November 27, 2015

To whom it may concern:

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Minebea Aims to Commercialize "Biological Information Monitoring System by Applying Bed Sensors" within a Year ～Based on the Joint Research Project with Chiba University and IBM Japan～

Tokyo, November 27, 2015 –Minebea Co., Ltd. ("Minebea") has completed a joint research project by using measuring components applying strain gages in collaboration with Chiba University Graduate School of Medicine, Chiba University Hospital and IBM Japan, Ltd. ("IBM Japan") having its sights set on the development of biological information monitoring system. Based on the said joint research project, Minebea plans to develop and commercialize such products within a year.

Biological information described here refers to (1) the presence or absence of breathing as well as the estimated number of times of breathing, (2) amount of ventilation per breath (depth of breathing), and (3) a pattern of breathing, all of which serves as the information bases on which to monitor a weight of the person on the bed, body movement and a state of breathing of such person. In the prior empirical analysis of the biological information, advanced machine learning technologies of the Tokyo Research Laboratory of IBM Japan have been actively applied.

Professor Shiroh Isono, who is a project partner of this collaboration and Vice-Director (Medical Safety) at Chiba University Hospital as well as Professor, Department of Anesthesiology at the Graduate School of Medicine, Chiba University, says by explaining with great expectations, "The status of breathing of a person on the bed is a critical information in order to watch the physical state of a patient and a person to be nursed in the fields of medical care and the nursing care as well as very useful information on which to grasp the symptoms associated with the respiratory disorders during sleep such as respiratory failure and cardiac failure, and figure out the suppressed respiratory symptoms caused as side effects of the administration of drugs such as the anaesthetics and pain-killer, etc. given therapeutically. When the attention is required in particular, a doctor will monitor a patient by attaching a sensor to a body of a patient. However, 90% of the inpatients in the hospital are checked only once in several hours and it is not uncommon that the condition of a

patient may change suddenly in the meantime. As such, by applying this monitoring system where information can be continuously observed in the non-invasive manner, there is a possibility to save many lives.

The greatest feature of this system is non-invasive and non-contact, being capable of observing biological information in real time. Therefore, a subject patient can enjoy a comfortable stay in the hospital and obtain a sense of security where his / her life has been watched all the time, while being set free from restriction of activities due to the monitoring devices attached to the body as well as insomnia caused by discomfort or sense of incongruity.

The fact that quantified data on a real time basis are provided to medical personnel enables an automatic input and indication of information on breathing conditions in nursing records (vital records) and automatic transmission of information on the aggravation of breathing to nurses. This would not only enhance medical safety through early case detection and early stage medical treatment, but also make it possible to reduce the workload of nurses by cutting down on the number of times of the night patient check by nurses and improve the quality of the sleep of patients.

In this joint research, we have noticed productive outcome where through the use of a retrofitted load sensor to a bed, we could tackle with the measurement of not only a body weight, but also a smaller body movement and the number of times and depth of breathing, etc. The analyses of body movement and breathing enable a distinction between sleeping and awakening, thereby leading us to come up with early response and treatment for insomnia and night time recognition dysfunction, etc. as well as preventive measures against fall accidents. As such, even when such medical accidents happen unfortunately, biological information described above should become the important clues for detailed cause investigation and help prevention of medical accidents in the years to come.

Medical services based on this monitoring system will be realized by the combination of high-precision load sensors provided by Minebea and machine leaning and cloud technology (*1) held by information technology companies such as IBM Japan. In addition, it will be made possible that the biological information of a person on the bed for a long period of time that has been measured in a non-invasive manner will be analyzed so that machine learning will efficiently determine such information where it could facilitate an improvement of sleeping and prevention of medical accidents.

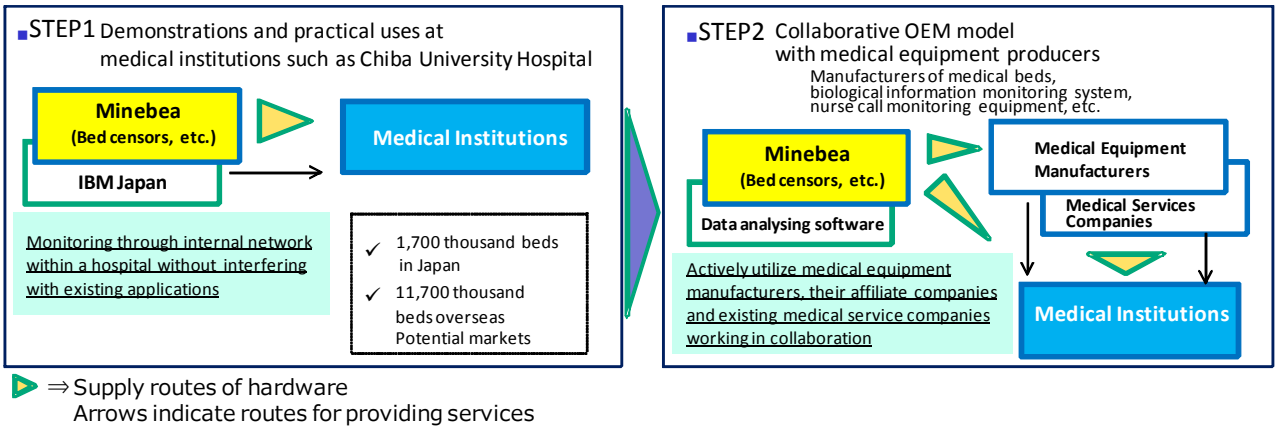
Minebea intends to study and develop medical services loaded with application software that are based on such a cloud service having machine learning capability and this monitoring system (SaaS*2).

