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A REVIEW ARTICLE ON PHARMACEUTICAL SOFTWARE

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1. ABSTRACT

With the growth rate of the pharmaceutical industry increasing, the various aspects of it are important to take into consideration. There is a need for some new innovation, besides solving the scientific problems, such as pharmaceutical industry's studies of production, documentation, and other regulatory authorities. The day's computer application provide convenient and easy means to monitor and maintain pharmaceutical record. Pharmaceutical software installation is done to fulfill the demands of regulatory authorities. This article describes the overview of such software, it's importance and its need convered. A single software is occasionally used while sometimes two or more are combined. Roughly 19 types of software are used in the whole pharmaceutical industry, while important companies have theire respective product lines. It is only after the initiation of GMP, GLP, and GCP that the usage of software has increased.

KEYWORDS: Pharmaceutical, Industry, Software, cGMP practices, Computer system software etc.

2. INTRODUCTION

The pharmaceutical industry is among the most complex and regulated, and the development of new drugs requires quite a long time, resources, and skill. More recently, software has become an essential tool in ensuring success in the industry. This study will discuss the various software application in the pharmaceutical sector, theire benefits, and theire role in the development and commercialization of innovative new drug. Software in the pharmaceutical industry can be applied in different areas: for electronic data capture, it involves the collection, management, and analysis of clinical data collected from clinical trials where by researchers can concurrently make analysis to detect trends abundantly and draw valid conclusions. The CTMS help deal with the administrative side of clinical trials, study protocol documentation, budgeting, and recruitment. The pharmacovigilance system serve a safety and effectiveness-monitoring role after drugs enter the market. These include reporting adverse events, signal detection and risk management. Electronic documents are becoming vital for the pharmaceutical industry, as it helps companies keep better control over processes, data, and compliance requirements. from pharmaceutical value chain operations is drug discovery and development to clinical trials and post marketing surveillance, every aspect of the industry was transformed by the advent of software. Productivity, efficiency, and accuracy have immensely improved and helped companies to get innovative new drugs to market more quickly and at reduced costs. Basing on this, software used in the pharma industry indeed justifies itself to support the intricate and highly regulated nature of daunting drug development and commercialization. Each software type is designed for a specific area and in most cases companies might be incorporating several types of software into theire operations. The use of software is becoming increasingly popular over the last few years in the pharmaceutical world for data management, process management, and regulation compliance. Every aspect of the pharmaceutical product value chain-from drug discovery and development, through clinical trials and post marketing surveillance-has been digitalized by software application. This has greatly enhanced productivity, efficiency, and accuracy in the field, thus, greatly reducing the time and cost involved in bringing a new drug to market. The introduction of software into the field has become the industry. This review refers to the different software application used in the pharma industry, the significance of such application for innovation and markets, benefits, and of course, the various characters that bear on this whole new business on drug development. Application of software are also found throughout the pharmaceutical industry. Electronic clinical data capture (EDC) collects, manages, and analyzes clinical trial data so that researches can analyze trial data in real time,

determine trends, and make decisions five systems of clinical trial management serve to control many administrative aspects of clinical trials, from study protocol through budgeting to recruitment. Other system of pharmacovigilance serve to monitor drug safety and effectiveness once drugs are on the market. Examples of work normally done by pharmacovigilance units within industry are: adverse event reporting, signal detection, and risk management. EDMS aids in maintaining regulatory compliance via document **creation**, review, and approval. Many advantages accrue from the use of software in the pharmaceutical industry. One foremost advantage is that it improves efficiency, as software applications can automate tedious task and streamline processes. This will safe time and minimize errors, allowing firms to gate thaire drug to market faster and at lower cost. Other advantages of software are that they aid in the management of data across the research spectrum by allowing researchers to collect, store and analyze data is real-time, thus expediting and marketing decision-marketing accurate and sound. In addition, software aids in compliance with regulatory mandates, which is a fundamental requirement of drug development and commercialization.

