JOURNAL OF CONTEMPORARY TRENDS IN BUSINESS AND INFORMATION TECHNOLOGY (JCTBIT)
Vol.4, pp.16-23, June 2018

Artificial Intelligence and Parallel Cloud role in Future Modern Economies

Munesh Singh Chauhan
Information Technology Department,
College of Applied Sciences,
Ibri, Sultanate of Oman.

Abstract

The present economic scenario remains highly volatile especially when it comes to the role played by disruptive technologies such as Artificial Intelligence and Parallel Clouds. Major economies of the world stand at the cusp of breakthroughs especially in the fields of AI and parallel computing space. Ignoring these technologies can be detrimental and could tilt the scales against fortunes of nations if they fail to acknowledge this in time. Traditional technology firms such as Google, Microsoft, Facebook, etc. have already shown how people-focused development and research can change the way the world do business. Since we have reached the peak when it comes to conventional IT technologies, the only way available is to bring machine intelligence into the fold. Major future decisions shall rest on the remote bots which shall be embedded as smart software applications in various devices and gadgets. This shall be realizable in the very near future as the amount of data being generated by clouds is quite large and in the range of Peta-scale: beyond any conventional means of storage and interpretation. These bots will channel all transactions ranging from e-governance, health, industry and many others. Hence, it is anticipated that future economies shall be transaction-based requiring high speed computing and analysis on-the-fly.

We propose a novel system that assimilates the salient features of AI and Cloud in a typical economic setup. Our model outlines the template that can be replicated with minor changes across broad spectrum of economies. With the burgeoning population, nations have to shift to automated systems to maintain all pervasive and ever-expanding economic ecosystems. Our model aims to bring semblance in the present chaos and creates avenues for organized and sustained growth.

Keywords: Artificial Intelligence, CATS model, Cloud, Economies and Smart Software,

ISSN: 2521-3288

Introduction

The present world economy model is in tremendous strain. Indicators contributing to this overwhelming pressure on the contemporary economic growth models are competition, predatory practices, technological obsolescence, chaotic customer interaction strategies and unpredictable economic climate. Our paper focuses on how cloud based technologies can leverage growth of enterprises spanning across all trade segments. The aim is to implement a general template that can help in nurturing as well as providing salubrious ambience for economic growth across all domains.

The present disorientation towards technology selection in a typical economic model has contributed to the confusion as to whether the technology shortlisted is the right choice. Further, common phobias related to the obsolescence of technology always remain especially since technology adoption has huge costs in terms of know-how acquisition, talent hire and training. In the midst of these challenges, a sound and smooth economic model is needed that can weather all above mentioned odds.

Technology has a played a crucial role in the industrial revolution and ever so plays a more inclusive role in the present digital revolution. The major technology inputs are in the following domains:

a. Digital communications
b. Web based Internet
c. Cloud computing
d. Accelerated computing
e. Artificial Intelligence

These five technology pillars are a must for any growth model to be sustainable in future. Other allied technologies especially bonded with the nature of industry are not being considered.

Digital communications in the form of mobile communication has seen phenomenal rise. Almost all major transactions are now possible through smart phones. The spurt in the offerings of myriad financial services on smart mobiles has helped in expanding the base of Fintech companies. This has created new avenues of growth but at the same time exposed financial transactions to greater risks of hacking and malicious disruption.

ISSN: 2521-3288

Web based internet technologies have allowed enterprises to shift their entire operations to internet thus cutting substantial costs that would have accrued from hiring office space and human resources. Most banking transactions are now performed online and it is very rare that one has to visit the bank personally. Further sharing of web infrastructure is also on the rise. Small banking institutions are now piggy backing their operations on large bank-owned infrastructure where the capacity is abundant and available. This has become a win-win situation for the all stake-holders in the infrastructure sharing process.

Cloud computing is the process of making available data digitally on the web servers thus making it omnipresence 24x7. Not only the storage but the data can be processed following business algorithms. This has resulted in automation of the data process and thus helping all especially the small enterprises that do not have the wherewithal to purchase expensive computing equipment.

