Exploitation and Exploration Underpin Business and Insights Underpin Business Analytics

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Abstract. The revolutionary development in the cognitive computing is connected with natural language processing. For example, the IBM Watson Personality Insights service is research-based and IBM's intuition is that writing always reflects the author's personality. The IBM Watson Personality Insights service provides a list of the behaviors that the personality is likely (e.g., treat yourself) or unlikely (e.g., put health at risk) to manifest. However, the usefulness of the objective insights has to figure out in the business context in where the organizations have to perform and conform they duties. Furthermore, the organizations have to predict the future outcomes within several business analytics. In this paper, the ideas around organizational ambidexterity (i.e., exploitation and exploration) are used to clarify the meaning of the objective insights. The objective insights increase the behavior-centric value propositions, as well as, decrease the number of stakeholder-centric business analytics.

Keywords: Exploitation · Exploration · Insights · Principles

1 Introduction

The insight-driven organizations [1] are increasing in future, as well as, insights as services. The insights are generated for further usage, for example, to cover unknown desires or needs (i.e., the human being does not know yet that his desires and needs are formed by this experiences and they have left their marks on his linguistic expressions). When we have insights from the human being, then we will offer him the first of all experiences within products and services the suitability of which corresponds within the needs and desires (or values) of the human being. When we want to be human- or behavior-centric, then we have to learn to question by the mouth of the human being as follows [2]:

- Advise me (i.e., bring expertise to interactions)
- Alert me (i.e., personalize communication within real-time predictive analytics)
- Ask me (i.e., consult on products, services, and social issues)
- Compare me (i.e., offer peer analytics on virtual channel)
- Educate me (i.e., offer digital online and give tips "in the moment")
- Excite me (i.e., offer unexpected services at unexpected moments)

- Find me (i.e., use visualization and analytics to discover segments)
- Grow with me (i.e., connect data and insights the lives and households)
- Know me (i.e., offer new products and services based on understanding desires and needs)
- Let me choose (i.e., offer optional versus prerequisites, roadmaps versus checkboxes)
- Protect me (i.e., offer multifactor security)
- Trade with me (i.e., give in return better products and services based on sharing data, location, and new ideas)

In the dataism era (or data-ism [3]), the world is controlled by the conceptualization in where the concept is defined "abstract entity for determining category membership" [4]. For example, the personality is under conceptualization by cognitive computing. The IBM Watson Personality Insights service [5] applies "linguistic analytics and personality theory to infer traits" [6] from text (e.g., from social media, enterprise data, or other digital communications [7]) - "IBM's intuition is that writing always reflects the author's personality, regardless of the subject matter" [8]. The IBM Watson Personality Insights service uses a corpus of words that reflect the high or low values of particular characteristics [9] at four levels of strength [10]: weak (100 ∼ 1500 words), decent (1500 ∼ 3500 words), strong (3500 ∼ 6000 words) and very strong (6000 + words). The IBM Watson Personality Insights service enables the objective insights of the human beings. The utilizations of the personality insights may differ from self-study to personalized services such as product recommendations [10], matching individuals such as doctor-patient matching because patients prefer doctors who are similar to themselves, monitoring and predicting mental health such as predicting postpartum and other forms of depression from social media, monitoring radical and rogue elements via social media [11]. There are some applications (e.g., Celebrity Match [12] and Investment Advisor [13]) in where the IBM Watson Personality Insights are meaningful part.

One way to bring the insights closer to the experiments in business is to use the same concepts as in business. Nowadays, the evidence-based decision making is required. ISO 9000:2015 has the principle for the evidence-based decision making and the statement of the principle is the follows [14]: "Decisions based on the analysis and evaluation of data and information are more likely to produce desired results". In this paper, the analysis of data and information refers to the business analytics the meaning of which is to predict the outcomes. The evaluation of data and information refers to the business intelligence the meaning of which is to judge the performance. Furthermore, within the business analytics and business intelligence the ideas around organizational ambidexterity (i.e., exploitation and exploration) have been adapted both to clarify the meaning of the business analytics and the objective insights.

The "original meaning of ambidexterity was an individual's capacity to be equally skillful with both hands" [15]. In 1976, Duncan defines organizational ambidexterity to be the ability of an organization to balance short- and long-term objectives. At beginning of the 90's, March replaces short- and long-term objectives within exploitation and exploration. Bøe-Lillegraven crystallizes previous ambidexterity studies as follows [16]: "exploration is linked to growth whereas exploitation is linked to profits". There are a lot

of articles written about organizational ambidexterity. However, there was only one article [16] in where ambidexterity is combined within analytics (Google Scholar, intitle:ambidexterity + intitle:analytics) and it does not handle either business analytics or insights based on cognitive computing. In this paper, the adaption of the organizational ambidexterity is novelty - ambidexterity is combined within business analytics and the objective insights such as the personality ones.

