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# An Integrated Cognitive-Motivational Model of Ikigai (Purpose in Life) in the Workplace

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## Abstract

In the Japanese philosophy of life, ‘ikigai’ broadly refers to having a ‘reason for living’, or a purpose in life. From a phenomenological and empirical viewpoint, ikigai is reported to increase human well-being and even life expectancy. However, it remains difficult to translate, define and formalize with regard to contemporary psychological theories. In this respect, the aim of this paper is twofold: to capture as accurately as possible what ikigai is, and to examine whether the concept applies to a professional context. We first offer a comprehensive overview of ikigai, bridge the gap between this specific body of literature and related psychological theoretical frameworks, such as those addressing motivation, well-being, and attention. On this basis, we conceptualize an integrated cognitive-motivational model of ikigai using an IPO (Input-Process-Output) framework: we organize dispositional or situational factors supposedly supporting ikigai as inputs, fueling the core process of ikigai (mainly built from motivational and attentional mechanisms), which produce outcomes (including well-being). A feedback loop completes the model and allows the process to maintain over time. This conceptual proposal is a first step towards applying and testing the model in professional contexts, in order to renew our approach of engagement, well-being, and performance at work as well as inspire workplace evolution.

## Keywords

Ikigai, Work motivation, Well-being, Mindfulness.

Ikigai was introduced in Japanese literature by Kamiya (1966) and, although it has no exact translation, it refers to a sense of "life worth living" (Kotera et al., 2021; Weiss et al., 2005), encompassing well-being (Shirai et al., 2006), "purpose in life" or "reason for living" (Mathews, 1996; Mori et al., 2017; Sone et al., 2008). It can be defined as "a feeling obtained by a person who is doing something useful for someone else or society and, consequently, feels that life is worth living" (Fukuzawa et al., 2018, p. 1). However, to date, there is no consensual academic definition of ikigai (Kumano, 2003).

Two decades of essentially Japanese empirical research on ikigai have been conducted in medicine (Ishida, 2012; Nakanishi, 1999; Shirai et al., 2006; Sone et al., 2008), psychology (Fukuzawa et al., 2018; Kamiya, 1966; Kumano, 2012, 2018), education (Hikmawan et al., 2019), anthropology (Mathews, 1996; Murray, 1993), and social sciences (Kono et al., 2019). Ikigai is said to improve health (Nakanishi, 1999) and longevity (Sone et al., 2008; Tanno et al., 2009) by reducing risks of all-cause mortality. As such, it appears as an inspiring concept intrinsically linked to Japanese unique culture.

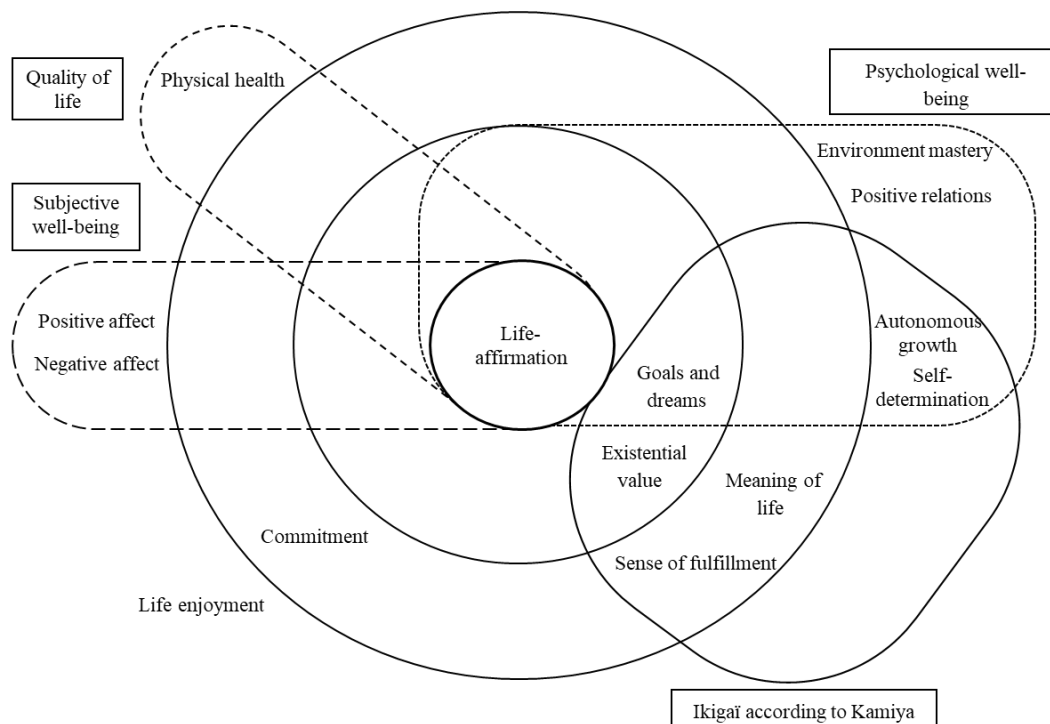
Our aim is first to understand whether ikigai can be fully modelled based on existing psychological theories, or whether it brings a new approach to scholarly view on well-being, motivation and related concepts. After presenting literature dedicated to ikigai in the first place, we will link it to current psychological theories, including Self-Determination Theory (Deci & Ryan, 2000), the PERMA theory of building blocks of well-being (Positive emotions, Engagement, positive Relationships, Meaningfulness and Accomplishment; Seligman, 2011), and Mindfulness (Ryan et al., 2008). Secondly, we also wish to bridge the gap between ikigai as a philosophy of life and self-fulfillment at work, which can be approached for example through the Theory of Purposeful Work Behavior (Barrick et al., 2013), or the Job Characteristics Model (Hackman & Oldham, 1976). We present these insights organized as a process that we call the integrated cognitive-motivational model of ikigai.

