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Missed Moments: Kodak's Failure to Define the Consumer Market for Digital Photography

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Department of History

Missed Moments: Kodak's Failure to define the consumer market for digital photography

A Thesis in
History

By

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of the Requirements
for the Degree of

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Abstract of Thesis

Missed Moments: Kodak's failure to define the consumer market for digital photography

The focus of this thesis is to provide an expanded interpretation of the decline of the Eastman Kodak Company. Kodak is a company synonymous with cameras, pictures, and photography. The American photographic giant created a vast empire that was able to dominate the industry for the better part of the Twentieth Century. Yet, it missed the opportunity to develop its digital camera technology. This makes Kodak an interesting study in business decision making in the face of advancing disruptive technology.

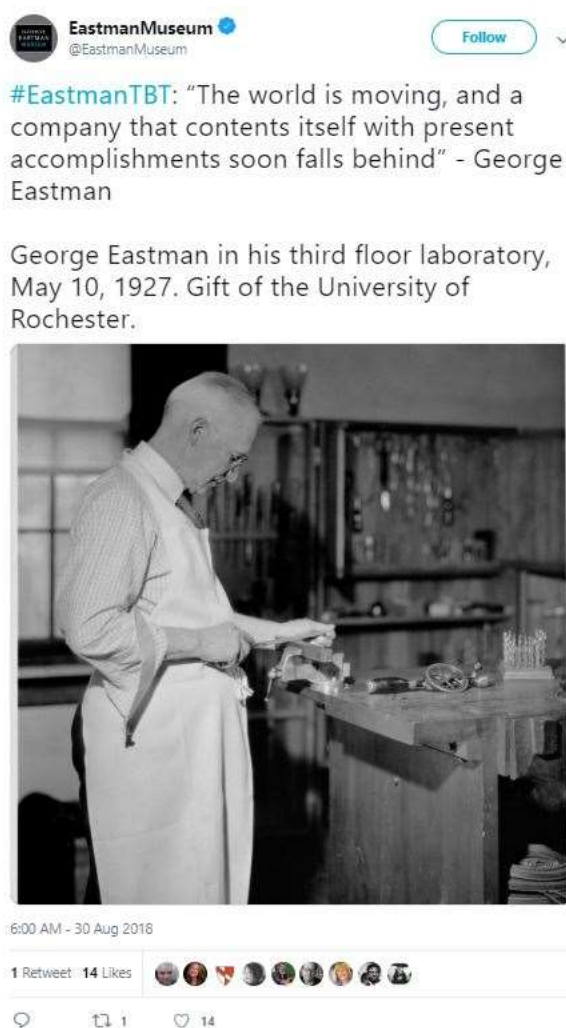
In a historical context, there is a lack of work that deeply inspects the fall of the Kodak company in the late twentieth and early twenty-first century. The small amount of work available focuses on a narrow explanation for the decline of the company. A closer look reveals a more nuanced story that includes institutional restrictions coupled with a changing consumer electronics culture and business model.

In this thesis, Kodak's lack of desire to create a consumer market for digital photography is presented as a major misstep in the history of the company. It is not the aim of this work to exonerate or remove blame from the Kodak company for their actions. This thesis, drawing from primary documents found in the Eastman Kodak archives housed at The University of Rochester, aims to bring new ideas and explanations to the conversation. The argument presented should serve as an expansion of currently available interpretations which place singular blame on Kodak's reliance on film profits for their downfall.

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Chapter 1: Eastman Kodak's Decline and Connections to Consumers, Advertising, and New Technologies



1

¹ Eastman Museum. "#EastmanTBT: 'The world is moving, and a company that contents itself with present accomplishments soon falls behind' - George Eastman George Eastman in his third floor laboratory, May 10, 1927. Gift of the University of Rochester." *Twitter*, 30 Aug. 2018, 6:00 a.m., twitter.com/eastmanmuseum/status/1035150329187323905.

This tweeted quote, and attached image, demonstrates a juxtaposition of Eastman's own thoughts with modern photography and how photographs are used in a post-film age.

There is an established narrative surrounding the decline of the Eastman Kodak company in the late twentieth and early twenty first centuries. That narrative includes several widely accepted explanations for the company's fall from its position as one of the most respected and dominant companies in the world. When examined more closely though, this narrative lacks depth and a more nuanced understanding.

One of the most widely circulated reasons for Kodak's decline is simply that upper management in the company had become complacent. By choosing to rely on film photography's large profit margins, management did not display the foresight needed to navigate the coming digital photography revolution. This idea is made all the more compelling by the fact that the Eastman Kodak company invented, and held the first patents for, digital imaging devices.

More in-depth interpretations of Kodak's decline can be made if we look at ideas surrounding consumer history, advertising history, and how new technologies affect markets and businesses. The following brief summary of consumer history is meant to articulate and place its importance in American business and society, and provide a basis of discussion regarding Kodak's success in integrating its business with that evolving consumerism.

Consumer History

The study of consumption history in America - "how Americans have acquired and used goods not strictly necessary to biological existence" - has emerged as a field of history, gaining attention in the past three decades. With its legitimacy as a field in question for most of that time, many historians have only recently begun to accept consumption history as its own area of

study. Such an integral part of our culture, and therefore an integral part of our cultural history, should not be left unstudied.

Fortunately, there have been a handful of historians who have focused on consumption. These historians have been able to write about their subject through studies in social sciences and the histories of economics, labor, advertising, and business. Some even began their research with nothing but commonly preconceived notions of the topic they are studying. Because of (this) consumption history's development out of other, more established histories, some historians argue that consumption history should not be treated as an actual field of study as "a prism through which many aspects of social and political life may be viewed."² Other historians disagree, stating "consumers can stand as central characters across the span of the nation's past."³

Many questions still exist in the field of consumer history. Most of the writings available now, while covering many different aspects of consumer history, focus specifically on the late nineteenth and early twentieth centuries. This is the most commonly accepted timeframe for the beginning of modern American consumerism, making it a logical place for historians to start filling in this history. What this means though, is that there is a lack of historical writing concerning consumption during periods before and after this timeframe. There are also many topics of consumption that are in need of more study. Issues from comparing the development of consumption in the U.S. with other nations to consumer awareness and autonomy are themes commonly raised when talking about the need for more investigation into consumption history.

² Susan Strasser, et al. *Getting and Spending: European and American Consumer Societies in the Twentieth Century*. Cambridge, Cambridge UP, 1998.

³ David Steigerwald. "All Hail the Republic of Choice: Consumer History as Contemporary Thought." *Journal of American History*, vol. 93, no. 2, Sept. 2006, pp. 385-403.

Given the relative newness of this field of history, and the field's growing popularity, one would think that the less developed issues in the field would be dealt with in time. The past decade has seen increased expansion in the scope of the works being produced in the field of consumption history. There has also been a wealth of research done since the late 1970s and early 1980s concerning advertising, moral attitudes towards spending, and the interpretation of historians who have commented on consumption before the expanded interest in the topic of the past few decades.

The Culture of Consumption: Critical Essays in American History, 1880-1980, edited by Jackson Lears and Richard Fox, is often pointed to as one of the first books to focus on the history of American consumption.⁴ This collection of essays presents ideas on subjects such as advertising and interpretation of past historians with respect to consumption.

In this work, Lears, a now noted cultural historian, discusses advertising's role in the making of a mass consumer society. In the late nineteenth and early twentieth century the public was becoming more and more uneasy about the concepts of mass society and their roles as consumers. In an attempt to ease consumer anxiety, advertisers, according to Lears, began presenting products as vehicles for self-realization. Lears refers to this as "the therapeutic ethos."

Thomas Frank expands on this idea, both in terms of time and cultural influence. Frank focuses on the changes in the advertising industry through the middle of the twentieth century and what these changes meant in terms of counter culture and consumption's influence on each

⁴ Richard Wightman Fox, and T. J. Jackson Lears. *The Culture of Consumption: Critical Essays in American History, 1880-1980*. New York, Random House, 1983.

other.⁵ What Frank calls “Hip Consumerism”, the idea that consumers can identify themselves as part of a counterculture through the consumption of mass-produced goods, was the result of advertisers injecting social criticism and counter cultural creativity into their ads. In this way “Hip Consumerism” builds on the ideas of self-realization brought to light by Jackson Lears. Frank suggests that the counterculture advertisements of the 1960s and 1970s were not merely simple co-optation but the effects of a creative revolution in advertising happening alongside the cultural revolution of the time. This raises some very interesting questions about the relationships between advertising, consumption, and countercultures. If counter cultures in advertising targeted parallel counter cultures in society this would imply that members of society’s countercultures are targeted as consumers. Is this molding? Does this make counter culture members “good” consumers?

Thomas Frank’s idea that advertising did not simply co-opt counter culture to sell products, but underwent its own revolution alongside the social revolution of the 1960’s combined with the self-realization of consumption, begins to shed light on the degree of autonomy held by consumers, an important piece of consumption history that needs to be explored in a more in depth manner.

Existing attempts to examine consumer autonomy and historical reasons for consumption seem to focus on the production and advertisement aspects of the issue. This approach tends to suggest very little consumer autonomy, implying that the roles of production and advertising are more important than the role of the consumer in consumption. A common

⁵ Thomas C Frank. *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism*. 5th ed., Chicago, Univ. of Chicago Press, 1997.

criticism of this approach is that “What is largely missing from these discussions is the consumer.”

Richard Fox’s essay, in *The Culture of Consumption*, on Robert Lynd, the often referred to early observer of consumer culture, focuses on Lynd’s upbringing and religious work before his historical and social sciences work.⁶ This essay raises some questions about the connection between religion, morality, and consumption. Fox suggests that religion plays a role in the organization of a mass society. This may be a factor in the prevalence of moral criticism in late nineteenth and early twentieth century American consumer society.

The issue of morality in regards to consumption is dealt with by historian Daniel Horowitz, in his book *The Morality of Spending: Attitudes Towards the Consumer Society in America, 1875-1940*. Horowitz gives valuable insight into the prevailing moral stances of the late nineteenth and early twentieth centuries. Core Protestant values of thrift, delayed gratification, and hard work are at the center of these stances. This would indicate an agreement among some historians as to the existence of a point of view, held by early consumer society observers, that was based on the contrast of right and wrong.⁷

Some of the attitudes surrounding spending and how certain people should, or should not, spend their money began to shift during the period Horowitz’s was writing about. Moving through the 20th century, morals concerning consumption began to morph. Later moralism

⁶ Richard Wightman Fox. *The Culture of Consumption: Critical Essays in American History, 1880-1980*. New York, Random House, 1983.

⁷ Horowitz, Daniel. *The Morality of Spending: Attitudes toward the Consumer Society in America, 1875-1940*. Chicago, I.R. Dee, 1985.

focused more on an increasingly materialistic middle class, mass culture, and an economic system that was seen as becoming predatory upon the consumer. With inflation in the pre-World War I era came a realization by the middle class that they too may have to sacrifice in some areas of spending to maintain in another areas. The moral scrutiny began to focus on them.

While there is a bit of consensus about the right and wrong moral observations of early consumption critics, the influence of these critiques is debatable. Whether or not, and what portion of, actual consumers followed the moral guidelines set for them is called into question in Lendol Calder's *Financing the American Dream: A Cultural History of Consumer Credit*.⁸ Calder argues that because of the rise of wage labor and the regular pay period, people began to borrow money, for consumptive purposes, in anticipation of their next paycheck. Calder describes early forms of borrowing by working and middle-class consumers and also includes moral objections to these forms of consumer credit. One of Calder's conclusions is that there has become a "myth of lost economic virtue", that although moral critiques of consumption were abundant, they were not always followed.

Calder also includes an interesting insight as to why the practices of consumer credit became acceptable. Calder argues that borrowing, and its resulting debt, caused consumers to follow strict budgets and encourage saving in order to pay these debts. The idea that consumer credit and debt provide reasons for hard work, thrift, and budgeting are attributed to the moral acceptance of consumer credit.

⁸ Lendol Calder. *Financing the American Dream: A Cultural History of Consumer Credit*. Princeton, Princeton UP, 2001.

