



PORTFOLIO #4

COMPUTER HARDWARE AND SOFTWARE: THEIR IMPLEMENTATION IN THE DIFFERENT INSTITUTIONS IN THE COMMUNITY

THE IMPORTANCE OF COMPUTER HARDWARE

ACCORDING TO **ENG.ABDALGADER EGREIRA & ALI ABUHAMRA (2023)**, HARDWARE OF A COMPUTER IS THE **BACKBONE** OF THE COMPUTER INDUSTRIES. WITHOUT PROPER DEVELOPMENT OF HARDWARE, IT IS IMPOSSIBLE TO THINK ABOUT THE DEVELOPMENT IN THE COMPUTER FIELD. FOR THIS PURPOSE IT IS ESSENTIAL TO LEARN ABOUT THE BASIC OF THE COMPUTER HARDWARE, THAT'S WHY THE MAIN OBJECTIVE IS TO DISCUSS AND ANALYZE THE KEY COMPONENTS OF A COMPUTER HARDWARE SYSTEM AND EXPLAIN EACH OF ITS FUNCTIONS. THE HARDWARE'S CONSISTS OF MANY IMPORTANT ASPECTS WHICH MAKE IT A WORTHWHILE TO DISCUSS IT.

COMPUTERS ARE USED IN DAY TO DAY ACTIVITIES. ONE OF THE **MOST IMPORTANT FACTOR** USED IN A COMPUTER ARE ITS HARDWARE. THE HARDWARE IS A VITAL PART OF A COMPUTER. THE HARDWARE PLAYS A MAIN ROLE IN THE COMPUTATION AND EXECUTION PROCESS OF A COMPUTER. COMPUTERS HAVE A TREMENDOUS SCOPE FOR IMPROVEMENT AND REFINEMENT.

COMPONENTS OF COMPUTER HARDWARE



CPU



CENTRAL PROCESSING UNIT

THE CENTRAL PROCESSING UNIT (CPU), SOMETIMES CALLED MICROPROCESSOR OR JUST PROCESSOR, IS THE REAL BRAIN OF THE COMPUTER AND IS WHERE MOST OF THE CALCULATIONS TAKE PLACE.