Accelerated computing is the new buzzword and a very important feature of clouds. Previously supercomputers were mainly used in scientific circles, but now these machines are in great demand in powering and accelerating the cloud farms. With the amount of data being generated by billions of devices each second, it is next to impossible to process and infer data in order to derive any worthwhile semblance. Fast computing machines fitted with multicores (called GPUs or Graphical Processing Units), now provide cheap computing power at commodity rates. The multicore architecture has become a major disruptor in the accelerated computing scene.

Processing of data is not the final goal of major enterprises; in fact the prime aim is to derive analytics in the form of inference, prediction of customer behavior, marketing influencers such as human psychology, etc. such that these new valuable information can be fit into the growth model. Cambridge Analytica is the case in point where a relatively small firm was able to provide crucial information using Facebook profiles of millions of subscribers. Hence privacy of information is a big concern, as machine learning algorithms can be tweaked for malicious intent too. Despite the risks, AI will play a big role in future in the form of decision making, optimized manufacturing and cost cutting in general. The area where AI can contribute is 360 degrees wide and any event, action, data, act, can be channelized through the AI algorithms.

ISSN: 2521-3288

The Tech Chaos and a Need for Demarcated Models

The five major technologies outlined in the previous section have created a mad rush for their acquirement. To exacerbate the problem these technologies are considered a so-called panacea to all the challenges a typical business might face primarily while in its infancy. Many an occasions such stop-gap acquisition of these technologies has resulted in serious cost and operations stalemate often creating more problems than solving one. This has often resulted in disappointments and a general distaste as well as fear for trying new things. Technology in itself is not a silver bullet that can solve all business problems but it is the smart implementation and its adoption. By this, businesses can tilt the scale of progress in the positive direction. In the current scenario, no such model or prototype exists that could harness as well assimilate these five technologies and create a common template for all business enterprises to emulate. A need is being felt for a customizable prototype that could be relevant to all major businesses in general. This paper primarily attempts to address this gap.

Before outlining our proposed template, it need to be stated that businesses need not always aspire for two figure growth which has in general become a common yard-stick for measuring progress. The prime important factor remains and requires businesses to leverage and create value that could address the consumer needs. Without a sound fundamental and an eye to innovation and creativity most businesses may see a slow death even though they may have spent millions to imbibe the latest technologies. The technologies are just a tool and not the end for creating success.

Proposed Model (CATS - Cloud Accelerated Template System)

The CATS template comprises of the following:

a. User Interface Design layer
b. Domain specific application layer
c. Virtual host layer
    i. Cloud based hosting
    ii. Acceleration of compute intensive app segments/ fragments
d. Hardware specifications
e. TCP/IP stack