## Ikigai as a Unique Japanese Concept

Beyond linguistic specificities, ikigai may be difficult to translate and define because of cultural specificities. Anthropological studies have emphasized differences between Japanese and North American self (Kotera et al., 2021; Mathews, 1996; Smith, 1991). Japanese self may be more contextual and socio-centric (Mathews, 1996), with Japan's cultural profile lying in the middle (46/100) of the individualism/collectivism dimension (Hofstede et al., 2010). In contrast, North American conception of the self seems particularly individualistic (Spiro, 1993), specifically in the USA (which scores 91/100 on individualism; Hofstede et al., 2010). In individualistic cultures "*societies exist to promote the well-being of individuals*" (Oyserman & Lee, 2008, p. 311); individuals are encouraged to define themselves as autonomous and distinct from others. Conversely, collectivism is group-centered: "*societies exist, and individuals must fit into them*" (Oyserman & Lee, 2008, p. 311), which means that individuals are encouraged to define themselves in terms of relationships with others. Consistently, East Asian people value interdependence (to friends and family), whereas North Americans value independence (Fukuzawa et al., 2018; Markus & Kitayama, 1991). Individualistic cultures are also more horizontal (equality of relationships with others), while collectivist cultures are more vertical (hierarchy; Singelis et al., 1995). Finally, people from individualistic and collectivistic cultures have different cognitive patterns and values which affect the way they interpret information and make decisions (Oyserman & Lee, 2008): cultures may value intrinsic or extrinsic motivation, and influence how universal needs are expected to be met. For example, cultures have different definitions of achievement: collectivist cultures value contribution to the group while individualist cultures value individual accomplishment (Ryan & Deci, 2000). Similarly,

individualistic cultures focus on personal needs and desires, while collectivistic cultures consider the needs and desires of others (Markus & Kitayama, 1991). In this context, how would people from individualistic cultures capture the concept of ikigai?

In Japan, the desire for ikigai is considered universal (Kamiya, 1966; Nakanishi, 1999) and may contribute to meet seven needs: (1) Survival, (2) Growth and Change, (3) Future such as life goals and dreams, (4) Influence (being necessary to others), (5) Freedom of choice, (6) Self-fulfilment or personal development through one's potential (autonomous growth), and (7) Meaning of life (a sense of value and worth of one's own life). In an attempt to formalize ikigai (Kumano, 2006, 2012), four factors described as psychological states were identified (Life-affirmation, Meaning of life, Life fulfilment, and Existential value), as well as five cognitive value-laden mechanisms through which people perceive life worthiness: (1) making sense of the past, (2) setting future goals, (3) being absorbed in the positive present, (4) accepting negative situations, and (5) coping with negative situations. Kumano (2013) further emphasizes the link between the four-factor model and the five value-laden mechanisms. This conceptualization gave rise to a hierarchical model highlighting central and peripheral elements of ikigai (Figure 1, Kumano, 2006, 2012). Key components of ikigai would be life-affirmation, goals and dreams, meaning of life, existential value, a sense of fulfilment, and commitment. Subjective well-being, psychological well-being, and quality of life would not be central to ikigai (Kumano, 2012).



