback	anger	0
aback	anticipation	0
aback	disgust	0
aback	fear	0
aback	joy	0
aback	negative	0
aback	positive	0
aback	sadness	0
aback	surprise	0
aback	trust	0
abacus	anger	0
abacus	anticipation	0
abacus	disgust	0
abacus	fear	0
abacus	joy	0
abacus	negative	0
abacus	positive	0
abacus	sadness	0
abacus	surprise	0
abacus	trust	1
abandon	anger	0
abandon	anticipation	0
abandon	disgust	0
abandon	fear	1
abandon	joy	0
abandon	negative	1
abandon	positive	0
abandon	sadness	1
abandon	surprise	0
abandon	trust	0
abandoned	anger	1
abandoned	anticipation	0

Note. Derived from SAIF M. Mohammad. NRC Emotion Lexicon. NRC. [online]. 2016. [quoted 2.10.2016]. <<http://www.saifmohammad.com/WebPages/ResearchInterests.html>>.

Table 27; Big 5 Dictionary

Big 5 Dictionary									
Extraversion		Agreeableness		Conscientiousness		Emotional Stability		Openness to Experience	
M	F	M	F	M	F	M	F	M	F
an amazing	i-love	just	goodness	done with	blessings	here we come	tonight	though	to read book
last night	my	got	great weekend	bless	birthday wishes	hit me up	this god is good	I ´m going	poetry
baha	weekend	psalm	thankful	opportunity	semester	basketball	volleyball	I don´t	you know
week	out	happy	love you guys	prayers	blessed	blessed	basketball	writing dark	reading a nature brain music
can´t	with	church	blessed	long day	dinner with	chill was	thanks	the world soul	dark death
wait	dance	thank	church grace	to work	exhausted	cowboys	praise	death	light dream
chill	ladies	you blessed	proverbs	great work	great day	greatness	be blessed	reality	sense dreams
baby	girls	and it was	praise	great day	the weekend	a great home	god´s	existence	drop
party	blast	had a prayers	prayer	the gym	everyone for	soccer chillin	the lord	blood	dead epic
A´int	bout	thanksgiv ing	much fun	weekend relax	thanksgivi ng	snowboar ding	beach	but zombie thoughts	completely black
love	love my little	cant wait	excited	blessings	prayers thankful	letss go	yall smh	seems apparently	right now
wit	chillin	great day	an amazing	the lord	so excited	the gym	success	darkness	strange book
lil	girls	amazing	a great god has	wait to	success	to team	day workout	evil	zombie
don´t	see	great weekend	beautiful day	thankful	relax	weekend football	sweet home	dreams art	universe
hit	I´m boys	friends and family	wonderfu l	work out	studying for	lakers	great weekend	universe	into the awesome
beach	bere	merry Christmas	god´s	relaxing	wonderful	champs	proverbs	the must human dream	cot perhaps
goin	pool	an awesome	merry Christmas	family and friends	classes	game tonight	worship	strong	I´m going writting
ya	gettin	god has	prayers in Christ	degree	with	swag	fam	music	human three
weekend	cant	the lord	faith	busy	ready for	workout	church	humanity	the world
chillin	last night	our hearts	strength	care of	vacation at work	a blast	blessings	poetry	nature
ill	wait	dang	romance	off to work	workout	gotta	with my successful	into the road	quote
girl	look in	a wonderful	!	to all my	relaxing	practice	Lakers	living	sigh
looking	party	camping	psalm	success	thank	ready	call	peace	apparently
boys	yall	proverbs	Corinthia ns	thanksgivin g	blast busy successful	bout	beautiful	brain	soul

gettin	lets	birthday wishes	worship	challenges	beautiful day	you	soccer	kind words	cat
miss	baby	excited	grace	ready	long day	volleyball	Corinthians	tense	perhaps
thats	night	dang	love you all	blast	enjoy family	fun	Celtics	I can't	kind of
bday	with :)	:)	prayer	training	super	doin smh	here I come	you know	college
dont	soho	faithful	today	on my way	excited	beach	on my way	the earth	evil
yall	great	heck	incredible	congrats	classes	kobe	fullest	I feel	the sky
blast	babe	happy Easter	can't wait	wait	day off	life is good	in Christ	within	completely
lovin	bestie	love you	awesome	forward	work tomorrow	now it's time	hang out	"	books
text	fane	Corinthians	with my family	here I come	thankful	was awesome	!	must	sigh art
me	beach	ready for	joy	will be	finals	training	entertainin g	human	listening to
!-!	Don't	just got	grateful	god	a blast	niggas	let' go	seek	music
hit me up	the best	prayer	glory	ahead	so glad	on my way	snowboardin g	I don't	black
here we come	ready	thankful	friendly	my truck	forward to	success	finals	light	realized

Note. Derived from SAIF M. Mohammad. NRC Emotion Lexicon. NRC. [online]. 2016. [quoted 2.10.2016]. <<http://www.saifmohammad.com/WebPages/ResearchInterests.html>>.