ISSN: 2521-3288

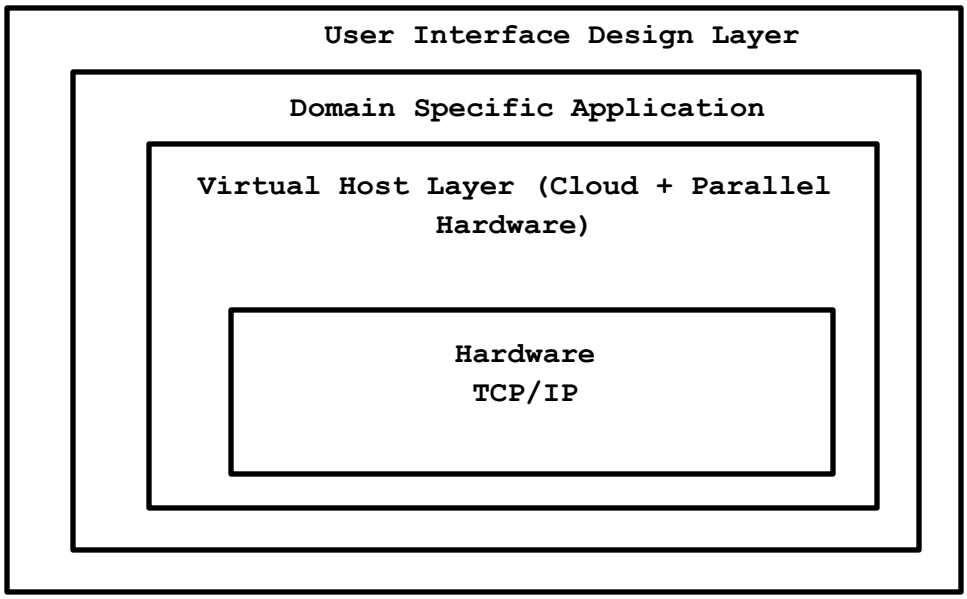

Figure 1: The Proposed CATS Model

Mathematical Equation for CATS Model

$$\Gamma(M) = \int \big(f(ui), f(dom), f(cloud), f(parallel)\big).\, dx$$

$$Where\ f(ui) = \int f(ci).dt \qquad where\ ci = c1, c2, c3, \dots;\ ci\ are\ ui\ omponents$$

$$f(dom) = [domain\ specific\ equations\ here]$$

$$f(cloud) = storage(in\ TB) + \frac{GFLOPS}{N\ (\#\ of\ cores)}$$

$$f(parallel) = \frac{LOC(linesOfCodes)}{N(\#\ of\ cores)}$$

a. The User Interface Design Layer

This layer is critical for the CATS model success. Any software acceptance rate directly depends on the ease of its usage. This is critical idea often overlooked by software designers. Despite the software being craftily designed and robust, its acceptability and popularity directly depends upon the lucidity of its interface. Many factors go into a typical usable interface design; the primary being, the language (vernacular), arrangements of menu components, intuitively designed interactive screen to name the few. It is desirable for the tech companies to spend more time and effort at this very important layer.

ISSN: 2521-3288

b. Domain specific layer

This layer provides the wideness in terms of applicability of our proposed model. A model is not deemed successful unless it caters to all segments of the businesses as well as encompasses all internal operations. This layer provides widespread extensibility to the model in terms of types of businesses. Currently it is often felt by many CEOs that this IT-enabled technology suits just small set companies. This is more a reality than a myth. To break this conundrum, the proposed model paves the way for domain specific development thus making its operations seamless and all inclusive. This is quite easily said than done, but the challenges and the bottlenecks can now be pinpointed with more accuracy towards domain specific issues rather criticizing the whole set of allied technologies.

c. Virtual Host Layer (Cloud and Acceleration)

This layer is the bed rock for all that is in latest technologies. It provides a single entry window for any new technology as well as existent ones to be embraced as part of the business requirements. The prime aim of this virtual layer is to provide accelerated cloud computing on the fly. As the demand for software increase an equally less visible need for a fast and omnipresent hardware is felt, many companies do not have the required wherewithal to acquire hardware. Further it is often the case where most of the hardware remains under-utilized or simply junked. Hence cloud based provider ensures that on-the-fly storage as well computing is provided at cheap costs based on the volume scale model. The power of multicores (GPUs) cannot be underestimated in this context. The GPU parallel devices provide time-critical on-the-fly super-computing facilities that would have been impossible a decade ago. Fast computing is often required by enterprises that work in domains like advertisements, motion picture, medical imaging, weather forecasting, etc. Now with the availability of cheap and sharable multicore computing, many other firms are looking for accelerating applications that have time lag. This has resulted in timely decision making, fast customer processing and overall satisfaction that comes from completion of processes before deadlines.

d. Hardware & TCP/IP stack

The hardware is provided by cloud based firms thus the only pending job left for businesses is to connect or plug to the clouds. As the internet connectivity improves and covers new areas, companies can derive anywhere, anytime access to our proposed model.

ISSN: 2521-3288

Advantages of CATS

A genuine concern beckons us to ponder as to how this CATS system is amenable to acceptance by all flavors of businesses. New models do have in them a big, stark fault line as they do not have the privilege of being tested for a substantial amount of time for their intrinsic worthiness. The same applies to our model. In our next endeavor, we envisage to write a paper about the experiences in fine tuning the above model for varied business domains.