The fact that practices once considered immoral were moralized and accepted shows consumer societies history of right and wrong thinking, and its need to present ideas in opposition to another. This can become a problematic way of thinking though. According to Susan Strasser “we have to drop the practice of framing our work with the binary opposites.”⁹ While Strasser does acknowledge the fact that binary thinking can answer broader questions about consumption history, she argues that “the realm of consumptions is a domain where dyads merge”, and that by “accepting and even embracing the contradictions, scholars have begun to revamp our conceptual apparatus.”¹⁰ In other words, binary opposites, such as right and wrong, production and consumption, and work and leisure often become one and the same in consumption history, and by understanding this we can be better prepared to evaluate consumption history.

An example of merging opposites can be seen in Lawrence Glickman’s *A Living Wage: American Workers and the Making of a Consumer Society*.¹¹ In this work Glickman offers insight into the emergence of wage labor and its role in creating an American consumer society.

Glickman’s main argument is that American laborers underwent a shift from producers to consumers. Instead of laborers seeing themselves as the producers of goods, entitled to the full benefits of those goods, Glickman argues that they began to accept that wage labor, if high

⁹ Susan Strasser. "Making Consumption Conspicuous: Transgressive Topics Go Mainstream." *Technology & Culture*, vol. 43, no. 4, Oct. 2002, pp. 755-70.

¹⁰ Ibid.

¹¹ Lawrence B Glickman. *A Living Wage: American Workers and the Making of Consumer Society*. Ithaca, Cornell UP, 1997.

enough, could allow a person to provide for themselves and their family by consuming goods in order to fulfill needs and wants.

Glickman illustrates some very important points in *A Living Wage*. First, production and consumption areas are not always clearly defined and separated. Laborers were still producing goods for consumption through their work as wage laborers. In this way laborers were, at the same time, producers and consumers, responsible for both sides of the dichotomy. Calder, in *Financing the American Dream*, also illustrates the merging of dyads, this time concerning the work/leisure dichotomy when he argues that, with the introduction of consumption credit came an increase in debt for consumer purchases. Because of this debt, the leisure of shopping required a stricter work ethic in order to repay the debts. Here we can see examples of the complications that can arise from thinking in binary opposites, no matter how tempting it may be to do so.

Glickman also provides background for some of the ideas presented in Calder's *Financing the American Dream* when he writes about the emerging wage labor system. Calder's argument that consumer credit's rise in popularity came along with the rise in wage labor is supported by Glickman's writing on the living wage. If laborer's increasing demand for higher wages, wages that might have supported a certain standard of living, were not met this would lead laborers to seek some form of borrowing in order to attain that desired standard of living.

What Glickman does not touch on is why laborers/consumers, or consumers in general, came to accept their new roles. Based on Glickman's shift in attitudes and Lears' observation about the growing uneasiness of mass society and consumer roles, questioning why, or what, caused the acceptance of modern consumer society seems like a logical question.

Then again consumption history is a growing field, and there are many questions that remain to be answered about it. These are just a few of those questions, and a small portion of the answers already offered. We can only assume that in time there will be more and more research done, books written, and answers given. These answers will undoubtedly produce more questions, as is the case with many areas of history.

All of this offers plenty of areas for historians to explore in the history of consumption, and these areas should be explored. Such an important and frequently performed, but often overlooked, action in our culture deserves serious attention. After all, as David Steigerwald has argued, "Consumption . . . may be the defining thread of American life."¹²

Advertising History

In addition to the valuable ideas that have been put forth on the subject of consumer history, advertising history can also provide important understandings needed for a more in-depth analysis of the Eastman Kodak company. What follows is the consideration of six books that have become important texts in the history of advertising. By weaving together various ideas and themes in advertising, these books, taken together, are able to provide a solid base in the study and understanding of the subject. By comparing and contrasting the ideas presented in the following books one can begin to navigate the conversation of advertising history.

Advertising history not only contributes to our understanding of consumer history, but it also plays an important role in understanding Kodak's interactions with consumer culture.

¹² David Steigerwald. "All Hail the Republic of Choice: Consumer History as Contemporary Thought." *Journal of American History*, vol. 93, no. 2, Sept. 2006, pp. 385-403.

Kodak's ability to create a consumer market for snapshot photography, which is discussed later in this thesis, can be seen in marketing campaigns and slogans that have become iconic pieces of advertising.

Advertising is a many faceted and complex operation. In assessing advertising's influence in shaping our American experience, a history of advertising can focus on a range of topics. While some authors may focus on the economics of advertising, others may emphasize advertising's cultural impact, the message of a certain type of advertisement, or the media used to convey these messages. In addition, the players effecting, or being affected by, advertising range from businesses who advertise, advertising agencies, and media executives to the general consuming public. In order to gain a proper understanding of advertising's history all of these factors must be discussed.

Daniel Pope's The Making of Modern Advertising is, chronologically, the first of the six books.¹³ Published in 1983, Pope's book marks the beginning of serious study on the subject and focuses on the development of advertising up to 1920. Until Pope's book most histories were focused on the artistic aspects of advertising or produced by in house historians of the advertising agencies themselves.

One major contribution of this book is an outlining of the development of the American advertising industry. This outline, which has been accepted and repeated by the other historians who will be discussed, begins with the patent medicine salesman of the mid-nineteenth century. These salesmen traveled about and stirred the imaginations and emotions of consumers in order to sell their products. As industrial manufacturing increased in the late nineteenth century and

¹³ Daniel Pope. The Making of Modern Advertising. NY: Basic Books, 1983.

large producers began to advertise their goods it would not be long before business owners sought out individuals who could place the advertisements they produced. By the end of the nineteenth century, early advertising professionals are often referred to as “space brokers”, middle men who could go between businesses and media outlets in an attempt to maximize an advertisement’s exposure. During the last decade of the nineteenth century and the first decades of the twentieth century advertising agencies and executives struggled to define their industry. Through the use of trade publications, agencies and executives were able to legitimize and standardize their emerging industry by the 1920’s.

Pope proposes a heavily economic interpretation of why this development happened. Mass production of goods by big business necessitated the expansion of markets in which goods could be sold. In order to make money by selling goods with low profit margins businesses had to sell large quantities of their products to large amounts of consumers. Improvements in communication and transportation during the late nineteenth century allowed goods to reach a wider range of markets. Therefore, advertising became increasingly important in stirring sales to these expanded markets. Pope also suggests that advertising agencies were successful in persuading businesses to compete through their advertisements instead of price competition, the latter of which could be extremely harmful to profits.

Pope does not use economics exclusively though. In assessing aspects of advertising other than business interests, Pope examines advertising agencies’ influence on the ethics of advertising as well as the types of messages conveyed. By examining multiple aspects of the development of American advertising, Pope provides a strong starting point for studying the subject.

Pamela Walker Laird's Advertising Progress: American Business and the Rise of Consumer Marketing focuses on the same time period of the late nineteenth century until 1920.¹⁴ Laird's contribution comes in the form of a more detailed analysis of the development of the advertising industry while also framing advertising as progress on several levels. Progress in production, the advertising industry, and consumption are all discussed.

In examining the progress in production that was pushed by advertisers, Laird relates stories of business owners using advertisements to announce improved quality and production capabilities, along with availability and prices, to previously unreachable markets. Laird's analysis, that advertising addressed businesses' immediate needs to sell products, is in line with Pope's economic analysis.

Laird also expands on Pope's discussion of the advertising industry's attempts to legitimize and stabilize itself. In examining a wide range of trade publications Laird put forth the idea that the advertising industry presented itself as a step in the progression of American business. Framing the emerging industry in the business trends of specialization and efficiency, the advertising industry was able to gain acceptance.

Progress in consumption came by advertising the buying of goods as a way to improve the buyer's life. The availability of goods could be seen as having a direct effect on improving the quality of life for the consumer. Other historians have their own way of addressing availability, emerging big business, and emotional, consumer focused advertising.

¹⁴ Pamela Walker Laird, and John Staudenmaier. "Advertising History." *Technology and Culture*, vol. 30, no. 4, Oct. 1989, pp. 1031-36.

Fables of Abundance: A Cultural History of Advertising in America is Jackson Lears' analysis of how advertising and the increased availability of goods have affected American consumer culture.¹⁵ According to Lears, the abundance of products made possible by the industrial revolution, and the subsequent advertising of these products, caused the efficient factory to replace the fecund earth as a source of abundant production. Because of this shift consumers became less attached to the products they consumed. Availability and uniformity of goods led to a decline in animism of products.

Lears attributes some of this shift to similar ideas presented by Pope and Laird, such as the need for stable economic conditions and the American affinity for efficiency. Emotional connection to products is the focus of Lears' book though. Touting the carnivalesque characteristics of early advertising methods, Lears argues that a great deal of emotional connection to a product is lost when businesses began modern advertising in the late nineteenth century. This emotional detachment between consumers and the goods they consume, along with Lears' therapeutic ethos, provides a narrative of shifting emotional connection from the products themselves to the idea that a product can improve one's life.

Lears provides a history that is focused on how advertising affects consumers and American culture. His aim is not so much to shed light on the businesses that used advertising and why they advertised. Lears spends little time on how the message of advertising is delivered

¹⁵ Jackson Lears. Fables of Abundance: A Cultural History of Advertising in America. NY: Basic Books, 1994.

through various media channels. What Lears does focus on is the message of advertising and how it affected the consuming public's view of their world.

In contrast, Roland Marchand's Creating the Corporate Soul: The Rise of Public Relations and Corporate Imagery in American Big Business does a fine job of weaving emotional public opinion concerning big businesses with how and why those businesses tried to change public opinion.¹⁶ In doing so Marchand evaluates several forms of media used to deliver messages along with the role that advertising agencies played in shaping institutional advertising. The focus of Marchand's book is how institutional advertising was used by big businesses to generate good will and combat perceptions of large soulless corporations. By analyzing the rise of public relations, Marchand demonstrated that big businesses were able to change the way the consuming public viewed such institutions. Marchand lays out a shift from skeptical criticism during the Progressive era to acceptance of big business by the 1950's.

Marchand strengthens his argument through the use of public opinion polling and customer feedback. Marchand uses this information in much the same way that Pope uses economic figures to prove the effectiveness and growth of advertising. Advertising that attempts to sway the public opinion of a large corporation in this manner can be seen as directly addressing and overcoming the issues of cold, mechanical mass production and the preoccupation with efficiency that both Lears and Laird present.

¹⁶ Roland Marchand. Creating the Corporate Soul: The Rise of Public Relations and Corporate Imagery in American Big Business. University of California Press, Berkley and Los Angeles, California: 1998.

Marchand also touches on the attempts of big businesses to sway public opinion in relation to political issues. Beginning with Franklin Roosevelt's presidency, Marchand initiates a discussion based on using media and advertising to persuade voters. Advertising executives, such as Bruce Barton, persuaded corporations to sway public opinion away from government involvement in business to free enterprise.

In Better Living: Advertising, Media, and the New Vocabulary of Business Leadership, 1935-1955 William L. Bird Jr. offers an expanded view of the conflict between government and industry that played out in the advertising media since Franklin Roosevelt's presidency.¹⁷ Although Bird begins his book discussing the success of government public relations campaigns, his focus quickly turns to efforts made in combating these campaigns. Some reading on how government uses the media and advertising to influence voters may be a good compliment to this book. By assessing the role of industrial associations, advertising executives and media executives, Bird provides a rich explanation of how advertising media turned from educational dictation to entertainment in order to sway the public. Much like Marchand, Bird used opinion polling to demonstrate the effectiveness of entertaining styles of advertisement. This information was essential in order for advertising businesses to accept this new style, and also continued to validate advertising agencies and executives.

Some interesting questions can be asked, and comparisons can be made, when looking at the Bird and Lears books. Does Bird's entertaining style of advertising conflict with Lears

¹⁷ William L. Bird Jr. Better Living: Advertising, Media, and the New Vocabulary of Business Leadership, 1935-1955. Northwestern University Press, 1999.

decline in carnivalesque advertising? Most likely these two historians would be in agreement when focusing on the educational dictation used to combat Franklin Roosevelt's election campaign of 1936. In addition, Lears presents accounts of consumer habits that suggest a desire for his carnivalesque advertising and therapeutic ethos. It is possible that this desire was met with an advertising style that entertained consumers while projecting the idea that consumer goods, and the companies that produced them, could provide the consuming public with a better life. According to Bird, however, this does not mean that advertisers produced entertaining ads for the sole purpose of fulfilling consumer desires. If those desires were met it is most likely because when those desires are fulfilled it generates larger audiences of potential consumers. In Better Living Bird lays out an advertising culture that eventually would end up paying for actors and programs that would attract the largest audiences possible.