Going forward, a clinical study is going to be carried out in the medical field under the supervision of Professor Isono at the Chiba University Hospital, and we aim for a commercialization of products by the end of the fiscal year ending March 31, 2017.

After building up a track record of empirical studies in the clinical research, Minebea aims for the sales of around 4 billion yen for the fiscal year ending March 31, 2021 in anticipation of the practical use of the system in the domestic medical institutions. We assume a potential market size for the products at 120 billion yen as the premise for our sales goal mentioned earlier while targeting for the expanding areas on the basis of the total hospital bed capacity in medical facilities in Japan having more than 400 beds per hospital.

Furthermore, against the background of the track record in the medical facilities, we intend to expand the sales to service facilities for the elderly and medical services for general homes such as nursing care and home medical treatment system.

[Medium- to Long-Term Business Plan]



Detailed explanation of technical worlds

(*1) IBM provides "IBM Bluemix," a cloud service for the development of applications and operations thereof on a cloud system. IBM Bluemix is a cloud service supporting quick development of applications using cutting-edge technologies such as machine learning, and ensuring high level of security and efficiency improvement of operation and maintenance control in the cloud environment.

(*2) Saas (Software as a Service) is the service that a user uses applications software and system via a network on an as-needed basis.

【Profile of Professor Shiroh Isono】

Vice-Director at Chiba University Hospital (Medical Safety)

Professor and chairman, Department of Anesthesiology, Graduate School of Medicine, Chiba University

Professor Isono was born in Katsuura, Chiba Prefecture. After entering the Department of Anesthesiology, the School of Medicine at Chiba University, worked for the Chiba Emergency Medical Center, studied overseas in Canada, and has worked for the Chiba University Hospital since 1989 for the second time. Dr. Isono's areas of expertise and interest include anesthesiology, sleep medicine, and respiratory physiology.

Outline of Minebea

(1) Company name	Minebea Co., Ltd.
(2) Location of head office	4106-73 Oaza Miyota, Miyota-machi, Kitasaku-gun, Nagano
(3) Representative	Yoshihisa Kainuma Representative Director, President and Chief Executive Officer
(4) Principal business line	Machinery components business, Electronic devices and components business
(5) Paid-in capital	68,258 million yen (as of March 31, 2015)
(6) Established	July, 1951
(7) Financial closing date	March 31
(8) Major shareholders and shareholding ratio	The Master Trust Bank of Japan, Ltd. (Trust Account): 7.64% Japan Trustee Services Bank, Ltd. (Trust Account): 5.51% Takahashi Industrial and Economic Research Foundation:4.08% (as of March 31, 2015)
(9) Total net assets (consolidated)	233,679 million yen (as of March 31, 2015)
(10) Total assets (consolidated)	490,043 million yen (as of March 31, 2015)
(11) Net sales (consolidated)	500,676 million yen (Fiscal Year ended in March 31, 2015)
(12) Number of employees	3,852 (as of September 30, 2015) (Non-consolidated) 69,833 (as of September 30, 2015) (Consolidated)

Outline of IBM Japan

(1) Company name	IBM Japan, Ltd.
(2) Location of head office	19-21 Nihonbashi Hakozaki-cho, Chuo-ku, Tokyo
(3) Representative	Paul Yonamine General Manager, IBM Japan
(4) Principal business line	Provides end to end information technology solutions to help client's cognitive businesses
(5) Paid-in capital	135,300 million yen
(6) Established	June 17, 1937
(7) Financial closing date	December 31
(8) Major shareholders and shareholding ratio	IBM AP Holdings Limited Private Company: 100% (as of December 31, 2014)
(9) Total net assets (consolidated)	337,951 million yen (as of December 31, 2014)
(10) Total assets (consolidated)	780,576 million yen (as of December 31, 2014)
(11) Net sales (consolidated)	881,034 million yen (Fiscal Year ended in December 31, 2014)
(12) Relationship with Minebea	Capital relationships & personnel relationships, etc.: None

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