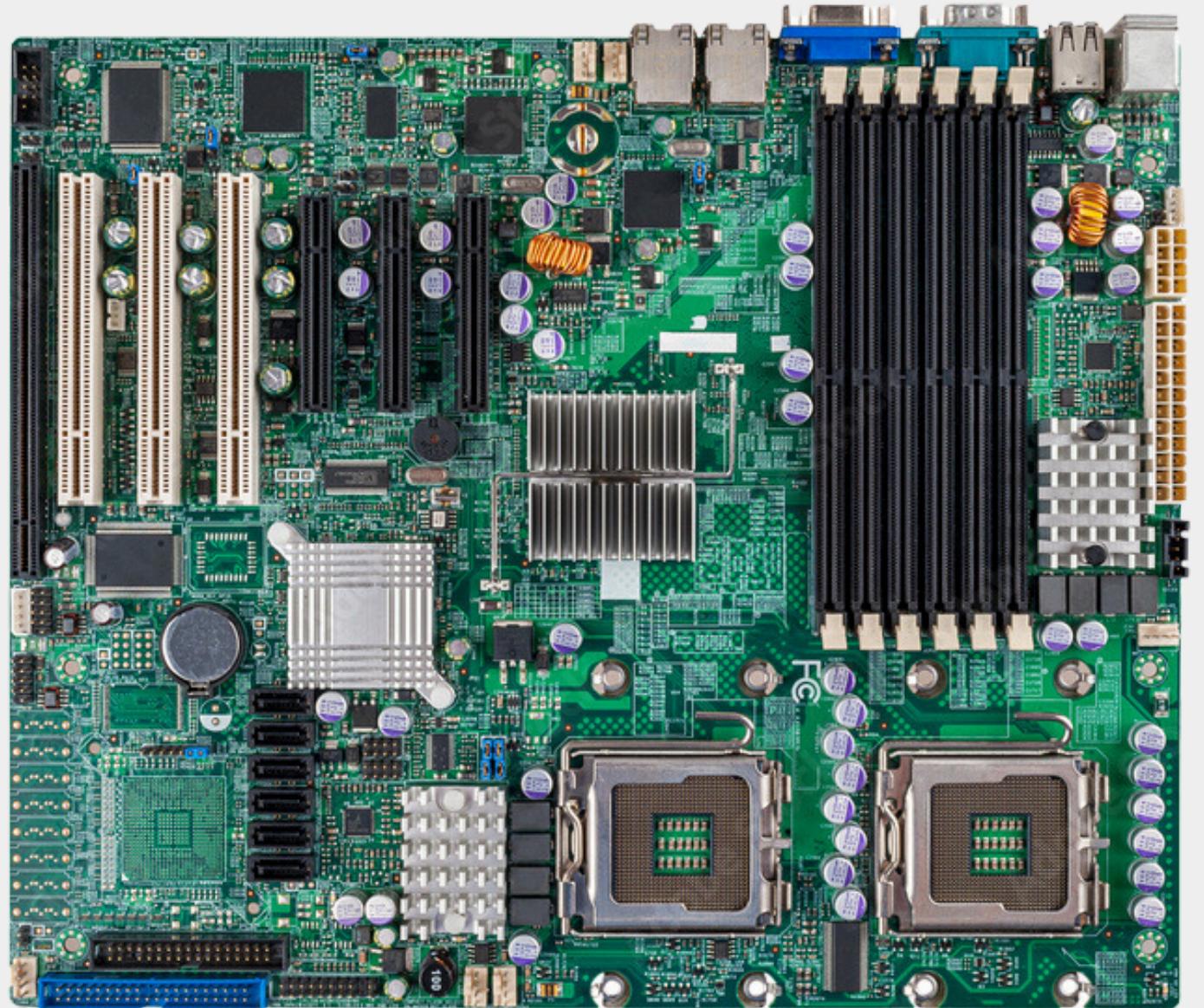
CENTRAL PROCESSING UNIT (CPU) CONSISTS OF THE FOLLOWING FEATURES:-

- CPU IS CONSIDERED AS THE BRAIN OF THE COMPUTER.
- CPU PERFORMS ALL TYPES OF DATA PROCESSING OPERATIONS.
- IT STORES DATA, INTERMEDIATE RESULTS, AND INSTRUCTIONS (PROGRAM).
- IT CONTROLS THE OPERATION OF ALL PARTS OF THE COMPUTER

COMPONENTS OF COMPUTER HARDWARE



MOTHER BOARD



MOTHER BOARD

- THE MOTHERBOARD IS THE BACKBONE OF THE COMPUTER.
- IT IS A PRINTED CIRCUIT BOARD (PCB) THAT CONTAINS BUSES, OR ELECTRICAL PATHWAYS, THAT INTERCONNECT ELECTRONIC COMPONENTS.
- THESE COMPONENTS MAY BE SOLDERED DIRECTLY TO THE MOTHERBOARD, OR ADDED USING SOCKETS, EXPANSION SLOTS, AND PORTS.

