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(ii) Dr.Sybila Pius Fernandez, Head & Research Guide,

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(I) Riji N. Das, Knowledge Officer, ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, Kerala, email: riji.n@ictkerala.org

(ii) Sreekanth D., Knowledge Officer, ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, Kerala, email:sreekanth.d@ictkerala.org

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Introduction

It is a peer reviewed multi disciplinary journal which aims to provide new perspective on engineering, technology & employability. If people want to learn and grow, publishing is an imperative bustle to be bespoke as a habit particularly for academicians and cooperates. With this in mind ICT Academy of Kerala has stepped into an impudent & scholarly venture of publishing an Engineering, Technology & Employability Journal under the marquee "CONVERGENCE". This journal will accentuate on decidedly erudite Research Articles, Case studies, Reaction Papers, Innovative Ideas & Opinions. CONVERGENCE is a publication platform where we expect novel & paradigmatic articles from academicians, industrialist, professionals and other luminaries in the field of Engineering, Technology & Employability. We invite articles, research papers, case studies and Book reviews from faculty members & research scholars from sacrosanct institutions and be a part of this noble endeavor.

Editorial Correspondence should be addressed to Chief Editor, ICT Academy of Kerala, L-9, Thejaswini, Technopark, Trivandrum – 695581, Kerala. Email: manoj.as@ictkerala.org/info@ictkerala.org.

Details concerning the preparation and submission of manuscripts can be found on the inside back cover of each issue



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Knowledge Process Outsourcing: A Strategic Choice for Innovation

Abstract

In the current business environment with increasing importance given for innovation, firms are looking for options to expand their knowledge reach. As such, knowledge process outsourcing is gaining prominence with many firms in developed economies opting to outsource their knowledge requirements to organizations in developing regions. From a strategic perspective, this article identifies major considerations that an organization needs to take while deciding in favour of KPO.

Introduction

Innovation is important for a firm to achieve and sustain the necessary competitive advantage in the present rapidly changing business world. For a firm to be innovative, availability of knowledge is crucial since innovations are built on knowledge. One specific opportunity for firms to expand on the reach of knowledge is to opt for Knowledge Process Outsourcing (KPO). It involves the contracting of a firm's knowledge-based activities to an external service provider for accomplishing the goals of the organization. These activities involve the production of knowledge and to a certain extent, include capabilities that are specific to the organization. It can include market research, equity research, financial research, brand management, legal services, analytics services, pharmaceutical research and other specific knowledge process areas.

Increasingly organizations based in developed economies are outsourcing their knowledge-based activities ranging from data mining to animation services to developing economies, specifically countries like India, China and Philippines. Based on a study of Associated Chambers of Commerce and Industry of India (ASSOCHAM), the market for outsourcing of knowledge-based activities in India is

expected to touch \$30 billion in 2015. India currently caters to over 70% of the KPO globally.

The decision to outsource knowledge-based activities is critical for a firm to take. This is because the firm will have to form an alliance with the partner or vendor. Creating the right balance in outsourcing activities and to get desired output from partners and vendors is the key success

Strategic importance of knowledge based activities

Considering KPO as a strategic decision important for innovation, it is important for the organization to evaluate the strategic potential of those activities intended to be outsourced. Such an evaluation helps the organization to convey the business value expected on opting for KPO. Particularly it has to demonstrate the benefits of that decision compared with internal execution of those activities.

There is a group of knowledge based activities which are not contributing to the development of core competencies. Such activities having only minor strategic value form the front runners to be favoured for outsourcing. However, there is a steady growth in the propensity of organizations to outsource those knowledge based activities which are of higher strategic value. Evaluation to find any existing gap in the performance of knowledge-based activities against expectations is an important part of the decision to opt for KPO. After this, the major criterion for deciding whether it should outsource those activities or not depends upon the

investment involved in the transaction, performance benefits and external vendors with better capabilities to perform them. Organizations are opting for KPO where they can have stable and long-term collaboration with vendors. Firms now view KPO as a means to complement their capabilities and augment their strategies to ensure improved utilization of their resources.

Strategic propensity for KPO

While deciding for KPO, an organization needs to separate these knowledge activities into its components. This will allow the firm to identify the components of lesser strategic importance that do not contribute to competitive advantage. Such knowledge activities with low levels of integration with the core competencies of the firm can be outsourced through contractual agreements between the client and the vendor. These activities will not involve high levels of interdependence of knowledge between the client and the supplier. So the contractual agreement is adequate to make sure that the vendor employs its normal procedures to generate knowledge that the client can utilize.

At certain times a firm decides to outsource knowledge-based activities which complement its core competencies necessary for innovation. In such instances it needs to have an organized alliance relationship with the vendor rather than a contractual agreement. Improvements in complementary capabilities are critical to enhance the core competencies of the client. Hence in such cases, it is essential to take measures to develop the relationship between the client and the vendor into a collaborative partnership between the member firms engaged in improving value creation.

On rare instances a firm can opt to outsource components

of core knowledge-based activities through alliances. Core processes generate knowledge critical for the firm to develop innovative products and services required to prosper in the highly competitive environment. Since core processes form the basis for a firm's competitive advantage, while taking a decision to opt for the outsourcing of such activities the organization has to handle critical risk aspects. Misappropriation of the transferred knowledge, not attaining alliance strategic objectives and alliance partners not complimenting are possible risks to be handled.

Conclusion

Value of knowledge is on the increase with firms giving more importance to innovations. Organizations increasingly sense that KPO is a means to gain strategic benefit and build competitive advantage. Thinking beyond market transactions involving contractual agreements is essential as a firm decides on KPO. The need is to have alliances focusing upon collaborative efforts. Also, keeping the highly dynamic and competitive nature of the environment and uncertainties businesses face, a firm opting for KPO has to continue managing and monitoring the structure and functioning of the alliance.

Along with the increasing dependency of knowledge as a valuable asset to gain competitive advantage and strategic growth the firm should be attentive to the available transaction opportunities to build on competencies affected by knowledge-based activities. KPO, which is certainly one decisive transaction opportunity accessible for firms to make sure that they can enhance such competencies, is highly likely to play an important role in the strategic growth of organizations.

Dr. Bhaskar Prasad, Assistant Director
New Service Research, Ernst & Young LLP- Global Talent Hub Kerala

Aiming for Sustainable Success - Learning & Employability

Learning to Learn Differently

There's a huge emphasis on education and learning in many parts of the world. People recognize the importance, tangible benefits and positive impact it could bring to lives, society and the future. While the importance and acknowledgement is visible, many aspects and approaches related to learning seem to require a rethink.

In India, the application of education to life seems to be less important than the rank or scores in an examination. Without doubt, exam scores do matter but everyone needs to think seriously about the value of learning to life beyond college or university.

The first part of this article is more focused on the individual learning perspective for students to consider. These notes come from the benefit of having been through multiple learning experiences in different levels, subjects and countries.