3. TYPE OF SOFTWARE USED PHARMACEUTICAL INDUSTRY

Fig 1: Types of Software used in Pharmaceutical Industry

1. Data analytics and business intelligence software (BI): Data analytics and business intelligence software can be used to analyze and derive insights from huge datasets, like clinical trial data and sales data. such analysis can thus help identify trends, patterns and assist in making business decisions. Various business process are analyzed, and futher insights gained via data analytics and business intelligence (BI) solutions in the

pharmaceutical industry. Some specific examples of data analytics and business intelligence software are commonly used in the pharmaceutical industry.

a) System application and products in data processing Business object (SAP)**:** SAP Business objects is one of the business intelligence software used by many industries, including healthcare. It offers reporting, dashboard, and data exploration features to enhance how users put insight into various business processes.

b**)** Tableau: Tableau is a data visualization and analytics software used in many industry, including the pharmaceutical. It allows users to create interactive visualizations and dashboard from various data sources, allowing rapid and easy analysis of data.

c) Business intelligence Microsoft power**:** Business intelligence Microsoft power is fancy data analytics and visualization software. Pharmaceutical organization, among other industries, developed a passion for using it. Features such as data visualization, data modeling, and data exploration would, therefore, provide hooks and angles for obtaining the best insight into a multitude of business processes.

d) Oracle business intelligence**:** Oracle Business intelligence is a BI product that works for various industries, the pharmaceutical industry being one of its most influential users. It provides reporting features, dashboards, and data exploration, which allow for insight into diverse business processes.

e) Statistical analysis system (SAS): SAS is the foremost data analytics software and its widespread application has carved it a niche in the pharmaceutical industries. It equips enterprises with enhanced analytics and data visualization abilities, allowing for information extraction using multifaceted diverse data sets.

f) IBM cognos analytics**:** IBM cognos analytics is a BI software used by various industries such as that of pharmaceutical. These encompass reporting, dashboard, and exploration that provide information relating to various business aspects.

2. Electronic document management system (EDMS): The software utilized for electronic document management systems is used for the creation, administration, and storage of electronic documents such as standards operating procedures (SOPs), regulatory filings, or any related documents in drug development and manufacture. The most commonly employed EDMS software in the pharmaceutical industry include the following.

a) Share point**:** Share point is a web-based collaboration and document management platform developed by Microsoft. Its functionalities include document management, workflow, versioning, and compliance tracking.

b) Master Control**:** Master control is a cloud-based quality management system for pharmaceutical companies to manage theire documents, processes, and quality in a compliant manner. It has features like document control, charge management, audit trails, and compliance tracking.

c) Veeva vault**:** This is a cloude-based EDMS platform for pharmaceutical companies to use to manage theire documents, data, and processes in a secure and compliant manner. Notable features include document control, collaboration, audit trial, and compliance monitoring.

d) Open Text**:** OPEN Text is an enterprise management content, processes, and information software. It has a wide range of features like document management, records management, archiving, and compliance tracking.

e) Documentum**:** Documentum is an enterprise content management system that integrates the management of content and processes within a single platform for any organization. Some of the features include document management, records management, workflow automation, and compliance tracking.

3. Electronic Health Records (EHR) Software: Electronic health records software could keep patient health records in an orderly manner. Such data would include patient medical histories, test findings, and medication histories. Other purposes of EHR softwares are to deal with patient data related to clinical studies, drug safety, and pharmacovigilance. Some examples of EHR software find use in the pharmaceutical industry include.

a) Oracle health sciences inform**:** Oracle health sciences inform is hospital-oriented software focused on pharmaceutical industry use in clinical trial data management purposes. Also, it harbors features of electronic data capture, clinical data management, and reporting.

b) Electronic data capture Vault**:** Electronic data capture vault is electronic health records software that is used in the pharmaceutical industry for the management of data coming from clinical trials. It offers electronic data capture, clinical data management, and reporting features.

c) Bio clinica electronic data capture**:** That provides for electronic data capture, clinical data management, and reporting. Bioclinica electronic data capture is electronic health records that’s used in the pharmaceutical industry to manage clinical trial data.

d) Open clinica**:** Openclinica is an open-source electronic health records management software that is employed by the pharmaceutical industry in recording clinical trial data. It incorporates electronic data capture capabilities, clinical data management functions, and reporting capabilities.

e) Medidata rave**:** Medidata rave is an electronic health records software program for the pharmaceutical industry to conduct trial and mange there data. This software has the capacity for electronic data capture, clinical data management, and reporting.