**Figure 1. The Structure of Ikigai and Similar Concepts (adapted from Kumano, 2006, our translation).**

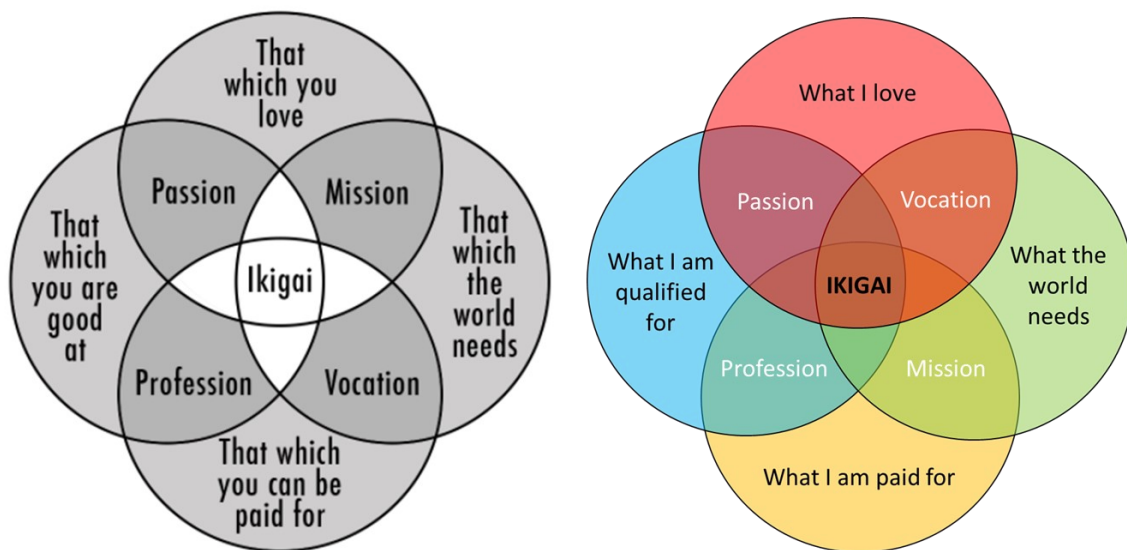
This model provides a better understanding of the Japanese view of ikigai. It also highlights a few inconsistencies between Kumano's and Kamiya's views regarding the core concepts of ikigai (as pointed out in Figure 1). Finally, although this model has been used in many Japanese ikigai studies, it lacks parsimony.

In Ohsaki's Study (Sone et al., 2008), which is a longitudinal study with 43,391 participants over seven years, ikigai was measured through simple questions like "Do you have ikigai in your life?" (Sone et al., 2008; Tanno et al., 2009). The results suggested that subjects who did not find their ikigai exhibited higher risks of all-cause mortality. Ikigai was mainly

investigated with elderly people to study longevity in blue zones<sup>1</sup> (Fukuzawa et al., 2018; Nakanishi, 1999; Shirai et al., 2006; Tanno et al., 2009), and with students (Hikmawan et al., 2019; Kono et al., 2019; Kumano, 2003). These studies highlight, for example, the role of social network for elderly people (Fukuzawa et al., 2018), and ikigai decline with age (Fukuzawa et al., 2018; Nakanishi, 1999).

A large part of these studies was conducted in Japan (Fukuzawa et al., 2018; Iida & Oguma, 2013; Kono et al., 2019; Shirai et al., 2006; Sone et al., 2008; Tanno et al., 2009), others in Indonesia (Hikmawan et al., 2019). In Europe, Ikigai-9 scale (Imai, 2012) was translated into English and French (Fido et al., 2019; Vandroux & Auzoult-Chagnault, 2023) but did not give rise to intercultural studies to date. Some studies published only in Japanese (Kumano, 2003, 2006) support the cultural specificity of the concept (Nakanishi, 1999), which may question the portability of this life philosophy to other cultures.

In the USA, ikigai is represented by Winn's diagram (Figure 2), which builds on four areas: "what you love", "what the world needs", "what you are good at", and "what you are paid for", the intersection of which being named ikigai. This diagram does not come from the scientific literature and its origins are uncertain. Initially, it was meant to represent purpose (Zuzunaga, 2012): the "Purpose Venn Diagram" ultimate intersection was named "purpose" (i.e., "Propósito" in Spanish) instead of ikigai. Besides, a TedTalk conference titled "How to live 100+" (Buettner, 2009) revealed to a predominantly North American audience that ikigai was a reason for long-living in Okinawa. These two sources may have inspired the publication of a blog post (Winn, 2014) presenting an adaptation of the Purpose Venn Diagram renaming the intersection "ikigai". Winn (2014) also renamed the field "what you are paid for" by "that which you can be paid for" without elaborating on his choice, while the other three areas are formulated as achievements, not potentials. Intermediary intersections also show discrepancies between "profession" and "mission". We present below an iteration on Winn's (2014) diagram with simplified labels for the areas (Figure 2) and use of the first person for appropriation purposes. We also swapped "mission" and "vocation", as a "mission" refers to an important assignment and may be more likely associated to an external reward while "vocation" refers to a strong sense of fit for a career and may be more likely associated to personal liking.