Build self-awareness and learning plan based on your own learning preferences and styles.

We all have different learning styles, preferences and paces. It is important to identify our own learning style. At least, understanding the learning preference (visual, auditory, reading-writing, kinesthetic) can improve our learning experience and effectiveness. Focus and self-discipline are core elements of any learning process. Similar to building physical muscles by exercising constantly, it is important to build mental muscles through a disciplined process.

Learn something that you're passionate about and aligned to strengths.
A starting point in any learning process is to think about and

answer the following questions:

- What do I want to achieve?
- Why I am learning this?
- How do I achieve my target outcomes?

If the answer is aligned to our own passion, values and priorities, the probability of a successful learning experience is high. Many students choose a professional path due to external or peer pressure. If the direction is not clear, it is fine to experiment or listen to experienced advices. Unfortunately, many parents in India force their children to professional streams that they don't want to be in.

Reap the benefits of social learning.

Learning becomes deeper and richer when we are exposed to multiple perspectives. One option is to work with a peer review group. Start with a common purpose for the whole team. Being able to synthesize various inputs is a highly appreciated skill in today's world. It also helps to work with positive peer pressure and manage team environment challenges involving contradictory opinions. Awareness of the potential of one's ego to disrupt is extremely important.

Use multiple sources and media.

There is so much knowledge accessible today in the public domain, with mobile devices and ubiquitous internet connectivity. The opportunity to stay updated on the latest developments in any area and learn from the best, irrespective of location is tremendous. Keeping industry interaction active provides valuable employment perspective. People in our own first or second-degree network could share their valuable first-hand experiences from workplaces – culture, ways of working, notes for effectiveness etc.

Create an attractive learning environment.

It is important to feel good about learning. Neuroscience studies show that our brains function much better when it is in a 'reward' state, not a 'threat' state. Even if learning may involve tough work, a collegial, fun, open and social environment, refreshing variety of methods used, and great people around are factors that contribute to an enjoyable experience. Each one of us can contribute to that in the way we show up.

Improving Employability

It would be worthwhile for students to ask themselves how much of their time and energy is invested on developing themselves beyond learning normal curriculum in professional institutions.

Educators also have to constantly think beyond standard curriculum to improve employability of their students.

One of the common discussions I've run into with friends and ex-colleagues in India is regarding employability. 'Employability' could be defined as the ability to gain and maintain employment (Billett, 1998).

Multiple connections from the corporate world mention that they're finding it more and more difficult to find hire quality candidates from among freshers. On the other hand, the number of professionals leaving off students passing out has gone up by a big margin in recent years. This gap seems to be widening in a contradicting manner. There is little doubt about the need for an active dialogue on this topic.

How could we look at improving employability?

In simple terms, organizations generally tend to look at three core areas, especially among fresh professional graduates.

1 Technical or Hard Skills

Includes strong knowledge in specific engineering, software programming, and functional areas.

2 Soft/Life Skills

Includes visible and measurable aspects like communication, behaviors, interpersonal skills, emotional intelligence, learning agility.

3 Attitude/Mindset

Includes professional approach to work, mindset, ethics, commitment, ability to take responsibility, and resilience in

difficult situations. There may be some overlap with the category above.

Skilled recruiters and hiring managers try to combine all the available data points from resume, grades, interview responses, visible behaviors, group discussions, extra-curricular activities and psychometric test responses, while finalizing a hire. Students with high degree of communication skills, self-awareness and emotional intelligence seem to stand out from the crowd.

Most corporate connections agree that the second and third categories mentioned above are equally important, compared to the first category of technical skills or knowledge. Many jobs/roles that hire professional students today may not relate to their primary area of study but require learning agility to adapt to other areas.

Designers of professional educational programs may need to rethink their effort, energy and overall investment across these categories. They will need to seek support from internal and external experts, including alumni and the industry. When professional education programs are designed with the intent to develop well-rounded personalities, they lead to higher probability of success in career and life. Working with core behavioral skills could go a long way to helping students navigate through their career beyond the initial years.

For teachers, the key question to ask is how you can play a key role in facilitating the learning process, thinking, acting and guiding students to find answers for themselves. In India, we have long held the notion that a teacher should have the answer for almost everything. As the wise proverb tells us, "Give a man a fish, and you feed him for a day. Teach a man to fish and you feed him for a lifetime."

For students, the investment in continuous personal development will always pay off in the long run. As much as possible, it is valuable to select work that is enjoyable and seem to hold some opportunities, with openness to experimenting early in career. Taking responsibility and feeling accountable for one's own decisions and actions is a very useful habit to build early. It is also extremely helpful to seek mentors and coaches to help you on your journey. Students can take responsibility for their own development, in a digitally connected world with instant availability to magnificent sources of knowledge and wisdom.

Success at the system level happens when the students, teachers, experts and administrators work together, with a common purpose. Deep learning for sustainable success involves learning beyond the prescribed boundaries set by a college or university. This results in personal growth, a deep sense of achievement and confidence to take on the world.

The Reality Bites in Entrepreneurship

Abstract

The new generation buzzword after IT job is Entrepreneurship. And with a global average age of new generation CEO's constantly dipping (from mid 30s to now mid 20s), the buzz is catching up virally amongst youngsters and students. The paper is aimed at educating the aspirants about the soft aspects involved in the journey of building a long lasting enterprise. The paper discusses some of the myths of Start-up and the areas to be re-evaluated critically at the time of starting up of an enterprise.

The Big Buzz

In the field of ICT industry, the trends are not limited to technology; it applies to process, to people as well and has been observed that for every five-year period there is a buzz. We hear of 'SMAC' in technology, 'Agile' in methodology, 'Social Media' as the new channel for marketing & sales and so on. Of late, there has been a fundamental shift in the way youths started to think of their career dreams. The new Career dream is about Entrepreneurship.

Being enterprising is the most desired state of a professional, where the individual concerned will be self motivated and will constantly demonstrate strong passion, focus, rigor in execution and financial prudence. It encourages individual's and team's creativity quotient significantly. It has a multiplier effect for the economy of a State or Country as it leads to the creation of self-sustained growth and more opportunities for employment. State and Central Governments consider encouragement to Entrepreneurship as a critical responsibility for youth empowerment and economic growth. Policy changes, financial, infrastructure and other incentives are being done by governments to accelerate this trend. The latest data

shows that the Start-up village has incubated around 560 start-ups in 1000 days - means 1 new venture every second day! However, as one can imagine, there are side effects to any change, any new journey.

One of the major challenges Entrepreneurship 'buzz' has created today is the hype factor amongst youths. Some youths think it as an alternative to hard work - an easy way to show up the career chain (flaunting the business card of CEO/Founder/ Director etc. has been seen as a status statement!). Many youths also joined the wagon of Entrepreneurship without enough thinking & vision.

As Start-ups become crowded space, the genuine, hardworking individuals who have laid strong foundations in setting up sustainable organisations, are caught in the wrong winds and get frustrated at being considered as another 'Start-up'.

