

Ecosystem Analysis in the Design of Open Platform-based In-Home Healthcare Terminals towards the Internet-of-Things

Zhibo Pang^{ab}, Qiang Chen^b, Junzhe Tian^b, Lirong Zheng^b, Elena Dubrova^b

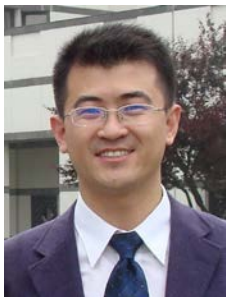
^aCorporate Research, ABB AB, Västerås, Sweden

^bICT School, Royal Institute of Technology (KTH), Stockholm, Sweden

pang.zhibo@se.abb.com

(Pt9)Abstract—In-home healthcare services based on the Internet-of-Things (IoT) have big potential in business. To exploit this opportunity, an ecosystem should be established first. Technical solutions should aim for a cooperative ecosystem by addressing the interoperability, security, and system integration. In this paper, we propose an ecosystem-driven design strategy and apply it in the design of an open-platform based solution. In particular, a cooperative ecosystem is formulated by merging the traditional healthcare and mobile internet ecosystems. Utilizing the existing standardization efforts, the interfaces between actors can be simplified. To balance the control and avoid monopoly, ecosystem-driven security schemes are proposed including the public-based authentication, repository-based credential management, SE-based cryptography, and non-invasive message handover. In order to achieve the economy of scale, an open platform-based in-home healthcare station is proposed. The proposed methodology and solution are demonstrated in implemented prototype system and field trials.

(Pt9)Keyword— Ecosystem-Driven Design; Internet-of-Things; In-Home Healthcare; Open Platform; Android; Security;



(Pt8) Dr. Zhibo Pang is a research scientist at ABB Corporate Research, Sweden, and a Ph.D. candidate at Royal Institute of Technology (KTH), Stockholm, Sweden. He received his B.Eng. degree in electronics engineering from Zhejiang University in 2002, and MBA in Innovation and Growth from University of Turku in 2012. Before joined KTH and ABB, he worked as technical manager in semiconductor industry, designing base-band and application processors for consumer smart devices. His current research interests include the Internet-of-Things, radio frequency identification, wireless sensor network, industrial communication, real time embedded system, enterprise information systems, system-on-chip, and network-on-chip. He has 14 patents in these areas. He is also working on the business-technology joint research such as business model design, value chain formulation, strategy, and entrepreneurship/intrapreneurship. He was awarded the National Great Invention Award by the Ministry of Information Industry of China in 2005, and won the First Place Prize of the RFID Nordic EXPO in 2008.