Creating New Value

Developing products that ensure ease of use for everyone by realizing new ideas with advanced technologies

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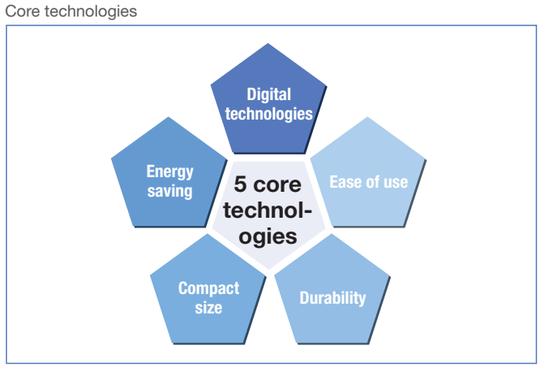
Casio's product development concept is simple: going from "0" to "1." The Consumer Division has faithfully adhered to this tradition by working to develop such products as electronic dictionaries, musical instruments, and projectors. As we have shown in the field of electronic dictionaries, which have made it possible for users to carry around vast amounts of information that would otherwise require dozens of printed dictionaries, our role is not only to improve the convenience of conventional tools, but to create a new culture using digital technologies and to produce new value that has never been created before.

The source of Casio's development skills lies in its digital technologies, but Casio's products, in addition to being smaller, lighter weight, and more energy-saving, must utilize advanced technologies that make them easy for anyone to use. We therefore put ourselves in the position of users and constantly listen to their feedback. In particular, the pursuit of the optimal user interface is a mission that has long been an essential part of the Casio product development heritage. Better interfaces are achieved through the efforts of engineers who are constantly striving to re-imagine the scenarios in which their products will be used and to match ideas with technologies in innovative new ways. Moreover, designing products suitable for mass production is an important part of the design process that determines our manufacturing costs and safety measures and drives our corporate competitiveness. Our division develops optimal designs that take into account all aspects of our business, from production to marketing to service, and thoroughly investigates the safety and environmental implications of its products.

Core Technologies for Realizing New Ideas

Casio creates products from innovative ideas by constantly developing its core technologies, including digital technologies, as well as technologies for making products more compact, saving energy, and for use in telecommunications.

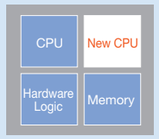
Core technologies



Digital Technologies Make the Impossible Possible

Digital technol- ogies

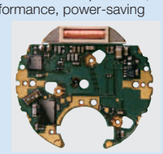
Casio's Exilim Engine 4.0 for digital cameras uses a multi-CPU design, in which two CPUs run in parallel, to achieve complex image processing at ultra-high speeds that had previously been difficult to achieve. These technologies have enabled Casio to create the Dynamic Photo function, which allows users to make composite moving images right on the camera, and a makeup function that helps make sure people's faces look beautiful in photos. The camera instantly analyzes the photographic conditions, performs optimization processing, recreates natural backlighting, and uses an innovative new noise-removal algorithm to remove low-frequency noise from high-sensitivity photography. This allows the camera to produce beautiful images, fulfilling the basic function people expect of the camera, while also achieving an energy savings of about 30% over earlier models.



Smartly Operating on Little Power

Energy saving

To create even more compact and energy-efficient radio-controlled watches, Casio has developed the industry's first all-band CMOS receiver LSI, which integrates the analog circuit that receives radio waves with the digital circuit that processes data. Because they only require a small amount of power to operate, CMOS receiving circuits are usually less effective at keeping out noise in radio-controlled watches. Also, the low level of power involved, about 1/1,000th of that required by ordinary communication devices, can make it difficult to maintain operational stability. To solve these problems, Casio developed the high-performance, power-saving circuit ahead of its competitors. As an LSI that can receive radio waves from transmitters around the world, it has been used for the first time in Casio watches featuring Multiband 6 technology.



Easy for Anyone To Use

Ease of use

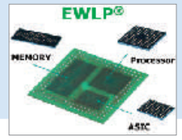
In an effort to meet the needs of users to know, to hear, and to learn, Casio has been striving to create electronic dictionaries that offer better operability and learning tools, with functions accessible via a touch panel design. Casio is a pioneer in the industry in its adoption of the twin touch panel. By using a touch screen for the main interface, the company has made it possible to search for complex Kanji characters by writing large versions of the character on the main screen. Casio has also achieved "map searching" that allows users to directly touch the map being viewed. The most recent model places the most frequently used icons along the right edge of the main panel, allowing even faster access to touch panel features.

