Impact of Information Technology in Medicinal Research Evidence based Planning

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Abstract:

Computer science is not only the science but the life of today’s era, as all research involve in any branch of bioscience hardly depends on computer data management system. Medical research related to surgery, medical imagine, drug designing etc. Information technology plays a critical role to retrieve drug overview, diagnosis, prognosis, treatment pattern, patient history provide effective results for bench to bedside treatment. This paper addresses the impact of information technology in medical and biological research planning. Method used as search and analysis of approximate 250 related papers by using general search engine as well as meta search engine through applying inclusion and exclusion criterion. As conclusion we can say that information technology predominantly set correct evidence based research plan for a researcher as well as shows easiest and effective way even during onsite research procedure with new direction and perspective of ideas with cost effective designs and protocol.

Index Terms—Computer, Diagnosis, Drug, Planning, Bioscience

I. INTRODUCTION

To design medical and biological researches should meet six aim to cross quality chasm of research viz. Safe, effective, efficient, timely, economic, targeted with clear need. Picture archival and communication system (PACS), data management system, mobile computing, virtual screening, sensorized robotic system, computer aided drug designing system implant a suitable passage or research planning for medical and biological researches. Also to establish a platform for easy and economic researches design that can ensure near to hundred percent result accuracy [1]. In biological research the biggest hurdle which opens the face is time and cost, most of biological research work are on the hit and trial basis, at times it become complex with much trial even with the human volunteers. That predominantly shows the time, cost and effort is most important factor for any biological research and become a hurdle if improper planning taking out in consideration. To minimize such a hurdle information technology plays a very impressive work by fast collection of literature, case study, pathways; analysis reduces the time of research. Correct protocol for correct point of pathway reduces the cost and effort of biological research with sure results interpretation and high yield. Information technology serves evidences for authentic and proper planning [2].
II. METHOD

Published literature with strict inclusion and exclusion criteria was extensively reviewed through use of general and meta search engines to elucidate the applications and implications of information technology in biological research planning. A systematic meta-analysis of 95 representative articles from the year 2000-2013 was performed. Some limitation hurdled effective research design as picking criteria for what counts as reliable evidence, selecting metadata, standardising and describing research materials and choosing nomenclature to classify data. These hurdles imposes a question to a researchers on reliability of results, which evidence determine correct result, whether evidence by human wet lab determination or by exhaust information of computer memory. But it seems to be clear more and more similar evidence based information turn the research plan on more faithful direction. It shows on an average basis Information Technology leads the research work plan on more faithful and reliable direction. The second hurdle is metadata selection, metadata reflects as an effective criterion for faithful research design, retrieval of manual metadata on wet lab finding is a tedious work for the planning as well throughout the research information technology exert its impact. This makes information technology something special than the other scientific equipment. It aids not only hypothesis formation and research design as well as data collection, data analysis and scientific result advertisement. The most powerful factor for research design is that, from which point of such topic needs start of research till what extent previous researchers draw the line, bulk of research data and its retrieval. The inclusion and exclusion criteria design during research planning, manual light over this factor is not competent enough to prepare error free research design and its planning its need strong resource of previous case study. Here Information Technology play a critical role for recent research retrieval with a big blessing of god as computer and subfield like bioinformatics and computational biology.

III. PACS

PACS (Picture Archiving and Communication System) Medical intensive cares units rush in demand of physicians suffer from delay of non routine chest radiographic examinations [3]. In order to improve unit efficiency of medical care unit even in the condition of highphysician workload PACS workstation effectively reduces the image information delay[3]. Based on hospital and radiologic information intelligent prefethching algorithm overcome longer latency of ad-hoc retrievals patient classification during image clustering can improve retrieval efficiency[4]. Now a day’s PACS system could involve implementation of image compression, prefethching and clustering [5]. Research related to image analysis need vigorous 3D image history without delay but with exact point of information. It is not possible to have paper based data to search and retrieve with exact match, in such condition PACS serve the researcher quick and correct image data of need.