4. Enterprise resource planning (ERP) system: Enterprise resource planning software is useful controlling corporate functions and activities such as inventory control, supply chain management, and financial management. Commonly used enterprise resource planning software in the pharmaceutical industry includes.

a) Microsoft dynamics: This software is a full-fledged enterprise that caters to business functions such as manufacturing, supply chain management, finance, and human resource management. Industries of pharmaceuticals have been using it to control inventory, batch tracking, among other diverse functions.

b) System application & product in data processing (SAP): System application & product in data processing is a platform of enterprise software comprising several integrated solutions. These solution help manage business operations in domains such as manufacturing, supply chain, finance, and human resources. Very common within the pharmaceutical industry, SAP comes with batch management, quality control, and compliance tracking functionalities, among other.

c) Epicor enterprise resource planning**:** Epicor ERP software includes a range of subsidiary programs to help manage business operations, from manufacturing to supply chain management, finance, and human resources. The pharmaceutical industry uses that software due to batch tracking, compliance tracking, and inventory management.

d) Oracle enterprise resource planning**:** Oracle ERP is an enterprise software suite that promotes a family of approaches to the management of manufacturing, supply chain, finance and human resource. It is employed in the pharmaceutical industry and manages functions, including inventory management, batch tracking, and compliance tracking.

e) Infor enterprise resource planning**:** Infor ERP is an enterprise software suite that facilitates various aspects of an organization, including manufacturing, supply chain management, finance, and human resources. If finds application in the pharmaceutical industry with capabilities such as inventory management, batch tracking, and compliance tracking features.

5. Manufacturing process management software (MPM): The manufacturing process management (MPM) software controls the production process from procuring raw materials

to the delivery of the end product. Examples of MPM software applied in the pharmaceutical industry include the following.

a) Master Control excellence**:** Master control manufacturing excellence is MPM software that offers a single source of truth to manage manufacturing processes. It include features batch record management, electronic device history record (eDHR) management and process automation.

b) Werum PAS-X: Werum PAS-X is an MPM software used in the pharmaceutical industry for management of various aspects of the manufacturing processes for pharmaceutical products. It covers important function like electronic batch record management, production management as well as quality management.

c) System application & products in data processing manufacturing execution**:** SAP manufacturing execution is an manufacturing process management software that conveys the real-time visibility and control over the manufacturing process. It allows users to manage production orders, trace material usage, and monitor quality control.

d) Camstar medical device suite**:** The medical device suite of camstar is an manufacturing process management software used in the pharmaceutical industry for the management of medical-device manufacturing. With features from manufacturing process control all the way through quality management and beyond, the application manages electronic batch recalls.

e) Apriso manufacturing execution system**:** Apriso manufacturing execution is enterprise-class MPM software that gives real-time visibility and control over the manufacturing process. It brings together production management, quality management, and compliance management functions.

6. Computer-Aided design software (CAD); Drug delivery system are manufactured and developed via CAD software, such as inhalers, injectors, and transdermal patches. Computer-Aided drug design (CADD) is one such process, and it is done using the help of a computer using specific software, which in turn helps to optimize or design new drug. It involves various computational techniques to model and analyze the interaction of the drug molecule with biological targets, including enzymes and proteins. The goal of CADD is to identify drug candidates with optimal properties, such as high potency, selectivity, and bioavailability, with the lowest possible level of side effects and toxicity.

a) Molecular operating environment (MOE)**:** MOE is a suite of software with tools for molecular modeling, simulation, and visualization. It is commonly used in drug discovery

application such as protein-ligand docking, molecular dynamics simulation, and pharmacophore modeling.

b) Schrodinger**:** schrodinger is an assemblage of software, featuring molecular modeling, virtual screening, and drug design. It has been applied in a number of drug discovery activities, from target identification to hit discovery and lead optimization.

c) Accelrys**:** Accelrys is a software suite designed for molecular modeling, simulation, and analysis. The application range from protein-ligand docking, molecular dynamics simulation, and QSAR modeling in the drug discovery.

d) Discovery studio**:** Discovery studio is as suite of application composed of tools for molecular modeling, simulation, and analyses. It is used in many drug discovery applications, including protein-ligand docking, virtual screening, and homology modeling.

e) Open Eye**:** Open Eye is a software suite that encompasses tools for molecular modeling, visualization, and analysis. It is commonly used in drug discovery applications, almost invariably including virtual screening, molecular docking, and molecular dynamics simulations.

