

Associative Informatics: An Approach Shift to Address Growing Technological Demand

Kamal Kumar Ghanshala and Durgesh Pant

Abstract—This paper presents a newer approach to tackle the gap between demand and supply of technological resources which exist in any society, nation or organization. The population factor in countries like India poses serious challenge for the policy makers and technology implementers to address the gap between technological resource requirement and availability. In this paper, a new ‘Associative Informatics’ approach has been put forward supported by the ‘wise doves’ approach’. The paper demonstrates how a cloud based resource can be shared by a group of villagers. The results show that there is 99 % probability of using 500 hrs of a cloud by the sample community per month.

Index Terms—Associative informatics, wise doves’ approach, technological demand- supply.

I. INTRODUCTION

Information Technology as we have witnessed and realized, have tremendous transformational prowess. Over the years, it has blended seamlessly into our psyche, and there are hundreds of tasks we do every day that we just don’t think about anymore like making a simple phone call, answering an email, video chatting with someone from across the globe, paying bills, automating tasks, finding information [1].

The way Information Technology has changed the world ever since it came into existence, is truly amazing. The human society has been immensely impacted by the agriculture and industrial waves in its long journey but the information wave that swept across the planet in the 20th century, no doubt created an indelible mark on it. In the list of inventions that took place in last 25 years - ‘Internet’ tops the list and it happens to be the backbone of Information Technology.

The world over economies have changed to Information Economies [2] and therefore, there have been deliberative attempts on the part of the companies, organizations, countries, and states to take leverage of Information Technology’s ever expanding application-spectrum. This attempt can also be referred to as Information Technology Initiatives or IT-Initiatives. As a consequence, the world over, there have been attempts to launch IT-Initiatives. In the process the dynamic nature of information technology also led to becoming informatics. Primarily, IT applications have been initiated to increase efficiency and reduce time. The human activities and processes have been ‘**electronified**’ and

IT has provided the necessary tools to become accessible and available as an application, at any distance and place as and when required.

The electronic engagement made its way into multiple dimensions. Business and commerce have also found newer methods of engagements in terms of e-commerce and e-business. Electronic commerce or e-commerce refers to a wide range of online business activities for products and services. It also pertains to “any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact” [3]. The rapid growth of e-commerce and integrated logistics has forced organizations enterprises to adopt new models all over the world. Therefore, it has its impact on productivity and business values [4].

Similarly, IT-Initiatives have an important role in driving development activities of a state, organization or country. The involvement of these initiatives in devising strategies for triggering developmental processes is crucial. It may be for economic development, job-creation, rural development and poverty-alleviation etc. These initiatives have great potential to bring in the desired social transformation by enhancing its access to people, services, information and other technologies. Opportunities for the people can be enhanced by introducing IT applications by improving their access. Similarly, citizens can be empowered by these initiatives through reaching out to them ensuring social and financial inclusion [5]. These initiatives can also elevate living standards in remote and rural areas by providing important commercial, social and educational benefits [6-7].

II. DEMAND AND SUPPLY PROBLEM WITH CONVENTIONAL APPROACH

So far, the traditional approach of taking informatics’ benefits to the people at large has been through government interventions. A number of IT-initiatives launched by various governments world-over found their way through various e-governance schemes. Similarly, there have been G2C (Government 2 Citizen) strategies to provide service to citizens. The citizens can be tremendously empowered by these IT- initiatives ensuring social and financial inclusion. However, the technological service supply depends on the computing and informatics’ resources.

The central or distributed availability of computing & informatics resources’ is not sumptuous in difficult and developing countries in the world. The infrastructure and capacity building is on the high priority but the huge burgeoning population outshine the supply. By all accounts, the technology-resource demand is much higher than the

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technology-resource supply. Its also heartening to observe during the course of this study that the booming device explosion coupled with the lower cost of hardware has helped people to own devices previously only available to a particular exclusive class of Information-haves.

However, there is emerging need to reach out to people that includes last man at last mile. The G2C strategies become inconsequential if the large sections of society which had so far no access to IT-Initiatives and services don't get benefitted. For example, in India the following constraints pose hindrances for the spread and adoption of IT-initiatives at the bottom of the pyramid;

A. Economical Constraints

The economy of the country is peculiar with wealth segregated in segments. The **80-20 principle** can be observed with only 20 % of the wealth shared by 80% of people. The lower strata comprises of people who are not in the financial position to afford high end technological interventions.