Table 28; MBTI Match Table

MassMatch compatibility																																			
I	S	T	J	I	S	T	J	E	S	T	J	E	S	T	J	I	S	T	J	E	S	T	J	E	S	T	J	I	S	T	J	E	S	T	J
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
E	E	E	I	I	E	I	E	I	E	E	E	I	E	E	E	E	E	E	E	I	I	I	E	E	E	E	E	E	E	I	E	E	E	E	E
S	S	S	S	S	S	S	S	S	N	S	S	S	S	S	N	S	S	N	S	N	S	T	F	T	T	T	T	T	T	F	T	T	F	T	F
T	F	T	T	T	F	T	T	T	T	F	T	T	T	T	T	T	T	T	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	
J	J	J	P	J	J	J	J	P	J	P	J	P	J	P	J	P	J	P	J	J	J	J	J	J	J	J	J	J	P	J	P	J	J	J	J
I	E	I	E	I	I	E	E	E	I		I	I	I	E	E	E	E	E	I	I	E	E	E	E	E	I	I	I	I	I	I	I	I	I	
N	S	S	S	S	N	S	N	N	N		N	S	S	N	N	N	S	N	S	N	S	N	S	N	S	S	N	S	N	S	N	S	S	S	S
T	F	T	F	T	T	F	F	F	T		T	F	T	F	T	F	F	F	T	F	T	F	T	T	T	T	T	F	T	F	F	F	T	F	
J	P	J	P	P	J	J	J	J	J		J	P	P	P	J	P	J	J	J	P	J	J	P	J	P	J	P	J	J	J	J	P	J	P	J
I	E	E	E	E	I	I	E	E		E		E		I	I	E	I	E	E	E	I	I	I	E	E		I		I	E	E		I	E	E
S	N	N	N	S	N	S	N	S	N		N	N	N	N	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N
T	F	T	T	T	F	F	F	T	T		T	T	T	T	F	T	F	T	F	T	F	T	T	T	T	T	T	T	T	T	T	T	T	T	
P	P	J	P	P	J	J	J	J	P		P		J	J	P	J	P	J	P	J	P	J	P	J	P	J	P	J	P	P	P	P	P	P	P
E	I	E	I		I	E	I		I		I		E	I	I		I	E	E	E	E	I		E		E		I	I		I	I		I	
S	N	S	N		N	N	N		N		N		N		N	N	S		S	S	S	S	N	N		S		S		S	N	S		S	
T	F	T	T		F	T	F		T		T		T		T	F	T		T	F	T	F	T		F		F		F	T	F	T		F	
P	P	P	P		J	J	P		P		P		J		P	P	P		P	J	P	P	P		P		P		P	P	P	P	P		P
			E		E	I	E		E				I		I	E				I		I			I		I		I		I		I		N
			N		N	N	N		N				N		N	N				N		S	N		S		S		N		N		N		N

			F J		F P	T J	F P		F P				T P		T P	F J			T J		F J	F P			F P		F P		T J		F P
			I N F J		I N F P										I N F J				I N T J						E N T P						
			E N F P												I S T J										I N F P						
			I N F P																						E N F J						
Tandem processes compatibility																															
I S T J	I S T P		E S T P	E S T J		I S F J	I S F P	E S F P	E S F J		I N F J	I N F P	E N F P	E N F J		I N T J	I N T P	E N T J	E N T P								E N T P	E N T J			
E S T J	E S T P		I S T P	I S T J	E S F J	E S F P		I S F P	I S F J		E N F J	E N F P	I N F P	I N F J		E N T J	E N T P	I N T J	I N T P								E N T P	E N T J			
I S F P	I S F J		E S F J	E S F P		I S T P	I S T J	E S T J	E S T P		I N T P	I N T J	E N T J	E N T P		I N F P	I N F J	I N F J	I N F P								E N F J	E N F P			
E S F P	E S F J		I S F J	I S F P		E S T P	E S T J		I S T J		E N T P	E N T J	I N T J	I N T P		E N F P	E N F J	E N F P	E N F J								E N F J	E N F P			
Secondary cognitive function compatibility																															
T e	S e		T i	S i		F e	S e		F i	S i		F e	N e		F i	N i		T e	N e		T i	N i									
I S T J	I S T P		E S T P	E S T J		I S F J	I S F P		E S F P	E S F J		I N F J	I N F P		E N F P	E N F J		I N T J	I N T P		E N T J	E N T P									
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
E N T J	E N T P	I S T P	I S T J	E S T P	E S T J	I S F P	I S F J	E S T P	E S T J	I S F P	I S F J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N T P	I N T J	E N F P	E N F J	I N T P	I N T J	E N F P	E N F J		
E S T J	E S T P	I S T P	I S T J	E S F P	E S F J	I S T P	I S T J	E S F P	E S F J	I S T P	I S T J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N T P	I N T J	E N F P	E N F J	I N T P	I N T J	E N F P	E N F J		
E S N J	E S N P	I S T P	I S T J	E S N P	E S N J	I S F P	I S F J	E S T P	E S T J	I S F P	I S F J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N F P	I N F J	E N T P	E N T J	I N T P	I N T J	E N F P	E N F J	I N T P	I N T J	E N F P	E N F J		
Primary cognitive function compatibility																															
S i	T i		S e	T e		S i	F i		S e	F e		N i	F i		N e	F e		N i	T i		N e	T e									
I S T J	I S T P		E S T P	E S T J		I S F J	I S F P		E S F P	E S F J		I N F J	I N F P		E N F P	E N F J		I N T J	I N T P		E N T J	E N T P									
E S	E S		I S	I S		E S	E S		I S	I S		E N	E N		I N	I N		E N	E N		I N	I N									

