

Chapter 8

Information and Communication Technology in Logistics as a Comparative Advantage

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ABSTRACT

In a time, when the economic crisis is filling the news, it may seem hard to even think about improvements in terms of research and development, since there are lacking funds even for the reproduction. However, the last economic revolution was born in a crisis. Therefore it is sensible to look at the current situation as an opportunity for the next economic revolution, bringing the economy a new cycle of development. The potentials for growth with the globalization have been mainly exploited so far, bringing considerable negative consequences into our lives and our environment that have triggered anti-globalist and ecological movements around the world. Now it's time to think how to make things better and more humane. The main goal of this chapter is to lay the foundation for an advanced-research technological platform for logistics applications networks.

INTRODUCTION

In times of big economic growth the need for ecologically aware and logistically perfected production was small. Now economy is seeking savings on each step and the benefits of good logistics come to front – companies with good logistics were able to adapt to new circumstances more quickly and have

been more successful in redesigning their production to suit the needs of the market. Hence, we see the future of a logistically well supported business in both ways – technologically and organizationally advanced and interoperable, to lower the costs of production and transport, and ecological, where companies would integrate the ecological criteria with their quality standards to provide for a healthy environment in the long run (Pfohl H.Chr., 2004).

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Improving the existing logistics support especially in production and transport has proven possible by integrating Information and Communication Technology (ICT) with a well developed infrastructure in the developed world (Ballou R.H., 2004). In other application areas appropriate partial solutions are also gaining importance. In developing regions of the world (e.g. China, northern Africa) the logistics infrastructure is being built intensively (Bartens S., 2008). Hence, we might say that the next economic “(r)evolution” is probably going to be a logistic one and will be founded on the use of modern ICT technology (Straubhaar T., 2008).

The European Union (EU), being a heterogeneous and strongly connected market, has invested largely into building transport nodes and connections for different kinds of transport. The time has come for improvements of the existing infrastructure and establishing/improving interfaces with the global world. Since the European economy is largely oriented at services and production – the import of raw materials and product components and export of products – the efficient use of its storage and transport infrastructures is of utmost importance. On the other side flexibility in production through the achieved higher levels in factory automation is gaining importance due to quick market changes and demand on lowering production expenses while maintaining the con-

stant high quality of products. In this chapter some of the guidelines for using the ICT technology as infrastructure in modern production and transport systems of the future are outlined.

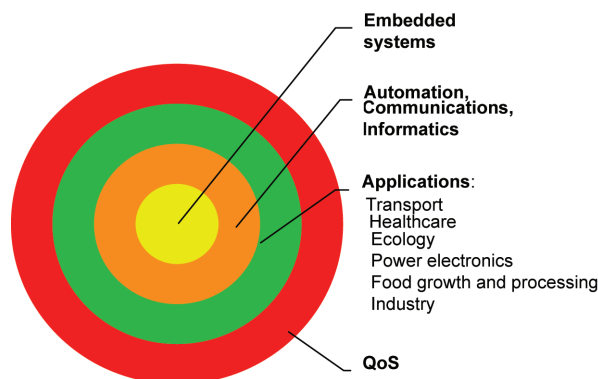
The goal of this contribution is to encourage the systematic integration of modern ICT technology into contemporary logistics systems in production, transport and services. Due to great diversity of the application areas first the technologies and their impact on the quality of service in their application areas are explored and categorized to determine the critical factors, which must be observed for their successful integration. After that the layouts of future integrated solutions are defined for the application areas under observation. Finally, based on an example of good practice, a foundation for reference technology platforms for logistics applications that would enable systematic modular integration of ICT technology into modern businesses by application area is laid out.

ICT Technology as Infrastructure

In Figure 1 the schematic representation of the ICT infrastructure and its application areas are presented:

1. systems/devices with their services and data processing capabilities; here, on one side, a very broad spectrum of embedded computing

Figure 1. ICT components and applications (schematically)



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