B. Geographical Barriers

The peculiar geography of the country poses a grave challenges for the technology to provide a level playing field to one and all. The sub-continent is marked by geographical features that are quite unique. The ice-cold lofty heights of the Himalayas to the sun-baked sands of the Thar Desert; the highly fertile Gangetic plains to the Deccan Plateau; the extensive Salt expanses of the Rann of Kutch to the tropical evergreen forests in the north-east; India is a land of tremendous geographical diversity. The country has some of the highest mountain passes and largest glaciers. Its length and breadth is crisscrossed by umpteen rivers. Spectacular waterfalls, breathtaking valleys and backwater networks add to the diversity of India's geographical features. With a coastline of up to 7500 km, India is also home to the largest delta in world. However, this geographical differentiation poses greater complexities in the technological interventions.

C. Social Readiness

The country has a huge pollution tilt towards the rural segments that accounts to about 70 % of its population. However, the rural India is yet to be in a state of **informatics resonance**. The demography plays a major role in the adoption of technology. The indifference towards using technology as change agent creates inertia. It is also due to initial fear of technology and the misnomers attached to it.

III. ASSOCIATIVE INFORMATICS: THE SOLUTION

In the light of above discussion, Associative Informatics is proposed to address the mentioned constraints. It denotes sharing technological interventions where a comparatively subdued member is facilitated by a relatively stronger member. This chain of efforts would enhance the group's overall informatics understanding and usability.

The features of associative informatics are

A. Group or Community Effort

It involves the association of people to work towards the upliftment of individuals and hence the group as whole.

B. Combined Problem Solving

The problem can be solved by the combined knowledge of the association hence the contribution of each member helps to the group's learning.

Weaker member helped by relatively stronger one and so on...

There is when a relatively weaker member is helped by a relatively stronger member of the association.

C. Group Learning

The process of learning is accentuated many folds since the learning takes a holistic group-dimension.

D. Rise in Collective Awareness and Usage

Not only the individuals but the association as whole comes to know about the new tools and techniques thus increasing the level of awareness and hence the usability also increases.

E. Sharing of Resources

The number of resources is limited and the users are many, hence the resources got to be shared. Herein, Associative Informatics ensures optimum utilization of limited resources.

IV. RESEARCH DESIGN

Effective utilization of resources has always been an important factor for IT-Interventions. There are several points where technology-resource can be shared. One such sharing is possible through cloud computing. Cloud computing provides an efficient way for sharing the computing and informatics resources like software, hardware or platforms. Cloud computing is a type of computing that relies on sharing resources rather than having local access to the applications. Limitless virtualization of scalable environment, cost effective benefits, device and time independence, optimization of resources has expanded the potential of cloud computing.

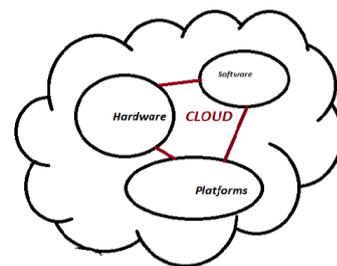


Fig. 1. Cloud computing

A representation of cloud is given in Fig. 1. Traditionally, cloud computing supports four basic type of models:

A. Private Cloud

The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise [8].

B. Public Cloud

Public cloud applications, storage, and other resources are made available to the general public by a service provider. These services are free or offered on a pay-per-use model [9].

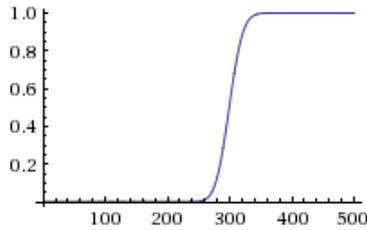


Fig. 4. Usage probability

Hence Fig. 4 shows that there is 99 % probability of using 500 hrs of a cloud by this community per month.

VI. CONCLUSION

Associative informatics is the key to the resource allocation problem faced by developing economies in general and countries like India with huge population in particular.

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