

PLENARY SPEAKER ESCAPE27

ABSTRACT

Tuesday, October 3rd | 14:30-15:30 - Room C1

Title: Prospects and Challenges for Process Systems Engineering in Healthcare



Gintaras V. (Rex) Reklaitis, *Purdue University, West Lafayette, USA.*

Healthcare is a major sector of every developed economy and is growing rapidly in importance in the developing economies. In 2015 worldwide healthcare cost exceeded \$ 7.7 trillion per annum representing 10% of world GDP. In the US alone healthcare spending exceeded \$ 3.2 trillion in 2015, representing 18% of GDP (Keehan et al, 2017). The largest portion of this expenditure is for hospital, clinical, laboratory nursing, personal care and physician services, but some 10% is on expenditures for medicines. Without question the services portion can derive significant benefit from process systems engineering contributions in the form of planning, scheduling, supply chain management and decision support tools relying on data analytics. Moreover, process systems engineering methodology has particularly strong contributions to offer in the design, development, manufacturing and delivery of pharmaceutical products. However, the pharmaceutical sector is far from homogeneous – there exists significant differences in market characteristics and needs across the developed, pharmerging and developing economies, a variety of enterprise-level decisions support needs and a diversity of product associated process types (Reklaitis, et al, 2017). This diversity poses different process systems engineering (PSE) research and development challenges and opportunities. In this paper we review some of these opportunity areas, provide examples of current developments and project promising areas for futures application. In particular, we will discuss applications in four major areas spanning the pharmaceutical product life cycle: product and process development, manufacturing, personalized medicine and product development pipeline management.