David E. Nye's Image Worlds: Corporate Identities at General Electric is a case study of one corporation's efforts to address a number of audiences.¹⁸ By focusing on the photography of in house General Electric publications, Nye reveals how one big business portrayed itself in a number of ways. Nye shows that there are wide ranges of individuals who can be seen as consumers by examining advertisements geared towards labor, engineers, management, executives, and the consuming public.

Much like Roland Marchand, Nye shows that a corporation can use advertising and imagery to persuade opinion. Nye puts forth a more nuanced interpretation though. General

¹⁸ David E Nye. Image Worlds: Corporate Identities at General Electric, 1890-1930. MIT Press, Cambridge, Mass. 1985.

Electric did not attempt to persuade only the consuming public, but also every level of employee in the company. Each group was given its own messages which were carefully constructed to combat possible negative feelings towards the company. In addition, each group was provided with messages that would cultivate positive opinions of General Electric in that group.

Nye's analysis of the artistic aspect of photography is presented as well. Here, Nye seems to be in opposition to Lears when he argues that corporate and advertising photography is very different from artistic photography. In Fables of Abundance Lears argues for the artistic merits in some aspects of advertising such as technical ability in producing imagery. Lears is also very fond of pop art, which often uses consumer goods and images to create art that, according to him, gives new energy to the animism of goods. Nye argues that advertising photography, while technical and well put together, is created for very different purposes, mainly to persuade consumers.

Nye offers a top-down history in Image Worlds. Unlike Marchand's text on institutional advertising, Nye spends a small amount of time addressing the consuming public in his book. In addition, Nye does not include information that would indicate the effectiveness of General Electric's strategies. Pope, Marchand, and Bird all surpass Nye in qualifying their proposals with data.

It is surprising that a subject that has such a significant cultural impact did not receive serious attention until the early 1980's. Some articles from this time lament the delay in the development of advertising history. Others praise the advent of studying advertising history, and propose questions that advertising history should address. Fortunately, there is now a collection of work on the subject.

In all, these six books represent a solid foundation on which to begin studying advertising in American history. When taken together they represent a rich tapestry of corporations, government, advertising agencies, media executives, and a wide range of consumers of advertising. In addition, the many reasons for why advertising has developed the way it has and how it has developed have been explored along with the effectiveness of the messages and methods used. All of these factors combined tell the story of advertising's effect on American consumption habits and cultural history.

Connecting Kodak to Consumer and Advertising History

As an American company, the Eastman Kodak Company became a beneficiary of the histories of consumption and advertising. Its place among the most respected, even envied, companies on the planet is a direct result of many of the ideas just discussed. Kodak's relationship with consumer history and advertising history is not only as a beneficiary of these histories though. Kodak also played an important role in shaping these histories.

Another important work in the histories of consumption and advertising is Nancy Martha West's Kodak and the Lens of Nostalgia. In her book, West lays out some of the early advertising strategies that were employed by George Eastman, founder of the Eastman Kodak Company.¹⁹ West argues that Kodak's advertising strategies of the late nineteenth and early twentieth centuries set the company on a trajectory that would allow them to dominate the photography world. The path Eastman took to legitimize simple snapshot photography, and the

¹⁹ Nancy Martha West. *Kodak and the Lens of Nostalgia*. Charlottesville, UP of Virginia, 2000.

products his company sold in order to produce the snapshots, relied heavily on marketing and advertising.

This advertising is credited with having the effect of taking photography from an expensive, time consuming activity, to something that almost anyone could participate in. Kodak essentially created a market for what was seen as inferior equipment and processes at the time. This not only serves to prove the effectiveness of advertising strategies in changing the opinions and habits of consumers, but also provides a foundation to study how entire consumer markets can be created. In this way we can use West's history and apply it to more recent historical events in an attempt to create a deeper understanding of these events.

New Technologies and Disrupted Markets

The idea of new technologies and their impact on markets is an important piece of a more nuanced understanding of the Eastman Kodak company in the late twentieth and early twenty first centuries. By gaining an understanding of the history of how new technologies can disrupt markets and affect businesses, it is possible to form new understandings that challenge the accepted narratives surrounding Kodak's decline. Because it is important to approach a subject from multiple angles to gain a more complete understanding of that subject, we will explore a set of ideas that are not explored deeply enough in relation to Kodak.

What happens when new technologies come to market? How does this affect the companies involved in a particular market? Why do companies have difficulty coping with new technologies? These questions and others that relate to them are an interesting area of study and have an established literature surrounding them. What follows is a summary of the work of two

important people who have worked to interpret the effects of new technologies on businesses and markets.

Clayton M. Christensen's incredibly important book, The Innovator's Dilemma, outlines how companies can and do mismanage new technologies.²⁰ Throughout history we can find large, successful companies that go out of business because of this mismanagement. Christensen provides insight into how this happens and why.

By dividing new technologies into two categories, sustaining technologies and disruptive technologies, Christensen begins to form an understanding of how this all works. Sustaining technologies are technologies that enhance current technologies. Sustaining technologies are easy to promote and integrate. They often require very little rethinking or reworking of technologies, but offer benefits such as increased capacities, smaller sizes, and dropping price points. In contrast, disruptive technologies often start out expensive and underwhelming. Usually, disruptive technologies will underperform compared to established technologies in similar established markets. Disruptive technologies also, initially, only appeal to niche markets. These early markets are seen as unprofitable and a difficult place to find growth for the company. For these reasons, Christensen argues, managers will promote sustaining technologies and kill disruptive technologies.

Christensen argues that this is often where companies undo themselves. Over time an established technology and its sustaining technologies begin to provide more than consumers need, want, or can afford. At the same time, sustaining technology is added to the initial

²⁰ Clayton M Christensen. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business Review Press, 2015.

disruptive technology, improving capacity, size, and price, until disruptive technology has an opportunity to take hold of that market. This is the pattern that Christensen sets out as the cycle of technology markets.

While Christensen's study of computer hard-drives offers a wonderful case-study for his ideas, digital photography easily fits into the category of disruptive technology. In fact, later versions of the book identify digital photography as a disruptive technology that fits Christensen's mold. This is part of the reason that this work is an important piece of this thesis. It is an interesting exercise to apply Christensen's advice for how to handle disruptive technologies to the Eastman Kodak Company. When done, several things become clearer about how Kodak viewed itself, its abilities, and its markets.

Also adding to this discussion is Christian Sandstrom, a professor at Chalmers University of Technology, the Ratio Institute, and Jönköping International Business School, Sweden. Sandstrom's work deals with innovation, technology, and business. What makes Sandstrom's work interesting and valuable to this topic, is his personal interest in the photography industry. He has written about Swedish photography company Hasselblad and about the Eastman Kodak Company.

Expanding on Clayton Christensen's ideas of disruptive technology, Sandstrom adds that the business model of a company ties them to certain ways of doing business. When a disruptive technology is introduced, a company's old way of doing business may make it impossible for that company to compete in the new market. As an example, Sandstrom uses the shift to digital photography to point out that Kodak had every advantage in markets based on chemicals and

photo papers, but that chemical engineers were not nearly as useful for producing high quality digital imaging parts.

This idea of a company's identity being set by its abilities and personnel is something that can be expanded upon when combined with a study of a company's use of advertising. How a company views itself has a large impact on the markets it involves itself in. Because of this, we can look at advertising and marketing pushes to gain a better understanding of how a company sees itself.

Kodak and Digital Photography

Why should we take a deeper look at Eastman Kodak's missteps in handling digital photography? Why should we question the existing literature and commonly held beliefs about the company's fall from grace? These questions need to be explored in order to create a fuller, richer picture of this story. This development, Kodak's downfall, did not rest on a single issue. It did not happen because of a single event, single idea, or lack of will in a single area. Instead, the decline of the Eastman Kodak company was caused by a number of decisions and institutional views that led to a chain of events. The story of Kodak's failure to capitalize on its digital photography patent can be viewed through a number of lenses.

While there is a relatively small amount of literature on this subject, almost all of it revolves around a single concept. The idea that Kodak executives grew complacent, content with large profit margins on photographic film products, and their dominance of the film market, are the standard reasons given. The idea that dominates popular opinion is that no matter what the leaders of the company were told, no matter what was being forecast by those in advisory

positions, the particular set of people in charge during the 1970s, 80s, and 90s saw no reason to deviate from the standard operating procedure. While large profit margins would have been a factor, along with a secure position in the upper echelon of Fortune 500 companies, this would not have made Kodak's position impenetrable. Given the fact that Japanese film companies began to take more of the market share for film at this time, any reasonably competent executive would have been able to see at least a small storm on the horizon. To assume that a company as large and dominant as Kodak, for as long as Kodak was large and dominant, could go twenty-plus years without minimally competent leadership seems highly unlikely. This makes the investigation of other possible causes a significant pursuit.

In addition, the Eastman Kodak company's cultural impact is hard to overstate. Kodak is a company that is synonymous with photography and imaging. Almost all Americans, and many other people around the world, who were alive during the twentieth century are sure to have experienced their own "Kodak Moment." George Eastman, founder and namesake of the Eastman Kodak Company is a pivotal figure in bringing snapshot photography, photography for non-professionals, to the masses. His history of invention and innovation in the field of photography was directly responsible for a wide range of products such as roll film, affordable cameras, and streamlined processing systems. These innovations helped to bring photography to the masses in the late nineteenth and early twentieth centuries. His cultural impact is still thriving today, even if the company that bears his name is not. One needs only to visit a popular tourist attraction to see legions of selfie-snapping consumers to understand the continued importance that snapshot photography plays in our lives today. Because of the cultural significance of such a company, a study of that company's missteps should be valuable.

The rest of this offering will argue the following thesis and some of the logical consequences that stem from it.

One of the major reasons for Eastman Kodak's failure to capitalize on digital photography is because they failed to set the market for their new, disruptive, technology, as they once did with snapshot photography. For the purposes of this thesis, to "set the market" will mean that a company is more effective than other companies in communicating to consumers what a new technology or product might mean to them. This would place a company in a position to dictate to consumers how a technology or product is used, what it is used for, and who might use it.

Chapter 2: Kodak's History of Making Consumer Markets

The Eastman Kodak Company has a history of innovation in the field of photography. The digital imaging device that Kodak created in 1975 was by no means the first time they produced a product that would shift the photography field in fundamental ways. Kodak products changed the who, what, where, why, when, and how of late nineteenth and early twentieth century photography. By introducing roll film and affordable, easy to use photography equipment to the general public, George Eastman and the Eastman Kodak Company simplified a highly scientific process. Producing photographic images became something that almost anyone could do.

In 1849, Henry Hunt Snelling published *The History and Practice of the Art of Photography: or the Production of Pictures Through the Agency of Light*. This early work was an explanation of the mechanics and processes used in producing photographs, and was, according to Snelling, intended to “fill a void, much complained of by Daguerreotypists — particularly young beginners.”²¹ Snelling then proceeded to explain that “all the English works on the subject — particularly on the practical application of photogenic drawing — are deficient in many minute details which are essential to a complete understanding of the art.”²² Snelling’s intention seemed to be aimed at producing a text that would make photography more accessible to a particular group of people.

At the same time *The History and Practice of the Art of Photography* serves as a perfect window into the complicated nature of early photography. The level of understanding and

²¹ Henry Hunt Snelling. *History and Practice of the Art of Photography*. Kindle ed., (New York, G.P. Putnam, 1849.), 3

²² *Ibid*, 3

instruction needed to produce a photograph in the mid-nineteenth century, and the barriers this caused, are summed up well when Snelling wrote that he wanted to produce a complete system of photography that could

enable any gentleman, or lady, who may wish to participate in the art, for profit or amusement, to do so without the trouble and expense of seeking instruction from professors, which in many cases within my knowledge has prevented people from embracing the profession²³

What followed was an offering that was very much a textbook for aspiring professionals. Overflowing with technical descriptions of chemical solutions and proper processes, the book reads like an upper level college book, with a healthy dose of mechanical engineering added in. Photography of the time was clearly not something that was done without thought. Photography was not a hobby. It was a profession and an art that required knowledge, training, and experience.