The main aim of this paper is to encourage for experiments around the behavior-centric value proposition based on the objective insights. Therefore, we clarify our ambidexterity adaption within the data- and principle-based extractions and the building blocks of the business models, as well as, we mapped some business analytics within exploitation and exploration (Sect. 2). Furthermore, we clarity whether there are explicit explanations for the personality traits of the IBM Watson Personality Insights service and how we can use them for the planning value proposition (Sect. 3).

2   Ambidexterity and Business

Nowadays data is ennobled for the insights that can be equated within the principles. If we understand the patterns in the data, then it is possible to understand principles [17], and vice versa. There have to be two-way transparency between selected data (i.e., capta "which is taken in analysis" [18]) and principles (Fig. 1). Data have to process from raw data to principles and the principles have to have identified mechanisms (i.e., metrics the sources of which are datasets) that will be used to measure whether the principle has been met or not. By setting metrics for monitor performance, organizations can capture timely information to help drive organizational performance.
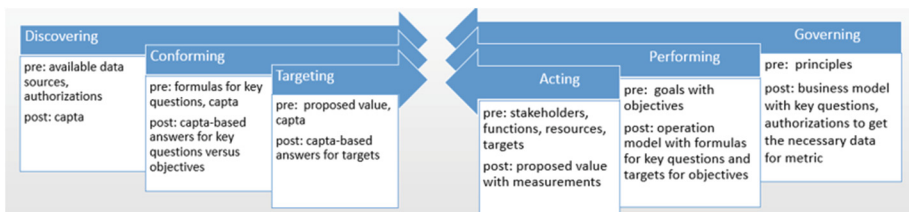

Fig. 1. Data-based and principle-based extractions

When the strategic goals are clear, this means measurable objectives the target of which are set. TOGAF [19] defines the objectives, as time-bounded milestones for enterprises used to demonstrate progress towards goals tracked against measures (i.e., indicators or factors). In generally, the governing body (the "person or group of people who are accountable for the performance and conformance of the organization" [20]) has to understand in where the organizations have to perform and conform they duties, as well as, the governing body familiar with the predictable outcomes within several business analytics. Hence, for example, Bernard Marr has published the world-wide known publications to clarify key questions for analytics and performance [21], key

performance indicators [22], key business analytics [23], and even the construction for strategy board having six panels in where the panel-specific questions are as follows [24]:

- The Purpose Panel - why your business exists, and what you want your business to be in the future?
- The Customer Panel - how much you know about the customers, and what you may need to find out in order to deliver on your strategic objective?
- The Finance Panel - how does your strategy generate money, and are you confident your business model is accurate?
- The Operations Panel - what you need to do internally to deliver your strategy, and what core competencies will you need to excel if you are going to execute your chosen strategy?
- The Resource Panel - what resources you need to deliver your strategy and what you may need to find out?
- The Competition and Risk Panel – what is threatening your success?

Instead of panes or canvases the ideas around organizational ambidexterity are used in this paper both clarifying insight-based business and encouraging for experiments around, for example, new technology. Organizational ambidexterity refers to compete both in mature and new markets and technologies – the mature one is labelled with efficiency, control and incremental improvement; the new one is labelled with flexibility, autonomy, and experimentation [25]. Furthermore, there are some alignments (e.g., strategic intent, critical tasks, competences, structure, controls and rewards, culture and leadership role [26]) that have been taken into consideration when exploitation and exploration have been compared.

Business models are described either within building blocks of Business Model Canvas (BMC) or Lean Canvas. The BMC building blocks as follows [27]: Key partners, Key resources, Value proposition, Customer Relationship, Customer segment, Distribution channel, Revenue stream. However, Lean Canvas replaces five building blocks he following way [28]: Key Partners are Problem, Key activities are Solution, Key resources are Key Metrics, Value Proposition is Unfair Advantage, and Customer Relationship is Unfair Advantage. It is obvious that Business Model Canvas supports mainly exploitation and Lean Canvas supports mainly exploration. However, exploitation and exploration are business models having several interaction or integration mechanisms. For example, Bøe-Lillegraven constructs six dimensions for explore and exploit value chains in where activities can be partly the same. Bøe-Lillegraven illustrates the interaction mechanisms between the following six dimensions: resource allocation, cost structure, value proposition, market performance, revenues, and profits. The resource allocation is the first dimension of the value chains and it seems to be challenges for leaders because they have to be "able to orchestrate the allocation of resources between the old and new business domains" [25].

