

Chapter 16


Camera Industry Logistics and Value Co-Creation of Customers in the Internet Economy

Balaji Gopalan

 <https://orcid.org/0000-0002-1082-5597>

Faculty of Management Studies, CMS Business School, Jain University, India

Jaykumar Padmanabhan

 <https://orcid.org/0000-0003-0770-5778>

Faculty of Management Studies, CMS Business School, Jain University, India

ABSTRACT

Analog cameras have evolved into the more advanced digital single reflex lens cameras, mirrorless cameras and light weight smartphone cameras. Camera brands are heavily dependent on inter-firm innovations, patent sourcing, research and co-design, investments, micro/nano/opto industries, material science, battery industries, information and communication technologies, production and engineering. Cameras have transformed businesses and professions of advertising, entertainment, publicity, archiving, sciences, photography and hobbies for over a century. Camera manufacturers are dependent on compact camera module assemblers, lens manufacturers and suppliers, complementary metal oxide semiconductor sensors, auto focus and optical image stabilization suppliers. The manufacturing of cameras and accessories has faced challenges in terms of optimizing the costs of production, profitability, product portfolio management, standardization of technologies, inventory management, logistics, demand forecasting and obsolescence. This paper explores the camera industry ecosystem.

1. INTRODUCTION

Digital camera technology is constantly evolving, requiring brands to adapt. The industry relies heavily on collaboration and innovation across different fields. Camera manufacturers face challenges in managing costs, product lifespans, and changing consumer demands. The shift from analog to digital

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cameras, highlighting the need for adaptation & details the dependence on various sub-industries like microelectronics and material science, indicating the interconnectedness. A study of 1,816 digital camera models introduced between January 1996 and December 2017 was able to identify new trends in the digital camera market with the emergence of digital single lens reflex (DSLR) cameras, mirrorless interchangeable lens cameras (MILC) and point and shoot cameras (Kirjavainen et al. 2022). Early entrants in the digital camera business were able to outperform competition and customer evaluation played a significant role in camera sales. Profits, market share, survival, revenue on investment, brand sales trial and sales were relevant for the business. Brand's superior performance was dependent on the number of quality customer evaluations of the product. Hu et al. (2014) in a study showed that over three fourth of customers purchasing a product reported trusting customer evaluations of the product and over two thirds read at least four reviews before the purchase. Market equilibriums are caused when innovative firms attempt to fulfill market needs and opportunities with 'entrepreneurial discovery' (Smith et al. 2001). The pace of market evolutions, technology popularity, variability and network effects have stabilized markets (Suarez and Lanzolla 2007). Motorola developed the first cell phone and then Nokia and Ericsson became fast followers and market leaders, and was followed by Samsung, LG, and Apple who are global leaders in the mobile phone industry (Wunker 2012). Challenges like production cost optimization and product portfolio management point towards the need for a dynamic strategy. This dynamic approach will allow firms to navigate the ever-changing digital camera landscape and maintain their position in the market. It was found that after the year 2015, only 20 digital camera brands have survived (Kirjavainen et al. 2022). Digital cameras were usually classified into: (i) DSLR (high-end), (ii) medium (mid-range); and (iii) compact (low-end) cameras. The imaging sensors such as the Charge-Coupled Device (CCD) sensor and the Complementary Metal-Oxide Semiconductor (CMOS) sensor tremendously influenced the design of digital cameras. CMOS sensors eventually dominated its introduction into digital photography due to its imaging quality.

Toshiba and Fuji photo films around the year 1989 pioneered into creating the first digital electronic camera. Casio went on to make its own in the early 1990s and also the popularity of Polaroid cameras and various other brands is legendary. Today, the digital single reflex lens (DSLR) cameras are being replaced by mirrorless cameras with better image configuration. DSLR cameras have always claimed to produce high-quality images and brands offer various types of high-quality lens that capture more light and offer a good depth of field and have transformed the camera industry with its advanced digital imaging technologies such as digital image sensors and electronic shutter mechanisms (Yoon et al., 2013). A research study on the birth of the digital camera industry in the 1990s details how Japanese camera manufacturers between the years 1991 and 1996 focused on target costing and only 17 percent of camera development projects were able to manage with the target costs by the 6th month of mass production (Koga 1999) because of the cost of production. The Canon Digital, one of the first "Single Reflex Lens" digital cameras was priced at \$1000. Previously, digital SLR cameras cost between \$2000 to \$7000 (Norton 2003). Other popular brands in the year 2003 were Olympus, Nikon, Sony and Kodak. The worldwide digital camera market was valued at around \$13 billion. In the case of Kodak, a market leader in analog cameras, the company was unable to capitalize on its invention of digital cameras as it did not realize its full potential. Great product ideas may require the support of product and accessory bundling, product portfolio planning, packaging, pricing and offers (Weinreich et al. 2022). Companies have had to reinvent themselves in terms of identifying and evaluating the most promising product ideas during product innovation (Janeczko et al. 2021; Hvenegaard 2002). Mirrorless interchangeable lens cameras (MILCs) have disrupted the camera industry and brands such as Panasonic, Olympus, and Sony,

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