T	T	T	T	F	F	F	F	F	F	F	F	F	T	T	T	T
P	J	J	P	P	J	J	P	P	P	J	J	P	P	J	J	P
E	E	I	I	E	E	I	I	E	E	E	I	I	E	E	I	I
S	N	S	N	S	N	S	N	S	N	S	N	S	N	S	N	S
F	T	F	T	T	F	T	F	T	F	T	F	T	F	T	F	T
P	J	J	P	P	J	J	P	P	J	J	P	P	J	J	P	P
Opposite match																
I	I	E	E	I	I	E	E	I	I	E	E	I	I	E	E	I
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
T	T	T	T	F	F	F	F	F	F	F	F	F	T	T	T	T
J	P	P	J	J	P	P	J	J	P	P	J	J	P	P	J	J
E	E	I	I	E	E	I	I	E	E	E	I	I	E	E	E	I
S	S	S	S	S	S	S	S	S	N	N	N	N	E	N	S	N
T	F	T	T	F	T	T	T	F	N	F	F	F	T	T	F	T
P	J	J	P	P	J	J	P	P	P	J	J	P	P	J	J	P
E	E	I	I	E	E	I	I	E	E	E	I	I	E	E	E	I
S	S	S	S	S	S	S	S	N	N	N	N	N	E	N	N	N
F	T	F	T	T	F	T	T	T	T	T	T	T	F	F	F	F
P	J	J	P	P	J	J	P	P	J	J	P	P	P	J	J	P
									I	I					I	
									N	N					S	
									T	T					F	
									J	P					J	
															I	
															N	
															F	
															J	
Most frequent match primary, opposite																
I	I	E	E	I	I	E	E	I	I	E	E	I	I	E	E	I
S	S	S	S	S	S	S	S	S	N	N	N	N	E	N	S	N
T	T	T	T	F	F	F	F	F	F	F	F	F	T	T	T	T
J	P	P	J	J	P	P	J	J	P	P	J	J	P	P	J	J
E	E	I	I	E	E	I	I	E	E	E	I	I	E	E	E	I
S	S	S	S	S	S	S	S	S	N	N	N	N	E	N	N	N
T	T	T	T	F	F	T	F	F	F	F	F	F	T	T	F	T
P	J	J	P	P	J	J	P	P	J	J	P	P	P	J	J	P
E		I		E		I		E			I		E			
S		S		S		S		N			N		E			
F		F		T		F		T			T		F			
P	J	J		P		J		P			J		P			
Most frequent match secondary, mass, tandem processes																
I	I	E	E	I	I	E	E	I	I	E	E	I	I	E	E	I
S	S	S	S	S	S	S	S	S	N	N	N	N	E	N	S	N
T	T	T	T	F	F	F	F	F	F	F	F	F	T	T	T	T
J	P	P	J	J	P	P	J	J	P	P	J	J	P	P	J	J
E	I	E	I	E	I	E	E	I	E	E	I	E	E	E	E	I
S	N	S	N	S	S	S	N	S	N	N	N	S	N	S	N	S
T	F	T	F	T	F	T	T	F	T	T	F	T	F	T	F	T
J	P	P	J	P	J	P	P	J	P	P	J	P	J	P	J	P

Note. Derived from Compatibility for Myers Briggs Type Part 2. [online]. Apr-17-2009. [quoted 2.12.2016]. Blog. <<http://pstypes.blogspot.de/2009/04/myers-briggs-compatibility-part-2.html>>. and Compatibility for Myers Briggs Type Part 1. [online]. Mar-31-2009. [quoted 2.12.2016]. Blog. <<http://pstypes.blogspot.de/2009/03/myers-briggs-compatibility-part-1.html>>.

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