



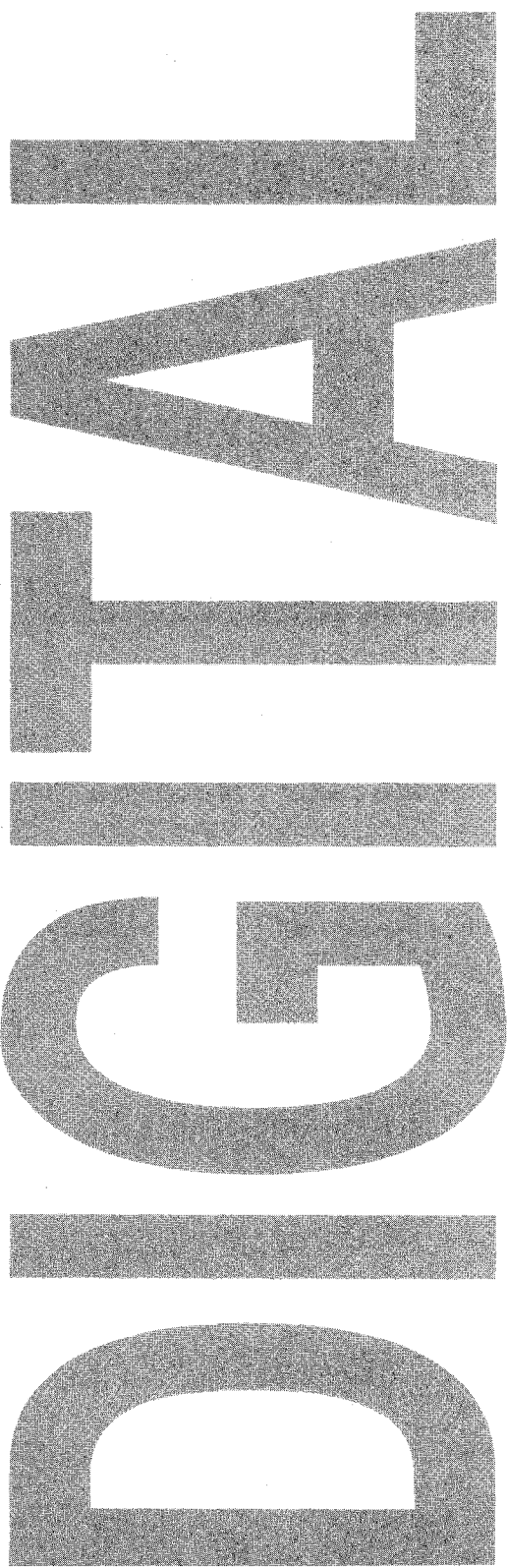
PC based PACS : π - View

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..... π View™ is a Windows95/NT™ based stand-alone software that acquires, displays, processes, prints, archives, and transmits medical image data. It is produced by Mediface, a Seoul-based company dedicated to medical image management since 1994. π View™ can be used as the viewing workstation component of the full-scale Mediface PACS, or can be used singly as a personal image management system on any PC that meets minimum hardware configuration and supports the Windows95/NT operating system. It is fully DICOM compliant, supporting DICOM Query/Retrieve, DICOM Store, and DICOM Print functions. π View™ is a powerful tool that makes personal image management system that run on Windows95/NT™ a reality.

1. The π View™ Display

π View™ displays medical images from US, CT, MR, CR, EBT, DR, DF, DSA, NM, and SC, as well as other 16-bit gray-scale and 24-bit color images, such as endoscopic, dermatologic, and pathologic images. π View™ screen can be displayed in one or



two standard VGA monitors. Screen resolution is scalable from 1024x768 pixels upwards. The basic π View™ screen consists of Image Window, the Toolbox, and the Thumbnail Images Index. The Image Window, which is the main viewing window, has a fully configurable layout, which can be selected from 5 preset formats or can be user-defined. The Toolbox is extremely user-friendly, supporting the multiple functions of π View™ with maximum efficiency and speed. The Toolbox is set on both monitors when using two monitors. All functions of the Toolbox can be carried out using short-cut keys and pop-up menus. A unique feature of π View™ is a short-cut key that allows multiple selection: all operations can be done simultaneously on multiple images. The Thumbnail Images Index displays the images that have been selected, and gives instant Image Window access to images with just a click. The Thumbnail Images Index can be switched off to widen the Image Window.