This was a very different kind of photography, and a different idea of photography, than our modern photography. Throughout the twentieth century picture taking had become something that was accessible to so many. It became something done almost reflexively, during vacations, parties, holidays, and in so many more situations. These shifts were the result of the efforts of the Eastman Kodak company in the late nineteenth and early twentieth centuries.

A few new forms of technology and a change of ideas were needed to permanently change photography from a profession, and an art form, into a hobby or even a reaction. These new technologies did not immediately take hold, and the new ideas that Kodak spread required considerable time and effort to take to gain a foothold. Through focused advertising campaigns

²³ Ibid, 3

and a willingness to embrace inferior, but more convenient, technology, Kodak eventually molded the photography industry into a market they would dominate for the majority of the twentieth century.

One of the new technologies that Kodak embraced was roll film. While Kodak did not invent roll film, or even initially think that it would be a viable technology, the company did eventually use it as a way to bring photography to the masses.²⁴ As Kamal A. Munir and Nelson Philips described:

The major advancement of Kodak's roll-film camera was the replacement of the fragile glass plates by a chemically coated film that allowed permanent images to form. This relieved the photographer from handling glass plates, and made cameras much more compact. However, the images produced by these cameras were of extremely poor quality compared with those produced on dry glass plates, and were openly derided by the professionals and serious amateurs who then dominated the practice of photography²⁵

Roll film provided conveniences for consumers, but it came with a price. By eliminating the need for large glass or metallic plates covered with chemicals, roll film greatly simplified the mechanics and chemistry of the camera. Once Kodak was able to implement a process by which they would be responsible for developing rolls of film containing the consumer's pictures, much of Snelling's instruction on chemical compositions and the mechanics of handling large equipment was no longer a concern for the person who was taking the picture. This idea is superbly conveyed in 1888 by George Eastman's famous "You press the button. We do the rest" slogan.

²⁴ Kamal Munir, and Nelson Philips. "The Birth of the 'Kodak Moment': Institutional Entrepreneurship and the Adoption of New Technologies." *Organization Studies*, PDF ed., vol. 26, no. 11, 1 November 2005, pp. 1665-87.

²⁵ Ibid

The No. 1 camera, introduced in 1888 was Kodak's first offering in a line of cameras that would bring about the convenience and popularization of snapshot photography. According to the Kodak company:

With the KODAK Camera in 1888, Eastman put down the foundation for making photography available to everyone. Pre-loaded with enough film for 100 exposures, the camera could be easily carried and handheld during operation. It was priced at \$25. After exposure, the whole camera was returned to Rochester. There the film was developed, prints were made and new film was inserted -- all for \$10.²⁶

Ten years later, in 1898, available Kodak cameras included the Pocket Kodak and the Folding Pocket Kodak (figures 1 & 2). Both of these cameras were small, handheld cameras that could be loaded with film that would provide 12 exposures. While the Folding Pocket Kodak cost consumers ten dollars, the Pocket Kodak came with a smaller price tag of five dollars.²⁷ No doubt, lower prices made these cameras even more accessible to consumers.

The portability of these two products was emphasized in both advertising and available accessories. Kodak made several small carrying cases for their pocket cameras, with some of the cases being made specifically for mounting on a bicycle (figures 4 & 5). The ease and portability of photography had developed to a point where all necessary equipment could be brought with consumers, in a small case, and carried anywhere a bicycle could go.²⁸

²⁶ *Kodak.com*. Kodak, www.kodak.com/cl/es/corp/aboutus/heritage/georgeeastman/default.htm. Accessed 27 June 2019.

²⁷ *1898 Kodaks*. Rochester NY, Eastman Kodak Company, 1898, www.libraryweb.org/~digitized/tradecats/kodak/Kodaks_and_Kodak_supplies_1898.pdf. Accessed 30 June 2019.

²⁸ *Ibid*

Both the Pocket Kodak and the Folding Pocket Kodak used Kodak's cartridge loading film system. The system boasted ease of use and an ability to load film in broad daylight.

According to Kodak's 1898 catalogue section titled "Cartridge Photography":

The absolute simplicity of the system has been the secret of its success. Indeed, so easy has photography become under our system of cartridge cameras that any bright boy or girl of ten years can successfully accomplish every step of picture-taking, from "pressing the button" to "doing the rest."²⁹

In 1900 the Eastman Kodak Company introduced the Brownie Camera. With a cost of only one dollar, it was the most affordable camera to date. Considering the price-point of the Brownie, along with the fact that less equipment and education were needed to operate the camera, the cost to own and operate the Brownie was much less prohibitive than other photography systems and set-ups. Kodak had, over a series of years and several different camera models, created the perfect scenario for taking photography to the masses.

Photography of the late nineteenth century was already established, as mentioned before, as a serious profession and an art form. There was little demand by these groups for the new technology that Eastman had pursued. There were some attempts to spread photography beyond these established photography groups, but, as with the Warnerke roll film system that will be discussed later, none had been very successful. In addition, the quality of images produced by roll film was inferior to existing systems. This meant that roll film and the smaller camera it allowed for was originally rejected by the established photography community. As Kamal and Munir put it

A major reason for its poor reception up to that time had been the extremely poor quality of the images it produced. While the camera did offer more mobility, this feature could not compensate for this drawback, which was exceedingly

²⁹ Ibid, 4

important to both professionals and serious amateurs, who constituted the great majority of the market for cameras³⁰

In addition, roll film produced inferior images to glass plates at the time. Glass plates were much more stable, and resistant to bending, than plastic roll film was. This meant that photographers would get less distortion and a clearer image from glass plate photography than they would from roll film.

At the same time, there were obvious drawbacks to the photographic glass plate methods and processes of the time. Eastman was not the first to attempt a roll film photography process. The roll film process that had received the most attention from the photographic journals before Eastman began development of his system was the Warnerke system. This system had at least five major criticisms brought by the photographic journals of the time. They included the assessments that the film was too expensive; that the mechanics of the rollers used to hold the film were awkward; that mechanisms for advancing and cutting the film would damage the film; that humidity had a negative impact in the structure of the film, causing warping of the film and images; and that the entire system was more expensive and less reliable than glass plate technology.³¹

Just because serious professional photographers were not demanding lighter and more compact equipment, and less complicated processing systems, that does not mean that other consumers, potential casual photographers, would not appreciate these things. It was this vision,

³⁰ Ibid

³¹ Reese V. Jenkins. "Technology and the Market: George Eastman and the Origins of Mass Amateur Photography." *Technology and Culture*, vol. 16, no. 1, 1975, pp. 1–19. *JSTOR*, www.jstor.org/stable/3102363.

the belief that other consumers could exist for photographic products, that inspired George Eastman to pursue roll film and compact equipment.

How, exactly, George Eastman and his Eastman Kodak Company addressed these problems, how they changed the idea of photography, and how they created a market for amateur snapshot photography is well documented. The strategies used to implement this shift are laid out in Nancy Martha West's book *Kodak and the Lens of Nostalgia*. West touches on several themes that Kodak pushed through its advertisements between 1888 and 1932.

As mentioned before, the Brownie Camera played a significant role in changing photography. It was not just a low price point that made it so important though. The portability of the camera allowed for consumers to take the Brownie with them wherever they went. Kodak used this in a thread of advertisements that encouraged consumers to bring their cameras with them on vacations. The idea was that vacationers should document their travels, forming narratives along the way. Kodak also implied that these memories could be kept forever, never forgotten, as they were physical proof to relive the experience through.

Another way that Kodak shifted the idea of photography was to emphasize the fashion elements of their equipment. Kodak positioned cameras as a must have accessory, offering different colors in order to coordinate with the user's outfits. Through marketing campaigns that emphasized photography as central to travel, fashion, and a lifestyle with enough free time to participate in these things, Kodak was able to shape consumer perceptions of photography. Snapshot photography would become something that was essential to a stylish middle-class experience.

Several advertisements were produced showing fashionable young women with their Kodak. These women in the advertisements were not necessarily using the cameras, but the implied message was that it would be fashionable to be seen with their Kodak camera. Through these advertisements Kodak was able to convey their message of the camera as a modern fashion accessory to people of lesser means as well. One did not have to be on an expensive vacation in the Catskills to use a Kodak camera, a trip to Coney Island would have been just as much of a reason to capture memories. In addition, although the consumer was to understand that the women in the advertisements were off on idyllic adventures, the images convey a message that even if one was not seen taking pictures of locations traveled to, being seen with a Kodak camera creates a perception that the owner is a person who could travel to these locations.

The final step in changing the idea of photography was to confront and eliminate the aura of death associated with photography. Many families would display post-mortem photographs of deceased relatives. These pictures that were taken by professional photographers so that living family members could remember the deceased. Kodak aimed its advertisements at building happier, more playful narratives. Kodak was successful in eliminating the mournful aspects of post-mortem photography and replacing them with the idea that photographs should capture important, joyful moments that could be revisited and remembered fondly.³²

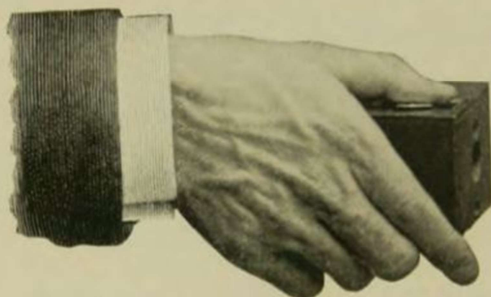
In several ways, George Eastman and the Eastman Kodak Company reshaped the way people thought about photography after 1888. Many of the ideas that were presented in Kodak advertising have lasted decades in the collective minds of consumers. Some of the ideas that

³² Ibid, 136. West dedicates an entire chapter of her book to her explanation of how Kodak dismantled the aura of death that surrounded snapshot photography in the last half of the nineteenth century.

originated in the late nineteenth century still have a significant effect on how we think about photography in the early twenty-first century. These lasting ideas are proof of Eastman's influence on the creation of a long-lasting consumer market.

That consumer market that the Eastman Kodak Company was able to create, to satisfy a demand that was not there, was a market that Kodak dominated for decades. Kodak was not only able to change the idea of photography, but to change the idea in such a way that it was tailored to their own business model. Throughout the twentieth century Kodak made the majority of their profits by selling and processing roll film. The camera was a vehicle for their more important products and services. Getting an affordable and portable piece of equipment into the hands of a consumer would facilitate that consumer's continued reliance on, and therefore purchase of, other Kodak products and services. This was the Kodak business model, and the market they created for their business model, that kept Kodak at the top of the photography world throughout the twentieth century.

THE POCKET KODAK.



Measures $2\frac{1}{4}$ x $2\frac{7}{8}$ x $3\frac{7}{8}$ inches, makes a picture $1\frac{1}{2}$ x 2 inches, and weighs only 6 ounces.

The Lens is carefully tested, and has a fixed focus of sufficient length,

($2\frac{1}{2}$ ins.) to avoid distortion.

Built on the "Cartridge System" and can be loaded in daylight. Has improved rotary shutter and set of three stops for lens. The slides for changing stops and for time exposures are alongside of the exposure lever and always show by their position what stop is before the lens and whether the shutter is set for time or instantaneous exposures, thus acting as a warning.

A Plate Holder for glass plates can be provided with each Pocket Kodak, no extra attachment being required. The change from a film to a plate camera can be made in a few seconds.

A rectangular Finder is provided for locating the image with accuracy. The construction is simple and accurate. The Camera Body is wonderfully strong and light.

In the quality of work they will do, Pocket Kodaks equal the best cameras on the market. They make negatives of such perfect quality that enlargements of any size can be made from them. We do it, at a reasonable price, or you can do it yourself with a Pocket Kodak enlarging camera.

The Pocket Kodaks are covered with fine leather, and the trimmings are handsomely finished and lacquered. They are elegant, artistic and durable.

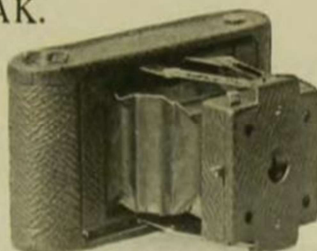
Can be readily carried on the bicycle by use of our special cases. See page 25.

| | |
|---|--------|
| Pocket Kodak covered with fine Leather, with roll of film for 12 exposures, | \$5 00 |
| Leather Hand Carrying Case (for Pocket Kodak and three extra spools of film). Price of case only, | 75 |
| Light Proof Film Cartridge, 12 exposures, | 25 |
| Complete A B C Developing and Printing Outfit, | 1 50 |

Figure 1. Advertisement for the Kodak Pocket from the 1898 Kodak catalogue. Not only was the camera portable and easy to use, it could be fitted with a glass plate holder to facilitate glass plate photography as well.