COMPONENTS OF COMPUTER HARDWARE



INPUT

- INPUT DEVICES ALLOW THE USER TO COMMUNICATE WITH A COMPUTER.
- SOME OF THE FIRST INPUT DEVICES INCLUDE:
- **KEYBOARD AND MOUSE** – THESE ARE THE TWO MOST COMMONLY USED INPUT DEVICES
- **ADF / FLATBED SCANNER** – THESE DEVICES DIGITIZE AN IMAGE OR DOCUMENT
- **JOYSTICK AND GAMEPAD** – THESE DEVICES ARE USED FOR PLAYING GAMES
- **KVM SWITCH** – A HARDWARE DEVICE THAT CAN BE USED TO CONTROL MORE THAN ONE COMPUTER WHILE USING A SINGLE KEYBOARD, MONITOR, AND MOUSE

KEYBOARD & MOUSE



FLATBED SCANNER



JOYSTICK & GAMEPAD



... KVM SWITCH



COMPONENTS OF COMPUTER HARDWARE



OUTPUT

- AN OUTPUT DEVICE TAKES BINARY INFORMATION FROM THE COMPUTER AND CONVERTS IT INTO A FORM THAT IS EASILY UNDERSTOOD BY THE USER.
- **MONITORS AND PROJECTORS** - BOTH DEVICES THAT DISPLAY CONTENT, BUT THEY DIFFER IN HOW THEY WORK AND WHAT THEY'RE USED FOR
- **PRINTERS** - PRINTERS ARE OUTPUT DEVICES THAT CREATE HARD COPIES OF FILES.
- **VR AND AR HEADSETS** - USES COMPUTER TECHNOLOGY TO CREATE A SIMULATED, THREE-DIMENSIONAL ENVIRONMENT.
- **SPEAKERS AND HEADPHONES** - AUDITORY OUTPUT DEVICES

MONITORS & PROJECTORS



PRINTERS



VR & AR



SPEAKERS & HEADPHONES



SOFTWARE

IT IS A COLLECTION OF PROGRAMS THAT MAKES A COMPUTER SYSTEM TO RUN. IT MAKES A COMPUTER TO UNDERSTAND THE USER'S REQUIREMENTS, FUNCTIONS TO BE PERFORMED AND THE DESIRED OUTPUT TO BE GIVEN. SOFTWARE IS INTANGIBLE I.E., WE CANNOT BE TOUCH THEM BY HAND. EXAMPLE: PAINT, SWORD PROCESSOR, SPREAD SHEET, ETC. (JAVID, 2020)

```
6      require 'spec_helper'  
7  
8      require 'rspec/rails'  
  
9      require 'capybara/rspec'  
10     require 'capybara/rails'  
  
11     Capybara.javascript_driver = :webkit  
12     Category.delete_all; Category.create!(name: "Electronics", description: "Electronics products")  
13     Product.delete_all; Product.create!(name: "Laptop", description: "A laptop computer", price: 1200, quantity: 10, category: Category.find_by_name("Electronics"))  
14     Product.delete_all; Product.create!(name: "Smartphone", description: "A smartphone", price: 800, quantity: 15, category: Category.find_by_name("Electronics"))  
15     Product.delete_all; Product.create!(name: "Tablet", description: "A tablet", price: 600, quantity: 5, category: Category.find_by_name("Electronics"))  
16     Product.delete_all; Product.create!(name: "Headphones", description: "A pair of headphones", price: 200, quantity: 20, category: Category.find_by_name("Electronics"))  
17     Product.delete_all; Product.create!(name: "Mouse", description: "A computer mouse", price: 100, quantity: 30, category: Category.find_by_name("Electronics"))  
18     Product.delete_all; Product.create!(name: "Keyboard", description: "A computer keyboard", price: 150, quantity: 25, category: Category.find_by_name("Electronics"))  
19     Product.delete_all; Product.create!(name: "Monitor", description: "A computer monitor", price: 300, quantity: 10, category: Category.find_by_name("Electronics"))  
20     Product.delete_all; Product.create!(name: "Speaker", description: "A speaker", price: 100, quantity: 15, category: Category.find_by_name("Electronics"))  
21     # Add additional records here  
22  
23     # Requires supporting files within the same directory as this file.  
24     # run as spec files by themselves, using their own environment.  
25     # in _spec.rb will both be required by the parent .rb file, so you don't  
26     # need to specify the path to each one.  
27     # This supports ActiveSupport's test helpers.  
28     # run twice. It is recommended to do this in .rspec, if you're using it.  
29     # end with _spec.rb. You can remove this line if you're not using it.
```



