

Toward Motivation-Igniting Society

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ABSTRACT

What characterizes humans is we came to stand up and walk on two legs. When we are four-legged, the center of gravity is fixed. So we have no other choice but to adapt to the current environment and situation. Animals live for now. But we, humans, changed two legs to arms. So, we can balance freely and create movement as we wish. Thus, we can live for tomorrow. We can challenge to make our dreams come true. Humans try to satisfy their material needs just as animals do, but with time, our needs shift to satisfy mental (emotional) needs and finally we pursue to actualize "Self". As our body builds and how we move our muscles vary from person to person, it brought a large degree of diversification. Thus, in the case of 4 legged animals, some of their species die out due to the change of environments. But human species are diversified, humans survive, no matter how the real world may change. But our current society is developed to satisfy material needs and rapidly growing material needs consumes too much energy and society shift from one to another, so the current industrial society is coming to its end. Now, we need to design and develop a new society for the next generation. Its challenge is our society is quickly aging and the rapid global expansion needs another approach to develop a society. If we can develop a society where our motivations are ignited, seniors can live for tomorrow and young ones can develop a society where they can share their emotions. A newly developed approach to satisfy the needs of old and young persons at the same time is described.

Keywords: Energy running out, Industrial society terminating, Next human-centered society, Self-sustaining, Self-enjoying society

TO THE NEXT SOCIETY

Our society shifts from one to another with time (see Figure 1).

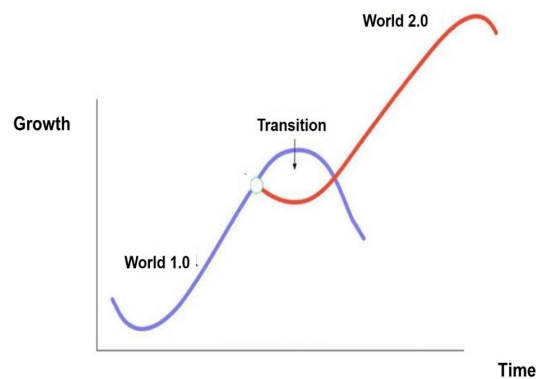


Figure 1: Society shift with time.

World 1.0 indicates the current Industrial Society. As it is coming close to its end, it is time now to design and develop the next society World 2.0. What we should do and how we can achieve this purpose is the topic of this paper.

WHAT CHARACTERIZES HUMANS

World 0.0 is the society previous to World 1.0. But the human world and the animal world are completely different. So let's start by thinking about how humans are different from animals.

There are many different types of animals, but here I would like to compare animals with four legs with humans. In ancient times, humans also got around on four legs. But maybe just like apes, humans came to stand up and started walking. They stood up on hind legs and let front legs free.

There are a little difference between apes and monkeys. Apes form societies, but monkeys do not particularly seek to form societies. So, let us compare apes and humans with four legged animals. I am not a zoologist, but a mechanical engineer, so I would like to discuss the issue from that perspective.

In the case of four-legged animals, the center of gravity of their body is fixed. Therefore, there is very little freedom of movement. We need to think about why living things are called "Creatures" in English. It comes from "Create movement to survive". Therefore, many four-legged animal species will become extinct if the environment changes drastically. In other words, four-legged animals can only do their best to adapt to their current environment. However, by transforming their two front legs into hands, humans became able to freely change the center of gravity of their bodies. In other words, it became possible for them to move freely and to flexibly respond to changes in the environment. Therefore, although humans initially tried to satisfy the physical needs of food and lodging just like four-legged animals, they became over time primarily engaged in mental activities and try to realize their expectations by moving about in various ways. In short, four-legged animals live for now, but humans came to live for tomorrow. Humans can create the future.

Abraham Maslow made human needs clear (Maslow, 1943), (see Figure 2).



Figure 2: Maslow's hierarchy of human needs.

Maslow clarified human needs from the perspective of human motivation. So, I would like to consider the differences between humans and non-human animals from the perspective of motivation.

Animals other than humans can only live in the Tangible World in front of them. In other words, their motivation is derived from interacting with the real world.