CASIO
Core Technologies

Compact, Slim, Lightweight

Compact size

Use of WLP,[*1] a high performance, compact, highly reliable, low-cost semiconductor packaging technology, is rapidly expanding, particularly for cellular phone applications. Casio is also developing technologies and applications for cutting-edge, high-density EWLP[*2] packaging in which the chip itself is embedded in the printed circuit board. In the future, making products without the use of solder will allow for a reduction in the consumption of heat energy in the manufacturing process. Solderless packaging is a vital technology in the electronics industry since it can significantly reduce a product's environmental impact.



A Sense of Security Anywhere, Anytime

Durability

The G-Shock watch, with its more than 25 year history, is the jewel in Casio's crown of shock-resistance technologies. The glass face, buttons, and back of the case are all designed not to make direct contact with the ground if dropped, allowing the plastic components to absorb all the shock. Further, the heart of the watch is protected from shocks by a layout that keeps the internal module suspended in a hollow structure. Each electronic component, down to each quartz, is protected by buffer materials. The standard radio wave receiver is a stack of amorphous membranes that are difficult to bend, even when subjected to an impact. In its latest radio-controlled solar-powered Tough Movement, the module itself is shock resistant, and will automatically correct even if a shock causes the hands of the watch to shift slightly.

*1. WLP (wafer level package): An LSI package that enables rerouting of copper traces, formation of electrode terminals, and encapsulation of chips in epoxy resin, all on an intact wafer.
*2. EWLP (embedded wafer level package): By embedding WLPs on a system circuit board, this packaging technology maintains the high performance of electronic devices while making them even more compact, slim, and lightweight.

Joint Industry-Academia Research to Develop Technologies for Replacing Rare Metals

The rare metal indium is used in the transparent electrodes needed in LCDs, and the ability to meet growing worldwide demand for this resource is being threatened. Casio was commissioned by the Ministry of Economy, Trade and Industry in fiscal 2008 and the New Energy and Industrial Technology Development Organization (NEDO) in fiscal 2009 to launch a joint industry-academia research project among several companies and the Kochi University of Technology. The participants are working to develop technologies that can create transparent electrodes using the more easily attainable zinc oxide. Transparent electrodes made using zinc oxide have excellent optical properties, and can help LCD panels to offer better brightness and color than conventional models. Casio is responsible for identifying and solving the challenges involved in the manufacturing process, with the ultimate goal of making this approach commercially viable. Prototype panels have been displayed at exhibits and research meetings such as CEATEC Japan in September 2008. The project has already demonstrated that it is possible to achieve visual quality just as good as conventional LCD panels.

Casio subjects the G-Shock to a variety of tests, including shock-resistance tests, vibration tests, and underwater pressure tests, and rigorously checks its reliability to ensure that it meets industry standards.

Digital Design Data Shared on a Network

Casio products are all designed in 3D using computer software, and are stored as digital data. These files are centrally managed along with circuit diagrams, component data, specifications, and production schedules, and are shared via network with production sites and logistics facilities. This system was established to enable Casio to flexibly adapt to changing conditions, such as changes in user needs and the economic environment.

By sharing this data throughout the company, Casio can ensure that circuits and parts that work the same way, even if used in different product areas, are standardized, achieving lower procurement costs and greater efficiency in assembly. If any problems arise in relation to quality or the environment, Casio can efficiently go through its past product lineup to determine if there is a need to replace a certain part, or can work across departmental lines to examine the total environmental impact, for instance, calculating the amount of designated chemical substances contained in products.

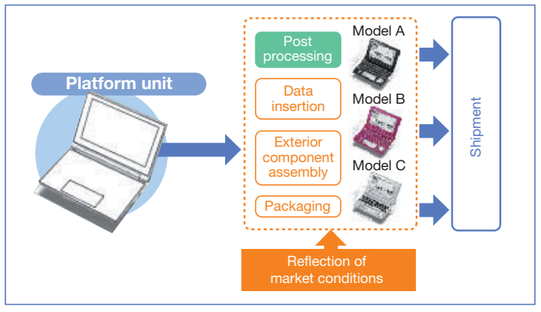
Design data is also used in the creation of catalogs and instruction manuals. Since design data can be used to create 3D diagrams and cross-section diagrams, there is no need to start drawing new diagrams from scratch. This accelerates the production process and keeps costs down.