Myths of Entrepreneurships

It may sound discouraging, but the statistics shows that less than 10% of the start-ups actually flourish globally as successful enterprise, that too after several hiccups and cash crunches nearly kneeling them down! The myths surrounding start-ups are many. Some of the blind spots to be aware of are

I have an idea and I want to 'Start-up': An idea is only 'AN' element for start up but way too far from the actual start-up

Not a problem I have a lot of support: True, but a start-up needs around 3 years to know if it is heading in the right direction and may be another 3 years to cross the hump.

The initial environment and ecosystem vanishes after a couple of years, leaving the start-up partners to find their own ways

The market needs this product: Great! But how long and which markets? Many start-ups don't validate the Market need in terms of its product depth. This poses serious problems when it comes to expansion to more customer segments or even larger market. Many small organisations, due to limited research ends up innovating products and services that already exist. This leads to other complications including legal issues that can blow up the entrepreneurial dream

I can always go back and do something else: Sure. If they are unsuccessful, you can go back and do something else (or start again), but have they gauged the 'consequences'. It is an irony that the process involved in closing a company legally is more complicated than starting one in the first place. There are lot of other dependencies such as financial obligations, people commitments as well, apart from legal problems

I just need to survive for 3-5 years and then I will get bought over for Big money: As reminded in the beginning, less than 10% cross the hump of the painful start-up period. It takes even longer to be able to prove its viability finally fitting into another big one as a compliment. It will be absolutely delusional for an entrepreneur to start with this mind-set. They should look at building enterprises that last longer

Foundations for a strong Organisation

Is there any secret formula for successful enterprise? Gosh, if someone has found one, they would become the most precious individuals in the world...

Researches have framed a lot of scientific approaches in building successful enterprises. It focuses on Governance, Financial sustenance, People, use of technology, Quality of Customer Experience, Sales, Marketing and so on. The points discussed here are subtle, but critical areas that are often overlooked or deliberately ignored in the heat of other 'important' parameters.

Be ready for a long run: The process of deciding to be an entrepreneur is in itself a big deal – it has an analogy of a person preparing for a marathon. It can be fatal a thought! One must be prepared to endure for a long time without anything in return... One's family support, social relations

and own physical and mental readiness for a long haul, needs to be ascertained before taking the first thought of being an entrepreneur, to the next level of seriousness. In essence, the time taken for preparation is as critical and long as it takes for the actual setting-up of the Company.

Do the homework before the plunge: One may think of a great idea, but unless the market or customer sees it that way, there is no way forward. An idea validation through thorough market research becomes the next crucial element in the journey of entrepreneurship. While there could be a lot of secondary resources available as data inputs, it is suggested that obtaining direct view from the potential customers will provide more valuable insights for the topics. It doesn't stop there. One needs to estimate the ideated products expected life. Scientific methods such as Resource Based View [1] could be applied for this. This is an important step, as it determines the longevity of an organisation itself. When setting up an Organisation, it is important to envision its purpose to be long term.

Money matters: While most of the Entrepreneurs have ~~finances~~ as the key area in their Strategy and planning, ~~more a major~~ share of any business plan, an important ~~area~~ that gets overlooked is in balancing the sources of ~~finances~~ and costs. To start with, a clinical approach to ~~finances~~ the founder's capital as more costly source of capital ~~than other sources~~ should be enforced. This mind-set on ~~finances~~ founders will prevent them from investing their ~~finances~~ funds (and save the founder's family assets being pledged) during financial crisis. The next behaviour that needs to be encouraged is to understand that Assets are the 'uses of Capital' - which is to ascertain the fact that, unless the Assets starts contributing to the profit of an organisation, it is not worth calling as Assets! The third, and the most important element to carefully manage is the cash flow; at the end of the day, cash at hand does matter the most than any other financial jugglery!

Focus on Customer experience: Gone are the days where customers bother more on the quality of products and less on all other aspects of a provider. The new generation customers gauge the overall experience with the provider. So Customer service is no more a department's responsibility, but for every body in the organisation. It is important for the Organisation to measure the Customer experience at every touch point (may be a campaign, sales, product installation, service etc.). The group that is overlooked in applying this principle is sales / business development teams. It is so important for the sales team to be sleek on managing sales with customer

needs. The sales teams should do enough research on Customer needs and focus on addressing them faster, cheaper and better - the term 'need' is deliberately used, as it is different from requirements! Needs are broader and hence the scope for the sales team to carve out a Unique Selling Proposition is higher. It is an opportunity to excite the Customer and drive the sales from the supply side. Once the customers are clear on their 'requirements', it becomes more of a 'Yes' and 'No' discussions to check if the product specifications meet the requirements. It becomes a demand driven sales and often leading to stiff competition and ultimately leading to differentiation on price points alone.

Stand out, but don't be alone!: Every one wants to be a leader in their segment. With the spread of social media, Competition is intense. And for Start-ups the non-existence of their brand is a competitive disadvantage. To add to the complexity, the lack of resources can become a huge bottleneck to standout amongst competition. The way to balance these extremes is to collaborate! The Organisation should focus its resources only on 'Core' business. The organisation should create a powerful network of its suppliers, outsourcing vendors, alliance partners and sometimes its Customers and leverage the collective strength in fulfilling its vision. A truly collaborative network can become symbiotic adding to more businesses and growth to all in the network. To be successful as a network, the identification of complimentary services, alignment of the strategic fitment & value system of the networked organisations become critical. And care should be taken to avoid over dependency on an organisation in a network as it can lead to undue stress on ones business and potential.

You are as good as your team: While the organisation's leadership provide the long-term vision and the character of an organisation, it is the next level team that takes the organisation literally forward! Even if it means a higher investment, it is worth investing in the right set of next level team leads. For Start-ups, it is important to get people who are hands-on than people who are pure play managers. Secondly, during the initial phases of an organisational setup and growth, people need to be capable of multi-tasking in multi-disciplinary streams (say the Operations guy may end up managing the Finance; A delivery manager may double up as HR etc.). By this way, the organisation will also be building automatic backup mechanisms to limit people risks. The last vital aspect will be to have people who are aligned to the larger vision and character of the organisation. Many top leaders would vouch for the fact that even if the individuals are a bit low on skills, they wouldn't compromise

on the attitude part.

Don't take Governance lightly! While most start-ups are created as individual or partnership organisations, many of them have the habit of tying up with Big names and call them as Advisors or Board members etc. While it is an attempt to create brand impact and to have some sort of procedural compliance, it is to be noted that strong corporate governance even at the start-up phase is one fundamental element for organisation's sustenance. The advisory team or Board should be created with independence and with clear responsibilities such as validating the Organisation strategy, regular operations review as well as being an independent team to review the legal and ethical compliances. The advisory team/Board should be seen as one of the best opportunities for the Start-ups to leverage on, for validating new ideas and directions of the Organisation. The founders should have a mechanism to constantly engage with them and also make them feel a part of the Organisational growth.

