THE INTEROPERABILITY OF CYBER-PHYSICAL SYSTEMS IN DIGITAL MANUFACTURING OF THE INDUSTRY 4.0

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The task is to integrate cyber and physical systems into the Industry 4.0 digital production company. Cyber and physical systems integration is done with open interaction interfaces in the company virtual and physical levels. The interaction physical level of production machines is defined with the property of technical (technological) interoperability of cyber and physical systems. The program level of production machines interaction is done with the property of semantic interoperability of cyber and physical systems. There is a linear structure of digital production company. There is a scheme with its means of cyber and physical systems technical and semantic interoperability provision for the Industry 4.0 smart factory.

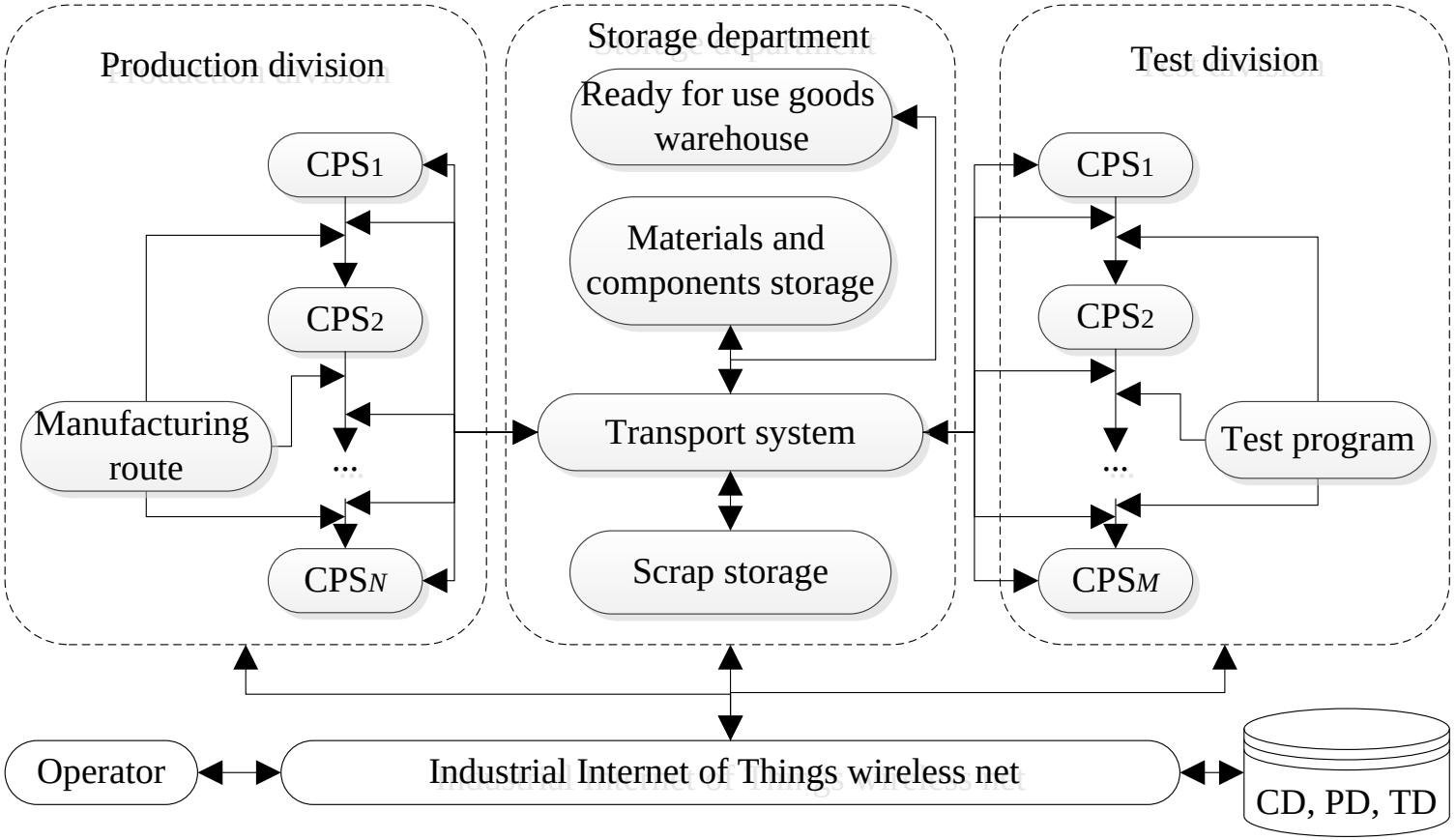

Figure 1. The Industry 4.0 digital production linear structure.