FOLDING POCKET KODAK.

For rectangular pictures $2\frac{1}{4} \times 3\frac{1}{4}$ inches; capacity, 12 exposures without reloading; size of Kodak, $1\frac{5}{8} \times 3\frac{1}{2} \times 6\frac{3}{4}$ inches; weight, $14\frac{1}{2}$ ounces; length of focus of lens, 4 inches.



In this Kodak we have adapted the Film Cartridge System to an instrument that has been appropriately called a "Photographic Pocket Piece." Though but one and one-half inches in thickness and so light as hardly to be noticed when carried in the pocket it is in every way a complete camera.

The lenses used in these instruments are specially ground, are strictly achromatic, are carefully tested by an experienced inspector and have a fixed focus of 4 inches, a sufficient length to avoid that violent perspective which is so disagreeable in many amateur photographs. They are in short the finest achromatic lenses that can be made, covering the plate clear and sharp to the very corners.

The shutter is entirely new and is simplicity itself. It is always set. A single downward pressure on one exposure lever makes a snap shot. The instant the pressure is removed the shutter sets itself ready for the next exposure. A pressure on another lever opens the shutter for time exposure while a second pressure closes it.

It has a set of three stops and is equipped with two view finders, one for vertical and one for horizontal exposures. There are no loose parts to become lost or mislaid, and to load the instrument is simplicity itself. Made of aluminum covered with the finest black morocco, with handsomely nicked fittings it is at once strong, dainty and durable. In short the Folding Pocket Kodak is an instrument of the finest quality and workmanship, but of the smallest compass; and though a practical pocket camera makes pictures of good size and of artistic shape and so sharp that they can be enlarged to any size.

Can be readily carried on the bicycle by the use of our special cases. See pages 26 and 27.

| | | | |
|--|---|---|---------|
| Folding Pocket Kodak with achromatic lens, not loaded, | - | - | \$10 00 |
| Light-proof Film Cartridge, 12 exposures, $2\frac{1}{4} \times 3\frac{1}{4}$, | - | - | 40 |
| Black Sole Leather Carrying Case, | - | - | 1 25 |
| Complete A B C Developing and Printing Outfit, | - | - | 1 50 |

Figure 2. Advertisement for the Folding Kodak Pocket from the 1898 Kodak catalogue. Note the emphasis on both technical and convenience aspects of the camera.

BICYCLE CARRYING CASES.



THE POCKET KODAK BICYCLE CASE.

THE POCKET KODAK
BICYCLE CARRYING CASE.

The Pocket Kodak Bicycle Carrying Case is made of the best black sole leather and will hold, beside the Kodak, three extra spools of film. It attaches to the frame in much the same manner as a tool bag and may be carried suspended from the top bar of the machine either at the head or at the seat post.

Price of Pocket Kodak Bicycle Case, - - - - - \$1 00

Figure 3. Advertisement for Pocket Kodak bicycle case from the 1898 Kodak catalogue.



Figure 4. Advertisement for Folding Pocket Kodak bicycle case from the 1898 Kodak catalogue.

Chapter 3: Digital and Decline

Early Success in Digital

In 1975 Kodak produced the first true digital imaging device, which could be called the first digital camera. This device was created by Steve Sasson, a Kodak engineer at the time.

“Hardly anybody knew I was working on this, because it wasn’t that big of a project,” Mr. Sasson said: “It wasn’t secret. It was just a project to keep me from getting into trouble doing something else, I guess.”³³

Mr. Sasson’s small project eventually led to U.S. patent US 4131919 A. In the patent abstract the device is described as an,

Electronic imaging apparatus, preferably an electronic still camera, employs an inexpensive information-recording medium such as audio-grade magnetic tape for "capturing" scene images. The camera includes a charge coupled device comprised of an array of photosensitive elements which form a charge pattern corresponding to an optical image projected onto the elements during an exposure interval. A charge transfer circuit converts the charge pattern into a high frequency pulsed electrical signal immediately following the exposure interval to remove the charge from the device in a short period of time to maintain unwanted "dark current" at a low level. Each pulse represents the image-forming light projected onto a particular photosensitive element. A high-speed analog-to-digital converter converts these pulses to multi-bit digital words in real time. A digital buffer memory temporarily stores these words, then retransmits them at a rate that is compatible for recording on the audio-grade tape. The image can be displayed on a conventional television receiver by reading the recorded words from the tape and converting them to a format compatible with the signal-receiving circuitry of the television.³⁴

³³ James Estrin. "Kodak's First Digital Moment." *Lens: Photography, Video, and Video Journalism*, New York [Times](https://www.nytimes.com/2015/08/12/kodaks-first-digital-moment/?smid=pl-share), 12 Aug. 2015, lens.blogs.nytimes.com/2015/08/12/kodaks-first-digital-moment/?smid=pl-share. Accessed 6 Mar. 2018.

³⁴ Gareth A Lloyd, and Steven J. Sasson. Electronic Still Camera. US Patent US4131919A, 20 May 1977. *Google Patents*, patents.google.com/patent/US4131919. Accessed 6 Mar. 2018.

Sasson's creation was far from what we would recognize today as a digital camera.

Modern digital cameras evolved from a machine that was heavy, slow, and required an array of additional equipment to have an image displayed. Sasson described the device as follows,

It had a lens that we took from a used parts bin from the Super 8 movie camera production line downstairs from our little lab on the second floor in Bldg 4. On the side of our portable contraption, we shoehorned in a portable digital cassette instrumentation recorder. Add to that 16 nickel cadmium batteries, a highly temperamental new type of CCD imaging area array, an a/d converter implementation stolen from a digital voltmeter application, several dozen digital and analog circuits all wired together on approximately half a dozen circuit boards, and you have our interpretation of what a portable all electronic still camera might look like.³⁵

From his description of the device, it is not hard to imagine that the budget for such a project was underwhelming at best. With parts and pieces scavenged from old equipment, the only piece Sasson refers to as "new" is a CCD, or charge-coupled device, imaging sensor.

Charge-coupled devices, the very first digital imaging sensors, were still a relatively new technology at the time. CCD had only been invented six years earlier, in 1969, by George Smith and Willard Boyle of Bell Labs. Early CCDs yielded low resolution still images, but were put to use in video cameras in 1970. The first major leap in imaging sensor resolution for still images came in 1980 when Japanese engineer Nobukazu Teranishi invented the pinned photodiode. It would be another 15 years after the pinned photodiode before NASA engineer Eric Fossum invented the complementary metal-oxide semiconductor, or CMOS, active pixel image sensor.

³⁵ Michael Zhang. "The World's First Digital Camera by Kodak and Steve Sasson." *PetaPixel.com*, 5 Aug. 2010, petapixel.com/2010/08/05/the-worlds-first-digital-camera-by-kodak-and-steve-sasson/. Accessed 11 May 2018.

CMOS imaging sensors are the sensors used in most twenty first century smartphone and standalone cameras. The particular CCD in Sasson's device was a Fairchild 100 x 100 CCD. This CCD produced a 100 x 100-pixel image. This was the equivalent of a 0.01-megapixel image.

While it is a difficult comparison to make in terms of megapixels, the difference between digital and film photography image quality as expressed in megapixels can be staggering. Estimates of image quality of a photograph taken with film can range from 80 megapixels, using 35mm film, up to, potentially, 400 megapixels with large format film coupled with professional cameras and equipment.³⁶ This would mean that the first digital images that Mr. Sasson captured and displayed would have been vastly inferior to the average snapshot. An amateur photographer using their Kodak camera and Kodak 35mm film could produce a photographic image with an image quality that was approximately 8,000 times higher than the first digital images.

As will be discussed later, Kodak's identity was that of an imaging company. The company's business model was based on processing and providing high quality images. This is part of the reason that Kodak executives did not immediately welcome digital imaging devices. The technology clearly needed to be advanced to a point where image quality approached a standard that the company had not just held itself to, but a standard on which Kodak based a

³⁶ Tim Parkin. "Comparing the Image Quality of Film and Digital." *PetaPixel*, petapixel.com/2014/12/18/comparing-image-quality-film-digital/.
Ken Rockwell. "Film Resolution (Pixel Count)." *KenRockwell*, kenrockwell.com/tech/film-resolution.htm.

substantial amount of its identity. To bring this new technology to market too soon would have done considerable harm to the Kodak brand.

In addition to a low image quality, the device weighed in at around 8 pounds. It was also comparable in size to a toaster and required 30 seconds to record the image to a storage device (Figure 5). Of course, convenience was not the aim of the project. Sasson had succeeded in his self-described busy work when he was able to compile an assortment of parts into a working, all electronic, imaging device. Efficiency could come later.

The new digital imaging device was not the only piece of equipment that Sasson used to produce his images. The camera would record images to digital cassettes that were placed in a playback unit, consisting of a unit that would play the tapes and a computer, which was hooked up to a television (figure 6). Once the tape was inserted an image would appear on the television. Sasson described the process where he would “pop the cassette tape out, hand it to my assistant and he put it in our playback unit. About 30 seconds later, up popped the 100 pixels by 100 pixel black and white image.”³⁷

It is not hard to imagine why Kodak executives were less than enthusiastic when presented with the new digital imaging process. At the time, Kodak was the dominant company in global imaging and picture taking. The company was enjoying large profits on an array of products. Kodak had built a fantastic business model in which consumers could purchase a Kodak camera and film, take their pictures, and then have them developed with Kodak

³⁷ James Estrin. "Kodak's First Digital Moment." *Lens: Photography, Video, and Video Journalism*, New York Times, 12 Aug. 2015, lens.blogs.nytimes.com/2015/08/12/kodaks-first-digital-moment/?smid=pl-share. Accessed 6 Mar. 2018.

chemicals and printed onto Kodak paper. Kodak's business model was a near perfect example of vertical integration.

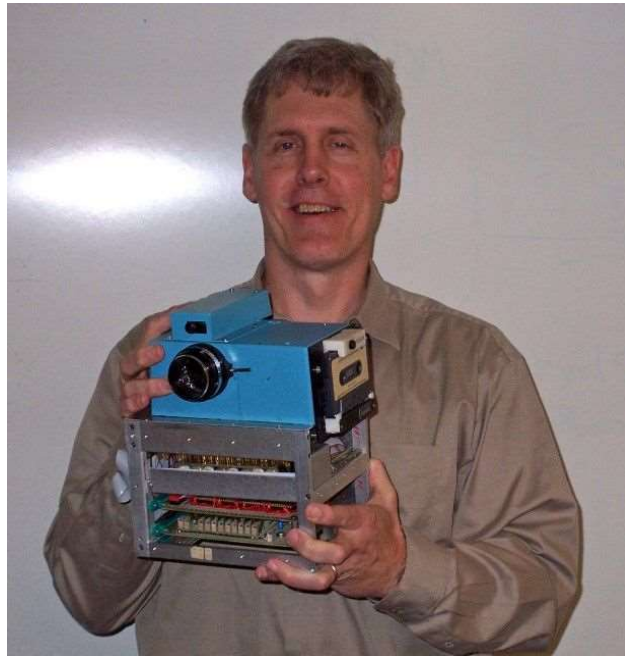


Figure 5. Sasson holding the device that he is credited with inventing, Kodak's original digital imaging device.³⁸

³⁸ Stewart Wolpin. "20 Years Ago, Apple and Kodak Launched the Digital Camera Revolution." *Mashable*, 24 June 2014, mashable.com/2014/06/21/digital-camera-20th-anniversary/. Accessed 30 June 2019.



Figure 6. Additional equipment used to view images captured with Kodak's original digital imaging device.³⁹

By his own admission, Steve Sasson knew his digital imaging device and system could not immediately compete with film photography. Sasson, using Moore's Law to predict the advance of technology, estimated that digital imaging would not compete with film for another 15 to 20 years. As Sasson saw it, "When you're talking to a bunch of corporate guys about 18 to 20 years in the future, when none of those guys will still be in the company, they don't get too excited about it, but they allowed me to continue to work on digital cameras, image compression and memory cards."⁴⁰ Sasson's prediction was accurate, and in 1993, 18 years later, Kodak offered its first consumer digital camera.