Platform Design for Flexible Production

Casio's electronic dictionaries come in a variety of models and in a wide array of colors to meet the needs of today's diverse users. To efficiently produce product lineups that span a wide range of configurations, Casio integrates all the common parts of each product to create a single "platform unit." This allows Casio to keep costs down by ordering parts in large quantities, and to improve manufacturing efficiency by standardizing production processes.

Casio determines how many of each product to ship by looking at the market conditions immediately before shipment, inserting different types of content into the platform units, assembling the exterior, and then packaging the products. This allows Casio to supply only the number of models necessary in the shortest period of time.

Use of platform unit in electronic dictionary



Strengthening Green Product Development Standards

In fiscal 2002, Casio launched its Casio Green Products campaign to promote the creation of environmentally friendly products. Products that meet rigorous standards, based on the results of a product environmental assessment, are certified as "Casio Green Products." The company set a goal of having Casio Green Products account for 80% of total product sales by fiscal 2009, and met it ahead of time. Going one step further, Casio then established an internal committee that decided to identify the most environmentally friendly of the Casio Green Products as Casio Green Star Products. This committee set a new goal in fiscal 2010 of 30% of total sales coming from Casio Green Star Products by fiscal 2013.

Ensuring Safety Through Flame-Resistant Design

To prevent the occurrence of major product accidents (fires or fatal accidents) that might threaten the safety of consumers, Casio is working to create products with flame-resistant design. To prevent a fire from breaking out due to a malfunction or electrical abnormality, Casio not only builds in safety when designing product circuitry, but has also established a safety design standard mandating use of flame-resistant materials in circuit boards and external casing. This ensures that the product itself will not ignite, even if by some chance a fire were to ignite inside the case, such as could potentially happen if a product were used at the wrong voltage.

The designers also envision a scenario in which a product is engulfed in flame from the outside, and then confirm the safety of the product by conducting a test of forcible ignition to verify whether it could cause a fire.

Verifying the Properties of the G-Shock Through Strength Analysis

During the design phase, Casio rigorously tests the shock-resistance of the G-Shock watch. First the individual parts are analyzed, and checked for adequate strength. When these are assembled into the final product, Casio considers all the shocks that could hit a particular part, conducts a shock simulation from different directions using a 3D CAD program, and verifies that no problems occur.

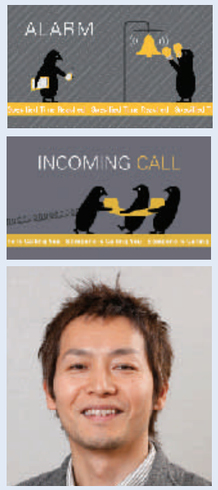
The superior shock-resistance offered by the G-Shock has been achieved not only by applying this analysis but also through the combination of cutting-edge molding technologies and surface-processing technologies including urethane coating.

Employee Message

"Heart-Craft" Concept is User Friendly

Casio is introducing the "Heart Craft" concept into its shape and screen design, as a means of making cellular phones easy to understand and use in spite of their growing multifunctionality and increasingly complex uses.

Unique, friendly characters, such as the Adelie penguins, appear on the screen, and act out heartwarming animated scenes with story lines. This is being done to help users enjoy the many functions of their phones, and to relax and enjoy the short bursts of time they spend waiting while making phone calls and sending their email.



Taichiro Tsujimura
Design Center

Universal Design Through Human-Centered Design

The main objective for Casio's universal design activities is simply to improve the quality of the user experience. Casio works to develop products using human-centered design (HCD) in conformity with ISO 13407 processes.

To achieve HCD, Casio listens to feedback from customers who actually use its products, places top priority on approaching product development from the customer's perspective, and strives to improve the ease of use of all elements of its products, from the product itself and its packaging to the instruction manuals—all based on the results of user tests and feedback obtained from the Customer Support Center.


Handheld terminal DT-X7

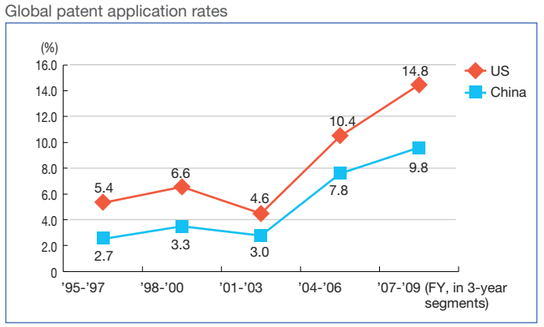

Universal design calculator

Global Development of Intellectual Property Activities

Casio treats the technologies, designs and other intellectual property produced by its employees in the development process as important management resources, and therefore works to obtain patents, utility model patents, design rights, and trademarks.

