

7 Summary

A digital camera is a strong product of Japanese export competitiveness. Quantitative analysis about "application patent data" and "digital camera shipment quantity" of 7 digital camera manufacturers was put into effect by this analysis. The application patent data which is an outcome of research and development was divided into analog technology and digital technology by quantitative analysis, and a time lag of an application patent and shipment quantity was considered. 63 kinds of time lag was considered in each analysis period covered in each company. The regression analysis was put into effect for 7 years (regression model of all 3087). When it's compared with familiar technology, it takes time for non-familiar technology to have an influence on shipment quantity. When applying for 1 patent of familiar technology more than applying for 1 patent of non-familiar technology, shipment quantity become big. It was 3 out of 7 companies that the tendency of the analysis appeared, its tendency was as follows. When it's compared with familiar technology, it takes time for non-familiar technology to have an influence on shipment quantity. When applying for 1 patent of familiar technology more than applying for 1 patent of non-familiar technology, shipment quantity become big. The manufacturer to which the tendency has not gone out can consider the following cause in this analysis. There is a possibility that change has occurred to research and development and a patent strategy during an analysis period. There is a possibility that market application of an outcome of research and development wasn't developed as scheduled. There is a possibility that a change has occurred to ambient surroundings. Source data of the quantity of applications of the digital camera related patent is being used by this analysis.

When an action after an application (reexamination request and registration circumstances) is seasoned, there is also a possibility that new knowledge is obtained. I'd like to try whether this analysis can also be applied in a fused product besides the digital camera field from now on.

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Appendix

Table 9: Description of Analog Patent (G02B1~G02B17)

IPC	Descriptions
• G	PHYSICS
• G02	OPTICS
• G02B	OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS
• G02B1/00	Optical elements characterised by the material of which they are made; Optical coatings for optical elements
• G02B3/00	Simple or compound lenses
• G02B5/00	Optical elements other than lenses
• G02B6/00	Light guides
• G02B7/00	Mountings, adjusting means, or light-tight connections, for optical elements
• G02B9/00	Optical objectives characterised both by the number of the components and their arrangements according to their sign, i.e. + or –
• G02B11/00	Optical objectives characterised by the total number of simple and compound lenses forming the objective and their arrangement
• G02B13/00	Optical objectives specially designed for the purposes specified below
• G02B15/00	Optical objectives with means for varying the magnification
• G02B17/00	Systems with reflecting surfaces, with or without refracting elements

Table 10: Description of Analog Patent (G03B1~G03B19)

IPC	Descriptions
• G	PHYSICS
• G03	PHOTOGRAPHY; CINEMATOGRAPHY; ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ELECTROGRAPHY; HOLOGRAPHY
• G03B	APPARATUS OR ARRANGEMENTS FOR TAKING PHOTOGRAPHS OR FOR PROJECTING OR VIEWING THEM; APPARATUS OR ARRANGEMENTS EMPLOYING ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ACCESSORIES THEREFOR
• G03B1/00	Film strip handling
• G03B3/00	Focusing arrangements of general interest for cameras, projectors or printers
• G03B5/00	Adjustment of optical system relative to image or object surface other than for focusing
• G03B7/00	Control of exposure by setting shutters, diaphragms or filters, separately or conjointly
• G03B9/00	Exposure-making shutters; Diaphragms
• G03B11/00	Filters or other obturators specially adapted for photographic purposes
• G03B13/00	Viewfinders; Focusing aids for cameras; Means for focusing for cameras; Autofocus systems for cameras
• G03B15/00	Special procedures for taking photographs; Apparatus therefor
• G03B17/00	Details of cameras or camera bodies; Accessories therefor
• G03B19/00	Cameras

Table 11: Description of Digital Patent (H04N5/22~25)

IPC	Descriptions
• H	ELECTRICITY
• H04	ELECTRIC COMMUNICATION TECHNIQUE
• H04N	PICTORIAL COMMUNICATION, e.g. TELEVISION
• H04N5/00	Details of television systems
• H04N5/222	Studio circuitry; Studio devices; Studio equipment
• H04N5/225	Television cameras
• H04N5/228	Circuit details for pick-up tubes
• H04N5/232	Devices for controlling television cameras, e.g. remote control
• H04N5/235	Circuitry {or methods} for compensating for variation in the brightness of the object
• H04N5/238	by influencing the optical part of the camera
• H04N5/243	by influencing the picture signal
• H04N5/247	Arrangements of television cameras
• H04N5/253	Picture signal generating by scanning motion picture films or slide opaques, e.g. for telecine
• H04N5/257	Picture signal generators using flying-spot scanners

Table 12: Description of Digital Patent (H04N5/33~36, H01L27/146~148)

IPC	Descriptions
• H	ELECTRICITY
• H04	ELECTRIC COMMUNICATION TECHNIQUE
• H04N	PICTORIAL COMMUNICATION, e.g. TELEVISION
• H04N5/00	Details of television systems
• H04N5/33	Transforming infra-red radiation
• H04N5/335	using solid-state image sensors
• H04N5/341	Extracting pixel data from an image sensor by controlling scanning circuits, e.g. by modifying the number of pixels having been sampled or to be sampled
• H04N5/343	by switching between different modes of operation using different resolutions or aspect ratios, e.g. between still and video mode or between interlaced and non-interlaced mode
• H04N5/345	by partially reading an SSIS array
• H04N5/347	by combining or binning pixels in SSIS
• H04N5/349	for increasing resolution by shifting the sensor relative to the scene
• H04N5/351	Control of the SSIS depending on the scene, e.g. brightness or motion in the scene
• H04N5/353	Control of the integration time
• H04N5/355	Control of the dynamic range
• H04N5/357	Noise processing, e.g. detecting, correcting, reducing or removing noise
• H04N5/359	applied to excess charges produced by the exposure, e.g. smear, blooming, ghost image, crosstalk or leakage between pixels
• H04N5/361	applied to dark current
• H04N5/363	applied to reset noise, e.g. KTC noise
• H04N5/365	applied to fixed-pattern noise, e.g. non-uniformity of response
• H04N5/367	applied to defects, e.g. non-responsive pixels
• H04N5/369	SSIS architecture; Circuitry associated therewith
• H	ELECTRICITY
• H01	BASIC ELECTRIC ELEMENTS
• H01L	SEMICONDUCTOR DEVICES; ELECTRIC SOLID STATE DEVICES NOT OTHERWISE PROVIDED FOR
• H01L27/00	Devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate
• H01L27/146	Imager structures
• H01L27/148	Charge coupled imagers