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Food Informatics and its Challenges and Opportunities- A Review

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Abstract—

Informatics is an important domain that deals with several kinds of information activities by the manual knowledge organization tools as well as computational tools. Informatics deals with many foci and it also has many domain dependencies. Informatics may also concentrate on other domains and in this way new domains may be created. The integration of Food Science with Informatics provides Food and Nutritional Information solution. Food Informatics may be treated as a practicing field for Organization of Information, Infrastructure building which includes designing and development of Information Systems, Enterprise Resource Planning, Decision Support Systems, Documentation solution with the help of manual tools and computerization systems for the Food and Nutritional facets. Till Food Informatics as a subject not received a wide scale of popularity but yes it has healthy possibilities to become an important interdisciplinary subject. This conceptual paper provides an overview of the possible role, challenges, and issues of the domain.

Keywords—

Information Systems, Informatics, Food Informatics, Issues, Nutrition, Malnutrition, Development, Health, Public Health.

Introduction—

Informatics is an important field of applied science which deals with the collection, selection, organization, processing, management as well as dissemination of information related to any

system and for that, it takes the help of several techniques and technologies. It is a kind of mechanism required for the information processing and management. Based on the knowledge cluster Informatics may create a new domain, for example, the combination of Informatics and Medical Science results in Medical Informatics. Similarly, integration as well as affiliation of Informatics with Food Sciences, have the potentialities of a new discipline called Food Informatics.

Objective—

The core main aim as well as objective of this study includes but not limited to the following—

- To know about the basic formulation of Food Informatics including its nature, characteristics, and features.
- To learn more on challenges, emerging trends as well as issues of proposed and possible Food Informatics in contemporary scenario.
- To learn about the emerging and future role of Food Informatics for better health, food and nutritional science practice and deeply healthy nutrition science development.
- To find out the possible and emerging tools and technologies of Food Informatics and allied domains.
- To learn about the core characteristics of the Food Informatics and Food Information Science in details.

Informatics: Fundamentals—

Based on foci, Informatics may classify different way these are maybe concentrated on Social Science or may be as Pure Science, Bio Science, Managerial Science. Food Informatics deals with the Information as well as Documentation of Health and Medicine related affairs. Informatics is synonymous with the Information Science [1], [5], [7]. In academia, Informatics and Information Science both are common terms. Informatics has to deals with many tools and technologies and that include but not limited to the Database, Web Systems, Multimedia, Networking Systems, and so on. Informatics is responsible for the designing and development of smart, intelligent, and healthy Information Systems creation, development, and up gradation. Informatics is the way for information as well as the technological solution.

Food Informatics: An Overview—

Food Informatics is a kind of mechanism and system which is responsible for designing and development of an information repository. In Food Informatics several things have been possible and these include the territory, possible processing opportunities from the food, marketing strategy etc. Designing and development of information systems or more simply Informatics is possible with the support from various technologies such as database technology, communication and networking technology, web and usability engineering [2], [3], [8]. Food Informatics may be

treated as an interdisciplinary subject which is dedicated to the collection, selection, organization, processing, management, and ultimate dissemination of the information. Food Informatics is mainly restricted to Processing and management on Food and Nutrition related information. Food Information Systems may be treated as working area of Food Informatics having the dedication to build Information Infrastructure as well as systems. The core possible task of the Food Information Systems include but not limited to the—

- Collecting as well as selecting Information in the field of food as well as nutrition science or simply on nutrition. It is required for dealing and delivery of nutritional benefits, as well as the availability of processing technologies related to food.
- Generating and creating a repository on nutrition and health based on users need is an another important function of a food information systems [4],[6], [9].
- Building food information systems powered by Food Informatics tools is another important matter which also depends on user demand as well as expectation.

Food Informatics is deals with combined Information Centre as well as similar foundations and established. Food related contents and information, tools and technologies as well as Users i.e. common people is the core requirement for building a sophisticated food information systems. Food marketing is another important need for the creation of Food Informatics Unit/Food Information Systems and also a platform for storage, dissemination or processing, and marketing (Fig: 1 is helpful to clear the whole concept as well).