That is to say, humans, like four-legged animals, are motivated by interaction with the tangible real world, but with two legs and the ability to move their bodies freely as they wish, they explore the intangible world. As a result, they are motivated to expand their own world, and move on to exploring the intangible world.

In short, the biggest difference between animals and humans is whether their motivation is tangible or intangible.

SELF-DETERMINATION THEORY

After about 40 years later, Deci and Ryan proposed Self-Determination Theory (SDT) (Deci & Ryan, 1985). SDT points out that we, humans, are satisfied to the maximum when we do the job internally motivated and achieve it in our own way, i.e., they pointed out that intangible motivation plays a very important role in humans. They also added it is very closely associated with growth.

Indeed, we wish to grow. Growth brings us another world beyond the current tangible world.

WHAT ABOUT INVERTEBRATES?

The above discussion has focused on vertebrates. So, let us study invertebrates.

Then, you will be amazed to find out how excellent the capabilities of the octopus is. Octopuses are known to have eight legs, but in fact only two of them are legs and the remaining six are arms. Although octopuses have large heads, their abilities are on the same level as dogs.

However, octopuses are known to be “masters of escape”. They can escape from just about any environment or situation, even from a screwed container.

Of course, this is because they have suckers, but unlike humans, octopuses do not panic when they cannot cope with. They calmly deal with it through trial and error. And they do this trial and error with the least amount of effort, avoiding unnecessary repetition. In short, octopuses live their life on pragmatism ().

PRAGMATISM

Figure 3 illustrates the basic idea of Pragmatism (2024) essence is Engineering, not Science. First, we perceive the current environment and situation. We became aware of them. Then, we are “motivated” and make a decision what action to take. If the outcome satisfies our emotion, then that’s fine. If not, we repeat the cycle until we are emotionally satisfied.

We must note that this is very much subjective. Information is processed by trial and error. What matters is how we can avoid unnecessary trial and error and satisfy our emotion or expectation.

Science is objective. Reproducibility plays an important role. It is tactical. It pursues how. The process is important. But in Engineering, what matters is the outcome. And in Pragmatism, we do not care how or reproducibility. If we can realize what we have on our mind, that's excellent. Even if we cannot reproduce the process, it does not matter much.

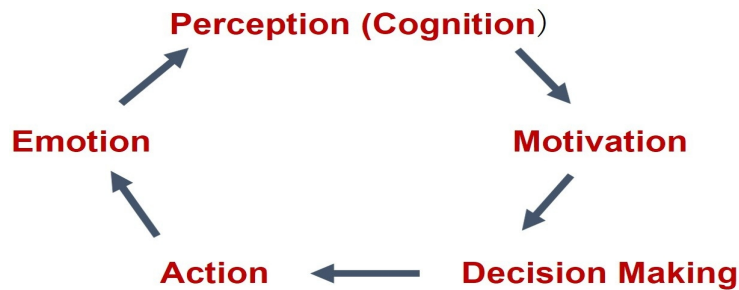


Figure 3: Perception-motivation-decision making-action-emotion (PMDAE) cycle.

EMOTION

Let us discuss “Emotion”. We must remember “Emotion” and “Motivation” come from the same Latin “Movere”, i.e., “move”. Thus, “Emotion” means to move out that is to move out into the Real World to establish your own world.

Thus, when you carried out PMDAE cycle and if it does not satisfy your emotion, then you are motivated to repeat the cycle until your emotion is satisfied.

We must pay attention to the fact that emotion is intangible.

Maslow pointed out that human needs shift from tangible to intangible.

Another important point we must keep on our mind is that the current Industrial Society is product-centric. In other words, the current society is composed of tangible things.

But what motivates us humans is intangible desire to make our dreams come true.

As the current tangible society is coming to its end and many issues are emerging. The greatest problem is energy is running out. We cannot sustain the current society anymore. We need to develop an intangible society.

Let us consider economy. The current economy is based on tangible assets. Banks provide loans based on tangible assets.

