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The Physical Internet: A Vision to Improve the Economic, Environmental and Social Sustainability of our Logistics System

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Abstract:

In the U.S. and Europe, truck trailers are only half full, which has enormous economic and environmental consequences. In addition, long-haul truck drivers, working in an industry with an annual turnover rate approaching 200%, are on the road for two weeks at a time, leading to significant social consequences. We ask: Is there a better way to design our logistics system to address the Global Logistics Sustainability Grand Challenge? Our answer: Yes, and our vision for a better logistics system design is called the Physical Internet (PI). The PI has been conceptualized as an open global logistics system founded on physical, digital and operational interconnectivity through encapsulation, interfaces and protocols. The aim of the PI is to enable an efficient and sustainable logistics web. We report on the latest research into the PI where we attempt to quantify the logistics system gain potential of the PI using real-world data.

Russell D. Meller



Russell D. Meller holds the title of the Hefley Professor of Logistics and Entrepreneurship at the University of Arkansas. He is currently on sabbatical as a visiting distinguished professor in the Institut für Technische Logistik at the Graz University of Technology in Austria.

He joined the Department of Industrial Engineering at the University of Arkansas in 2005 after six years on the faculty at Virginia Tech. He received his B.S.E., M.S.E., and Ph.D. in Industrial and Operations Engineering from the University of Michigan. He currently serves as Director of the Center for Excellence in Logistics and Distribution (CELDi; a National Science Foundation Industry/University Cooperative Research Center with over \$3M in research expenditures in 2011).

His research interests are in the area of facility logistics, logistics at the facility level, and logistics system design. He has published his research in leading journals, with over 100 total research articles published to date. He is an award-winning researcher (the Institute of Industrial Engineer's David F. Baker Distinguished Research Award, the Reed-Apple Award from the Material Handling Industry of America, the IIE Technical Innovation Award, among others) and teacher (Department and College level) and his research has been supported by over sixty grants from government agencies (including eight from NSF) and companies in many industries. The total support of his research is \$12M, with responsibility to date of \$4.6M. He is a Fellow of the Institute of Industrial Engineers.