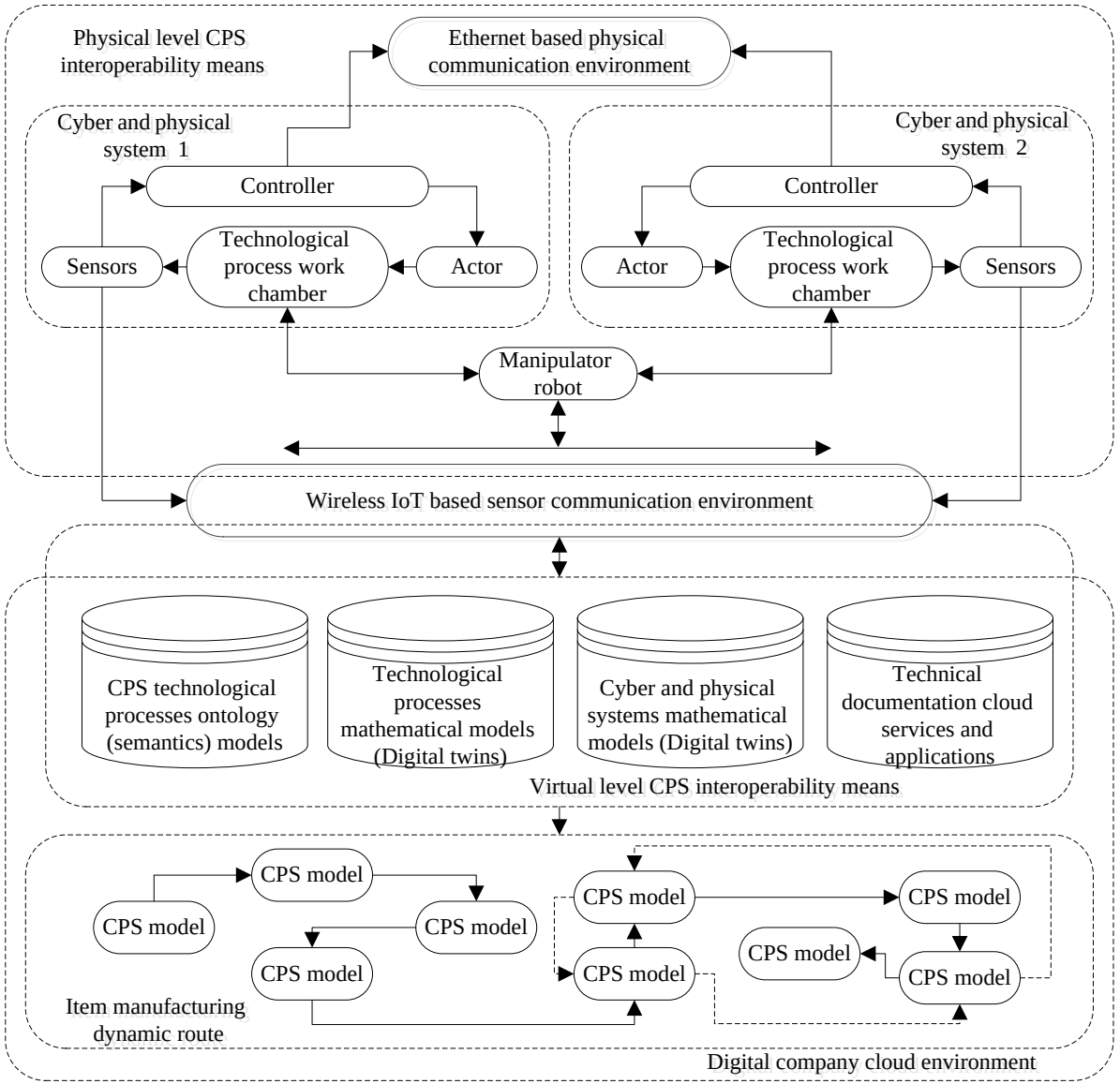

Figure 2. Cyber and physical systems interoperability means in its physical and virtual levels.

In Russian Federation the problem to standardize cyber and physical systems in the government level is for specially created technical committee 194 which objective is to design modern systems of norm and technical control in the projection and exploitation of CPSs and related informative technologies. The main purpose of the technical committee 194 is to create and implement some national standards of digital economy, which are in accordance with existing today international standards in the direction of the advanced production technologies.

Of course, the priority in standardization direction today is a cyber security matter to design integrated calculation systems, cloud technologies, wireless nets of internet communications and other.