FOR IMMEDIATE RELEASE

Mathematical model of conversational activity in the workplace using "Business Microscope"

- For improving organizational communication and meetings –

Tokyo, Japan, 17th October 2011 – Hitachi, Ltd. (NYSE: HIT/TSE: 6501, hereafter, Hitachi) today announced the successful development of a mathematical model of the level of activity during conversations in a workplace (hereafter, "activity level"). The model was created based on measurement of the activity level of 412 employees over 3 months using the communication measurement device, "Business Microscope," [*1] which can records who talks with whom and how often. The model quantifies the characteristics of workplace communication activity, which is currently acknowledged by personal experience. For example, the greater the number of listeners participating in a meeting, the more non-active a meeting is, or, that a greater activity level is observed in communication between the large number of people outside the formal meeting environment. By applying this model, it becomes possible to make suggestions on how to improve communication in a meeting or in a workplace, such as holding a meeting with a large number of people after the activity level has been raised by a small number of people. This model will be applied as a new approach in Hitachi's "organizational-reform solution service".

Focusing on face-to-face communications, Hitachi has developed the Business Microscope, which can measure and visualize face-to-face communication, and has been applying this in a solution service for organizational reform since 2009. The Business Microscope is a "sensor-net badge," [*2] which consists of infrared sensors, an accelerometer, a microphone sensor, and a wireless communication device, which is worn by employees while working and covers "who" talks to "whom", "how often," "where" and "how energetically." By analyzing this enormous amount of data, and visualizing the frequency and activity status of communication within an organization, it is possible to comprehend the actual state of organizational communication. Further, if a general model of face-to-face communications can be found through analyzing this enormous amount of data collected with the Business Microscope, it will be possible to propose methods to improve organizational communication and quantitatively evaluate efficacy. From this perspective, factors influencing activity level were analyzed, and a mathematical model describing face-to-face communication was developed. Details of the development are as described below.

(1) Activity level measured by Business Microscope

Conversational activity between 412 people working in a software development company was measured over 3 months using the Business Microscope. Based on total activity data including conversations in meeting rooms or casual chats, factors influencing the activity level of participants were analyzed, and the following two points were found.

1. Non-active participants in a conversation become active when the majority of participants are active, and vice versa. (The activity level of participants in a conversation conform towards the activity level of the majority)
2. Activity level during informal situations[*3] is higher than that during formal[*3] situations.

(2) Mathematical model based on similarities with physical phenomena

To model the activity level, it was noted that there was a similarity between the activity level of human communication (activity level of participants are synchronized to the majority activity level of those present) and the spin of atoms (the spin of atoms in a magnet tend to align in the same direction). The model of activity level was developed based on a model describing the state of the spin in a magnet[*4]. Moreover, the simulation results statistically verified the proposed model, by reproducing the experiment result.

The proposed model makes it possible to quantify the characteristics of workplace-communication activity, which is currently subjectively understood through personal experience, such as, the more people who attend a meeting, the less active it becomes. Moreover, the proposed model also makes it possible to develop methods for improving organizational face-to-face communications and quantitatively evaluate their effects. The model will be used to establish methods to improve the efficacy of meetings and communication between employees, and the methods will be provided as a new approach for the organizational reform solution service using the Business Microscope.

Notes

*1. Business Microscope: A communication measuring system developed by the Central Research Laboratory, Hitachi, Ltd. An “organizational reform solution service” using the Business Microscope has been commercialized by Hitachi High-Technologies Corporation.

*2. Sensor-net badge: The distance between people talking face-to-face is measured via infrared sensors. An individual’s activity level is measured by using a single three-axis accelerometer. The model created makes it possible to identify an individual’s activity level (active or non-active), which is determined on the basis of subtle movements detected (such as talking, nodding, and silence).

*3. Formal situation: Conservation occurring in a meeting space is considered formal, and conservation in other places is considered as informal.

*4. A model that represents the nature of a magnet: The Ising Model, which is a simple statistical model of magnetic substances, was used to model the conversational activity level.

About Hitachi, Ltd.

Hitachi, Ltd., (NYSE: HIT / TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 360,000 employees worldwide. Fiscal 2010 (ended March 31, 2011) consolidated revenues totaled 9,315 billion yen ($112.2 billion). Hitachi will focus more than ever on the Social Innovation Business, which includes information and telecommunication systems, power systems, environmental, industrial and transportation systems, and social and urban systems, as well as the sophisticated materials and key devices that support them. For more information on Hitachi, please visit the company's website at http://www.hitachi.com.

# # #

Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