In recent years, in response to the globalization of business activities, Casio has been specifically striving to increase the number of patent applications outside Japan. The goal is to increase the percentage to 30% of the company's total patent applications. In particular, Casio is working hard to acquire patents in the US, where intellectual property competition is particularly fierce, as well as in the growing market of China.

Global patent application rates



Customer Satisfaction and Quality Assurance

Casio's Approach to Quality Assurance

To offer products and services that please and impress customers, Casio is committed to making products that earn high marks in every possible aspect, including safety, of course, as well as function, design, price, reliability and durability, serviceability, and environmental conservation.

Together, these are what make "Casio Quality" what it is. The role of the quality assurance system is to ensure that Casio reliably delivers quality that meets or exceeds customer expectations.

Quality Assurance System

Constantly striving to achieve the highest level of Casio Quality helps improve customer satisfaction, leading to further growth for Casio's business. Casio's carefully designed quality assurance system is essential to this outcome.

Casio has created a company-wide quality assurance system, shown in the diagram below, and strives to ensure quality by enlisting the cooperation of all manufacturing, sales, and service departments.

The Casio Promotion Committee for Groupwide Quality Enhancement is the highest authority responsible for quality assurance. It meets semiannually, convening the heads from each business segment and manufacturing and service affiliate companies. Decisions are made at these meetings on company policies and important issues relating to quality. The policies and measures are then communicated to individual departments and reflected in specific quality assurance activities within the departments.

In addition, in the Electronics segment, the CS Control Group (within the Global Marketing Headquarters) has been linked together with the Engineering Department (within the Production & Purchasing Division) to improve product quality and services.

Pursuing Top Quality

Casio's efforts to achieve premium quality are guided by a clearly articulated Quality Concept and Quality Management Policies, which provide indices for evaluating all quality initiatives.

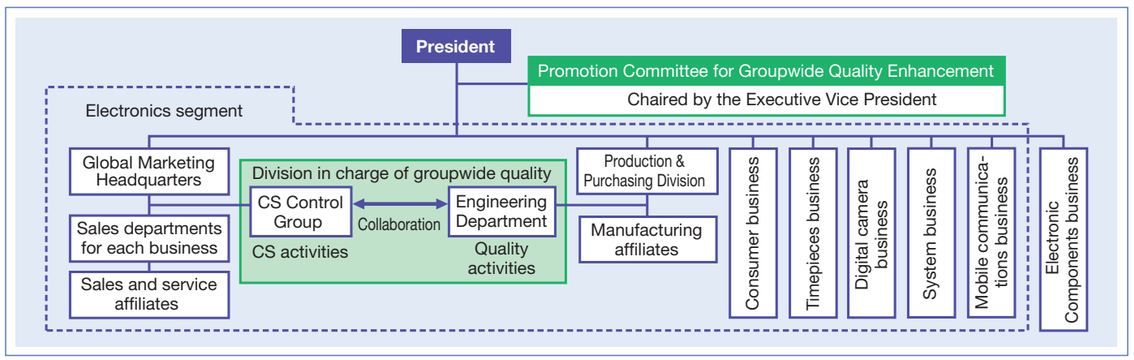
Quality Concept

Casio maintains a strong quality assurance system, based on its belief in "Quality First." This system requires all employees to make quality their first concern in every task they perform, enabling the company to offer products and services that please and impress customers. The company's commitment to quality supports its corporate growth and makes social contributions possible, while at the same time winning customers' trust and giving them peace of mind.

Quality Management Policies

- To build a good corporate image, we offer products and services that please and impress our customers, gain their strong trust, and ensure their peace of mind.
- We respond to our customers' requests and inquiries with sincerity and speed, and reflect their important comments on our products and services.
- In all our business processes, we base our actions on the Principle of the Five "Gens"—in Japanese, *genba* (on site), *genbutsu* (actual goods), *genjitsu* (reality), *genri* (theory) and *gensoku* (rule)—and adhere to the basics of business operations.
- We capture and analyze quality assurance activities quantitatively, using reliable data, and use the analysis to make continuous improvements. We also maintain a quality information system that enables the sharing of quality information and prevention of problems before they occur, and prevents recurrence of quality problems.

