INFOIMAGING @Kodak

COMPONENTS GROUP POSITION PAPER
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Sometimes technology hints at change. Sometimes it insists on it.

Right now, our business and our industry are undergoing dramatic and seismic shifts as a result of technology. Specifically, the convergence of image science and information technology has created a new industry in which Kodak competes—an industry called infoimaging.

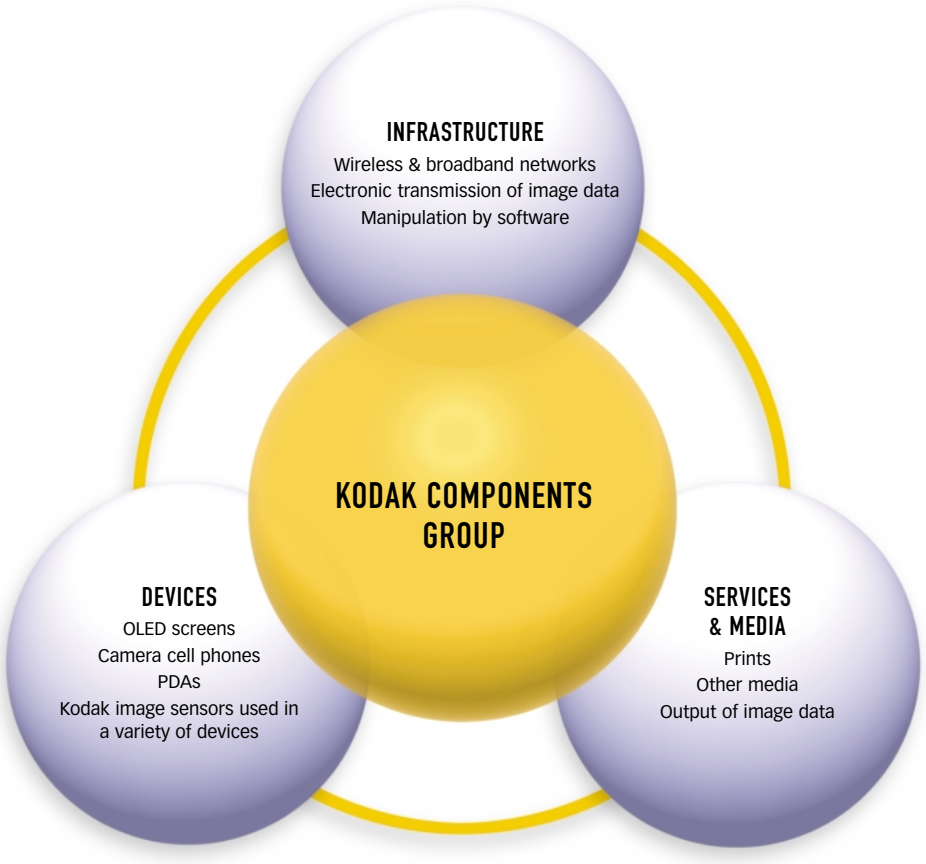
This new market space opens a host of possibilities and opportunities for Kodak. The convergence of image science and information technology has altered the value chain that connects imaging companies like ours with customers. In fact, infoimaging has expanded the value chain and opened the doors to new customers in markets that Kodak might not have targeted, say, 30 years ago.

Indeed, what will truly separate companies that succeed in this new industry from those that fail will be the willingness to look at their business through an infoimaging lens instead of seeing their business as they always have.

For Kodak and its Components Group, infoimaging is a way of life. We already are developing and selling products that have applications within and beyond the realm of taking and sharing better pictures. And infoimaging represents an enormous opportunity not only to initiate relationships with new customers but also to help other Kodak business units reinforce bonds with existing customers and pave the way for future relationships.

We must see the possibilities—and seize the opportunity.

One of Kodak's earliest forays into infoimaging—optics—predates "information technology" by decades.



BEFORE INFOIMAGING...

Before infoimaging, the value chain connecting Kodak to its customers was fairly simple and linear. The average Kodak customer pointed a camera, took a picture, developed the film, and picked up the resulting prints. Although Kodak has continually been the leader in new imaging advancements—new types of cameras, better film and processing, sharper color—the value chain essentially remained the same: camera, film, photofinishing, prints. As a result, Kodak derived value from only a few points in the value chain.

But that has changed because infoimaging has expanded the opportunities for us to connect with customers. Indeed, the digital camera prototype that Kodak unveiled in 1976—hooked up to a roomful of computers to process the image—was a harbinger of the flood of innovations and new products created by the convergence of image science and information technology. And investigation by Kodak scientists into specific building blocks of image capture, storage and output has given rise to new businesses based on these very components. For example, our research into digital storage for film-based images gave rise to image sensor technology that is now prevalent in digital cameras and a host of other applications and is developed and marketed by Kodak Image Sensor Solutions.

