

Chapter 4

A Review of Goal-Oriented and Business Process Modeling in Dental Clinic Software Management Systems

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ABSTRACT

This chapter reviews the integration of business process modeling (BPM) and goal-oriented modeling (GOM) in the context of dental clinic software management systems (DC-SMS). It highlights how important are test cases in guaranteeing the functionality and quality of healthcare software. The chapter looks at several GOM frameworks, including KAOS, GBRAM, and i. It also looks at how BPM—particularly BPMN—can be used to optimize workflows in DC-SMS. The chapter aims to demonstrate how GOM and BPM can greatly improve the effectiveness and precision of test case design and system testing. It also goes over the useful advantages of this integration, such as increased software system reliability, lower testing*

DOI: 10.4018/979-8-3693-7165-7.ch004

expenses and effort, and greater support for decision-making in healthcare settings. It is demonstrated that this integration addresses specific challenges in DC-SMS, such as aligning test cases with strategic goals and business process models, thereby contributing to more effective and comprehensive system evaluations.

1. INTRODUCTION

With the considerable increase in the world population, traditional healthcare systems cannot satisfy the demand. Therefore, healthcare industry is under pressure to adapt to satisfy the requirements of modern patients, Traditional dental clinic management systems as an important subset of healthcare domain face complex challenges that hinder their ability to achieve operational efficiency and deliver high-quality healthcare. These challenges include poor integration between administrative and clinical processes, leading to increased errors and conflicting appointments, as well as poor flexibility in the face of rapid changes in the work environment. Software systems precision and reliability are critical factors in the healthcare industry (Elhosseini, Gharaibeh, & Abu-Ain, 2023), as a result several solutions emerged as Mobile and smart health applications (M. K. Gharaibeh, Gharaibeh, & De Villiers, 2020), which have contributed to improving some operational aspects. However, these solutions alone are not sufficient to address all challenges, which emphasizes the need to address these issues from the Requirements Engineering Stage, to ensure the design of systems that achieve integration between operational and strategic objectives. particularly when it comes to a specific kind of healthcare systems, such as dental clinic software systems. These systems are essential for optimizing several dental practice functions, including treatment planning, patient scheduling, invoicing, and inventory control. However, the complex and varied features of a dental clinic software systems present challenging barriers to ensuring operations without errors and consistent with the strategic objectives of dental practices. To make sure these systems operate without a hitch, extensive testing protocols that surpass conventional techniques are required. The day-to-day management of dental practices and the coordination of staff care present sophisticated difficulties to practice management systems. These challenges include processing invoices, tracking inventory, integrating patient scheduling, and ensuring compliance with health regulations. Given the diverse nature of these processes, traditional test cases may not be sufficient to cover all strategic and operational aspects of these systems. (Vercammen, Ghafari, Demeyer, & Borg, 2018),

With recent technological developments and the trend towards digitization of processes, it has become necessary to search for innovative solutions based on effective models to improve performance and ensure the achievement of strategic

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