Nowadays, alternative calculations are made around available resources, cost structure, revenues, and profits. Therefore, we do not take optimization things into the consideration, when we want to find out in where the insights based on cognitive computing reduce the number of needed business analytics. When we map different business analytics within exploitation and exploration we used two dimensions (i.e., value proposition and market performance) of the multi-dimensional conceptual

Table 1. Mapping a set of business analytics

Business analytics	Reason for business analytics	Exploitation	Exploration	Value proposition	Market performance
Customer profitability	Finding money making customers	x		x	x
Product profitability	Finding money making products	x		x	x
Value driver	Clarifying value drivers		x	x	
Non-customer	Finding new opportunities		x	x	
Customer engagement	Estimating impacts on the customer experience	x		x	x
Customer segmentation	Increasing revenue by meeting needs		x	x	
Customer acquisition	Finding problems in the buying process		x	x	
Marketing channel	Where and when prospects and customers are reachable?		x	x	

framework of explore and exploit value chains by Bøe-Lillegraven. Therefore, the selected business analytics [23] concern mainly customers and market (Table 1).

Furthermore, if we found the corresponding performance indicators, then we mapped those within market performance. When we made our mappings, we realized that the most of the business analytics concerns the different stakeholders (e.g., customers, employees and shareholders). Therefore, we exemplified the questions in where the personality insights are in centric (Table 2).

Table 2. Mapping personality insights for business analytics

Business analytic	Trait-based question started by "What are the personality insights"
Customer profitability	… of the founded money making customers?
Product profitability	… of the buyers of the founded money making products?
Value driver	… of the most important stakeholders?
Unmet need, Customer segmentation, Customer engagement, Customer acquisition	… of the customers?
Non-customer	… of the prospects?
Marketing channel	… of the customers per marketing channel?

3 Personality Insights

The IBM Watson Personality Insights service provides [10] a personality scoreboard in where the traits are grouped into the personality insights of three kind (i.e., personality, needs and values) and "each trait value is a percentile score which compares the individual to a broader population". The service provides a list of the behaviors that the personality is likely (e.g., treat yourself, click on an ad, follow on social media) or unlikely (put health at risk, re-share on social media, take financial risks) to manifest. The behaviors are based on studies ``which reveal different correlations between personality traits and behaviors in certain industries or domains' such as follows [10]: spending habits are related to the emotional range, risk profiles to extraversion, and healthy decisions are related to conscientiousness.

"IBM tends to believe that personality evolves within certain bounds, it has conducted no studies to examine the upper and lower bounds of this evolution" [10]. However, IBM gives the following recommendations [10]: work with the latest data and with as much available data as possible, refresh personality portraits at regular intervals to capture individuals' evolving personalities. Furthermore, the Personality Insights service is evolving. For example, we tested within the IBM Watson Personality Insights service [6] the same text (Fig. 2) twice.

There is the research literature [29] behind the words and they have been validated by testing with users. The get personality traits are divided into three groups as follows [30]:

When we will categorize contents the triggers are formed using operators. The operators are used when the sentiments (i.e., positive, negative or neutral) are recognized, for example, from tweets. Furthermore, it is possible to compare sentences to have an algorithm scoring their similarity.

Nowadays, analytics tools support citizen data scientist, for example, hiding the names of techniques (e.g., algorithms) and instead of statistical issues the business-related concepts are used. For example, data contain data items the role of which (e.g., input or target) can vary. However, data modeling level or type (e.g., nominal, ordinal and continuous/interval) affects for patterns and models. For example, nominal data (e.g., names) can be counted, ordinal data (e.g., ratings) can be counted and ordered, and continuous data (e.g., amounts) can be counted, ordered and measured.

When we explore data then we try to find out patterns or models. The exploring is used of instead of the analytics which refers "to extracting useful business patterns or mathematical decision models from preprocessed data set". If there is no real target to steer the analyzing process, then the main aim is to describe patterns (e.g., associations or clusters). If there is the real target, then the main aim is to build models (e.g., networks, regressions and trees).