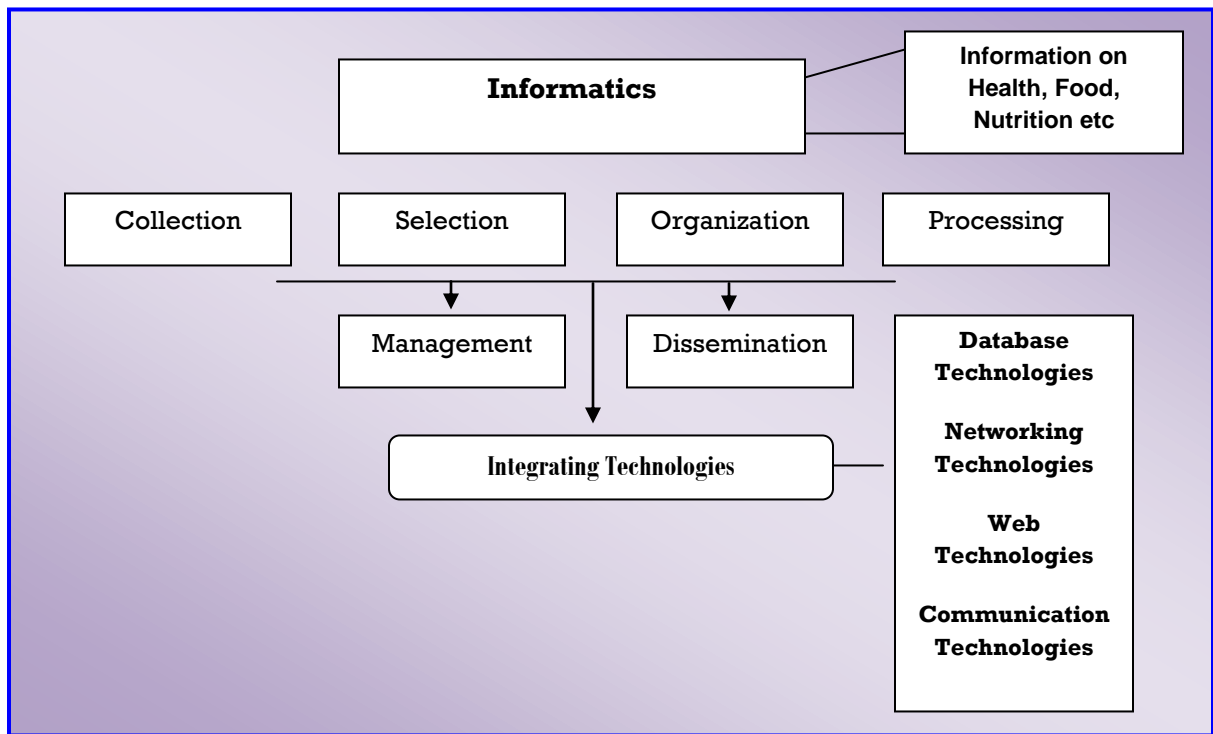


Fig: 1- Basic dealing and dependencies of Informatics

Key Opportunities, Challenges and Issues on Food Informatics—

Applications—

Some of the possible applications of food and nutrition Information Systems are include (but not limited to)—

- Collection and selection of content and information on Food and Nutrition is an important matter. Thus Government may get actual information and data on food. Moreover, food safety is an important matter for which Food Informatics may be applied [5], [11].
- Delivery of food and nutritional information among common mass is an important an example of Food Informatics uses. Hence creating awareness regarding the foods and fruits (even information on several vegetables, non-veg. etc.).
- With the applications of Food Informatics in general as well as common people may get health and medicinal benefits which include the food and fruit or vegetable.
- Food Informatics is a cooperative means for designing and building of sophisticated Food as well as medical informatics of a particular region and territory.
- Food Informatics is also responsible for the creation of mission fulfillment of a territory by the use of healthy food information systems [11], [13].
- Food Informatics is also helpful for the young academicians (including teachers, student, and researcher) in the field of food science, nutrition science, agriculture, horticulture, as well as other allied sciences.
- In Clinical and medical segments among the staff members physician and allied health professionals may utilize food information systems benefits. Here they may get nascent information on food and nutrition.
- Improving and developing Public health is the core agenda of any nation and with the integration of real Food Informatics in community development projects it is very much easier to achieve such objectives.
- Collecting information on Nutritional benefits of traditional foods and vegetables etc. is helpful for nutritional product manufacturing companies.

Challenges & Issues—

There are many issues and challenges fall under the Food Information System or Food Informatics and that may include (but not limited to)—

- Designing and Building of Food Information Systems is a vital criterion which needs skill and knowledge of the domain concerned i.e. Food and Nutrition etc.

- Database, Web development, Networking, Communication, and their integration is very much important and valuable for designing an error free and sophisticated Nutritional Information Systems.
- Food Information System is helpful for the common people and thus better human computer interaction (HCI) and usability engineering is essential for healthy results [10], [12].
- Regarding farmer and agriculturist, Food Information System is able to offer market related information of different varieties of foods around the world. Significantly for better market strategy, Food Information System is required.
- Food processing industries may gain solidly with better Food Information System practice and it helps in better and healthy connection and interact each other.
- Funding is a big problem everywhere and from early stage healthy information infrastructure designing and building is required [12], [14].
- There are many benefits of Food Information System but practically for creation of awareness among the common people but there are many challenges waiting for.
- It is essential to offer program, training, and full-fledged degrees on food information systems, food informatics in the universities, colleges etc.
- Planning and initiatives of government is very much essential. Moreover, collaboration and joint venture between food/health or computing, information department or ministry as well as between different countries etc. are highly appreciated.
- It is important that among the food and nutrition experts, teachers etc. awareness on Food Information System is highly compulsory [5], [15].

