

Chapter 4

INDUSTRIAL ENGINEERING APPLICATIONS IN OPERATING ROOMS

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Introduction

Industrial Engineering (IE) is a branch of engineering which focuses on improving the efficiency of systems composed of human, machine, material, money and information. IE's history goes back to the late nineteenth century and it is a dynamic profession which attracted special attention since it provides satisfactory solutions to the challenges and demands of manufacturing, government, and service organizations throughout the twentieth century. Historians of science and technology agree on that roots of the profession date back to the Industrial Revolution which started in England in the second half of the eighteenth century. Based on the concepts of specialization of labor and interchangeability of parts, the earliest concrete applications of IE were realized in the last decades of the 19th century when the shops of craft production were transformed into the factories of mass production. First, Frederick W. Taylor, who has been known as "the father of industrial engineering", and later, the couple of Gilbreths, Frank B. and Lillian M., set up the foundations of the profession by their writings and practices in the areas of scientific management, motion and time study. IE has evolved further by introduction of statistical quality control and human behavior focused approach to productivity improvement before WW II. The field of operations research emerged after WW II in order to apply mathematical approaches to formulate and solve industrial problems under resource limitations having observed combined efforts from different expertise become successful in the management of military operations (Salvendy, 2001; Zandin, 2004).

Similar to other disciplines of science and engineering, IE continues to evolve to generate solutions to the rapidly changing industrial and service systems. In this work, we aim to present the contributions of IE to health systems with a special concern on operating rooms. In his seminal book of "The Principles of Scientific Management" which was published in 1911, Frederick W. Taylor included methods improvement applications in health services (Zandin, 2004). As early as the period of 1914-1916, Frank and Lillian Gilbreth published several articles describing the work they did in hospitals including operating rooms (Baumgart & Neuhauser, 2009). Since major IE applications in health systems throughout the 20th century were presented in the two widely used IE Handbooks (Salvendy, 2001; Zandin,

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Ergonomics in OR, OR Facility Design, Safety and Risk Analysis in OR. We hope to draw attention to more multi-discipline research opportunities in every aspects of operating room settings.

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