Count your known risks! While every entrepreneurial stint involves a lot of risks, it is important to understand them, plan for alternatives if it comes true. This will eliminate unwanted delays in decision-making. It is to be noted that in leadership decision-making process, there are no right decisions or wrong ones, but only choices and consequences. As long as one can ascertain the 'price' to be paid for the consequences of a decision and if the negatives are outweighed by the benefits, one should go forward than trying to mitigate all the potential risks.

Conclusion

Choosing Entrepreneurship as a career is a serious business that impact ones own life and a number of other people who would be linked with the Organisation. Choosing this path with a short-term view and with focus only on the financial is going to be a catastrophe. One needs to apply enough diligence before getting into it; once into it, one must be prepared to persevere for a long time till the light is seen on the other side. Having said that, entrepreneurship brings in a lot of opportunities for self as well as for many. The impact one can make is huge. It also grooms individuals on a lot of professional skills that can set them apart from others. Every enterprise is different and it is nearly impossible to derive common principles for a

start-up enterprise. The paper attempts to expose certain time tested soft aspects of building a strong foundation that would make it long standing and high performing enterprise.

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Santhosh C. Kurup, CEO,

ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, Kerala – 695581, email: ceo@ictkerala.org

Transforming Teaching towards 21st Century Student Learning

Abstract

It is high time to respond assertively to a fundamental and paradigm shift in the mission of our education system and learning methodology of the students. The students who pass from their schools should be provided with high quality advanced education, where we must prepare all students with the right skills & knowledge to succeed in a very competitive, fast changing global economy. As we are in the nation building process for building new generation of professionals, and are convinced that effective teaching requires preparation for an increasingly complex global society. Our current education system has some flaws which makes us are unprepared students with plethora of challenges coming out every year finding difficult to get jobs. It is frustrating that the onerous structures of the system currently governing our practice discourage many promising graduates from pursuing quality education for professional development.

It is seen that the teaching profession embraces collective accountability for student learning which is balanced with collaborative autonomy that allows educators to do what is the best for the students. Today most of the educational institutions including the professional institutions have a hierarchical structure controlled by individual gatekeepers, responsible for knowledge dissemination, & decision making. Meanwhile this structure is mirrored in the classroom, where individual teachers/ faculty members make decisions behind the closed doors. Educators can become more effective & efficient by working together with shared responsibility, which will also help to engage the students better and there will be effective learning takes place among students. It is high time to go for a systemic changes in the educational structures by engaging teachers in decision making processes that impact student learning &

development.

Key words: Skills, Knowledge, Collective Accountability, Collaborative Autonomy, Decision Making, Student Learning & Development

Effective Teaching – An Introduction

One of the crux of effective teaching is that it should be student centric, which leads to improved student outcomes, which is very clear and demonstrable. We do not vouch that all the teachers are equally effective. In fact the effectiveness varies widely among the teachers, some teacher's may be good in a student group many not be good in other group. It is affected by plethora of indicators like personal & academic background, pedagogical preparation, teaching assignment, institution & management support and also the peer support & influences. Always the effective teaching has a positive impact on student learning. An effective teacher is very clear about the content and knows how to deliver the content to the students. They have the dispositions, aptitudes & attitudes to work very effectively with the student community. They have mastered the teaching strategies to teach effectively and help the student learn. They plan instruction purposefully, analyze student learning outcomes, reflect on their own practice and adjust future planning as needed. Effective teachers consider collaboration as an essential element of their practice. They take the responsibility of teaching students in the classroom and off the classroom and also promotes virtual learning too. Thus they help the students in their learning process and be an integral part of their holistic development. The effectiveness of a teacher is judged by

certain parameters like the skill & competency development of the students, employability skill development of students and readiness of the students to accept challenges.

Effective Teaching focuses on the following;

- It engages all students in the overall learning process
- Envisages on the teacher student interaction, simulation activities etc.
- Encompasses collaboration among teachers.
- Helps the students to enhance their Skills, Knowledge and well-being.
- Helps in continuous professional learning cycle like planning, implementation, reflection, analysis, and change of practices.

Principles for Teaching Profession

The teaching profession rests on three guiding principles, they are as follows;

- a. Student learning is at the center of everything a teacher does.
- b. Teachers should take the primary responsibility for student learning.
- c. Effective & efficient teacher share in the leadership with their colleagues in the holistic development of students.

21st Century Professionalism

We all believed that the twenty first century education system should support and help all students, across institutions. Meanwhile effective and efficient teachers should have the precise skills and competency to work together to design and craft instruction and measure student learning based on eloquent goals and unblemished learning standards. The educational institutions are envisioned to develop students' academic knowledge, critical thinking & creativity, and innovation skills, while giving significance to their overall well-being. Effective teachers are facilitators of learning who develop and assess students' expertise through formal & informal learning capabilities.

Based on the system, we envision four key qualities, that are explained as follows:

Commitment to accurate and diverse student growth

This system that focuses on learning in formal and informal settings is given much importance and value which can be easily measured. This system of learning, will engage students with meaningful and rigorous content, which

helps to incorporate the student interests, opinions, strengths and their expectations in their future professional life. Here the learning helps to connect the students with the external world real time experiences and this type of learning will help the students to understand, what is really happening in the industrial setting. The student progress is measured based on the demonstrated mastery rather than time spent in the classroom. The field experiences, industrial visits, hands-on experiences and online learning platforms will be a continuous endeavor with flexible scheduling and adaptable staffing patterns.

Aligned system of standards, Supports and Measures

This system focuses on the student learning which commences with clear cut, brief and challenging standards that describe what students should know and be able to do in academics and beyond. These standard and aligned curriculum helps the students to learn about the latest skills and knowledge in accordance with the industry requirements. This system also help to measure the student learning based on the practices and standards for preparing and supporting teachers which are directly related to systems and standards for student learning.

Hybrid leadership roles in institutions

Hybrid leadership is a joint endeavor with highly qualified classroom faculty. In a collaborative institution, all faculty members share responsibility for student learning and well-being of students across institutions & universities with shared decision-making models, utilizes classroom expertise in advancing the effectiveness of educational institutions. The college management/administrators and teachers should have a collaborative relationship characterized by joint decision-making and accountability. Faculty assume hybrid roles that involve both teaching and leading, which can help the students to cultivate an attitude of leading & leadership.

Effective use of technology for all students

The faculty members & student should use cutting-edge educational technology were they need the support to use it productively. Most of the students use the latest technology in learning and the teachers should also use the state-of-the art technology to teach students. Now teachers can use plethora of e-learning platform to teach students. Now there are most modern teaching techniques like Flip & Process Oriented Guided Inquiry Learning (POGIL) & Massive Open Online Courses

(MOOCs), where technology is used more to make the teaching more interesting and a memorable experience. We are into the world of Mobile Learning (M-Learning), where teaching & learning can happen by using a mobile phone.