TYPES OF SOFTWARE

```
return <React.Fragment>
  <div className="py-5">
    <div className="container">
      <Title name="our" title="product">
        <div className="row">
          <ProductConsumer>
            {value =>
              console.log(value)
            }
          </ProductConsumer>
        </div>
      </div>
    </div>
  </React.Fragment>
```

SYSTEM SOFTWARE

SYSTEM SOFTWARE: SYSTEM SOFTWARE IS DEFINED AS A COLLECTION OF PROGRAMS DESIGNED TO CONTROL THE OPERATION OF A COMPUTER SYSTEM. SYSTEM SOFTWARE IS REQUIRED:

1. TO CONTROL ALL OPERATIONS REQUIRED TO MOVE DATA IN AND OUT OF THE COMPUTER.
2. FOR THE DEVELOPMENT OF APPLICATION SOFTWARE.
3. TO RUN APPLICATION PROGRAMS EFFICIENTLY. EXAMPLES: OPERATING SYSTEM, ASSEMBLER, COMPILER, INTERPRETER, ETC

APPLICATION SOFTWARE

APPLICATION SOFTWARE IS A SOFTWARE THAT IS PROGRAMMED TO PERFORM A SPECIFIC FUNCTION AND ITS FUNCTIONS OF THE APPLICATION SOFTWARE ARE NOT USED PARTICULARLY FOR COMPUTERS. THESE ARE USED FOR APPLICATIONS AS THE NAME SUGGEST AND AN EXAMPLE FOR THIS IS A TEXT DOCUMENT, WHICH HELPS USERS WRITE OUT A TEXT OF PARAGRAPHS, WORDS TO CREATE DOCUMENTS .



MIDDLEWARE

THIS SOFTWARE ACTS AS A BRIDGE BETWEEN APPLICATIONS AND SYSTEM SOFTWARE, ENABLING COMMUNICATION AND DATA MANAGEMENT ACROSS SYSTEMS. MIDDLEWARE IS OFTEN USED IN DISTRIBUTED APPLICATIONS AND INCLUDES DATABASE MIDDLEWARE, APPLICATION SERVERS, AND API GATEWAYS.

DEVELOPMENT SOFTWARE

SOFTWARE THAT AIDS IN THE CREATION, DEBUGGING, AND MAINTENANCE OF OTHER SOFTWARE APPLICATIONS. IT INCLUDES:

- PROGRAMMING LANGUAGES (E.G., PYTHON, JAVA) WITH TOOLS LIKE COMPILERS AND INTERPRETERS.
- INTEGRATED DEVELOPMENT ENVIRONMENTS (IDE'S), LIKE VISUAL STUDIO AND ECLIPSE, THAT PROVIDE A COMPREHENSIVE ENVIRONMENT FOR CODING AND TESTING.
- VERSION CONTROL SOFTWARE, SUCH AS GIT, FOR MANAGING CODE VERSIONS AND COLLABORATION.

THEIR IMPLEMENTATION IN THE DIFFERENT INSTITUTIONS IN THE COMMUNITY



HEALTHCARE INSTITUTIONS

IN THE MEDICAL INDUSTRY, SPECIFICALLY MEDICAL INFORMATICS, ORGANIZES PATIENT CARE, RESEARCH AND EDUCATION DATA USING THE INFORMATION SYSTEMS OF THE HOSPITAL TO COVER VARIOUS ADMINISTRATIVE AREAS. COMPUTERS ARE ALSO USED TO HELP RESEARCH BY ANALYZING DATASETS AND MANAGING THEM.