³⁹ Michael Zhang. "The World's First Digital Camera by Kodak and Steve Sasson." *PetaPixel.com*, 5 Aug. 2010, petapixel.com/2010/08/05/the-worlds-first-digital-camera-by-kodak-and-steve-sasson/. Accessed 11 May 2018.

⁴⁰ James Estrin. "Kodak's First Digital Moment." *Lens: Photography, Video, and Video Journalism*, New York Times, 12 Aug. 2015, lens.blogs.nytimes.com/2015/08/12/kodaks-first-digital-moment/?smid=pl-share. Accessed 6 Mar. 2018.

The Common Kodak Narrative

The downfall of the Eastman Kodak Company has been documented in news articles, blog posts, and books. Very few of these are what we might consider to have academic rigor. These currently available offerings have set the general opinion of the decline of Kodak, and have, since then, done little more than echo the same sentiment over and over.

The commonly accepted opinion on the subject is that Kodak did not want digital photography to cut into their profits on film and development, so they never pushed digital photography. According to the common literature, Kodak seems to have been a company run by aloof administrators, people unable to see the future of photography because of the profits they were enjoying from film sales. While this is an understandable narrative, there is more to the story. This one-dimensional explanation leaves some questions unanswered and lacks the nuances of a well-developed history.

The fact that Kodak was one of the top sellers of digital cameras in the 1990s does not make much sense if they were content to ride the profits of film and film processing at the time. Kodak sales exceeded \$10 billion in 1981, with film, and its profit margin of about 80%, leading the charge.⁴¹ Still, Kodak poured a large amount of resources into developing digital image storage solutions, as well. Kodak produced a number of digital photography products in the 1990s and 2000s, ranging from digital cameras to storage and organization solutions. By 2005

⁴¹ "What's Wrong with This Picture: Kodak's 30-year Slide into Bankruptcy." *Knowledge@Wharton*, 1 Feb. 2012, knowledge.wharton.upenn.edu/article/whats-wrong-with-this-picture-kodaks-30-year-slide-into-bankruptcy/. Accessed 12 July 2019.

Kodak ranked No.1 in the U.S. in digital camera sales.⁴² None of this seems agreeable with the common narrative of complacent executives getting fat off of film profits.

Complacency is a word that one often hears when examining the Eastman Kodak Company's decline. A number of sources explain that Kodak was resistant to change, satisfied with film profits, and locked into a rigid corporate structure. This is not false, or an overstatement. Still, for all of the articles that have been written on the subject and for the purposes of learning from Kodak's mistakes, there are small pieces of analysis missing that can enhance our understanding of the situation.

One available resource that outlines the commonly accepted narrative is John J. Larish's *Out of Focus: The Story of how Kodak Lost its Way*. As a former employee, Larish provides his view of the decision-making process surrounding Kodak's handling of digital photography. The book looks at several Kodak CEOs of the 1970s and 1980s and their handling of a number of products that Larish would seem to have handled differently, if he were in charge at the time.

Larish's connection to photography is wide-ranging. After returning from service in the Korean War, Larish entered the photography industry. Positions held by Larish before his employment with Kodak included working in a photofinishing lab and technical sales for Ansco, a small firm that Larish describes as "Kodak's only real competitor in the United States at that time."⁴³ Eventually Larish would find employment with Kodak. His time with the company

⁴² Steve Hamm and William C. Symonds. "Kodak: Mistakes Made on the Road to Innovation" *Bloomberg*, 17 Sept. 2007, <https://www.bloomberg.com/news/articles/2007-09-14/kodak-mistakes-made-on-the-road-to-innovationbusinessweek-business-news-stock-market-and-financial-advice>. Accessed 5 Aug. 2018.

⁴³ John J Larish. *Out of Focus: The Story of How Kodak Lost Its Direction*. Place of publication not identified, Createspace, 2012. 5

would see him travel the globe as a Kodak representative, conducting classes and trainings. Finally, Larish ended his career at Kodak in senior marketing intelligence. This allowed him to “bring the developments in electronics and other new technologies at the beginning of the 1980s to the attention of thousands of people within the Kodak family.”⁴⁴ After retiring from Kodak, Larish has published numerous articles on digital photography along with one of the early books dedicated to digital photography, *Understanding Electronic Photography*.

In *Out of Focus*, two main arguments form the foundation of Larish’s explanation of Kodak’s decline. First is the Kodak Company’s hesitation to invest in Digital photography. The second is Larish’s opinion that the culture of the Eastman Kodak Company produced sub-par leadership at the highest levels.

Larish places blame for Kodak’s decline squarely on the highest levels of management. In fact, the text is organized by giving each CEO of the past four decades a chapter, complete with a chapter title that neatly describes Larish’s issue with that CEO, such as chapter three: The 800 Pound Gorilla, and chapter seven: A Kodak Man from Inside. He also provides stories about his perceived failures with products that do not relate to digital photography by lamenting Kodak’s decision to abandon their pursuit of copy machine markets as well as a brief mention of the patent infringement lawsuit brought by Polaroid.⁴⁵ These stories all serve to enhance the idea that Kodak CEOs were nearly incapable of recognizing new opportunities, or at least unwilling to seize on them because of their reliance on film profits.

⁴⁴ Ibid. 5

⁴⁵ Ibid. 34-35.

Larish eventually makes his way back to digital photography and offers his views on the matter. According to Larish, when digital photography did begin to take off, Kodak was hesitant to push into the new territory. This was then an opportunity for other imaging companies to gain a foothold in the business. Because of previously failed products and a business model centered on film photography, “Kodak’s sole line of defense was film.”⁴⁶

To further illustrate his frustrations with Kodak management, Larish offers anecdotes such as this description of Steve Sasson and the original digital imaging device, “He lugged that ugly gadget around Kodak and took pictures, but everywhere he went he was told, “Forget it, don’t bother us.”⁴⁷ Larish also admonishes Kodak management for their reluctant acceptance of the fact that Kodak had produced the digital imaging device and their eventual grasp at credit for the accomplishment. Larish states:

To give Kodak the credit for inventing the digital camera, two decades after the initial digital camera patent was filed; Sasson was paraded around the world as the inventor of the digital camera and was even honored at the White House with the National Medal of Technology and Innovation. All of this attention certainly did not make up for the neglect that had been given to Steve Sasson and digital photography by Kodak over the same quarter century.⁴⁸

While this book is useful as a demonstration of the Kodak decline narrative, it often borders on a book of Larish’s personal complaints. John J. Larish is a former employee of the Eastman Kodak Company. Although he does not give any employment dates or position titles in the text, one can gather that he was involved in Kodak’s digital products in and around the

⁴⁶ Ibid. 43

⁴⁷ Ibid. 28

⁴⁸ Ibid. 28

1970's and 1980's. After his employment with the company he continued to stay active in the digital photography world.

Larish's research papers, used for this book, are also available. They are kept at the University of Rochester, the same institution that houses the Kodak archives. Larish's offering includes everything from personal correspondences with Kodak CEOs, newspaper and magazine articles, employee interviews, and more. The material also covers a range of topics such as Larish's own opinions, Kodak advertising and public relations, and internal company directives.⁴⁹ Unfortunately, it seems that the main purpose of most personal correspondences that are preserved is to provide self-serving proof of Larish's actions and warnings.

In late 2011 and early 2012, a number of articles were released concerning Kodak's impending bankruptcy. Newspapers and business magazines began analyzing how a company that was so dominant, so important in a particular field of business, could have come to that point. While some outlets did a better job than others in capturing the nuance of such a complicated set of events, one common thread runs through all of them, the idea that Kodak executives were complacent, stubborn, or just plain unwilling to move away from old technology to new technology is the dominant view expressed.

One of the best examples available to sum up how most people view Kodak's handling of digital photography, and their eventual decline, is offered by Steve Brachman when he wrote:

Addicted to the profits generated by its 35mm film, Kodak would do nothing that it saw as endangering the success of this business. A lack of early investment in digital photography during the 1970s brought a double-whammy during the 1990s as the giant corporation was not only laid low by smaller firms like Sony and

⁴⁹ John Larish Papers. 1970-2012. University of Rochester Rush Rhees Library, Rochester N.Y. *John Larish Papers, boxes 1-13*

Canon but the entire film photography industry created by the company was finally relegated to second-class status behind digital by the 2000s.⁵⁰

This quote offers up all of the standard arguments. First, that Kodak was reliant on film profits and would not move away from this business model. Second, by not immediately pushing digital imaging, Kodak did not move fast enough with its new technology. And lastly, that Kodak did too little, too late when digital imaging began to take hold of photography markets.

Again, complacency is a central factor in this common narrative. There were no lack of publications offering this opinion at the time. *Forbes* Magazine's website offered this insight into Kodak's missteps:

The organization overflowed with complacency. . . Kodak was failing to keep up even before the digital revolution when Fuji started doing a better job with the old technology, the roll-film business. With the complacency so rock-solid, and no one at the top even devoting their priorities toward turning that problem into a huge urgency around a huge opportunity, of course they went nowhere. Of course strategy sessions with the BIG CEO went nowhere. Of course all the people buried in the hierarchy who saw the oncoming problems and had ideas for solutions made no progress. Their bosses and peers ignored them.⁵¹

After Kodak filed for Chapter 11 Bankruptcy protection in January, 2012, the *Financial Times* ran a two-part story about Kodak's fall. While this is one of the better pieces that examined several aspects of Kodak's decline, the common thread of complacency could still be found.

In January, overburdened with the legacy costs of its industrial past, Kodak filed for Chapter 11 bankruptcy protection. The reaction of U.S. strategy expert Gary Hamel, who in 1992 praised Kodak for creating "stored energy" for the future, is

⁵⁰ Steve Brachman. "The rise and Fall of the Company that Invented Digital Cameras." *Ipwatchdog.com*, 1 Nov. 2014, www.ipwatchdog.com/2014/11/01/the-rise-and-fall-of-the-company-that-invented-digital-cameras/id=51953/. Accessed 12 Jan. 2018.

⁵¹ Kotter. "Barriers to Change: The Real Reason Behind the Kodak Downfall." *Forbes*, 2 May 2012, www.forbes.com/sites/johnkotter/2012/05/02/barriers-to-change-the-real-reason-behind-the-kodak-downfall/#206c145b69ef.

typical. Asked recently how he explained Kodak's decline, he said: "It was denial. It was just denial."⁵²

There has also been no lack of criticism for Kodak's lack of enthusiasm for digital imaging, and their slow movement towards acceptance of the technology. Former employees, and even Steve Sasson himself, have put forth the charge that Kodak did not act soon enough. An article in the *New York Times* about Kodak's development of digital imaging and production of the first digital camera, reported that "Kodak's marketing department was not interested in it. Mr. Sasson was told they could sell the camera, but wouldn't — because it would eat away at the company's film sales."⁵³ Sasson himself is quoted in the article, saying:

Every digital camera that was sold took away from a film camera and we knew how much money we made on film. That was the argument. Of course, the problem is pretty soon you won't be able to sell film — and that was my position.⁵⁴

The third aspect of the common Kodak narrative may be the most accurate through. Kodak did attempt to mount a digital strategy, but it seems to have been too little, too late. One thing that is striking about this is the pace of change in the photography industry. The quickness with which digital imaging did, finally, take hold was what caught Kodak off guard. As the *Washington Times* reported "The transition to a world without film occurred at lightning speed,

⁵² Andrew Hill. "Snapshot of a Humbled Giant." *Financial Times*, 3 Apr. 2012. *Financial Times*, www.ft.com/content/19a8e5fe-7989-11e1-b87e-00144feab49a.

⁵³ James Estrin. "Kodak's First Digital Moment." *Lens: Photography, Video, and Video Journalism*, *New York Times*, 12 Aug. 2015, lens.blogs.nytimes.com/2015/08/12/kodaks-first-digital-moment/?smid=pl-share. Accessed 6 Mar. 2018.