Criteria for selecting appropriate teachers

Selection of teachers is one of the area, where more emphasis has to be given, because quality of faculty is one thing which determine the holistic development of students. The selection should be made by giving more thrust to, the passion and innovative mind of the teacher. The emphasis should be given to the teacher with high mentoring quality, which can pave the way for the comprehensive development of the students.

Some of the other benchmarks' are as follows;

- Strong Academic Preparation & knowledge
- Dispositions
- Right Attitude & Aptitudes
- Demographic Needs

Based on the above criteria the vision development of students should focus on:

- Improved students learning & well-being
- Peer reviewed programs
- Job-embedded programs
- Differentiation by career stage, expertise, and other criteria.

Encouraging Leadership Roles for Teachers

Most of the teachers have spent their complete career isolated in classrooms, doing the same job of teaching the students. As institution culture is changing every time and becoming complex and collaborative, the need to differentiate teacher's roles and responsibilities becomes increasingly apparent. In the present context effective teachers may take on additional roles and responsibilities while they are teaching and also along with their administrative roles. It is proposed that there are some areas where the career path of a teacher can be effective. The career path the teacher;

- (i) Acknowledges the diverse expertise teachers acquire during their careers.
- (ii) Identifies specific roles & responsibilities and
- (iii) Defines the professional knowledge and skill teachers must acquire to fulfill each role.

Most of our teachers can take some leadership roles in institutions which will help the students in their learning also. They are;

- ▶ Instructional Leadership Role
- ▶ Educational Management Role
- ▶ Holistic Institutional Leadership Role

Endorsements & Conclusion

We believe that every teacher strives to be effective. But even the most accomplished among us cannot act in the best interest of students in a dysfunctional system over which we have little control or authority. We applaud the nearly nationwide adoption of college and career readiness standards articulated by the common core, but educational institutions need more just national agreement about what students should know and be able to do. Without an effective teacher for every student in every classroom, the promise of these standards will go unmet. The knowledge & skills that teacher must master to be effective for all the students in our institutions are complex & ever-changing.

Any person wants to be an effective teacher they follow a systemic, collaborative approach to making that our education system will provide effective learning for all. Every teacher should decide that it's their responsibility to prepare all students for participation in a fast-changing global economy. We must mitigate regional and socioeconomic disparities through universal access to quality education. The teacher should also believe that collaborative engagement is crucial to effective teaching. The institutions should also understand that supporting teacher collaboration promotes student learning. The institutions should be acknowledging effective teachers as instructional leaders helps to attract and retain strong, well-prepared professionals. The parents should also feel that collaboration between home and school strengthens student engagement and instructional planning. The society also has a responsibility in collaborating with effective teachers, were they connect the community and its resources to advances student learning. Our nation is also responsible in ensuring that every student has an effective teacher supports democracy, equity & economic well-being.

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Manoj A.S, Senior Knowledge Officer,
ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, India

Crowdfunding: Perspectives and Prospects

Abstract

Crowdfunding is an internet-enabled way for businesses or other organizations to raise money in the form of either donations or investments from multiple individuals. This new form of capital formation emerged in an organized way in the wake of the 2008 financial crisis largely because of the difficulties faced by artisans, entrepreneurs and early-stage enterprises in raising funds. Crowdfunding emphasizes financial mechanism and capital formation as a potential source of funding for start-ups, micro-enterprises and medium sized enterprises (SMEs). Crowdfunding can be divided into four categories: donation crowdfunding, reward crowdfunding, peer-to-peer lending and equity crowdfunding. Today, 45 nations in North America, Latin America, Europe, the Middle East and North Africa, Sub-Saharan Africa, and Asia have active crowdfunding platforms. The Securities and Exchange Board of India ("SEBI") on June 17, 2014, issued a consultation paper on crowdfunding with an objective to help start-up companies and SMEs raise capital and also to check misuse of such avenues. According to SEBI, the financial sector crowdfunding market has doubled year-on-year for the last 5 years to an estimated USD 6.4 billion in 2013.

INTRODUCTION

Fast and global spread technological developments influence our daily lives. Dynamic development of the Internet has changed the way people communicate, obtain information and conduct business. Development of Web 2.0 concept, online payment systems, social networks enable materialization of numerous concepts used in various types of electronic platforms. This ability for people to communicate and interact with each other has been crucial for the recent emergence crowdfunding—the possibilities for

financial inclusion are growing. The broader crowdfunding movement has its roots in the microfinance and microcredit trend pioneered by Nobel Prize winner Muhammad Yunus. The microfinance movement aims to attack poverty by giving individuals who cannot afford the transaction costs of traditional bank-based financing access to cash. Microfinance has carved out a role in promoting savings among impoverished communities, helping credit records for individuals who live in remote regions, and helping to hedge against income variability in the developing world. The preference for the "crowd" is also distinctive of crowdfunding. Instead of raising money from a very small group of rich investors, crowdfunding sets out to obtain funds from a large audience, where each individual provides small amounts of money.

The concept of crowdfunding derives from crowd sourcing, which describes the process of outsourcing tasks to a large, often anonymous number of individuals the "crowd" in the form of open call application to obtain ideas, feedback, assets, resources, knowledge and expertise to develop corporate activities (Hemer, 2011, p. 8). The "crowd" has since come to signify a collection of hundreds or thousands of individuals who together, fund something via the Internet. Crowdfunding is an emerging and innovative online platform that provides small businesses and startups with opportunities to increase their social media presence, investment base, and funding prospects. Crowdfunding is an internet-enabled way for businesses or other organizations to raise money in the form of either donations or investments from multiple individuals. This new form of capital formation emerged in an organized way in the wake of the 2008 financial crisis largely

because of the difficulties faced by artisans, entrepreneurs and early-stage enterprises in raising funds. With traditional banks less willing to lend, entrepreneurs started to look elsewhere for capital. crowdfunding involves an open call, mostly through Internet, for the provision of financial resources either in form of donation or in exchange for the future product or some form of reward to support initiatives for specific purposes" (Bellaflamme, Lambert & Schwienbacher, 2013, p. 8). Crowdfunding is a form of financing of various projects or a venture by the community which is group of individuals instead of professional parties like banks, venture capitalists or business angels.

Crowdfunding emphasizes financial mechanism and capital formation strategy as a source of funding for start-ups, micro-enterprises and small and medium sized enterprises (SMEs). Crowd funding, a popular concept started in the US and the UK, is an emerging way of raising capital, entails the use of internet or social networking sites such as Facebook or LinkedIn or Twitter or even some dedicated websites.