<sup>1</sup>The five blue zones are regions of the world where a significant number of people live much longer and better. They are Ikaria in Greece, Okinawa in Japan, Sardinia in Italia, Loma Linda in U.S.A and Nicoya Peninsula in Costa Rica.

**Figure 2. Winn (2014) Diagram of Ikigai (left) and our Adaptation (right).**

The viral nature of Winn's (2014) diagram could be due to its simplicity and accessibility to represent a profound Japanese concept. It is also inspiring as it prompts anyone to question life meaningfulness. Another strength of this representation is to articulate personal factors ("what I love" and "what I am qualified for"), external rewards ("what I am paid for") and altruistic purposes ("what the world needs"). Indeed, ikigai is positively correlated to a cooperative view of life and negatively correlated to contemplative life (Kumano, 2003). These features emphasize the significance of interpersonal or outward achievement in building a sense of self.

This diagram nonetheless shows some limitations. For example, the economic dimension ("what you are paid for") is subject to debate as ikigai can be reached independently from any financial reward (Nakanishi, 1999). Ikigai can be both the source of value in one's life or what makes life worth living and the mental and spiritual circumstances under which individuals feel that their lives are valuable. Beyond work, ikigai can be reached in one's family life or leisure time. Economic rewards are usually not referred to in Japanese literature except for one research including financial status as social capital (Fukuzawa et al., 2018).

Given these issues, a theoretical and testable model of ikigai is needed for improving our understanding of this concept and inspire new ways of viewing life and work. To our best knowledge, no attempt to provide a cognitive conceptualization of ikigai was made before.

## **An Integrated Cognitive-Motivational Model of Ikigai**

The lack of formal model of ikigai makes it difficult to use it as an intervention framework in the field. This is consistent with the view that ikigai is a "complex process and its role in mental and physical conditions difficult to measure" (Nakanishi, 1999, p. 323). Our model highlights both preconditions and benefits in terms of well-being (Shirai et al., 2006), health (Nakanishi, 1999; Sone et al., 2008), and performance (our hypothesis).

A cognitive process can be described through a causality chain linking Inputs, core Processes, and Outputs (I-P-O model, Šimleša et al., 2018). Such a model may provide a logical and straightforward vision of a complex process. Inputs are the conditions for the processes to start, what we can act upon. Core processes transform inputs into outputs. In a cognitive model, they correspond to individual intrapersonal unobservable mechanisms. An integrated cognitive-motivational model of ikigai refers to motivational and attentional functions as core processes. Finally, outputs are the observable and/or objective consequences we expect to achieve (e.g., behavior, psychological states), which also contribute to maintaining the system through a feedback loop.

This model of ikigai is based on core processes composed of self-determination, fundamental needs, and mindfulness. We assume that these processes are triggered by two types of inputs: dispositional factors (causality orientation), and situational factors (social and physical work environment). Finally, outputs include well-being, physical health, and performance (see Figure 3). Ikigai process is self-nourished by a commitment feedback loop.

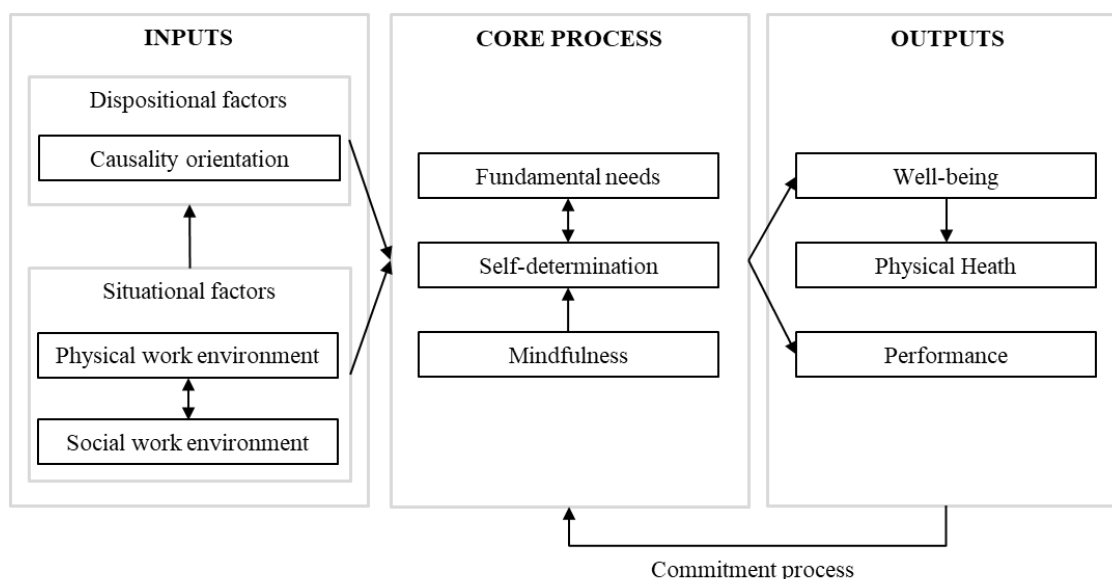


Figure 3. An Integrated Cognitive-Motivational Model of Ikigai.