⁵⁴ *Ibid*

and Kodak is still playing catch-up in securing a firm foothold in the amorphous realm of electronic media.”⁵⁵

In addition, the *Financial Times* articles dealing with Kodak’s downfall, attempts to convey that Kodak had come around to the idea of transitioning to digital, but that the decision had come too late:

Rick Braddock, a Kodak director since 1987, whose career spans Wall Street, online retailing and private equity, recalls that “the mindset of the company was ready for the challenge: it was ‘Batten down the hatches’. We sold the healthcare business and we started the process of developing a digital response. But the way the market shifted was dramatically faster than we had anticipated or than I’d ever seen”.⁵⁶

So, while the sentiment that Kodak did too little, too late is not inaccurate, it also does not express the entire situation that Kodak was in. In order to appreciate the full scope of Kodak’s decline, a slightly different approach must be taken.

A New Analysis

Kodak’s story of decline in the late twentieth and early twenty-first centuries is especially interesting if looked at through the lens of advertising and construction of consumer markets. If we allow ourselves to view two versions of the same company, separated by several decades, we quickly find striking differences in how those two versions operated. Nowhere is this more

⁵⁵ Ben Dobbin. "In Kodak's Troubles, a Snapshot of an Icon's Fall." *Washington Times*, 5 Oct. 2011, www.washingtontimes.com/news/2011/oct/5/in-kodaks-troubles-a-snapshot-of-an-icons-fall/.

⁵⁶ Andrew Hill. "Snapshot of a Humbled Giant." *Financial Times*, 3 Apr. 2012. *Financial Times*, www.ft.com/content/19a8e5fe-7989-11e1-b87e-00144feab49a.

apparent for the Eastman Kodak company than in their efforts to create snapshot photography, and then an apparent lack of effectiveness in creating a market for digital photography.

We know that Kodak invented the first all-digital imaging device, but does that mean they invented digital photography? If we look at digital photography as a specific consumer market with set expectations and narratives, and products that fulfill those expectations and narratives, then the answer is no. What the Eastman Kodak company did so well in the late nineteenth and early twentieth centuries, creating a market for amateur snapshot photography, they failed to do for digital photography. In failing to create, or set, the market for digital photography, Kodak allowed the digital photography market to develop into something that they were not set up to compete with.

To characterize Kodak's decisions as a series of choices that amount to the company being in denial and ignoring looming realities is misleading. If we apply well-established history and business theory to the subject, Kodak's decline can be seen as an eventuality for a number of reasons other than complacency and an unwillingness to heed the advice of people outside of the executive ranks. On the surface, complacency may seem like an obvious explanation, but it may be more significant to examine the very way Kodak did business, the identity it had created for itself, and the way it perceived itself. These factors, more than any ill-fated action or inaction, determined the future failures of the company.

Because Kodak's business model was based on developing images, digital imaging was obviously a disruptive technology for Kodak. Producing a digital image required no chemicals or papers. It required no professional processing procedures. All that was required was a digital imaging device and a display to view the images. This digital imaging process was as different

from Kodak's established model as possible. The process, or lack of process, completely cut out everything that Kodak made their profits from.

The focus of digital imaging would become the camera itself, not the process of developing the image. For the better part of a century, the actual camera used to take a picture was an afterthought in Kodak's business plan. It was a device used to sell film and to encourage consumers to use Kodak processing to get the best imaging results. In fact, a picture taker did not even have to own or use a Kodak camera to use Kodak films, papers, and processing. Kodak would still make a significant amount of money if their film was loaded into a competitor's camera.

It is this business model that created problems for Kodak once digital imaging took hold. Kodak was not equipped to handle the shift away from a way of imaging that placed little emphasis on the camera itself to a way of imaging that was almost entirely based on the camera itself. Kodak's expertise was in chemicals and chemical processes. The company's patents were littered with chemical technologies. This was the imaging process that Kodak was set up to dominate. This was the imaging process that George Eastman masterfully created in the late nineteenth and early twentieth century.

This was also the imaging process that Kodak had good reason to be protective of. Kodak had begun to experience stiff competition from rival film and imaging companies, especially Japanese companies. While they still controlled a majority share of the film and film processing market, their market share was dropping and rivals such as Fuji Film were applying pressure from abroad. Reporting for the *Washington Times*, Ben Dobbin wrote:

Entering the 1980s, Kodak still cornered nearly two-thirds of color-film sales worldwide. But excessive caution in exploiting new markets, such as point-and-

shoot 35mm and single-use cameras, was taking its toll. The innovative Japanese were plundering Kodak's fat profit margins. Fuji jumped from obscurity to within a whisker of edging out \$16 billion Kodak as No. 1.⁵⁷

But foreign companies were not the only companies pressuring Kodak. As Andrew Hill pointed out in his *Financial Times* article:

Bob LaPerle, who worked on the Kodak.com site from 2000 to 2005, claims clients such as U.S. pharmacy chains threatened to drop Kodak products in favour of archrival Fujifilm, if the group marketed its online gallery aggressively. "They were quite specific," he claims. "If [we] put the Kodak brand on [our] consumer website and it competed directly with [their] film and photofinishing business . . . they would shift to Fuji. They made that very clear."⁵⁸

In the United States, pharmacy chains also pushed Kodak. Pharmacies were an important partner for Kodak, because these were the places that consumers bought film, had film developed, and had pictures printed. If pharmacies did not agree with Kodak's direction, they could use their considerable leverage to persuade Kodak.

So, Kodak did what it needed to do to satisfy partners and maintain their dominance in their market. At the same time, what made Kodak a dominant film imaging company was not going to be useful in becoming a dominant digital imaging company. For a company to be able to dominate digital imaging, it needed no understanding of chemicals and papers. For a company to be able to dominate digital imaging, it needed no understanding of developing processes. What did a company need to dominate digital imaging in those formative years, though? We could look back now and create a list of attributes that current companies who dominate digital

⁵⁷ Ben Dobbin. "In Kodak's Troubles, a Snapshot of an Icon's Fall." *Washington Times*, 5 Oct. 2011, www.washingtontimes.com/news/2011/oct/5/in-kodaks-troubles-a-snapshot-of-an-icons-fall/.

⁵⁸ Andrew Hill. "A Victim of its Own Success." *Financial Times*, 5 Apr. 2012. *Financial Times*, www.ft.com/content/b2076888-7a52-11e1-839f-00144feab49a.

photography had. That list could be applied to Kodak and we would see that they were in no position to have any lasting force in a digital photography world.

At the same time, George Eastman started off in no position to dominate photography in the late eighteen-hundreds, but he ended up doing just that. He had created a disruptive photographic technology, but so did the Kodak of the late nineteen-hundreds. How was George Eastman able to succeed, but modern executives could not, given the similarities? This is the more interesting question.

A deeper, more nuanced understanding of Kodak's history can be gained by evaluating the effectiveness of its advertising campaigns. This is not an entirely new approach. Nancy Martha West did a fine job in examining George Eastman and Eastman Kodak's early advertising campaigns. What she revealed is a company that created a market for itself. It was a case of consumers not knowing that they needed a product until advertising efforts showed them how much they needed it. What better way to establish a century of dominance in an industry than to tailor make that industry for the company? This was Eastman's second stroke of genius. Unfortunately, this is exactly what Kodak did not do in the late twentieth century.

Kodak did not do enough to define digital photography on Kodak's terms. It did not do enough to define the market for digital photography, either. By not defining digital photography and its market, Kodak essentially allowed other companies to define the digital photography market. Once this happened, the market became something that Kodak was ill-equipped to handle.

The digital imaging market would quickly become part of the consumer electronics market. As Michael Zhang stated in a 2017 article for the website Petapixel

Things aren't looking good for the standalone point-and-shoot camera. As smartphone cameras continue to improve, compact camera sales continue to nosedive. A new historical sales chart with 2016 figures shows just how quickly point-and-shoots are dying off.⁵⁹

Even stand-alone digital cameras did not enjoy an extended period of time as the camera of choice. Cameras embedded in smartphones quickly skyrocketed, leaving all other cameras behind. This dramatic chart in Zhang's article demonstrated just how quickly and harshly the photography industry was changed by the combination of digital photography and consumer electronics (figure 7).

⁵⁹ Michael Zhang. "This Latest Camera Sales Chart Shows the Compact Camera near Death." *PetaPixel*, 3 Mar. 2017, petapixel.com/2017/03/03/latest-camera-sales-chart-reveals-death-compact-camera/. Accessed 6 Mar. 2018.

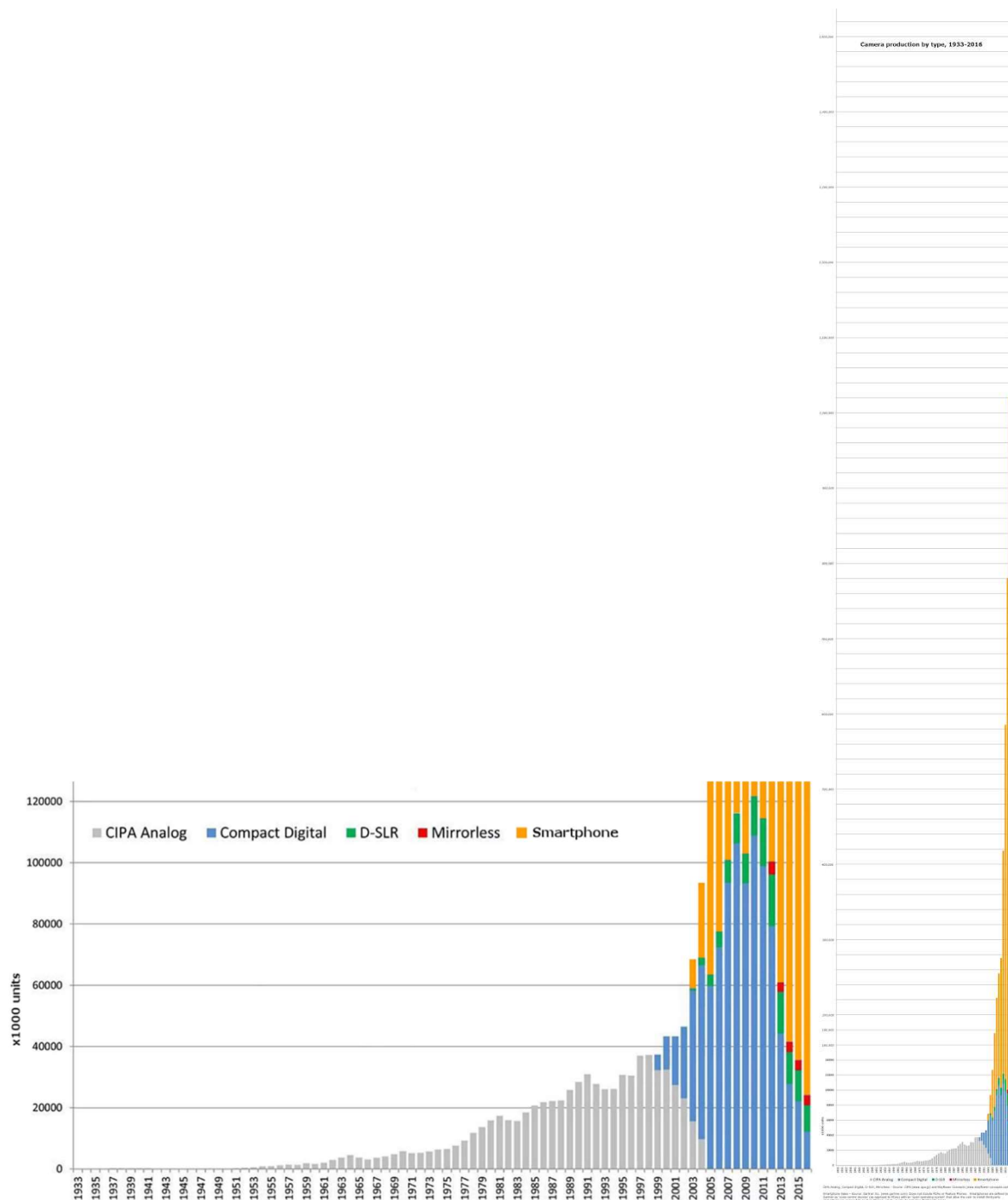


Figure 7. Chart documenting the rise of digital photography (especially smartphone cameras) based on unit sales.⁶⁰

⁶⁰ Ibid

It is unfair to say that Kodak ignored digital photography, but its advertising efforts were clearly much less effective than previous marketing campaigns. The established nature of the company meant there were structures in place that limited what and how Kodak could do with digital photography. The largest hurdle, the hurdle that Kodak could not clear, was their own self-image.

