Chapter 9
A Critical Comparative Analysis of Google Chrome and Microsoft Edge:
Effective Utilization of Artificial Intelligence Tools

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ABSTRACT

Most popular web browsers, Google Chrome and Microsoft Edge, have been built on a similar foundation in using the Chromium engine, but have taken different

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architectural approaches, adding their own flavors along the way. We review these approaches in this study, highlighting differences in their technical solutions including rendering engines, security frameworks, and optimization methodologies. Then the performance problems of rice are researched (which includes rice consumption, speed and cross-platform compatibility). It also examines user-facing aspects like privacy, personalization, or AI functions. However, this report is not just a guide comparing apples with apples; it also analyzes empirical performance benchmarks as well as user experiences informing competitive advantages and disadvantages of the two browsers. The results need to steer browser choice across the full array of use cases emphasizing efficiency (economy), security and even innovation in the modern web economy.

INTRODUCTION

Web browsers have become a critical part of today's digital ecosystem, serving as access points to information, tools, and services online. However, Google Chrome and Microsoft Edge stand out from the rest as the most widely used browsers. Chrome has long been the king as far as feature sets go, while Edge has made incredible strides, particularly since switching to the Chromium platform. With users needing improved efficiency, stronger security, and better browsing experiences, the battle to dominate the browser world has been heated between these two browsers. Since that time, their technical architectures, performance benchmarks, and user-centric features have continued to evolve, sparking an ongoing debate over which browser offers the best compromise between speed, resource management, and functionality(Mohamed & Ismail, 2022).

Google Chrome is also one of the oldest browsers on this list, having been launched by Google in 2008 and continuing to be the most popular browser around the world due to its cleanup layout, integration with other Google Apps, and rapid performance. Based on the open-source Chromium project, it introduced innovations like sandboxing for security, a highly efficient JavaScript engine (V8) and a huge extension ecosystem, giving users the power to customize their browsing experience. Chrome, despite its wide adoption, has been criticized for its resource-hungry nature (high memory usage), bad battery usage on mobile and laptop devices, and growing concerns about data privacy. As users place greater emphasis on performance efficiency and security, rivals have attempted to dethrone Chrome by filling gaps in its functionality(Salih, 2021).

Microsoft Edge replaces Internet Explorer in 2015 and in 2020 it runs on Chromium based architecture. This moves enabled Edge to take advantage of Chromium's compatibility while adding Microsoft's own enhancements to the mix, such as in-