As of now we outline the following main reasons why any template in general is more favorable than a ragtag conglomeration of technologies selected on ones' whims and fancies. The main ideas that are assumed as advantages are stated as under:

a. Provides a general template with inter-woven technologies. It is more beneficial to update/ upgrade the model than an idea crafted hastily.

b. Provides parallel development as layer is loosely coupled and hence a change in one should not affect the other.

c. More effort can be spent on development of domain-support for new domains as the developer is now free from the intricacies of the underlying architecture.

d. It can be tested for risk, fault tolerance and privacy related issues.

e. Training for a common model is more cost-effective than for several different unsupported models.

Challenges in the Acceptance of a Common CATS Template

Beyond the mentioned advantages in the previous section, the major challenge is in making the model acceptable. The first step is to ensure that the basic CATS model remain simple and easy to comprehend. It has been often felt that too much of complication and vagueness deters people on the outset. The second step is to develop local domain specific units that cater to major business segments so that the model can be immediately tested after it is downloaded. We plan to develop Fintech support in our model for small financial services based enterprises. The third feature we envisage is to create a fully functional mobile version alongside the desktop version. It is a common norm for major software developer to develop a full-functional desktop version followed by a truncated mobile

ISSN: 2521-3288

version. This creates resentment among users as most prefer to try a mobile version first. Our development effort shall focus equally in developing both versions coupled with full seamless functionality of migrating to any version effortlessly.

Conclusion

We have proposed a CATS model that fulfills a large vacuum created by ambivalent software available in the contemporary scenario. The confusion is marked by software acquisition without any thought given to the efficacy, scalability and extensibility of the software. Our model enters at this phase by providing the general software tools required by all businesses followed by a domain specific unit that caters to the trade of the enterprise. The model is a microcosm of all technologies fitted and rigorously tested units, to provide seamless and integrated functionality on the fly.

Future work

As outlined at different places in the paper, we envision upgrading and testing our model. Our primary focus is currently on making the model applicable for financial service providers and later on we aim to expand our model to other domains.

References

1. E. Curry, J. O'Donnell, E. Corry, S. Hasan, M. Keane, S. O'Riain, (2013) Linking building data in the cloud: Integrating cross-domain building data using linked data, pp. 206-219, Advanced Engineering Informatics, ScienceDirect, Elevier.
2. Richard T. Herschel, Nory E. Jones, (2005) "Knowledge management and business intelligence: the importance of integration", Journal of Knowledge Management, Vol. 9 Issue: 4, pp.45-55.
3. M. Brodie, Data Integration at Scale: From Relational Data Integration to Information Ecosystems, (2010) 24th IEEE International Conference on Advanced Information Networking and Applications, pp. 20-23.
4. K. Hawang, D. Li, Trusted Cloud Computing with Secure Resources and Data Coloring, (2010), IEEE Internet Computing Vol. 14, Issue: 5.
5. A. Arsenio, H. Serra, R. Francisco, F. Nabais, J. Andrade, E. Serrana, Internet of Intelligent Things: Bringing Artificial Intelligence into Things and Communication Networks, Studies in Computational Intelligence, Springer SCI, Vol. 495
6. O. Ben-Yehuda, M. Ben-Yehuda, A. Schuster, D. Tsafrir, Proceeding HotCloud'12 Proceedings of the 4th USENIX conference on Hot Topics in Cloud Computing, pp. 12-12
7. Lu, H., Li, Y., Chen, M. et al. Mobile Netw Appl (2017), Brain Intelligence: Go beyond Artificial Intelligence
8. R. Petre, Data mining in Cloud Computing , Database Systems Journal vol. III, no. 3/2012
9. Z. Khan, D. Ludlow, R. McClatchey, (2012), A. Anjum, Journal of Cloud Computing: Advances, Systems and Applications, An architecture for integrated intelligence in urban management using cloud computing.

 ISSN: 2521-3288