But, surprising enough, in Africa, you can buy products based on intangible “Trust”.

When you touch your smartphone to a store’s device, your credit rating is assessed and you can buy any item within the limits of your credit rating. This is intangible economy. We should develop such intangible economy and

society. Then, our society next will be self-sustaining and self-enjoying. This is nothing other than motivation-igniting society.

EMOTION EXPANDS YOUR WORLD IN TIME AND SPACE

As the fact that Emotion and Motivation come from the same Latin word, “Emotion” motivates you to create your own world. This is what Maslow calls “Self-actualization”. And you would like to achieve this in your own way. This is what Deci and Ryan’s Self-Determination Theory.

Thus, many autonomous systems are being developed that can perform tasks with little human interaction. These efforts are also crucial in part because the rapid aging of the population means more people need this kind of support.

But, this is a response to “Decline”. Humans need “Growth”. Of course, there are also autonomous systems that help growth. However, most of them are based on digital intelligence. And they aim to artificialize brain activity. Thus, “Brain Intelligence” is getting attention.

We must remember Wordsworth’s poem, “Our heart leaps up when we behold a rainbow in the sky”. Emotion works in our “Heart”. Not in our brain.

In fact, true death is sentenced when our heart stops working. Even when our brains stop functioning, our bodies continue to function.

FROM BRAIN-CENTERED DIGITAL APPROACH TO HEART-CENTERED ANALOG APPROACH

From this perspective, this paper considers how to build a human-centered society and proposes one method toward this goal. Simply put, it is a perspective that considers emotion to be the source of life.

As emotion is so important, many autonomous systems are being developed. But they are paying attention to the brain. But brain processes “Digital Information”.

Remember Wordsworth Poem “Our heart leaps up when we behold a rainbow in the sky”. Emotions are related to our “Heart”, not “Brain”. Emotion is analog and “Heart” works in an analog way.

As pointed out, “Emotion” and “Motivation” came from the same Latin word “Movere”. i.e., movement. Our movement is analog. And we move to survive.

Remember that human world is quickly aging. Our next society will be full of seniors. Thus, while society is aging, human life spans are increasing, and the idea of a 120-year lifespan has begun to be emphasized.

Until now, we have thought that our life expectancy is 80 years, so how we spend the next 40 years has become important. Therefore, motivation to live these 40 years has become important.

We have spent the past 80 years working for society. However, the word “society” originally comes from the Greek word “friend.” In the next 40 years, we must make true friends and associates and build a new society.

CHANGING COMMUNICATION

In order to make friends, you need to communicate. Until now, society has been based on words. However, in fact, we, or rather animals, communicate primarily through movement. The word “Visualization” is often used. This is because images play an important role in helping us understand our environment and situations.

Elderly people in particular may forget words (the name of the person the name of a place, etc.), but they do not forget images. Therefore, to put it simply, it is expected that from now on image communication, rather than verbal communication, will play a more important role.

Until now, robots have given instructions, but from now on they will be able to observe people’s movements and provide the necessary support.

IMPORTANCE OF PATTERN

Psychologically, images are deeply related to pattern recognition. We used to carry out research on detection of emotion from human face. We tried many techniques of image processing, but they took too much time and did not produce satisfactory results.

As Fukuda’s team continued to take on these challenges, Fukuda realized that when he look at cartoons, he can instantly understand the emotions of the characters.

They then created patterns of human faces and compared them with cartoon patterns. Then, they could instantly understand human emotions (Kostov & Fukuda, 2003), (see Figure 4).