The majority of Kodak's digital photography development and marketing was directed in two places. First, Kodak directed much of their digital camera marketing and sales towards professional photographers. Second, once the market for digital photography began to develop, Kodak developed systems and processes that attempted to treat digital photography as if it were the same as roll film photography.

An example presenting both Kodak's focus on professional photographers and a preference to market digital as a complement to film can be found in the company's involvement in the Olympics. Kodak had a history of involvement in Olympic competitions. Kodak cameras have even been a part of the official U.S. Olympic uniform in 1972 and 1976. Through this partnership we can gain valuable insight as to how Kodak viewed itself and the role of digital imaging.

At the 1992 Olympic games, held in Barcelona, Spain, Kodak began offering digital imaging services to professional Olympic photographers. According to a press release there were 12 digital imaging booths at the Barcelona games, most of them were unused. As a show of how rapidly digital imaging and photography took hold, the 1994 winter Olympics, held in

Lillehammer, Norway, had the same number of booths, yet there were lines of people at each booth.⁶¹

For the 1996 summer games in Atlanta, Georgia, U.S.A., Kodak announced it would provide 20 booths and 20-25 service people, dedicated to these digital booths. While Kodak would provide digital cameras that could be loaned out to photographers, and instruction on the use of the digital cameras, each booth consisted mostly of equipment that would ultimately be used to digitize images captured on film. The two major pieces of digital equipment that formed a digital booth were Kodak RFS 2035 plus film scanners and Kodak XLS continuous-tone printers.⁶²

Although Kodak announced that there would be three-times more digital equipment at the Atlanta games than there were at the Barcelona games, most of this equipment was focused on professional use. Kodak, in its press releases, touted its digital imaging for things like medical imaging that would be used in Atlanta area hospitals during the games. In addition, digitally produced Olympic Identification cards and security badges were boasted about.⁶³

The digital equipment that Kodak made available for the general public to come in contact with was made to seem as if it were the digital complement to traditional photography. Some digital cameras and editing software were made available to the public. As Kodak saw it though, these would allow spectators to digitally produce a keepsake of their Olympic

⁶¹ Kodak Imaging Center: A Haven of Technology for Olympic Summer Games Photographers. Aug. 1, 1995. University of Rochester Rush Rhees Library, Rochester N.Y. *Kodak Historical Archive #003, box 111 folder 2.*

⁶² Ibid

⁶³ Ibid

experience. By keepsake, they meant a photograph on Kodak paper, developed with Kodak chemicals.⁶⁴

It would be easy to point to this as proof that Kodak was determined to subjugate digital imaging to film and the old business models that had allowed Kodak to rise to its position. This could, and usually is, seen as folly, especially in the early and mid-1990s, when digital photography was beginning to take off. If we look at some of the other factors that Kodak would have seen at the time, it may be understandable why Kodak was still riding film sales.

The most glaring counterpoint to the argument that Kodak clung to film beyond a reasonable point is that film was actually still in demand through the 1980s and into the 1990s. We can again look at Kodak's involvement in the Olympic games to find evidence of this. Kodak saw a dramatic increase in film use at the Olympic games throughout this time.

The 1980 Winter Olympics, held in Lake Placid, saw Kodak develop 15,000 rolls of film. In impressive number, to be sure, but that number rose drastically for subsequent Olympic games.⁶⁵ In 1992, Kodak processed 130,000 rolls of film at their booths in Barcelona. That number rose again in 1994, when Kodak processed 135,000 rolls of film in Lillehammer. The estimates for 1996 were put at 175,000 rolls of film expected to be processed, and it is not hard to see why the company would have such lofty expectations.⁶⁶

⁶⁴ Kodak Digital Science™ Technology is Changing the Picture of the Olympic Games. Nov. 13, 1995. University of Rochester Rush Rhees Library, Rochester N.Y. *Kodak Historical Archive #003, box 111 folder 2.*

⁶⁵ Kodak Has History of Olympic Involvement. July 19, 1983. University of Rochester Rush Rhees Library, Rochester N.Y. *Kodak Historical Archive #003, box 111 folder 2.*

⁶⁶ Kodak's Imaging Technology – Bringing the Images of the Centennial Olympic Games to the World. Aug. 1, 1995. University of Rochester Rush Rhees Library, Rochester N.Y. *Kodak Historical Archive #003, box 111 folder 2.*

1980 was only a few short years after the first digital imaging device was produced though. So, it can easily be explained that digital photography had not yet begun to capture the market from film. What is not as easy to explain is the dramatic increase in film usage by professional photographers at the exact time that digital cameras were beginning to take over camera markets in the mid-1990s.

Kodak was stuck. They had a still lucrative business model that was worth protecting, but at the same time, held patents for digital technology that was beginning to transform the photography market. Obviously, many people have written and reported about Kodak's mishandling of this situation, but this has seemed to focus on reasons for how and why that do not include Kodak's inability to shape a new consumer market for digital photography and also dismisses the fact that film still made money for the company. The piece of common narrative that is most accurate is that Kodak did too little too late when digital photography began to take off. Even on this point though, we must acknowledge the extremely rapid rate at which digital imaging became a consumer electronics market and that Kodak was an imaging company that was ill-equipped to compete in a consumer electronics market.

Christian Sandstrom, in his article "You Press the Button. Kodak Used to Do the Rest" stated that:

the industry landscape was completely different in the digital era. . . the industry was flooded by entrants with a background in consumer electronics, such as Casio, Samsung, and Hewlett-Packard, not to mention Japanese camera manufacturers including Canon, Nikon, and Olympus. Large parts of Kodak's competence base related to chemistry and film manufacturing were rendered obsolete. The vertical integration that had previously been a core asset to Kodak lost its value. Digital cameras became a commodity business with low margins. The problem facing

Kodak wasn't just that film profits had died but that those revenues could not be replaced.⁶⁷

It can be argued that, as much as any other reasons previously given, Kodak failed to capitalize on digital photography, because it did not set the market for digital photography, and that once the market was set for digital photography it was a market that Kodak could not compete in. This argument not only takes into account factors that run counter to the common narrative of Kodak's decline, but it also raises another question. How could Kodak have possibly set the market for digital photography to a market that they could dominate, like they did for snapshot photography?

⁶⁷ Christian Sandstrom. "You Press the Button, Kodak Used to Do the Rest." MIT Technology Review, 9 Dec. 2011, www.technologyreview.com/s/426323/you-press-the-button-kodak-used-to-do-the-rest/. Accessed 9 Dec. 2011.

Chapter 4: Conclusion

To begin to answer the question of how could Kodak have created the market for digital photography, like they did for snapshot photography, we must look at the work of Clayton M Christenson and Christian Sandstrom. Christenson's *The Innovator's Dilemma* used the example of the computer disc drive industry as his main example of how disruptive technologies can influence markets and affect businesses. Sandstrom's work fits nicely with the subject of Kodak because of his focus on the imaging, camera, and photography industries.

If we apply the work of Christensen to Kodak's development of a digital imaging device, we can see exactly what was to come. Unfortunately for Kodak, Christensen's work was published about two decades too late to be of any substantial assistance. What Kodak had with digital imaging was the definition of a disruptive technology.

Digital imaging did not improve any of Kodak's already established products. It was not a sustaining technology that could help film photography produce a better image at a lower price point. Digital imaging was a technology that was completely different than, and in direct opposition to, film photography. As with many other companies that have faced disruptive technologies before them and since, the Eastman Kodak Company had a difficult time dealing with this disruptive technology.

How can companies effectively deal with disruptive technologies though? According to Christensen, a disruptive technology should be dealt with by a company whose size matches the size of the market for that particular disruptive technology. As disruptive technologies often start off as inferior products that have little appeal to established markets and consumers, they offer

no paths to substantial revenue. Because of this, large businesses, according to Christensen, will spend few resources on products that they see as unable to significantly boost profits.

However, that does not mean that all disruptive technology gets forgotten. Clearly digital photography was not altogether abandoned. These technologies require smaller companies to take up their cause, improve them, and build their business in a manner proportional to the revenue that smaller markets can bring.

Creating a smaller company, owned by, but independent of, Eastman Kodak, would have been one step the company could have taken to better position themselves in the digital photography industry. Kodak does have a history of spinning off companies and buying smaller firms. In 1993, Eastman Chemical was turned into a separate corporation after being part of Eastman Kodak since 1920.⁶⁸ Another, similar, route would have been to purchase a smaller firm with digital imaging and consumer electronics expertise. In 1995 Kodak did purchase a small Israeli company, Algotec Systems, that specialized in digitizing, storing, and sharing medical images.⁶⁹ Although the company did have some institutional knowledge of digital imaging services, their focus on professional medical imaging would have been of little use to Kodak in terms of mainstream consumer markets.

⁶⁸ “Kodak to Sell Off Eastman Chemical Co.: Restructuring: The spinoff, which will wipe out \$2 billion of debt, is in response to stockholder pressure.” 16 June 1993. *Los Angeles Times*. <https://www.latimes.com/archives/la-xpm-1993-06-16-fi-3622-story.html>. Accessed 5 Aug. 2019.

⁶⁹ “Kodak to Acquire Algotec, Bolster Medical Imaging.” 18 Nov. 2003. *The Wallstreet Journal*. <https://www.wsj.com/articles/SB106917001744738500>. Accessed 5 Aug. 2019.

In doing so, Kodak could have continued to protect their film and developing model while simultaneously being in a position to reap the benefits of digital imaging. Although Kodak had separate divisions within the company who were responsible for advancing digital photography, Christensen would argue that this set-up would be insufficient. Management executives in large companies almost always divert resources from small projects with proportionally small profit potential. Only by having an independent organization, focused on the development of the disruptive technology would there be an opportunity for that disruptive technology to flourish and become increasingly profitable.

This is a sentiment echoed by Sandstrom when he states “the market for digital photography was very small, almost insignificant for a multibillion-dollar company like Kodak.”⁷⁰ Kodak could have created a small spin-off company to handle digital photography, but even if they did they would have faced a substantial challenge from other companies that already had established expertise in consumer electronics. As Sandstrom reports,

It was in fact Casio – a company with no past experience in the camera industry, that came up with the dominant design of a compact camera. In 1995, Casio launched the first camera with an LCD screen. This concept turned out to be very attractive since images could be viewed instantly. The big Japanese players now invested extensively in developing this concept. Having introduced both electronic calculators and digital watches in the past decades, Casio had developed a unique capability to rapidly wire integrated circuits and LCD screens into consumer products. The company could essentially use the same skills in order to enter the camera industry.⁷¹

⁷⁰ Christian Sandstrom. "You Press the Button, Kodak Used to Do the Rest." MIT Technology Review, 9 Dec. 2011, www.technologyreview.com/s/426323/you-press-the-button-kodak-used-to-do-the-rest/. Accessed 9 Dec. 2011.

⁷¹ Michael Reichmann, and Christian Sandstrom. "The Rise of Digital Imaging and the Fall of the Old Camera Industry." *The Luminous Landscape*, 13 Jan. 2009, luminous-landscape.com/the-rise-of-digital-imaging-and-the-fall-of-the-old-camera-industry/.

If digital imaging and photography are viewed as a shift brought on by disruptive technology, then the missed opportunity to dictate to consumers what this new, disruptive technology is, and why it is important to use, has to be seen as Kodak's crucial misstep. If George Eastman's ability to communicate to consumers the value of amateur photography, and the ease of use of his new products, can be credited as a major reason for Kodak's dominance of the industry, then their inability to do the same for digital photography must be credited as a major reason for their downfall. Because Kodak did not do enough to create the market for digital photography, they had left the door open for others to define the market, and what digital photography would be.

While it is true that Kodak did not allocate enough resources to digital photography, it is not simply due to a lack of understanding or an unwillingness to listen to people who would eventually be proven right. Kodak followed a path that many responsible executives would have followed. They protected their largest markets and diverted resources from smaller markets that would provide less impact in their earnings. It is because of these reasonable decisions that Kodak failed, though.

Kodak's actions highlight the importance of marketing and market creation when handling disruptive technology. Because Kodak was the architect of their demise, in many people's eyes, the story becomes more interesting, but also more complicated. In the end, Kodak was not equipped to handle the technology they had initiated. This is not to say that the situation was out of their control or to excuse the decisions made, but once the digital photography market began to explode, Kodak was already too far behind to catch up.

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