7. Simulation Software: Simulation software are typically meant for modeling and mimicking the behavior associated with pharmaceutical products and production processes. So, this can help spot possible problems and thereby help streamline production processes. Simulation software are used in the fields of pharmaceutical-related drug discovery, pharmacokinetic modeling, clinical trails design, and process optimization. Among the simulation software being commonly used in the pharmaceutical industry, we have:

a) MALTAB: Simulation software is used in the pharmaceutical industry to model and imitate the behavior of pharmaceutical products and production processes. They may also assist in identifying potential problems and provide pathways toward streamlining the production matter. Per the various options available, simulation software in the pharmaceutical industry play the main role of drug discovery, pharmacokinetic modeling, clinical trials design, and so on and process optimization. Some simulation software commonly applied within this industry.

b) Gastro plus: Gastro plus is another simulation software for pharmacokinetic modeling that predicts the ADME properties of chemicals-that is, the absorption, distribution, metabolism, and excretion of the drug. Widely used in the drug discovery and development process for optimizing drug formulations and dosing regimens.

c) Virtual cell**:** Virtual cell is a software that simulates biological processes. These include cellular processes and the interaction of drugs in the body. It is an open-source modeling and simulation platform for study of living organisms, primarily cells. This tool is meant for a heterogeneous community of scientists from experimental cell biological biophysicists.

d) Simcyp: Simcyp is a simulation software dedicated to pharmacokinetic and pharmacodynamic modeling. It predicts drug pharmacokinetics across various populations such as infants, children, pregnant woman, and elderly people.

e) Advanced dose-Response analysis prediction tool (ADAPT)**:** ADAPT is an acronym standing for advanced Dose-Response analysis prediction tool, a simulation software designed for pharmacokinetic and pharmacodynamic modeling. It is used for the analysis of clinical trail data and optimizing drug-dosing regimens.

8. Regulatory information management (RIM): RIM software assists organization to manage and submit their application to regulatory bodies, including application for registration of products, clinical trials, and submission of regulatory documents in electronic formats. Some of the commonly used RIM system are.

a) Samarind RMS**:** Samarind RMS is a regulatory information management solution addressing the provision of pharmaceutical companies with regulatory information and compliance. It offers features like document management, submission tracking, and compliance reporting.

b) Arisglobal RIMS**:** Arisglobal's RIMS is a regulatory information management system developed to supply pharmaceutical companies with the necessary facilities for managing regulatory information and compliance. It has been commonly used for document management, submission tracking, and repotting compliance.

c) Lorenz Docubridge**:** The Lorenz docubridge is a regulatory information management system that assists pharmaceutical companies in the management of regulatory affairs information and compliance. It features document management, submission tracking, and compliance reporting.

d) ISI regulatory suite: This ISI regulatory suite is a regulatory information management system having been developed to help pharmaceutical companies mange regulatory information and compliance. It also provides features including document management, submission tracking, and compliance reporting.

e) Veeva vault RIM**:** The web-based regulatory information management system developed by veeva vault is to help pharmaceutical companies manage regulatory information and

compliance. The system itself includes document management, submission tracking, and compliance reporting.

9. Electronic Trial master file software (eTMF): The electronic trial master file, eTMF software is software used in the pharmaceutical industry to manage its clinical trial documentation. The eTMF represents a digital counterpart of the conventional paper-based trial master file, which consists of essential documents, generated or collected during the course of a clinical trial. The most popular solution for eTMF software are.

a) Phlexglobal phlexEview**:** PhlexEview is a cloud-based eTMF software solution for document management, collaboration, and reporting. With its provisions meeting regulatory requirements, it may be used across various geographies and languages.

b) sure clinical eTMF**:** Sure clinical electronic master file is a cloud-based solution for end-to-end TMF management. Features include document management, digital signature, and audit trials.

c) Mater control eTMF**:** Master control is a web-based electronic master file software solution enabling organization to manage there TMFs electronically. Document management, audit trial, reporting, and analytics are among other new facilities.

d) eTMF connect**:** eTMF connect is a cloud computing-based software solution built on document management, version control, and collaborative tools. It encompasses audit trials and reporting via integrations with other web-based tools, such as CTMS and EDC.