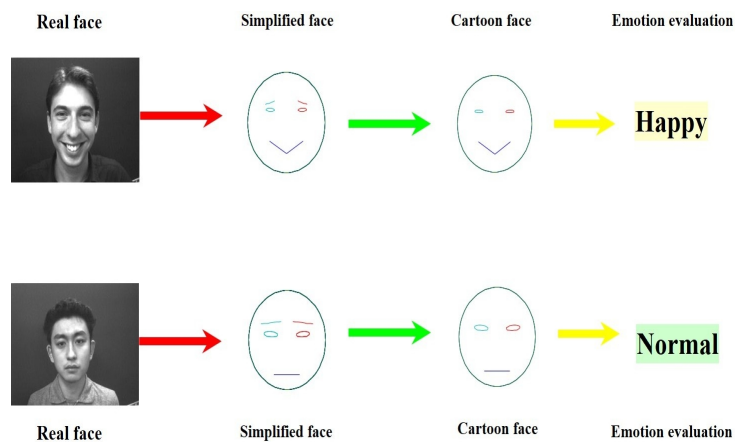


Figure 4: Pattern approach to detection of emotion.

IGNITING MOTIVATION

Based on our previous discussions, a method to ignite motivation is developed. This approach is human-based, which makes it different from other autonomous systems.

To make it easier to understand, let's use swimming as an example.

When you swim, the water around you is constantly changing, just like in the real world. Furthermore, each person has a different physique and the way they move their muscles is different. Therefore, there is no other way to learn swimming than by self-study.

If we attach wearable sensors to a swimmer who is trying to learn to swim, we obtain the table on the right of Figure 5. Each row represents the position where the sensor was attached. Thus, distance between Time T1 and Time T2 can be obtained. And dividing it with this time interval, we can obtain speed. And dividing it again with this time interval, we can obtain acceleration.

Thus, by referring to this table, we can understand muscle movements, and by following the table over time, we can understand how muscles change over time.



Figure 5: Mahalanobis distance-pattern (MDP) approach.

MAHALANOBIS DISTANCE-PATTERN (MDP) APPROACH

The approach developed here is called “Mahalanobis Distance-Pattern (MDP) Approach”. As described, “Emotion” can be understood by using image or pattern, And Emotion is deeply associated with “Motivation”. So, what is needed further is how we can evaluate the adequateness of our decision. Up to now, we have used “Euclidean Approach” because the current Industrial Society is product-based and we needed objective and quantitative approach.

But this paper is human-centered. So, we need subjective and qualitative measure to prioritize our decision.

Mahalanobis, a researcher in design of experiments, developed Mahalanobis Distance (MD) to remove outliers. MD just shows how a point P is far away from the mean of the individual data. Thus, we can utilize it for prioritizing our decisions (see Figure 6).

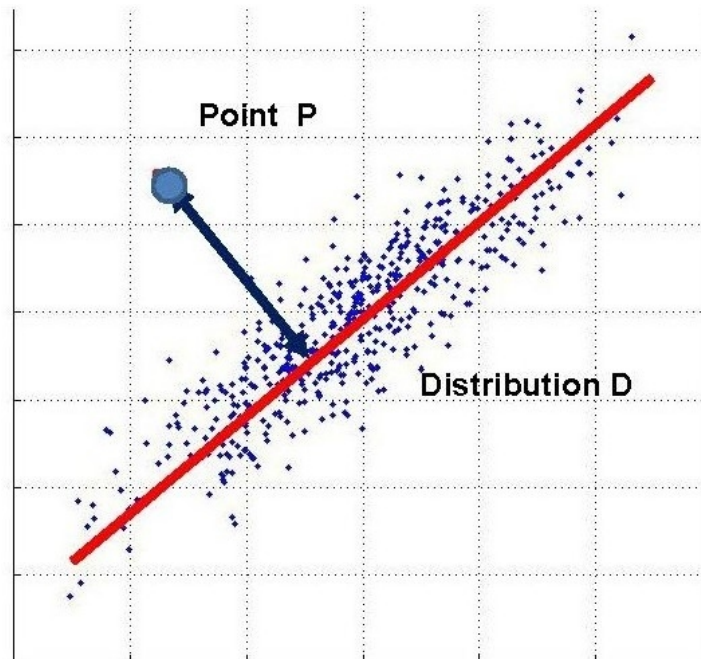


Figure 6: Mahalanobis distance (MD).

Mahalanobis Distance-Pattern (MDP) Approach is human-centered and it will bring us the next society where we can live a self-sustain and self-enjoying life.

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