

## Interview #3: Dr. Kazuo Yano Do AIs Dream of a Happy Workplace?

Dr. Kazuo Yano, Corporate Chief Engineer,  
Research and Development Group,  
Hitachi, Ltd.  
(Interview 3/3)

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*While utilizing data from multi-purpose AIs, Dr. Kazuo Yano, a researcher at the Research and Development Group, Hitachi, Ltd., discovered that it was possible to measure human happiness. He also found that happier groups achieve higher productivity. As the conclusion to this interview, this article introduces his very interesting idea that feedback from the results of AI analyses can make people happy.*

### ***Human data is essential to improving work***



I believe that Hitachi's techniques for obtaining data on human behavior are more advanced than the techniques of competitors. This is because Hitachi recognized the importance of human data early, and has collected a large amount of such data over 13 years.

The challenge of improving the economy in the future will be to improve the productivity of knowledge workers and service workers. To achieve this target, we must understand the behavior of such workers, which changes day-by-day.

In the last interview, I talked about the case of using a multi-purpose AI in a distribution warehouse. In that case, we used operations record data that showed how the workers conducted operations in the warehouse and on which days. For that warehouse, “to reduce the total daily operation time” was set up as the index (the desired outcome), and based on past operational data the AI learned how to automatically create the optimal order for item collection. The next day, the AI output this information as instructions for the workers. The workers collected the items based on the instructions, but they made efforts flexibly and adaptively; for example, by changing the route. At the end of the day, the AI adopted all such efforts and incorporated them into the instructions for the next day. In short, the humans and the AI learned from each other every day through data, so they were able to improve productivity in the warehouse.

## ***Data shows whether people are happy***

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While collecting human behavioral data, recently we made a breakthrough. We discovered that behavioral data can indicate the levels of human activity and happiness.

We have gathered human behavioral data totaling 1 million days of data, as measured using accelerometers. While analyzing this data, we were able to see various patterns of human behavior, such as walking, speaking, eating, and operating personal computers. We started thinking that we might be able to advance this analysis so that we could actually see the degree of human happiness.



We then began further research. First, we asked our subjects (468 persons in 10 organizations) 20 questions, such as how many days a week they felt happy, delighted, lonely, or sad, with choices scored from 0 to 3 points. The maximum score for the happiest person was 60 points (3 points x 20 questions). We calculated the average for each organization and obtained data regarding which organization had the highest level of happiness.

We then asked the subjects to wear accelerometers, collected behavioral data, and found that the level of happiness of those 10 organizations had a strong correlation to the data of a certain characteristic behavior. The correlation ratio was 0.94, which I think is an astonishingly high figure.

Briefly speaking, the characteristic is that a happy organization exhibits more diverse behavior. The diversity of behavior is measured according to the amount of time that the behavior continues. In other words, the length of time is different, such as one minute or 20 minutes, depending on the person, time, and occasion. Sometimes the behavior continues and sometimes it doesn't. In happy organizations, the amount of time that a behavior continues varies case-by-case.

However, in unhappy organizations, most behaviors (almost without exception) stop after about 10 minutes. By observing this behavior, you can tell if the organization is happy or unhappy. Our research also found that the happier the organization, the higher its productivity. When you see the word *happy*, you might think it means *ease*, but this is not correct. A happy organization should be rather active and at an appropriate level of tension.

Let's take a look at some examples. At a call center for merchandise sales, a higher success rate of 34% was seen on days when employees felt happier, compared to the days when they did not. At a retail store, sales higher by 15% were seen on the day when its employees felt happier. Further, at a manufacturer, we compared groups involved with developing new products, and we found that some project teams, whose members felt happier in the first two months of the project, were able to obtain higher sales over the next five years.

## ***Happiness is teamwork***

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You might think that happiness is an individual feeling. However, according to our research into human behavioral data, we have found that happiness is a collective feeling. Let me give you an example. When the Fukuoka Softbank HAWKS baseball team won the Japan Series Championship in 2015, Manager Kudo said in an interview: "This year, we were successfully able to keep the team in a good mood overall, and this contributed to our win. The two substitutes, Fukuda and Kawashima, passionately encouraged the team in tight situations, and this helped result in a better team mood." These seem to be simple words of appreciation, but I believe that this is actually a credible fact and an expected result.

In the call center example, in the success rate data for the last six months, some employees have higher rates of success and others do not, like regular home-run hitters and substitutes. Additionally, many of them are temporary workers, and the worker lineup varies every day. Therefore, many workers that are home-run hitters might be in the office on one day and not on another day.

You might think that the call center would mark a higher success rate on the day with many home-run hitters working the phones, but there is no such correlation. The team was able to mark a higher success rate on the days when there was a higher diversity of worker behavior in the office. So, do the workers who exhibit more diverse behavior have a higher success rate? No, not necessarily. Like Fukuda and Kawashima of the HAWKS, such workers are contributing to the improvement of the productivity of the team, by activating the workers around themselves. The home-run hitters are doing a good job, absorbing the activeness of the workers with a higher level of diverse behavior. In short, even if you gather only home-run hitters, you cannot make your team stronger.

So, how can we make an organization more active? From our research using multi-purpose AIs, we have found that

happiness in an office is influenced by various forms of communication, such as chatting among employees at lunch breaks and encouragement or advice being given by supervisors.

We have said that it's important to activate an organization, but "activeness" could not be measured numerically. Therefore, I think we can say that we do not put sufficient importance on such activation. Employees who help to improve the activeness of a company have never been highly evaluated by their companies. However, I believe that it will become necessary to highly evaluate the performance of those employees in the future.

## ***AI creates happy and productive organizations***

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You might think that the way in which we feel happiness, and even the definition of happiness, would be different depending on one's job, country, and culture. However, objective data indicates that this is not correct. It has been verified that diversity of behavior has a very strong correlation to happiness, regardless of industry or company. Therefore, we can use a multi-purpose AI to automatically provide feedback on what must be done to achieve more activeness (happiness) and productivity, based on human behavioral data.



This effort has already been undertaken by Bank of Tokyo-Mitsubishi UFJ and Japan Airlines, and the results were announced in one of our news releases.

The key to reactivating the economy in the future is to increase the productivity of knowledge workers and service workers. Additionally, the tasks of workers in these fields change day-by-day, and the members in any one office might change frequently. Therefore, it is very difficult to increase productivity with conventional methods.

If you obtain daily behavioral data and specify "to improve happiness" as the desired outcome in Hitachi AI Technology/H, you can obtain advice from that multi-purpose AI. This might include, for example, what meetings or forms of communication are necessary (or unnecessary) and how one must spend time in ways that are contrary to conventional practices.

These processes will enable us to achieve productivity improvements in a quantifiable form. The AI will respond to changes in situations based on the data, and this will result in the creation of an organization that will always continue to learn and grow. This service can never be achieved without a multi-purpose AI. This effort has just begun, and we wish to transform it into a solution that can contribute to human happiness in the future.

## **PROFILE**

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### **Dr. Kazuo Yano**

Corporate Chief Engineer, Research and Development Group, Hitachi, Ltd.

Dr. Yano joined Hitachi, Ltd. in 1984. From around 2003, he has helped develop world-leading technology that can collect and utilize Big Data. His dissertations have been cited 2,500 times, and he has applied for 350 patents. He is known for the width and depth of his expertise, from artificial intelligence to nanotechnology. Currently, he is the corporate chief engineer of the Research and Development Group. His book, *Invisible Hand of Data*, was selected as one of Bookvinegar's top 10 business book bestsellers in 2014. He has a Ph.D. in engineering and is an IEEE fellow.