Fig. 2. Example text for the IBM Watson personality insights service

- Big Five describe "how a person engages with the world". The model includes the following five primary dimensions (Tables 3, 4, 5, 6 and 7) the six facets of which further characterize an individual according to the dimension.
- Values describe motivating factors that influence a decision making. The model includes five dimensions of human values as follows: Self-transcendence/Helping others, Conservation/Tradition, Hedonism/Taking pleasure in life, Self-enhancement/Achieving success, Open to change/Excitement.
- Needs describe which aspects of a product will resonate with an individual. The model includes twelve characteristic needs as follows: Excitement, Harmony, Curiosity, Ideal, Closeness, Self-expression, Liberty, Love, Practicality, Stability, Challenge, and Structure.

We got partly different summaries (Fig. 3) and there were only two facets, Intellect and Authority-challenging, have decreased one percent from 100 to 99 (Fig. 4). There are explicitly explanations for the Big Five sentences [31]. However, we did not find out explanations for the sentences of Needs and Values. Furthermore, there are a lot of properties [32] for primary and secondary dimensions without explanations for the sentences (e.g., "You are shrewd and inner-directed") based on those properties of the summaries.

There are some traits which characterize that the personality can predict some outcomes. For example, conscientiousness predicts job performance and extraversion

Table 3. Facets of openness (openness is "the extent to which an individual is open to experiencing a variety of activities")

Facet	High explanation	Low explanation
Adventurousness	Adventurous: "You are eager to experience new things"	Consistent: "You enjoy familiar routines and prefer not to deviate from them"
Artistic interests	Appreciative of art: "You enjoy beauty and seek out creative experiences"	Unconcerned with art: "You are less concerned with artistic or creative activities than most people"
Emotionality	Emotionally aware: "You are aware of your feelings and how to express them"	Dispassionate: "You do not frequently think about or openly express your emotions"
Imagination	Imaginative: "You have a wild imagination"	Down-to-earth: "You prefer facts over fantasy"
Intellect	Philosophical: "You are open to and intrigued by new ideas and love to explore them"	Concrete: "You prefer dealing with the world as it is, rarely considering abstract ideas"
Authority-challenging (i.e., liberalism)	Authority-challenging: "You prefer to challenge authority and traditional values to effect change"	Respectful of authority: "You prefer following with tradition to maintain a sense of stability"

Table 4. Facets of conscientiousness (conscientiousness is a "tendency to act in an organized or thoughtful way")

Facet	High explanation	Low explanation
Achievement-striving	Driven: "You set high goals for yourself and work hard to achieve them"	Consistent: "You enjoy familiar routines and prefer not to deviate from them"
Cautiousness	Deliberate: "You carefully think through decisions before making them"	Bold: "You would rather take action immediately than spend time deliberating making a decision"
Dutifulness	Dutiful: "You take rules and obligations seriously, even when they are inconvenient"	Carefree: "You do what you want, disregarding rules and obligations"
Orderliness	Organized: "You feel a strong need for structure in your life"	Unstructured: "You do not make a lot of time for organization in your daily life"
Self-discipline	Persistent: "You can tackle and stick with tough tasks"	Intermittent: "You have a hard time sticking with difficult tasks for a long period of time"
Self-efficacy	Self-assured: "You feel you have the ability to succeed in the tasks you set out to do"	Self-doubting: "You frequently doubt your ability to achieve your goals"

Table 5. Facets of extraversion (extraversion is "a tendency to seek stimulation in the company of others")

Facet	High explanation	Low explanation
Activity level	Energetic: "You enjoy a fast-paced, busy schedule with many activities"	Laid-back: "You appreciate a relaxed pace in life"
Assertiveness	Assertive: "You tend to speak up and take charge of situations, and you are comfortable leading groups"	Demure: "You prefer to listen than to talk, especially in group situations"
Cheerfulness	Cheerful: "You are a joyful person and share that joy with the world"	Solemn: "You are generally serious and do not joke much"
Excitement-seeking	Excitement-seeking: "You are excited by taking risks and feel bored without lots of action going on"	Calm-seeking: "You prefer activities that are quiet, calm, and safe"
Outgoing (i.e., friendliness)	Outgoing: "You make friends easily and feel comfortable around other people"	Reserved: "You are a private person and do not let many people in"
Gregariousness	Sociable: "You enjoy being in the company of others"	Independent: "You have a strong desire to have time to yourself"

Table 6. Facets of agreeableness (agreeableness is a "tendency to be compassionate and cooperative toward others")