10. Statistical analysis software: The preclinical and clinical study data from clinical trials are analyzed and interpreted using statistical software. Statistically speaking, it is certainly one of most important tools in the pharmaceutical industry used for the analysis and interpretation of complex data from the drug development process. With this software, researchers and biostatisticians can pick out trends**,** patterns, or relationship from given data and, based on there results, formulate informed conclusions. Some of the most popular statistical analysis software used in the pharmaceutical industry include.

a) STATA**:** STATA is a statistical analysis software widely used in the pharmaceutical industry for data analysis and visualization. It provides a range of statistical techniques for analyzing data from clinical trials, observational studies, and epidemiological studies.

b) Statistical analysis system (SAS): Applied mainly in the pharmaceutical industry, SAS is among the most widely used statistical analysis software in features techniques and tools for

statistical analysis, including a range of data mining, predictive modeling, and other clinical trails analysis.

c) Medcalc**:** Medcalc is a statistical analysis software package used in the pharmaceutical industry to perform statistical analysis and graphically present data, with special emphasis on clinical trials and epidemiological studies.

d) Statistical package for the social sciences (SPSS)**:** Medcalc is a statistical workstation extensively used by the pharmaceutical industries for conducting statistical analysis and graphical presentation of data. More importantly, it is extremely handy depending on the type of clinical trial or epidemiological ads take it may be put into.

e) R**:** R is a very popular, triumphed, non-proprietary statistical software in the pharmaceutical industry of offering extensive statistical analyzed techniques and tools for visualization of data, statistical analyzed, and machine learning.

11. Quality management system (QMS): The QMS software used over the whole product life cycle consists in the management and control of quality throughout the pharmaceutical products. These include, during this phase, document management, deviation and non-conformance management, and change control. some of those are some of the QMS software freely available to the pharmaceutical industry as follows.

a) System application & products in data processing quality management (SAP QM)**:** SAP quality management integrated quality management system software with modules for good quality planning, inspection management, corrective, and preventive actions, and much more. The product is designed for sap's enterprise resource planning software to produce a fully integrated solution for enterprise-wide quality management.

b) Pilgrim Quality solutions**:** SAP quality management integrated software for the quality management system which has modules for quality planning, inspection management, and CAPA, among other requirements. It works in combination with its ERP software provided in quality management across an industry.

c) Mater control**:** Master control is a quality management software that is developed especially for regulated industries like pharmaceuticals. The software encompasses modules for document control, training management, CAPA, change control, audits, among other offerings.

d) Electronic quality management system reliance**:** EtQ reliance is a cloud-based quality management software that include modules for risk management, document control, change

management, audits, corrective and preventive actions, and others. Designed to meet the particular need of regulated industries, including pharmaceutical.

12. Manufacturing execution system (MES): The MES software is effective at accomplishing several tasks like batch processing, equipment monitoring, and quality checking during the entire manufacturing process. It incorporates, in a computer-borne manner, the management and regulation of production processes in the manufacturing industry. Usually, MES software gathers real-time information about the manufacturing execution processes, analyzes the data, and control manufacturing. Its purpose can be to enhance productivity, to save waste, and to maximize profitability.

a) ABB ability manufacturing operation management**:** ABB ability manufacturing operation management is an MES software solution with features that include planning optimization, shop floor control, quality management, and data analytics. It is intended for industries including metals, mining, pulp, and paper.

b) Wonderware manufacturing execution system**:** Wondeware MES software solution for production planning, scheduling, shop floor control, and quality management. It management. It may be applied to various industries including but not limited to food and beverage, pharmaceuticals, and chemicals.

c) System application & products in data processing manufacturing execution**:** SAP MES is a software product for the management of executing manufacturing processes including production, managing quality and inventory, and data analytics. It is to be used in many industries, including automotive, consumer products, and high-tech manufacturing.

d) Siemens opcenter**:** Siemens Opcenter formerly camstar, is an MES software suite that provides various features including production planning, shop floor control, quality management, and data analytics for all sectors, including electronics, medical devices, and aerospace.

13. Sales and marketing software: CRM is a information technology that intertwines the relationships and interactions of a company with its customers. It does aim establishing and sustaining good business relationships. CRM systems help to connect the company with the customers, streamline processes, and there by augment profitability. The software aids in sales and marketing activities like CRM, sales forecasts, market analysis etc.

a) System application & products in data processing sales cloud**:** SAP sales cloud is a sales force automation (SFA) software, used by a range of industries, including the pharmaceutical industry. The platform offers lead, opportunity, and order management features.

b) Veeva vault customer relationship management**:** Veeva vault customer relationship management (CRM) software designed for the life sciences industry. Veeva is used by pharmaceutical companies for sales and marketing operations; the management of lead and opportunities; account planning; and sample tracking.

c) Qlik view**:** Qlik view is a business intelligence and data analytics software used in many industries, including pharmaceuticals. It include capabilities for data visualization, exploration, and predictive analytics.

d) Adobe experience manager**:** Adobe experience manager is an application for digital asset managing operating in numerous industries, including pharmaceutical ones. It offers content management, workflow automation, and digital rights management capabilities.