This kind of purposeful pursuit has helped to expand that simple two-link relationship with customers. Today, the infoimaging value chain includes not only cameras, film, photofinishing and prints but also e-mail, kiosks, Web pages, e-commerce, scanners, compact discs, and wireless camera phones. As a result, the value chain is more web-like, with Kodak deriving value from multiple

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points within the web simultaneously. Infoimaging is made up of three rapidly expanding markets: devices, infrastructure and services and media. These three markets make up what we call the $385 billion infoimaging industry, and Kodak has the distinction of being one of the few players in all three segments.

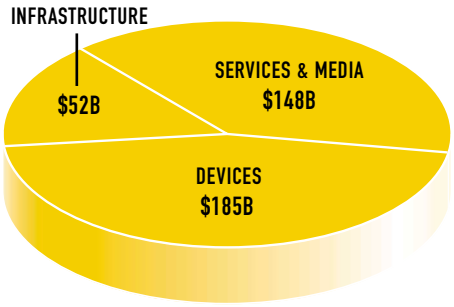
- Devices are products that capture, view, digitize and output. That's image sensors, optical devices and organic light emitting diode (OLED) display screens, and the products they go into—cameras, scanners, printers, CD and DVD players, PDAs and cell phones, to name a few.
- Infrastructure enables images to be processed, stored, edited, transformed and transported. That's hardware and software, including photo editing software and retail photofinishing networks, as well as the micro-optic lenses used to transmit data over fiber-optic telecommunications networks.
- Services and media allow images to be shared and preserved. That's photographic prints, long-term online storage, ink, CDs, film, paper and, of course, the chemicals and substances these media comprise.

INFOIMAGING IN ACTION

Kodak's Components Group and its business units—Display Products (OLED), Image Sensor Solutions and Optics—boast some of the most exciting developments in the infoimaging industry.

Image sensors are a good example. Kodak scientists recognized that in order to scan and digitally convert photographs, these devices would need to "see" more than the human eye. High-performance image sensors feature a matrix of tiny photodetectors (pixels) that convert light into an electrical signal that is read-out and converted to digital information, which can then be stored, printed, displayed or transmitted. The first Kodak image sensor was used in a high-speed camera in 1980, and more than 20 years later, we introduced the world's first 16 million-pixel camera. But digital cameras are not the only application for image sensors. Kodak image sensors are used in scanners, satellites, traffic cameras, copiers and machines that inspect semiconductor chips, as well as in microscopy and medical instruments for mammography, cardiology and endoscopy. Image sensors are the first step in connecting devices to the wider world of infoimaging because they capture image data that can be sent across the Internet, edited with software, displayed on a computer, and printed.

One of our earliest forays into infoimaging—optics—predates "information technology" by decades. Through years of production of optics for the photography market, Kodak perfected the design, materials and manufacturing process for molded optical lenses that are aspheric rather than the traditional, spherical shape. This lens shape is advantageous for any application that bends, folds or shapes light because it greatly reduces the amount of visual interference that naturally occurs whenever reflection is used to transmit light. What's more, for the last 10 years, Kodak has made component assemblies to integrate and direct light in laser-thermal printers and produced the first *plastic* micro-lens arrays, for use in projector illumination systems. The Optics business unit's combination of design, production and materials expertise is



The $385 billion infoimaging pie slices into three big pieces. This trio of interrelated sectors—devices, infrastructure and services/media—connects to form the infoimaging market.

relevant to the telecommunications industry—for example, in the construction of broadband fiber-optic networks, from the Internet backbone all the way to businesses and residences. This proficiency also holds potential for the consumer electronics industry's ongoing pursuit of high-performance, cost-effective subassemblies for CD and DVD players to deliver crystal-clear sound and images.

Consumer devices are poised to get a boost from Kodak display technology, too. Research by Kodak scientists into fuel-cell materials led to the discovery of OLED technology. A thin film of organic compounds is activated through a semiconductor circuit that carries electrical charges to imprinted pixels and causes them to emit light. Brighter, thinner and more colorful than traditional liquid crystal displays (LCDs), OLED displays provide an extremely wide (165 degree) viewing angle, with a refresh rate 100 to 1,000 times that of today's LCDs. The result: Active-matrix OLED displays offer crisper, clearer full-motion video. They also appeal strongly to manufacturers seeking next-generation display screens for lighter, smaller devices.