Figure 1: Capital Formation

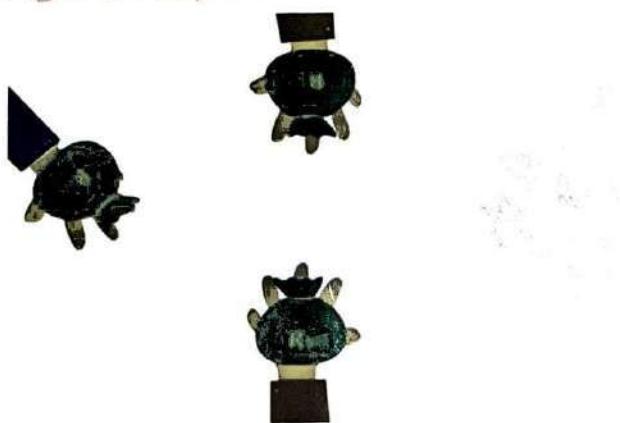
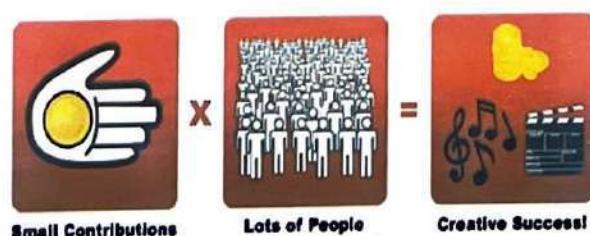


Figure 2: Fund raising in crowdfunding



Source: <http://www.statista.com>

The variables likely to determine the success of a crowdfund investment effort are different. They are more related to personal credibility and to communication.

With a crowdfund investment offering, the following

criteria might determine success or failure:

- Perception of the "social value" of a project or a business
- Quantity of the team's connections on social media networks
- Quality of the team's connections on social media networks
- Online credibility, credentials, and persona of the team
- Ability to communicate with individuals via social networks

This implies that with a crowdfund investing framework in place, additional "socially-conscious" ventures are likely to receive funding. This is especially relevant to governments that are struggling to fund a broad array of necessary social programs. So, crowdfund investing allows those with ideas to harness the power of the Internet to target one's personal network.

Objectives

1. Models of crowd funding.
2. The Global and Indian Perspective about crowdfunding.
3. The legal issues and challenges in India.
4. Economic Prospects of crowdfunding in India

Research Methodology

This research is a descriptive study in nature. The secondary data was collected from various websites, journals and news papers.

Models of Crowdfunding

IOSCO Staff Working Paper - Crowd-funding: An Industry Growing Fast, 2014 ('IOSCO Paper'), Crowd-funding can be divided into four categories: donation crowdfunding, reward crowdfunding, peer-to-peer lending and equity crowdfunding.

1. Social/Lending/Donation Crowdfunding

Donation crowdfunding denotes solicitation of funds for social, artistic, philanthropic or other purpose, and not in exchange for anything of tangible value. Kiva.org

2. Reward Crowdfunding

Reward crowdfunding refers to solicitation of funds, wherein investors receive some existing or future tangible reward (such as an existing or future consumer product or a membership rewards scheme) as consideration. Eg. Kickstarter and Indiegogo

With reward-based crowdfunding, people can pledge money to a new creative art project, a novel technology product in development, or a music artist producing a new album.

3. Peer-to-Peer Lending

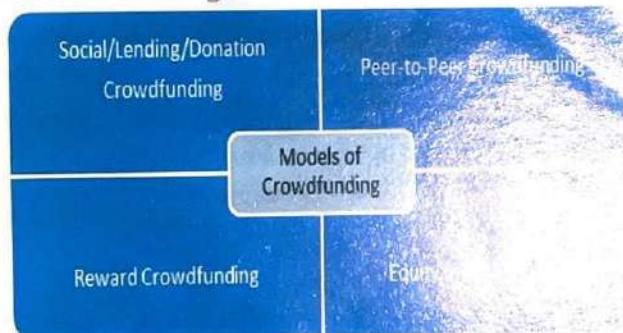
In Peer-to-Peer lending, an online platform matches lenders/investors with borrowers/issuers in order to provide unsecured loans and the interest rate is set by the platform. Some Peer-to-Peer platforms arrange loans between individuals, while other platforms pool funds which are then lent to small and medium-sized businesses. Eg. LendingClub, Prosper

4. Equity Based Crowdfunding

In Equity Based Crowdfunding, in consideration of funds solicited from investors, Equity Shares of the Company are issued. It refers to fund raising by a business, particularly early-stage funding, through offering equity interests in the business to investors online. Businesses seeking to raise capital through this mode typically advertise online through a crowdfunding platform website, which serves as an intermediary between investors and the start-up companies.

Eg. AngelList, CircleUp, FundersClub, OurCrowd

Figure 3: Models of Crowdfunding



Source: IOSCO Staff Working Paper -
Crowd-funding: An Infant Industry Growing Fast , 2014

Figure 4: Umbrella of Crowdfunding



Crowdfunding: Global Perspective

There were 452 active crowd funding platforms worldwide in 2011 (426 according to crowdfundingsinsider). This figure was expected to increase to 536 by the end of 2012, up 60% on the previous year (Crowdsourcing.org, 2012). Crowdfunding platforms raised \$1 billion in 2010 (Smartmoney) \$1.5 billion in 2011, \$2.7 in 2012 and it is forecasted that all crowdfunding practices taken together grew by 81%, reaching \$5.1 billion in 2013 (Crowdsourcing.org, 2013) although other more optimistic analyses forecasts \$6.1 billion in 2013 (Gartner Research). This money funded more than 1 million campaigns in 2012.

Table 1: Crowdfunding in US

Year	Fund raising (Billions Dollars)
2009	0.53
2010	0.85
2011	1.5
2012	2.8
2013	5.1
2013*	6.1

Source: crowdfundingsinsider, Smartmoney, Massolution*Gartner Research.