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TO ADD, IMPLEMENTING COMPUTER SYSTEMS FOR NURSING INFORMATICS, THEY USE THREE TYPES OF STRATEGIES, WHICH ARE BIG BANG, PARALLEL AND STEPPED IMPLEMENTATIONS. THESE STRATEGIES IMPACTS HOW WELL NURSING INFORMATICS CAN IMPLEMENT AN ENTIRE SYSTEM, COORDINATING CLINICAL INPUT, COORDINATING NURSING INPUT, ETC.

BUSINESS INSTITUTIONS

IMPLEMENT HARDWARE SUCH AS SERVERS, POINT-OF-SALE SYSTEMS, AND NETWORKED COMPUTERS, ALONG WITH INDUSTRY-SPECIFIC SOFTWARE FOR ACCOUNTING, HUMAN RESOURCES, AND CUSTOMER RELATIONSHIP MANAGEMENT (CRM). THIS INTEGRATION OF TECHNOLOGY SUPPORTS SMOOTHER OPERATIONS, DATA MANAGEMENT, AND ANALYTICS THAT AID DECISION-MAKING AND ENHANCE CUSTOMER SERVICE.

EDUCATIONAL INSTITUTIONS

ACCORDING TO PENUEL (2006), UPON PROVIDING STUDENTS LAPTOPS THAT HAVE CONTEMPORARY PRODUCTIVITY SOFTWARE, WHICH ARE WORD PROCESSING TOOLS, SPREADSHEETS, ETC., WIRELESS CONNECTIVITY AND A FOCUS TO LET THEM USE LAPTOPS TO HELP COMPLETE ACADEMIC TASKS, STUDENTS USE PRODUCTIVITY AND DESIGN TOOLS TO HELP THEM WITH THEIR ACTIVITIES AND ASSIGNMENTS. STUDENTS ALSO GAIN IMPROVEMENTS IN THEIR TECHNOLOGY LITERACY.

GOVERNMENT INSTITUTIONS

USE COMPUTER HARDWARE AND SPECIALIZED SOFTWARE TO AUTOMATE TASKS, MANAGE PUBLIC RECORDS, AND DELIVER E-GOVERNMENT SERVICES TO CITIZENS. THIS INCLUDES DATABASES FOR HANDLING PERMITS, LICENSES, TAXES, AND OTHER PUBLIC SERVICES. BY DIGITIZING RECORDS AND USING SECURE PLATFORMS, GOVERNMENT INSTITUTIONS IMPROVE TRANSPARENCY, REDUCE PAPERWORK, AND SPEED UP SERVICE DELIVERY.

ANALYSIS/REACTION

REFLECTING ON COMPUTER HARDWARE AND SOFTWARE, I'VE COME TO SEE HOW ESSENTIAL THESE COMPONENTS ARE IN OUR EVERYDAY LIVES. HARDWARE—THE PHYSICAL PARTS OF A COMPUTER LIKE THE CPU AND MOTHERBOARD—SERVES AS THE BACKBONE OF ANY SYSTEM. THE CPU, OFTEN CALLED THE “BRAIN” OF THE COMPUTER, HANDLES ALL THE PROCESSING AND CALCULATIONS. IT'S FASCINATING TO REALIZE THAT EVERY FUNCTION A COMPUTER PERFORMS, FROM BASIC TASKS TO COMPLEX OPERATIONS, STARTS WITH THIS SMALL COMPONENT. THE MOTHERBOARD, MEANWHILE, IS THE STRUCTURE THAT CONNECTS ALL THE ESSENTIAL PARTS, ALLOWING THEM TO COMMUNICATE AND WORK TOGETHER. WITHOUT THIS CONNECTION, A COMPUTER COULDN'T FUNCTION AS A SINGLE UNIT. THIS REMINDS ME OF TEAMWORK, WHERE EACH PART PLAYS A ROLE, CONTRIBUTING TO THE BIGGER PICTURE.