### Core Processes: Basic Needs, Self-Determination and Mindfulness

In Japanese literature, self-determination has already been included as a component of ikigai (Kumano, 2006), which directly refers to Self-Determination Theory (Deci & Ryan, 2000). Self-determination theory links human motivation to needs satisfaction, and includes three fundamental needs - need for competence, autonomy, and relatedness. Competence refers to the need to feel efficient and able to perform tasks at diverse levels of difficulty; autonomy corresponds to being at the root or source of one's activities; and relatedness refers to the need to feel associated to and supported by others. These higher-level goals refer to purposeful motivational strivings (Barrick et al., 2013) and meeting these needs results in psychological growth and well-being.

Self-determination theory mainly contrasts intrinsic and extrinsic motivation (Deci & Ryan, 1985, 2000, 2002), notably in a work context (Deci et al., 2017; Gagné & Deci, 2005). Intrinsic motivation refers to activities conducted for themselves, for pleasure, without external constraint (Deci & Ryan, 2000). An intrinsically motivated individual will perform activities for their own sake, without the need for reinforcement. Extrinsic motivation is characterized by reinforcements that are external to the individual (e.g., rewards).

Self-determination theory introduces variations of extrinsic motivation along a regulation continuum (Table 1) ranging from the least self-determined motivation (extrinsic) to the most self-determined one (intrinsic). In between, motivation is more or less internalized and characterized by five types of regulations (Deci & Ryan, 2000).

Behavior	Non-determined		Self-determined			
Type of Motivation	Amotivation	Extrinsic motivation				Intrinsic motivation
Type of Regulation	Non-regulation	External regulation	Introjected regulation	Identified regulation	Integrated regulation	Intrinsic Regulation
Locus of Causality	Impersonal	External	Somewhat external	Somewhat internal	Internal	Internal

**Table 1. The Self-Determination Continuum (from Deci & Ryan, 2000, p.237).**

Individuals expressing external regulation seek to achieve positive consequences which do not depend on themselves, such as obtaining rewards and avoiding negative consequences (e.g., punishment; Deci & Ryan, 2000). In introjected regulation, individuals seek to achieve internal positive consequences (e.g., self-esteem) and avoid negative consequences (e.g., feelings of guilt or shame). Identified regulation introduces the notion of values: individuals identify with the perceived value of a behavior. Identification contributes to the internalization of values, which generates commitment and performance (Deci & Ryan, 2000). Finally, integrated regulation "involves identifying with the importance of behaviors but also integrating those identifications with other aspects of the self" (Deci & Ryan, 2000, p. 236).

Self-determination theory seems to overlap in many ways with ikigai: Japanese literature mainly refers to intrinsic factors, but extrinsic factors are not excluded (Fukuzawa et al., 2018) and introjected motivation is mentioned through self-esteem (Kumano, 2006; Shirai et al., 2006). Identified and integrated regulation processes are also identifiable through the role of existential values for ikigai (Kamiya, 1966; Kumano, 2006).

Regarding fundamental needs, ikigai may be predominantly linked to the need for relatedness, which should generally be more salient in collectivist cultures. The social dimension of ikigai was also observed in empirical research (Fukuzawa et al., 2018). Furthermore, ikigai contributes to meeting needs for autonomy and competence through, for example, self-fulfillment, freedom of choice, and autonomous growth (Kamiya, 1966; Kumano, 2006).

Self-determination theory also fits to Winn's diagram of ikigai. Intrinsic regulation corresponds to "what I love", extrinsic regulation to "what I am paid for", introjected regulation to "what I am qualified for" and identified as well as integrated regulation to "what the world needs". However, there may be variations in the relative importance of identified vs. intrinsic motivation between self-determination theory and ikigai. As self-determination theory is focused on personal growth, intrinsic motivation is considered as the ultimate achievement, whereas in ikigai philosophy, and consistent to its definition, meaningfulness, usefulness, or altruistic goals should be considered above intrinsic pleasure and satisfaction. The "What the world needs" area may bring most of the inspirational power of Winn's diagram, because this idea of achieving something greater than one's own pleasure (self-transcendence) leads one to question the meaning of life in a deeper way.