INFOIMAGING'S IMPACT

These examples are but a few of the many infoimaging success stories from Kodak's Components Group, and we will be sharing more with you. Each of these examples illustrates how Kodak can create new opportunities for growth for itself and for customers. The proof is in the results. Consider these facts:

- Over the past 30 years, Kodak has molded millions of glass and plastic aspheric lenses both to support internal projects and to sell to other manufacturers.
- Kodak's 16 million-pixel image sensor, the KAF-16801, earned *Photonic Spectra's* prestigious Circle of Excellence award in recognition of its outstanding performance.
- Kodak Image Sensor Solutions has recorded 20 percent or greater annual growth since 1999. The worldwide market for image sensors is expected to reach $1.7 billion in 2003 [Cahner's In-Stat].
- The market for OLED displays, a key product line within the Kodak Components Group, is expected to range from $900 million to $3.6 billion by 2005, according to Stanford Resources and DisplaySearch. Kodak expects to generate $500 million in OLED display sales by 2005.
- Kodak's active-matrix OLED screens are just 1.5 millimeters thick—about the thickness of a quarter—a fraction of the size of LCD displays.

THE PATH TO GROWTH

Without a doubt, our company, our industry and our jobs are changing. Infoimaging is forcing us to look at how we serve customers in new ways. Technology is opening the doors to new products and services that we never before thought possible—from Internet connectivity at the speed of light, to home movies displayed on a cell phone, to tiny sensors that will power less invasive surgical techniques. This, in turn, is creating new opportunities for us to work with new and different companies—such as SANYO, with which Kodak formed SK Display Corp., an active-matrix OLED manufacturing venture—and to collaborate with companies that are also our competitors—camera back manufacturers Phase One and Sinar, among other customers for the KAF-16801 16 million-pixel sensor. In other words, what might have seemed impossible and impractical is now very probable and necessary.

So how we do communicate these exciting opportunities to each other within Kodak? It's actually quite simple:

OUR INDUSTRY

Infoimaging is the industry in which Kodak competes. It is a $385 billion industry created by the convergence of image science and information technology.

OUR STRATEGY FOR GROWTH

In order to grow in this new industry, Kodak has identified and is pursuing four growth strategies:

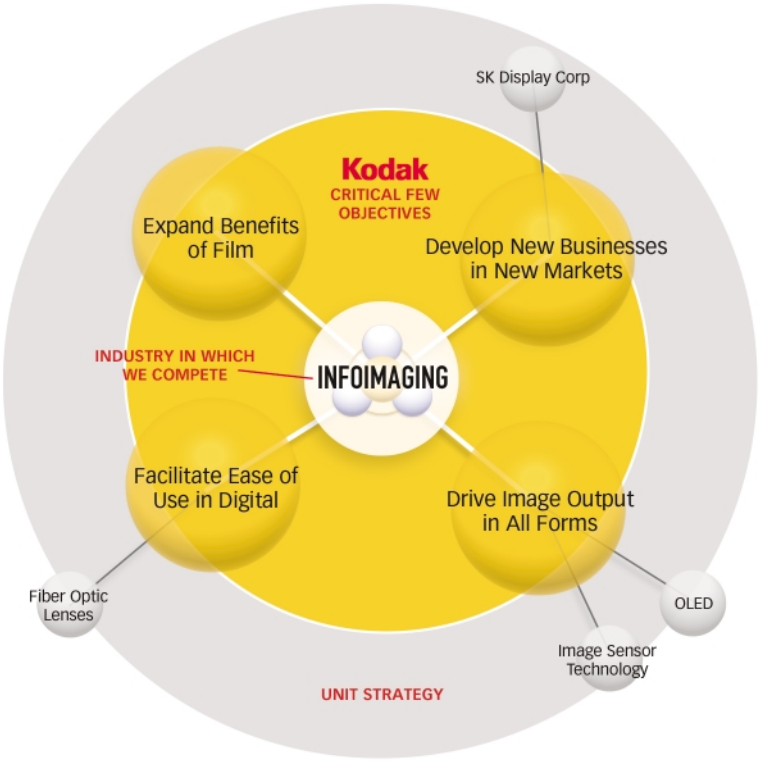
1. Expand the benefits of film
2. Drive output across all of our businesses
3. Make digital easier to use for both commercial customers and consumers
4. Develop new businesses in new markets

OUR VALUE PROPOSITION

The Kodak Components Group offers the very elements of infoimaging, the fundamentals of image science combined with information technology.

In other words, infoimaging is expanding the links in our value chain. The critical few growth strategies will enable us to seize the opportunities afforded by the infoimaging market. And the optics, image sensors and extraordinary display technologies are the ingredients that transform venerable industries such as imaging and accelerate others such as consumer electronics.

We must see the possibilities and then seize the opportunities.



For more information about infoimaging, go to:
www.kodak.com/go/infoimaging