Table 2: Number of CrowdFund investing platforms in selected countries

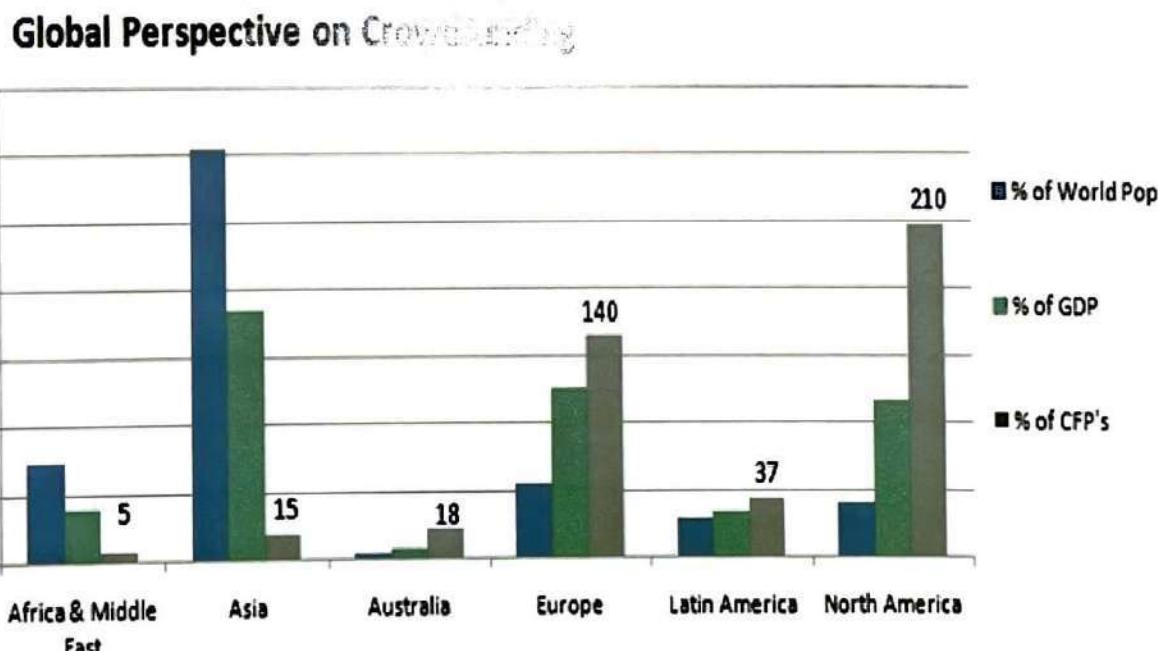
Country	No.of CFI Platforms	Country	No.of CFI Platforms
United States	344	India	10
France	53	Netherlands	34
Canada	34	Germany	26
Italy	15	Russian Federation	4
United Kingdom	87	Belgium	1
Australia	12	China	1
Spain	27	UAE	1

Source: www.fundingcircle.com/statistics

Crowdfunding has expanded rapidly since its inception only six years ago. CrowdFund investing (CFI), which grew out of the crowdfunding movement, began in Australia, across the world. Today, 45 nations in North America, Latin America, Europe, the Middle East and North Africa, Sub-Saharan Africa, and Asia have crowdfunding platforms.

The CFI market in the US was forecast to reach 3 billion US Dollars in 2013 (Deloitte 2013). Canada is fully engaged in developing crowdfunding-related legislation, and in Mexico, the government is consulting with business angel and venture capital groups about a crowdFund investing regulatory framework.

Figure 5: Global Perspective on Crowdfunding



Crowdfunding is dominated by the Western World, with the United States and Europe representing about 80% of

crowdfunding platforms (CFPs). North America and Europe factor to about 50% of the world's GDP (measured

in PPP – Purchasing Power Parity). It is appropriate to bear in mind that Asia currently represents about 44% of Internet users – and that is growing steadily.

Crowdfunding : Indian Perspective

Crowdfunding has always been a part of India's rich heritage. It may be argued that every major temple built in India over the past two thousand years has been financed through money contributed by scores of devotees. Every mass based, popular festival or event in India, is made possible only because of financial support from the local people – businessmen, shopkeepers, housewives, factory workers and so on. What is different about the new Crowdfunding wave is that the process has gone online – to social media (Facebook, Twitter), or through several new Crowdfunding websites, such as Wishberry.in, Catapooolt.com, Start51.com, Fundlined, and a half a dozen more, many of whom are members of the new National Crowdfunding Association of India.

India has seen a massive crowdfunding success story many years before the term was coined: the story of the Reliance Industries founder Dhirubhai Ambani. His small yet growing textile business was crowdfunded by communities across the Indian state of Gujarat. Today's India with its huge market and human capital has become a popular destination for global business and other investments that have identified opportunities.

There have been attempts at crowdfunding for art and culture like the Goa Project and campaigns like Teekay.org. Crowdfunding is slowly becoming an alternative funding channel for the film industry. Film Director Ravinder Singh from Karnataka recently raised Rs 51 lakh using Facebook and other platforms.

SEBI's Proposal

The Securities and Exchange Board of India ("SEBI") on June 17, 2014, issued a consultation paper on crowdfunding with an objective to help start-up companies and SMEs raise capital and also to check misuse of such avenues. The paper reflects much of the information in a previous IOSCO report and reviews the various approaches from other nations. The paper states that the crowdfunding platforms, approved by a screening committee, must play a role in reducing potential for fraud.

SEBI has provided various frameworks for raising of funds by startups, SMEs etc. as specified in the paragraph 7. In addition to the available frameworks, SEBI seeks to provide fresh avenues for startups and SMEs set up by young

entrepreneurs and technology professionals to raise early stage funding through internet based platforms, potentially more efficiently and cost effectively than through public issue or private placement offering.

Pure Donation Based Crowdfunding (where issuers directly seek donation from the grantors), Reward Based Crowdfunding (where issuers directly offers rewards like movie tickets, new computer game, download of a book etc.) and Peer-to-Peer lending do not fall within the regulatory purview of SEBI, as they do not generally involve issuance of securities for financial return, and may require authorization from other regulators. For example, Peer-to-Peer lending may fall under the purview of RBI. SEBI has proposed to allow only Accredited Investors to participate in crowdfunding. These include Qualified Institutional Buyers (QIBs); companies incorporated under the Companies Act of India, with a minimum net worth of Rs. 20 crore; High Net Worth Individuals (HNIs) with a minimum net worth of Rs. 2 crore; and Eligible Retail Investors.

Most of this limited class of investors expect an outcome out of their investment. This is a setback to creative works and social causes which do not give return on investments. The technical startups will benefit the most from this new class of analyze-before-investing. Earlier, most crowdfunding was through small donations from individuals who invested because a friend had recommended or they felt for the project. The emotional aspect in investment will take a backseat as the accredited investors will evaluate the project and its potential before investing.

A QIB will prefer to stay away from investing in a project where the risk element involved is higher and therefore, there are chances of investment not being returned. However, SEBI has proposed that a minimum of 5 per cent of the total number of shares of the company shall be held by QIBs.

The number of investors has also been limited to 200 except QIBs (on which there is no limit). SEBI gives a startup the freedom to have as many QIBs retains the traditional crowdfunding model, but does not address the disinterest of most QIBs in investing in creative or social cause startups as the chances of a return are lesser. A startup must be less than 4 years old and cannot raise more than Rs. 10 crore in a year. The investment may not satisfy the capital requirements of a few technical startups.

For receiving crowding, a company must not be a

subsidiary or related to any other company which has a turnover in excess of Rs. 25 crore. It must not be listed on any Exchange. Companies engaged in real estate and activities not permitted under industrial policy of the Government of India shall not be allowed to raise money through crowdfunding. Further, the issuer shall not raise capital from multiple platforms, and shall not loan out the funds.

An issuer shall have to disclose certain details of the company, its functioning and the venture it seeks to start. Most of the details required are basic and can be provided by an issuer. This is to ensure that an investor can make an informed choice.