14. Pharmacovigilance software: Pharmacovigilnce software is used for tracking and monitoring adverse drug reactions and other safety-related information. Pharmacovigilance forms a part of clinical trials, falling under the phase-IV category or post-marketing surveillance pharmacovigilance refers to investigations of adverse drug effects or systems of reporting safety problems due to pharmaceutical products. Some examples of pharmacovigilance software include.

a) Aris global safety: Arisglobal safety cloud-based pharmacovigilance software as case management, signal detection, and regulatory compliance capabilities. The software also contains functions like product labeling management, medical coding, and adverse event reporting.

b) PV works: Hitherto the PV works is a pharmacovigilance software offering case management, signal detection, and regulatory compliance feature, characterized by ease of use though automated management workflow and advanced inbuilt report generation features.

c) AB cube: AB cube is a complete software for pharmacovigilance case management, signaling and regulatory compliance other features include data analytics and visualization, which allow for batter insights into adverse event data.

d) Some of these examples of drug safety software available in the market are just a few when choosing pharmacovigilance software, one ought to consider several factors such as the

size and complexity of the time pharmacovigilance system, unspecified features to include in the system, and the budget itself.

e) Oracle argus: Oracle argus is a pharmacovigilance software with such functions as case management, signal detection, risk management, and regulatory compliance. It is commonly used by pharmaceutical companies and regulatory agencies globally.

15. Electronic data capture (EDC): It is a type of software that is used to collect the manage electronic data from clinical trials in clinical research. It serves is a replacement for traditional paper-based data capture methods which are often time-consuming and most prone to errors. EDC software is uniquely designed to capture data from subject directly, providing a secure and organized storage mechanism. Real-time data collection, monitoring, and management offer considerable improvement in the efficiency of clinical trails. Clinical trails data are collected, managed, and analyzed using the EDC software. Combing the EDC with clinical trails management system and clinical data management system is the usual practice examples of EDC mastered by the pharmaceutical industries are-real-time charts for asynchronous and syhchronous trails.

a) clinical conductor clinical trials management system: A clinical trials management system an track clinical research activities in a institution. The CTMS is an integrated centralized web-based resource using on core, applied in tracking and managing all clinical research carried out within or across the fred hutch cancer center and the university of Washington.

b) Oracle health sciences clinical: Designed by oracle, health sciences clinical is a CTMS software, it works end-to-end, from study planning and monitoring to reporting. Included in the features are data management, monitoring and compliance tracking, and site management.

c) Veeva vault clinical trials management system: Clinical trials management system provide an organization with tools to track and manage clinical trial operations. CTMS is a member of the family of application named vault clinical operations. Within a single vault, one, two, or all of these applications would be available to your organization. These application share a common data model, but bring additional capabilities to enhance running clinical trials.

d) Medidata clinical trial management system: clinical trial management system confers the capability for organization to tack and manage the critical activities of there clinical trial operations. CTMS is part of the vault clinical operations family of products. Within a singular vault, your organization may use one, two or either of these applications. These application are all based on the same data model, with each adding an additional piece of the functionality to expedite the management of the clinical trial process.

CONCLUSION

The software has enhanced activities of the pharmaceutical industry. In the coming years, it will continue the tendency of use because of the emergence of new technologies and innovations. Since drug development become complex and there is high demand for personalized medicine, software applications are going to play an ever-more critical role to enhance innovation and efficiency in the pharmaceutical industry. For a proactive and systematic approach some of the prominent software applications procured and being used in pharma are electronic data capture, clinical trial management system, pharmacovigilance system, electronic document management system. They help companies streamline processes for compliance and integration across different functions and also offer support in evidence-based decisions. The users of software in pharma will increase in years to come as new technologies and innovations emerge. Because of the increasing complexity of developing drugs and demand of personalized patient treatment, software applications will play an improved rule in driving innovation and efficiency in the pharmaceutical industry. In this review article, we introduce various computer system software useful for regular cGMP practices such as manufacturing, documentation, etc. which are followed in the pharmaceutical industry. This article also covers the current and future need for pharmaceutical software. There are some common chairs; this include quality control areas of research and development, storage, resource and generation in all disciplines of engineering and architecture, management, pharmacy, and agriculture. The listed software are referred to most widely in the pharmaceutical sector, for production, solution, data integrity problem, creating tamper-proof audit trials, data backup, and restoration.

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