More recent developments of self-determination theory account for this issue. For example, it was stressed that competitive individualism and capitalistic societies may hinder altruism and prosocial purposes, as well as lead to unsustainable attitudes and behaviors (Ryan et al., 2008). Self-determination alone cannot balance such sociocultural bias: the awareness of what is worth doing, the desire to make meaningful choices and the realignment to one's values require the mindfulness process. Mindfulness is defined as "awareness of what is occurring in the present moment, and is characterized by an open and receptive processing of events, both internal and external" (Ryan et al., 2008, p. 158). Mindfulness is also central to eudaimonia or psychological well-being. Hence, we decided to include mindfulness as a core process of ikigai.

Mindfulness is defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). It is a state of open and receptive awareness and processing of events. Contrary to flow, which is a narrow and internally-oriented attentional focus (Šimleša et al., 2018), mindfulness would rather correspond to a large and externally oriented attentional focus. Mindfulness emerges through intention, attention, and attitude



(Ruedy & Schweitzer, 2010; Shapiro et al., 2006, 2008) and its benefits on mental and physical health are well documented (Hölzel et al., 2011; Kabat-Zinn, 1982): it promotes well-being (Birtwell et al., 2019; Walsh & Shapiro, 2006), improves performance and relationships (Schultz et al., 2015) including in professional contexts (Chiesa & Serretti, 2009; Lau et al., 2006). It also increases leadership skills (Brewer et al., 2011).

## Inputs

As the Japanese model of ikigai does little to integrate dispositional and situational factors, we investigated preconditions to self-determination and integrated them as ikigai potential drivers. We distinguish between situational and dispositional inputs to self-determination in the workplace (Barrick et al., 2013; Gagné & Deci, 2005): situational inputs can be found in physical and social environment (e.g., job content, job context, and work climate), and dispositional input correspond to individual differences (e.g., causality orientation, personality).

### **Situational Factors: Social and Physical Work Environment**

According to the Cognitive Evaluation Theory, situational variables may impact motivation by affecting the feeling of autonomy and/or competence (Deci & Ryan, 1985; Gagné & Deci, 2005; Vallerand et al., 1987). The so-called "perceived locus of causality" ranges from internal (feeling of autonomy) to external (feeling controlled). External events can move the locus of causality: for example, a tangible reward can decrease the sense of freedom and intrinsic motivation while a merit reward can increase one's feeling of competence and intrinsic motivation.

Situational factors include psychological and environmental working conditions, which impact job satisfaction (Pujol-Cols & Dabos, 2019). For example, job characteristics (skill variety, task identity and significance, autonomy, feedback) can foster intrinsic motivation (Hackman & Oldham, 1976; Piccolo & Colquitt, 2006).

Physical work environment is also considered as an input or a moderator to self-determination (Bamberger, 2008), as it impacts work satisfaction, performance (Bechtel, 2010; Chandrasekar, 2011), communication, collaboration (Brill & Weidemann, 2001), engagement, and employee morale (Chandrasekar, 2011). In line with the Theory of Purposeful Work Behavior, discordant work situations, inconsistencies or lack of compatibility with basic needs should be removed from work environment (Barrick et al., 2013) to prevent any detrimental effect on ikigai.

### **Dispositional Factors: Causality Orientation**

Dispositional factors are relatively stable variables (Caspi et al., 2005; Dormann et al., 2006) that affect attitudes and behaviors at work (Judge et al., 2008; Ones et al., 2007; Pujol-Cols & Dabos, 2019) as well as work motivation (Austin & Klein, 1996). Consistently to the three-level hierarchical model of motivation (personality, life domain, and state motivation; Vallerand, 1997), Amabile et al. (1994) show that intrinsic-extrinsic motivational orientation is relatively stable across time and situations. The Causality Orientation Theory (Deci & Ryan, 1985) even considers this motivational orientation as a trait. Finally, dispositional and situational factors interact: autonomous causality orientation leads to intrinsic motivation disregarding situational factors (Gagné & Deci, 2005) and controlled orientation promoting extrinsic motivation is more strongly influenced by job characteristics.

## Outputs

The Japanese model of ikigai is more accurate on outputs, which is consistent to seeing ikigai as a state. On the basis of both ikigai and self-determination literature, we integrated three outputs: well-being, physical health, and performance.