SOFTWARE, ON THE OTHER HAND, BRINGS THESE HARDWARE COMPONENTS TO LIFE. SYSTEM SOFTWARE, SUCH AS OPERATING SYSTEMS, CONTROLS THE COMPUTER'S BASIC FUNCTIONS AND KEEPS EVERYTHING RUNNING SMOOTHLY.

ANALYSIS/REACTION

IT ACTS AS THE BRIDGE BETWEEN THE HARDWARE AND THE APPLICATIONS WE USE. APPLICATION SOFTWARE, LIKE WORD PROCESSORS AND DESIGN TOOLS, ALLOWS US TO PERFORM SPECIFIC TASKS, TURNING A COMPUTER INTO A POWERFUL TOOL FOR CREATIVITY, LEARNING, AND PRODUCTIVITY. MIDDLEWARE LINKS DIFFERENT PROGRAMS, AND DEVELOPMENT TOOLS ENABLE THE CREATION OF NEW SOFTWARE, ADDING EVEN MORE FUNCTIONALITY. I'M STRUCK BY HOW THESE LAYERS OF SOFTWARE MAKE COMPUTERS INCREDIBLY VERSATILE, ADAPTING TO COUNTLESS NEEDS AND MAKING LIFE EASIER AND MORE EFFICIENT.

CONSIDERING THE IMPACT OF COMPUTERS ACROSS DIFFERENT FIELDS HIGHLIGHTS HOW DEEPLY INTEGRATED THEY ARE INTO MODERN SOCIETY. IN HEALTHCARE, COMPUTERS ARE INVALUABLE FOR MANAGING PATIENT RECORDS, SUPPORTING RESEARCH, AND HELPING DOCTORS MAKE DECISIONS. THEY STREAMLINE PROCESSES THAT WOULD OTHERWISE BE TIME-CONSUMING, IMPROVING BOTH THE QUALITY AND SPEED OF PATIENT CARE. IN BUSINESS, COMPUTERS HANDLE TASKS LIKE DATA MANAGEMENT AND CUSTOMER SERVICE, MAKING IT EASIER TO ANALYZE INFORMATION AND MAKE INFORMED DECISIONS.

ANALYSIS/REACTION

THIS EFFICIENCY ENHANCES PRODUCTIVITY AND HELPS BUSINESSES GROW. EDUCATION HAS ALSO BEEN TRANSFORMED BY COMPUTERS, AS THEY PROVIDE STUDENTS LIKE ME WITH NEW WAYS TO LEARN AND ENGAGE WITH INFORMATION. USING LAPTOPS OR TABLETS FOR ASSIGNMENTS, RESEARCH, OR CREATIVE PROJECTS HAS BECOME THE NORM, GIVING STUDENTS THE OPPORTUNITY TO DEVELOP ESSENTIAL DIGITAL SKILLS. GOVERNMENT SERVICES, TOO, BENEFIT FROM COMPUTERIZATION, MAKING IT EASIER FOR CITIZENS TO ACCESS PUBLIC RECORDS, APPLY FOR PERMITS, AND RECEIVE SERVICES. THE USE OF COMPUTERS IN THESE AREAS HAS INCREASED TRANSPARENCY AND REDUCED PAPERWORK, SAVING TIME FOR BOTH THE PUBLIC AND GOVERNMENT EMPLOYEES.

OVERALL, THE COMBINED POWER OF COMPUTER HARDWARE AND SOFTWARE HAS RESHAPED OUR WORLD, MAKING PROCESSES FASTER, MORE EFFICIENT, AND MORE ACCESSIBLE. REALIZING HOW MUCH WE RELY ON TECHNOLOGY EVERY DAY MAKES ME APPRECIATE THE NEED FOR CONTINUOUS LEARNING IN THIS FIELD. AS COMPUTERS EVOLVE, THEY OPEN UP NEW POSSIBILITIES, OFFERING SOLUTIONS TO CHALLENGES AND OPPORTUNITIES FOR GROWTH IN NEARLY EVERY AREA OF LIFE.

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