Quality assurance system



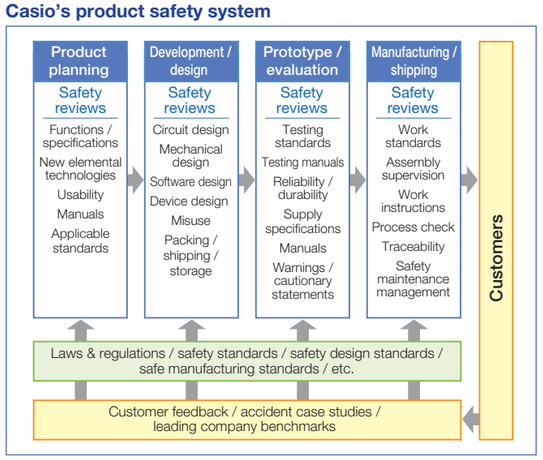
Offering Users Peace of Mind

Casio makes every effort to ensure product safety so that customers can always use Casio products with peace of mind.

As shown in the diagram below, Casio carries out rigorous product safety reviews during each process, including product planning, development, design, prototype production, evaluation, manufacturing, and shipping. The company also takes proactive measures to head off problems or prevent them from recurring.

To comply with the legislative intent of Japan's recently revised Consumer Product Safety Act, which went into force on May 14, 2007, the Casio board of directors has adopted the Fundamental Policies on Product Safety. Based on these policies, Casio has put in place the Product Safety Voluntary Action Plan which specifies the details of the steps to be taken. The company has also reengineered its response systems for handling those unusual situations when a product-related accident occurs, and has established procedures for managing such situations. These include the steady, timely collection and dissemination of accident information, the issuance of notifications and reports to customers and relevant administrative agencies, prompt, appropriate response measures, efforts to identify causes, and measures to prevent any future recurrence.

Casio's product safety system



Strengthening safety measures

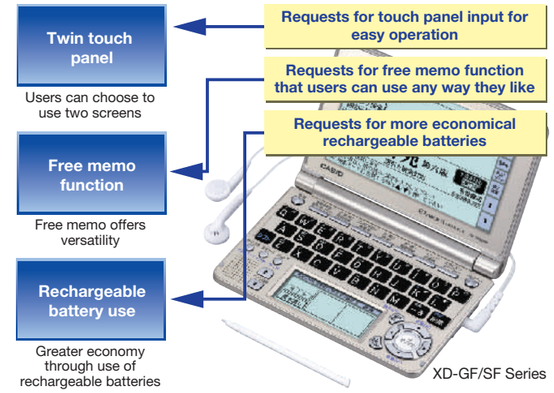
Design plays a key role in product safety, and Casio has established safety design standards to prevent variations in product safety depending on the particular designer or organization involved. Since fiscal 2009, Casio has been conducting forced ignition tests on products based on the rare possibility of such an occurrence, confirming the safety of its products even under these conditions, revising its materials and structures as necessary to ensure that no fire or other significant damage could occur, and striving to strengthen its safety design framework.

To realize total safety management in the manufacturing process, Casio has revised its rules to ensure that, when new types of products move from the development and design divisions to the manufacturing divisions, relevant product safety management tips are more clearly described and are carefully implemented in the actual production process.

Ensuring Customer Satisfaction

To make sure that its products continue to satisfy customers, Casio periodically conducts satisfaction surveys that address not only issues of breakage or safety, but also issues of comfort during use and design features. Casio constantly works to improve customer satisfaction by utilizing the feedback offered by customers via the Customer Support Center in the product development process.

Improvements to electronic dictionaries after customer feedback



Quality Assurance Activities in Fiscal 2009

Steps to ensure customer safety

In addition to strengthening safety measures as described above, Casio conducted safety inspections and legal compliance measures with regard to products with lithium ion rechargeable batteries, which have been added to the items governed by Japan's Electrical Appliance and Material Safety Act (enacted November 20, 2008).

The government of Japan took this step to strengthen safety regulations following a series of dangerous accidents worldwide involving the heating and ignition of lithium ion rechargeable batteries. Casio's response was robust, including provision of internal education and guidance to ensure legal compliance with regard to the applicable products.

Measures to improve market quality

Having analyzed last year's market quality conditions, Casio summarized the key issues in each of its product categories, and has set quality goals for each. At the individual quality meetings held every month, participants discuss issues related to improving market quality, and make plans regarding the revision of quality standards and the strengthening of maintenance and management systems.

Activities to reduce losses due to quality issues

Casio has identified the key improvements that are needed by focusing not only on the ratio of defective products reaching the market, but also on the overall number of defects, and is taking painstaking efforts to reduce this number. The company has been working to prevent any recurrences, to eliminate the causes of problems, and to reduce losses due to quality issues.