### Well-Being as a Psychological State

As ikigai can be viewed as a process and well-being is a state (Imai et al., 2009), the question of the relationship between ikigai and well-being is central to the Japanese literature (Fukuzawa et al., 2018; Iida & Oguma, 2013; Kumano, 2006; Shirai et al., 2006). Subjective or hedonic well-being relates to how people feel and think about their lives (Diener, 1984). It combines an affective dimension (high levels of positive affect and low levels of negative affect) and a cognitive dimension relying on global life satisfaction and on evaluation of specific life domains (e.g., job satisfaction or marital satisfaction). Psychological well-being, also called eudemonic well-being (Ryan & Deci, 2001), is another construct based on cognitive evaluations of long-term life experience such as autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The distinction between all these constructs (subjective, affective, cognitive and psychological well-being) is theoretical and conceptual, but empirical studies tend to show that all well-being dimensions are positively intercorrelated (Anglim et al., 2020). Furthermore, although life events impact subjective well-being, in particular in its cognitive dimension (Luhmann et al., 2012), well-being in general appears to be rather stable over time and related to personality profile for about half of its variance (Anglim et al., 2020). It is also interesting to note that the causal relation from subjective well-being to job satisfaction seems to be stronger than the causal relation from job satisfaction to subjective well-being (Bowling et al., 2010).

From a linguistic viewpoint, ikigai is closer to eudemonic well-being and "Shiawase" better corresponds to hedonic well-being. Although ikigai literature mentions all kinds of well-being (Fukuzawa et al., 2018; Shirai et al., 2006; Tanno et al., 2009), the Japanese ikigai model (Kumano, 2006) also emphasizes eudemonic well-being as more central than hedonic well-being. In our aim to formalize a testable model of ikigai in a professional context, we chose to include well-being through the PERMA framework, as it is a theory of the building blocks of well-being (Seligman, 2018) and may contribute thereby to understand ikigai dynamics more accurately. Those building blocks are: Positive emotions (feeling joyful), Engagement (interest and absorption in the task), positive Relationships (satisfaction with one's social relationships), Meaning (the belief that one's life is valuable and connected to something greater), and Accomplishment (making progress, experiencing self-esteem and sense of achievement). PERMA components have been independently validated as contributing to overall well-being (Kern et al., 2015; Seligman, 2011). The Japanese model of ikigai (Kumano, 2006) includes at least four PERMA components: positive affects (P), positive relations (R), meaning of life (M) and sense of fulfillment (A). They are all positioned from the second to the third peripheral level of ikigai, which is consistent with their output status in our model.

PERMA appears as a consistent output to our core processes, as self-determined, intrinsic levels of motivation directly generate pleasure (P), engagement (E) and accomplishment (A). Besides, positive relations (R) and accomplishment (A) correspond to fundamental needs (relatedness and competence) motivating self-determination process and meaning (M) may result from the mindfulness process.

## **Physical Health**

Consistent to the Japanese model which integrates it peripherally, we consider physical health as an output. Finding and experiencing ikigai is frequently associated to better physical health (Kotera et al., 2021), and a weak ikigai is associated to "poor general health" (Nakanishi, 1999). In particular, ikigai reduces risks of diseases (Sone et al., 2008; Tanno et al., 2009). Furthermore, research also addresses the link between well-being and physical health – in particular subjective well-being (Diener & Chan, 2011). Engagement (E) and meaning (M) could play an important role in this link (Roepke et al., 2014).

## **Performance**

Although ikigai literature does not explicitly refer to performance, we added this output for two main reasons. Firstly, our aim to model ikigai in the workplace calls for further examination of the effects of ikigai on performance. Secondly, performance is considered as a direct output of intrinsic motivation (Vroom, 1994), whereas extrinsic motivation can degrade performance (Gagné & Deci, 2005).

## **Feedback Loop: Commitment Process**

Commitment is the process linking behaviors (i.e., observable outputs) to the individual's attitudes and cognitive processes (Kiesler & Sakumura, 1966). Commitment contributes to determining people's behaviors through the actions they have previously taken and not only through their opinions and values. From the Japanese model of ikigai, we introduced commitment as a feedback loop to nurture a lifelong, self-maintained ikigai process.

## **Conclusion and Future Orientations**

This integrated cognitive-motivational model of ikigai may bring several contributions. The first one is to gather Japanese literature and contemporary psychological literature to build a unified consistent model. In this respect, we found self-determination combined with mindfulness as the most likely core process of ikigai. This enabled us to identify plausible dispositional and situational factors likely to enhance ikigai or explain individual differences in ikigai. Considering ikigai in the workplace, we also introduced performance as an output variable resulting from ikigai and consistent with known outcomes of self-determination and mindfulness. With regard to current approach of well-being and performance at work, the effort to conceptualize ikigai led us to introduce mindfulness in the core processes as a way to highlight the importance of meaningfulness at work and eudemonic well-being, beyond individual pleasure and hedonic well-being.