Facet	Explanation of summary for high value	Explanation of summary for low value
Altruism	Altruistic: "You feel fulfilled when helping others and will go out of your way to do so"	Self-focused: "You are more concerned with taking care of yourself than taking time for others"
Cooperation	Accommodating: "You are easy to please and try to avoid confrontation"	Contrary: "You do not shy away from contradicting others"
Modesty	Modest: "You are uncomfortable being the center of attention"	Proud: "You hold yourself in high regard and are satisfied with who you are"
Uncompromising (i.e., morality)	Uncompromising: "You think it is wrong to take advantage of others to get ahead"	Compromising: "You are comfortable using every trick in the book to get what you want"
Sympathy	Empathetic: "You feel what others feel and are compassionate toward them"	Hard-hearted: "You think people should generally rely more on themselves than on others"
Trust	Trusting of others: "You believe the best in others and trust people easily"	Cautious of others: "You are wary of other people's intentions and do not trust easily"

Table 7. Facets of emotional range (emotional range is "the extent to which emotions are sensitive to the environment")

Facet	High explanation	Low explanation
Fiery (i.e., anger)	Fiery: "You have a fiery temper, especially when things do not go your way"	Mild-tempered: "It takes a lot to get you angry"
Prone to worry (i.e., anxiety)	Prone to worry: "You tend to worry about things that might happen"	Self-assured: "You tend to feel calm and self-assured"
Melancholy (i.e., depression)	Melancholy: "You think quite often about the things you are unhappy about"	Content: "You are generally comfortable with yourself as you are"
Impulsiveness (i.e., immoderation)	Hedonistic: "You feel your desires strongly and are easily tempted by them"	Self-controlled: "You have control over your desires, which are not particularly intense"
Self-consciousness	Self-conscious: "You are sensitive about what others might be thinking of you"	Confident: "You are hard to embarrass and are self-confident most of the time"
Susceptible to stress (i.e., vulnerability)	Susceptible to stress: "You are easily overwhelmed in stressful situations"	Calm under pressure: "You handle unexpected events calmly and effectively"

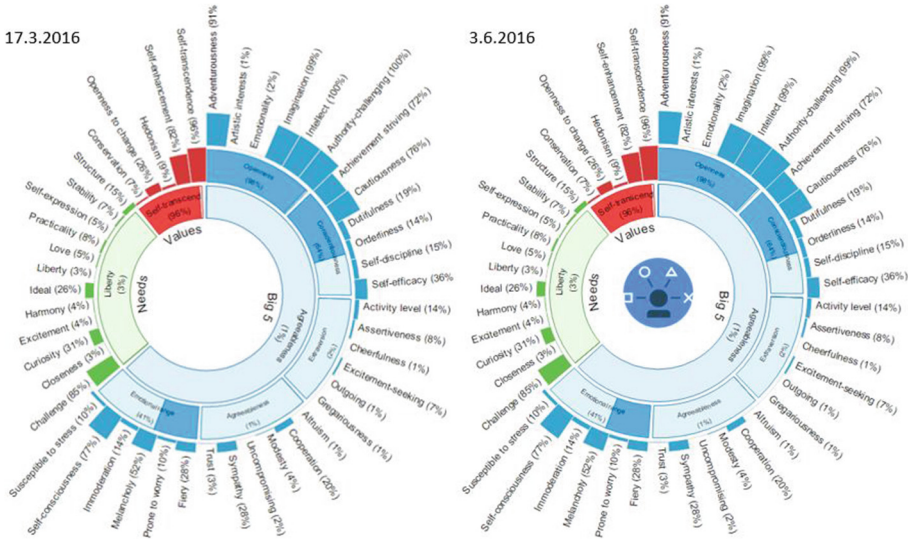**Fig. 3.** Examples of summaries

Fig. 4. Examples of sunbursts

Table 8. Examples of mappings between primary characteristics and outcomes

Openness	Conscientiousness	Emotional range	Agreeableness	Extraversion	Outcome
High					Try new thing
High					Respond to product respond
	High				Not abuse credits cards
		Low			Abuse credits cards
	Low		Low		Avoid to take risks
				High	Take risks
High	High				Self-improvement
High	High			High	Greater life expectancy
		High			Consume high-fat food
	High				Consume low-fat food
High					Try varied diet
			High		Participate religious practices

indicates job satisfaction. However, we collected 12 outcomes [30] (Table 8) which can be explicitly relate within primary characteristics. Actually, the primary characteristics are called social propensities in the Tone Analyzer service [33].