IV. MITIS

For the management and processing of medical data MITIS prove as effective tool to records patient, operations and examination data as well shows powerful application in image processing as manipulation, processing and storage of ultrasound and mammographic images [6] MITIS bridges the gap between researcher and correct evident data [7].
However MITIS serve as a powerful tool during research planning to direct the researcher for correct idea to method design by providing evident data within a second with easy retrieval protocol.

V. DMS (DATA MANAGEMENT SYSTEM)

To improve quality of clinical study, Data Management system reflect significant role. Data management system involved DMP (Data management plan) and GCDMP (good clinical data management practice), DMP a realistic and high quality auditable document on request of regularity officer. DMP involve approval page, the protocol summary, role and training, timeliness, database design, creation, maintenance and security, data entry, data validation, quality control and quality assurance, the management of external data, serious adverse event data reconciliation, coding, database lock, data management reports, the communication plan and the abbreviated terms [8], but from these majors 4 effective majors serves DMP as striking tool for evidence based research planning are designing a standardized database of the clinical study, entering data in time with validation and cleansing data efficiently. The CDM (Clinical data management) exert direct effect over quality of data which significantly modulate the result outcome. CDM complies of collection, cleaning, and management of subject data in correspondence with regulatory standards. CDM regulated by guidelines and standards with code of federal regulation to ensure accuracy, reliability, integrity, authenticity, secure with timeliness retrieval of data [9].

VI. RHIS (ROUNTE HEALTH INFORMATION SYSTEM)

To provide information time to time to fill information needs RHIS shows a predictable output. Quality health data and information improve RHIS interventions. Electronic health record on the routine basis of interval like RHIS gives a predominant impact on new medical research as routine health variation of patient, where to draw line of research to particular disease, effective data retrieval for research findings as well as improves health system functioning [10].

VII. MOBILE COMPUTING

The iOS ‘model view controller (MVC)’ software architecture serves a compact and extremely efficient tool as ‘Hematopoietic Expression Viewer’ to interact with complex hematopoietic expression data. This application helps to retrieve list of genes and refined gene of interest specifically stem cell biology. As in today’s era stem cell biology become a most popular entity due to its tremendous application in biological and medical researchers. When gene of interest found automatically apps displays probes for this target gene. After tap suitable probe apps automatically displays the bar-chart [1]. Hence such a information can be retrieve easily within a minute as well as predicting the diseases, diagnosis, prognosis and compliance monitoring to draft a suitable evidence based biological research planning and hope for next generation personalized pharmacies.

VIII. GRID COMPUTING

Grid computing platform allows multiple location computer resources work for common goal parallel with complete computing device. Grid computing serves as a powerful tool for efficient methodology development through massive biological data. Protein secondary structure prediction is a tedious process which squeezes maximum time of researcher through sequential execution of large protein sequence data with genome scale protein folding spacing [11]. Hence grid
computing express the efficiency of within a minute protein structure analysis even on the genome level which in turn facilitates the researcher time and cost effective evidence based biological research planning

IX. CADD

Computer Aided Drug Design (CADD) Three dimensional database system runs to find out best suited pharmacophore for its availability, solubility and toxicity determination through what atom connected with other atom in what manner and how these two atoms close together in spatial three dimensional sense [12].

X. CONCLUSION

Information Technology predominantly set correct evidence based research plan for a researcher as well as shows easiest and effective way even during onsite research procedure. As we all know plan is a very important and primary step of any research procedure, if something wrong involved while the planning may spoil the whole effort, resource, time and finance of researcher as well as faith of granting authorities. So that proves the importance of evidence based plan which easily achieve by using the information technology based resources. Even during onsite research procedure when researcher stuck in dealing with next batch of procedure information technology governs quickest, less tedious and less effort based path. This shows its great impact on different area of medical and biological research for its new direction and perspective of ideas with cost effective design and protocol.

XI. REFERENCES