Further Potentialities—

For promoting Food Informatics one of the important tools is Web 2.0. It is actually a procedure dedicated for online communication among the user at any time. Here the user may share contents and information including audios, videos, text, and pictures between dedicated users. Depending upon need, where users can share their views any time i.e. contents depending upon requirement & request. Some of the networking sites such as Facebook, Orkut are kind of web 2.0 site. There are various web 2.0 domains such as education and web- *Education 2.0*, Social work with Web 2.0 having the possibilities of Social Work 2.0, Medical, and Web has created is Medical 2.0. Similarly, Health 2.0 has originated from the combination of Web Systems and Health Field [5], [16].

Thus there is a potentiality of integrating Web 2.0 in the field of food and nutrition science. And that concept may be flourish as Food 2.0 or Nutrition 2.0. Hence the further development of Food

Science and Nutrition may purely depend on Nutrition 2.0. It may be treated as a tool for creating consciousness as well as awareness on following—

- Food Safety,
- Food Nutrition,
- Public Health,
- Hygienic and so on.

Better and healthy communication of the academicians along with researchers of the concerned and allied fields such as food science, nutrition science, agriculture, and food engineering etc. are positively possible with the initiation of Food 2.0 or Nutrition 2.0 [6], [17]. With such platform, it is possible to create an open accessible website and thus in most of the cases, anyone can register with this. Improvement of the entire food infrastructure is positively possible with this Food 2.0. Creating awareness regarding the nutritional benefits of several fruits or vegetables (including non-vegetable item), juice etc. are positively possible with the application of Food 2.0 or Nutrition 2.0. It may consider as a promotable media for reducing food habits and creating awareness regarding the foods which are harmful and injurious to the health. Differences between Food 2.0 and food information systems is that—“Food 2.0 is a kind of web platform or website responsible for sharing of information and contents on food as well as on nutrition to the general public (including food expert to some extent) to the common public. However, Food Information System is a kind of Health Informatics mechanism responsible for information dealing related to Food as well as nutrition and repository [8], [16]. Food Informatics or Food Information Systems may be started as a subject of interdisciplinary bio sciences in the departments such as Bio Sciences, Food Sciences, Nutrition Sciences, Food Technologies, Home Sciences, Information Sciences, Information Systems etc. with Major. However, initially, program may be started as Minor program.

Findings—

- Food Information System may be considered as a tool as well as an interdisciplinary domain integrated by the Food Science and Information Sciences.
- Development of Food Information Systems or Food 2.0 is responsible for bringing of Food hygienic environment, Food safety, food information as well as awareness.
- Healthy Public Health is also responsible for the creation of sophisticated Food Information Systems and Food 2.0 tools.
- Better communication among food expert and professionals are positively possible with the initiation of Food 2.0.
- All the stakeholders of food and nutrition science are responsible for information and communication and here Food 2.0 is an important name.

- For the development of a true India (or any other country), Food 2.0 is very much important and essential.
- Need based creation of DBMS, Networking, and communication technologies are essential for designing and development of Food Information processing much smarter.
- Awareness regarding the Food 2.0 and Nutrition 2.0 is limited not only in developing countries but also in developed countries, in many ways.
- Initiatives and awareness regarding the Food 2.0 and Nutrition 2.0 and whole Food Informatics are very much limited from the side of administrative and Government.

Conclusion—

Apart from Food 2.0 or Nutrition 2.0 platform, another important tool for promoting Food Informatics is Nutrition Information Networks. It is a grid dedicated to various kinds of nutritional activities such as collection, selection, organization, processing, management, as well as dissemination. Information and contents regarding nutrition basically organized for general people, professional, academicians with the help of Nutritional Information Networks. In better Food Informatics practice Nutritional information systems may also be treated as an important name and helpful for solving adequate, optimum and good nutrition, nutrition stages, diet control, nutritional care, malnutrition and preparation for sophisticated nutrition and so on buying adequate information delivery. A healthy Nutrition Information Networks is also responsible for building smart health system to the society in which common people may get nutritional benefits various ways. Collecting as well as storing nutrition and food related information and sources are the core for successful Food Informatics practice. It is urgent that Government should establish a health policy on Food 2.0 and Nutrition 2.0, Nutritional Information Networks for the establishment of a healthy Food Informatics Infrastructure and to bring a Healthy Digital Health Society.

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