The Celebrity Match service in where the personality traits (Table 9) are adapted in the way that might decreases the credibility of the IBM Watson Personality Insights service. However, the matching idea comes clear, for example, when the prime minister of Finland has nearly same values as Dalai Lama (Fig. 5).

When we offer experiences within products and services, then it is crucial to understand that the consciousness of the human being is the wholeness of the experiences [34] the contents of which can be qualitatively (consciousness degree, clarity and linguistic to be indicated) different. The human being gets both intentional and unintentional experiences [35]. The intentional experience can be either manifest or latent. The manifest experience will be immediately understood. However, the latent one can be evolved the manifest one, for example, with the help of teaching, growing, psychotherapy or self-assessment. The human being is allowed and he should have unintentional experiences, such as concerts, only for affecting his well-being state. When we are going to arrange or offer experiences of different kind, for example, to our customers, then we adapt the names of the expected experiences as follows: manifest experiences are insightful ones, latent experiences are challenging ones, and unintentional experiences are sensuous (even attractive) ones. When we map the traits (Table 10) within the expected experiences of different kind then we will be behavior-centric when we plan value propositions.

Table 9. Example of adapted personality traits

Extremes of Celebrity match		Personality	Needs	Values
Cautious	Curious	X		
Easy Going	Organized	X		
Reserved	Outgoing	X		
Analytical	Compassionate	X		
Confident	Sensitive	X		
Ease	Challenge		X	
Independence	Belonging		X	
Fulfillment	Exploration		X	
Calm	Excitement		X	
Contentedness	Acceptance		X	
Imperfection	Perfection		X	
Restraint	Freedom		X	
Introversion	Extroversion		X	
Complacency	Eagerness		X	
Obliviousness	Identification		X	
Risk	Stability		X	
Flexibility	Structured		X	
Modernity	Tradition			X
Constancy	Stimulation			X
Stoicism	Hedonism			X
Non-conformity	Conventionality			X
Egoism	Selflessness			X

Fig. 5. Celebrity match between Juha Sipilä and Dalai Lama

Table 10. Some personality traits mapped within experiences

Personality trait	Explanation	Insightful	Challenging	Sensuous
Adventurousness	Adventurous: "You are eager to experience new things"	x	x	x
Impulsiveness	Hedonistic: "You feel your desires strongly and are easily tempted by them"			x
Artistic interests	Appreciative of art: "You enjoy beauty and seek out creative experiences"			x
Imagination	Down-to-earth: "You prefer facts over fantasy"	x		
Liberalism	Authority-challenging: "You prefer to challenge authority and traditional values to effect change"		x	
Intellect	Philosophical: "You are open to and intrigued by new ideas and love to explore them"	x		

4 Discussion

We found the zoo of performance indicators and even business analytics. Therefore, we illustrated the business analytics mapping within exploitation and exploration. Furthermore, we took two building blocks (i.e., value proposition and market performance) to fulfill our construction in where we mapped the set of business analytics. When we made our mappings between the business analytics and insights, we realized that the most of the business analytics concerns the different stakeholders (e.g., customers, employees and shareholders). Usually, when the organizations are interested in the engagements of the stakeholders, then the personality insights are reasonable form to them.

When the organization find out balance between exploitation and exploration, it can allocate resources optimally. Hence, within data-driven optimization the understanding organizational ambidexterity, i.e., the organization has to improve and invent at the same time, are needed. The pressures for performance and conformance together with prediction are growing when the organizations either compete or try to be more effectiveness. Therefore, we believe that the understanding the possibilities of the objective insights is crucial. However, the insights have to be actionable ones. Therefore, we constructed both business analytics based mappings within the insights, as well as, the personality traits mappings within the expected experiences (i.e., intentional and unintentional ones the names of which can be modified in value proposition).

If the insights services are going to be used for value propositions, then the insights have to be transparent, i.e., the explanations have to be explicit. Furthermore, the organizations have to form their own points of view for the adaptions of the insights. In future, both experiments and research are needed around the presented constructions.

Especially, the traits of the IBM Watson Personality Insights service are difficult to understand without explanations the reason of why we collected the explanations of Big Five to this paper. The value proposition based on the personality insights might get the new points of view as follows: if you are going to give even provocative experiences then the authority-challenging personalities might be the best audience, if your audience is philosophical ones then well-argument things might be reasonable to offer with a straightforward style. However, the organizations have to make their own experiments if they want to achieve either competitive advantages or effectiveness by adapting the objective insights.

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