2. π View™ Key Image

π View™ enables users to select a key image when reviewing an image file. The selected key image is outlined in the Image Window. The key image is incorporated into the data base and is not lost with backing up. Because the key image is displayed in the pictorial search window, it can serve as a visual guide when users are accessing data.

3. Accessing with π View™-Data base Management Folder

Medical image data is accessed using the Data base Management Folder. The Database Management Folder accesses both the local π View™ database and the remote central PACS server database (or any other remote PACS database). Data in Database Management folder is displayed in one of two search windows: the text search window and the pictorial search window. The text search window displays patient demographics, exam information, diagnosis, etc, while the pictorial search window displays the key image of the data, in addition to basic text data. The pictorial search window of the Database Management Folder is a unique feature of π View™ that allows users to access data using only key images. The list of records in the Database Management Folder is fully configurable. For example, the list can be sorted according to patient, dates, type of examination, and body parts. Using functions of π View™ Report, the list can even be sorted by diagnoses and radiological findings, a novel function available only with π View™. Presence or absence of radiological reading accompanying an image file is displayed in read/unread status. User-specific login assures security to access.

4. Managing π View™ Data base

π View™ Report makes it the most effective tool for managing medical information. Each Report that accompanies an image file encloses the standard

information, including patient name, identification number, sex, age, date, body part, imaging modality, exam series number and image numbers. In addition, radiological reading, diagnosis, radiological finding, and two additional user defined index are incorporated into the data base through the Report. The diagnoses and radiological findings are selected from an indexed dictionary, more effectively organizing medical information. Thus the π View™ data base comprises of the medical images, the key image, and the text information contained in the Report. Retrieval using multiple selection criteria among patient name, demographics, date, modality, diagnoses, radiological findings, and 2 user-defined indexes is possible. In π View™ data base, data of one patient can be held in one file, and may also be allocated into multiple files. Data from multiple patients may be organized in one folder.

5. π View™ View Modes

Users can view and compare studies conveniently with the four π View™ View Modes : exam, stack, single, and series. The exam and stack modes are standard view modes. The exam mode displays all the images of a single exam on the screen and the stack mode displays the images of an exam "in stack", that is compiled front to back. Two unique view modes of π View™ are the single and series mode. The single mode can display single images from different studies, and patients in one screen, allowing different sets of images from different studies or patients to be viewed together, and

furthermore, to be saved into a common folder in the database as well. The series mode displays images of different series or examinations linearly on the same screen, for easy comparison between studies. It is especially useful to review MR series in comparison. One-click forward and backward buttons-another special feature on π View™-make quick reviews possible. Because π View™ can select multiple images on the same screen at the same time, the different series or studies can be forwarded simultaneously. Cine mode is also available for single or multiple series/exams.

6. π View™ Processing

π View™ has various tools for post-processing of images. Some of these are pseudocolor mapping & calculation, grayscale inversion, annotation using markers and texts, window-level adjustment(user defined pre-set levels available), panning, zooming, magnification, rotation, and flipping. There are 5 modes of filter and histogram function displays graphs of pixel values along a line selected by the user. Measurement(and calibration) of distances, angles, areas, and densities or signal intensities at full images or ROI aid in more efficient diagnosis. π View™ has an added feature that allows users to manually set a user-defined scale for measurement. Through multiple selection, processing can be done for multiple images simultaneously.

7. Presenting with π View™

π View™ is a superb tool for preparing presentation and education materials. π View™ converts processed images (the entire image or selected ROI) to JPEG, BMP, TIFF files or raw data. It transfers images to clipboard, along with annotations, so that they can be inserted into Microsoft PowerPoint or Word files. Interfacing with commercial slide makers using TWAIN, π View™ enables users to directly make slides. Files can be converted to DIR-DICOM format to be written on CD-ROMs.