Our model may nonetheless hold several limitations. The first one is its potential cultural bias challenging the possibility to adopt a Japanese way of living in a European or North American work context. Ikigai questions our self-perception (Mathews, 1996). However, because we managed to account for most of ikigai features through existing psychological theories, we still feel confident in the relevance of our model to inspire new ways of shaping the workplace. Secondly, using ikigai in the workplace can be viewed as a misappropriation of the concept. The attempt to translate Winn's diagram in theoretical terms led us to introduce extrinsic rewards into the ikigai process. Research repeatedly highlighted the detrimental effects of extrinsic motivation on performance (Amabile, 1983). In this respect, we believe that the success of ikigai process to generate eudemonic well-being, physical health and performance will depend on the respective salience of internal and extrinsic motivators for each individual and each situation – which further emphasizes the importance of dispositional and situational factors.

The integrated cognitive-motivational model of ikigai remains to be empirically tested. As research on ikigai has been conducted mainly with students and elderly people (Kumano, 2018), this would require to study ikigai within working population. Furthermore, we can study the extent to which variations in inputs (dispositional and situational factors) impact ikigai core processes and outputs. We can also conduct field interventions to influence situational factors and monitor their effects on ikigai. We can imagine introducing new managerial practices and new working conditions likely to foster intrinsic regulation, mindfulness, self-determination, and subsequently ikigai. We also intend to use our model as a framework to design tools (e.g., digital or robotic tools) that would be specified not only to meet functional needs (e.g., productivity, profitability), but also to meet workers' motivational needs (i.e., needs for competence, autonomy and relatedness), increase their sense of purpose, their well-being at work and more generally their feeling of a life worth living.

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## Biography

### Mégane Sartore

Mégane Sartore is a PhD student in Conception. Her thesis is the result of cooperation between SNCF Research Direction, CESI-LINEACT and Strate. This multidisciplinary research in Engineering, Psychology and Design is part of Robotics by Design Lab. Trained in Occupational Psychology, well-being at work is one of the strong values of Mégane Sartore, more specifically the question of the meaning of work in the context of Human-Robot Interaction. Her thesis is centered on robotics and ikigai, covering: well-being, engagement, self-determination and fundamental needs, mindfulness, causality orientation, locus of control, performance, leadership, social identification, work environment and user experience, robotics in the industry 4.0 and 5.0. Her research aims to develop original robotic solutions for railway maintenance tools that have the potential to increase user ikigai.

### Stéphanie Buisine

Stéphanie Buisine is Research Director at CESI Graduate School of Engineering. In her research lab LINEACT, she co-leads the team dedicated to Learning and Innovation processes. With a background in Psychology, Ergonomics, Human-Computer Interaction and Design Sciences, her research focuses on non-technological approaches of innovation: prospective and creativity methods, innovation process and management, leadership and organizational culture. The purpose of her research is to foster needs-centered and motivation-centered innovation, in particular in Industry 4.0.

### Ioana Ocnarescu

Ioana Ocnarescu is the Director of Research at Strate School of Design, where she is in charge of a multidisciplinary team of five researchers (PhDs in design, neuroscience and humanities). Ioana encourages design research for design students and instructs courses in experience design and robotics. Her research focuses on the following areas: experience design, low-tech prototyping, in-vivo and in-situ experimentation, living labs, transdisciplinary research,

simulation by design, and research management. She is in charge of "Robotics by Design Lab - AI, Robots & Humans - ecologies of living together" and co-directs 4 PhD projects. Prior to joining Strate, Ioana completed a PhD in design at Alcatel-Lucent Bell Labs France's User Experience division, working alongside Strate and the LCPI Laboratory from Arts et Métiers France. Before design, Ioana studied Applied Mathematics at École Polytechnique, France.

### **Louis-Romain Joly**

Louis-Romain JOLY is Program Manager in SNCF Research Direction. SNCF group is preparing new solutions that will enable everyone to travel more easily while preserving the planet. Regarding this goal, SNCF Research Direction offers new technologies to reinvent the rail system.

Louis-Romain JOLY graduated from the Ecole Nationale Supérieure des Arts et Métiers (ENSAM) and from the Universitaet Karlsruhe. He started his career in 2001 in a big French automotive company (PSA Peugeot Citroën) as a computing engineer (crankshaft dynamical behaviour and diesel combustion noise quality). Thanks to his expertise, he joined SNCF in 2007 as a diesel engine maintenance engineer. With his team (20 technicians and engineers), he was in charge of maintaining train engines in optimal operational conditions through the definition of maintenance rules and through the technical definition of spare parts.

He moved to SNCF Research Direction in 2015. His activities are now focused on Additive Manufacturing and Maintenance Robotics. His main target is to create an ecosystem that will boost robotics in the whole railway sector at least in Europe.

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## A Cognitive-Motivational Model of Ikigai

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