8. π View™ Media Archiving

π View™ stores data into removable media such as magnetic disk, optical disk, jaz, zip, CD-R, PD, and digital tape. π View™ can store data on any media that is supported by Windows95/NT™ and can also read data from them. Data stored in DICOM fully maintains original π View™ data base. When data is stored in DIR-DICOM format for CD-ROM writing, an index guides data management. Important information such as key images are not lost with media archiving. Backed-up data can be incorporated into larger scale archiving at will.

9. The Print Manager

π View™ supports DICOM Print functions and all Windows95/NT™ printer drivers. π View™ prints images using both paper printers and laser imagers that support DICOM Print. Composing print jobs is

easy and versatile using π View™ Print Manager, which enables users to format printing to suit individual preference. Film layout, including annotations and texts, is definable by the user. Images print exactly as they appear on the screen. Images from multiple patients, from multiple examinations, and in multiple settings can be printed on the same sheet. Printing jobs do not interfere with other functions.

Using π View™ Print Manager, reports that contain both images and text can be printed out on paper. They can attach to patients' records, significantly lowering clinicians' visits to the file room. Colorful operation records that contain gross pathologic images can be created easily as well, making medical records more informative and comprehensive.

10. NetGate (DICOM Query/Retrieve)

π View™ not only receives DICOM images from imaging modalities. Through NetGate, the DICOM Query/Retrieve module, π View™ also fetches images from any DICOM compliant remote central server or workstations such as GE Advantage Windows, Siemens Magic View, and Phillips Easy Vision. Through DICOM connectivity, π View™ also sends data via network to other workstations, including other View users on the network.

11. VisualGate

π View™ VisualGate module converts non-DICOM

images to DICOM format and vice versa. The VisualGate™ module facilitates import of virtually any image in TIFF, JPEG, BMP, or FFP format into π View™, including commercial graphics.

π View™ also captures images from film scanners, interfacing with all prominent commercial film digitizers. π View™ imports images from film scanners, document scanners, frame grabbers, digital cameras and slide scanners as well, making it a very powerful tool for acquiring data into the DICOM environment.

12. TeleGate

π View™ transfers data for teleradiology via WAN, ISDN, T1, ATM, or other dedicated line, in the same way it transfers data in LAN environment. π View™ transmits data for teleradiology via modem, using its TeleGate module. Data received and transmitted through teleradiology is incorporated into π View™ data base, with no loss of information. Information can be received simultaneously from multiple inputs. Transferring data for teleradiology does not interfere with other functions.

12.1. Key Features

- Pictorial/Text Search Windows
- Search by key images, diagnoses, findings, & user-defined indexes
- Multiple Cine/Series Views for convenient comparison between exams/series
- Window leveling of 16-bit gray-scale images
- Brightness & contrast control of 24-bit color images

12.2. DICOM Support

- DICOM Storage SCP & SCU
- DICOM Query/Retrieve SCP & SCU
- DICOM Print SCU
- DICOM DIR Part 10 Format

12.3. Database

- Local database(Microsoft Access)
- Oracle SQL Query from SPECTRA Server
- Back-up and Removable Media Database

12.4. Viewing and Image Processing

- User-friendly Toolbox in both monitors
- Pop-up menus and short-cut keys
- Forward & backward buttons
- Exam/Stack/Single/Series & Cine View Modes
- Pseudocolor mapping & calculation
- Grayscale inversion
- 5 modes of filter
- Annotation using markers and texts
- Panning, zooming & magnification
- Histogram
- Measurement of distances, angles, areas, etc
- User-defined scale for measurement

12.5. Output

- Paper printing with reporting
- Slide making
- Laser camera printing(DICOM Print)

12.6. Image Acquisition & Transfer

DICOM Query/Retrieve

Import & Export JPEG, TIFF, BMP, FFP files

Clipboard copy and transfer to Microsoft Word or PowerPoint

Import from film scanners, document scanners, frame grabbers, digital cameras and slide scanners

12.7. Teleradiology

ISDN, T1, ATM, etc
modem

12.8. Recommended PC Specifications

Microsoft Windows95 or WindowsNT operating system

1024×768 or higher resolution

16 bit or 24 bit color display

Pentium 133Hz or more

32Mb or 64MB RAM

Minimum 100MB HD space available for running view

Ethernet Network Card