According to SEBI, the financial sector crowdfunding market has doubled year-on-year for The last 5 years to an estimated USD 6.4 billion in 2013. A recent report in the Hindu Business Line indicates the emergence of the practice in India as well. The primary question under Indian law would be whether this would amount to a public offering in terms of section 67 of the Companies Act that requires a prospectus and associated compliances.

If the specific form of crowd funding involves issuance of securities such as shares and debentures, then an offer or invitation made to 50 persons or more could fall within the purview of a public offer. This is particularly so when the offer or invitation is made through the Internet or directed to specified persons. Moreover, this issue was magnified in the context of the litigation against companies within the Sahara group culminating in the order of the Securities

Appellate Tribunal. If the specific type of crowd funding indeed amounts to a public offering of securities, the secondary question would arise whether the Internet sites through which the funding is raised taken on the character of intermediaries that might require compulsory registration with SEBI.

Of course, this is still early days in the Indian context, but these are issues worth considering in advance of crowd funding becoming more prevalent in the Indian markets. Since the "Crowdfunding" phenomenon is gaining its popularity, its importance cannot be ignored. To regulate crowdfunding, it is very important to take note that while it is necessary to ensure that Start-ups/SMEs could raise funds at ease, it is equally important to ensure that no systemic risks are created wherein retail investors are lured by some unscrupulous players by substituting the existing framework, which has been developed over a

period of time through experience and observation.

Hence, there is Page 28 of 66 necessity to strike a proper balance between investor protection and the role equity markets can play in supporting economic development and growth.

10 Reasons Why India Could Fall In Love With Crowdfunding

Today, with India having given a decisive mandate to its new leadership, the country is poised to not just bring its economy back on track but also explore new ways to solve some of its challenges. It is here where creative concepts like crowdfunding could play a major role. Here are at least 10 reasons why:

1. More Jobs For Young India. 9 million Indians enter the job market each year, and this rising number will require the government to prioritize job creation plans, especially if they want the young and restless to be engaged and productive. How better to create jobs than to encourage entrepreneurship! Crowdfunding makes it easier for entrepreneurs to access the early capital they need for their business.

2. Global VCs Track Indian Startups. Stats like 3 out of 4 funded startups fail and 4 out of 5 startups in general fail, do little to increase investor confidence in Indian startups. Added to that the fact that most global investors, mostly US-based, tend to focus on startups in their vicinity. Therefore for Indian startups to grab attention of global VCs may will need to do much more. A successful crowdfunding campaign with some good traction can go a long way in helping investors buy into a startup's offering.

3. Customer Demand Leads Production. The notion that crowdfunding revolves only around funds can be misleading. While receiving funds may be the ultimate goal, it is the engagement opportunity with potential customers that is one of the biggest value-adds of running a crowdfunding campaign. With the delivery time established in the campaign, the product manufacturers can plan their product as per demand. There are many startups that have successfully planned and sold products with the help of a crowdfunding campaign. Crowdfunding helps maintain a good inventory turnover.

4. Collaborative Teams, The New Mantra. Thought-leaders have been regularly sharing various qualities needed for a startup to succeed — from founders' drive

and passion to having the right team in place and a good working relationship with partners. A successful crowdfunding project also requires the various stakeholders to collaborate for the larger goal. For example a product manufacturing company will need its production, delivery, sales and marketing teams to collaborate seamlessly in order to become successful.

5. Support Beyond Family & Friends. Unlike in some of the Western countries where government support is a way out in case of financial difficulties, in India it is the family and friends who tend to be more supportive. With crowdfunding, entrepreneurs may not only have the support of family and friends but also an extended group of early investors who believed in the offering. The support of this larger group can go on to contribute to a startup's success.

6. Fund Innovations For Indian Challenges. Unlike most mature economies, India's challenges are unique and more diverse. Crowdfunding can help address some of the issues such as supporting rural businesses through micro-financing, non-profits needing funds for causes like poverty alleviation, education, better health, scientific research and business growth.

7. Policymakers & Businesses Get together. It may be the case that the central government, various state governments and regulators have the biggest say in whether the benefits of crowdfunding can be realized. While lessons from other countries that have benefited from easing laws are out there to see, promoting crowdfunding in India may also set a good precedent of having law making by financial regulators and the industry working closely on issues that affect the country's progress.

8. SMEs Can Compete With Big Businesses. With the ability to reach out to the masses through crowdfunding, the small and medium enterprises (SMEs) have a good shot at competing with the bigger players who have the money and resources. With the funding figured, these SMEs can now focus on bettering their products and services. It is widely believed that if India needs to compete with the global powers, it not only needs large corporations but also innovative startups to succeed.

9. Fund Projects For & From The Community. Most corporates as well as lawmakers spread across political affiliations agree on many of India's priorities, including more citizens participation in governance and the need to improve infrastructure in the country. Successful crowdfunding projects like funds being raised by local

residents to build a foot over-bridge as well as other initiatives that serve a much larger community interest can be a good learning and implemented across India.

10. Compete Globally Based Out Of Anywhere. Crowdfunding also helps companies go global. No more does the location of the manufacturing unit or the founders' office matter, not as much as the founders' background and the product itself. Reaching out to the world has become much easier through crowdfunding.

Source: www.yourstory.com

10 Indian Online Crowdfunding Platforms

Crowdfunding in India is still in its nascent stages. The potential however is incredibly high for Indian crowdfunding with a nationwide upsurge in dynamic and fascinating independent projects breaking boundaries.

Table 3: Crowdfunding Platforms (CFP) in India

SI No.	Crowdfunding Platforms(CFP)
1	Ignite Intent
2	Start51
3	Bitgiving
4	Catapooolt
5	Wishberry
6	Funduzz
7	Pikaventure
8	Yourseva
9	Fundlined
10	The Hot Start

www.fundedflow.com

Challenges For The Development Of Crowdfunding

The researcher identified the following potential risks considered to be obstacles to the expansion of crowdfunding:

- Its novelty, continually changing nature and lack of research knowledge,
- Accountability and regulatory uncertainty,
- Lack of awareness of good practice,
- Uncertain sustainability of platforms,
- Public institutions are interested, but they still lack knowledge and a code of good practice.

Conclusion

India may soon bring in the requisite laws to support this in a big way, as efficient crowd funding system can really play the role of catalyst in bringing the startup ideas into reality. Creating such electronic platforms is beneficial from an economic point of view - they fill certain niches , increase the speed of financial transfers, their volumes and values, reducing transaction costs. Awareness of crowdfunding mechanism, safety and comfort behind the transaction will be key for the market to realize its potential. The growth of crowdfunding must be promoted, at the same time ensuring the avoidance of misconduct. The rate of growth of crowdfunding, and its emergence in developing and developed countries, suggests that this phenomenon can become a tool in the innovation ecosystems of most countries.

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(I) G.S Aneeshkumar

Assistant Professor, Post Graduate Department of Commerce and Research, BAM College, Thuruthicad, Pathanamthitta (Dist) Kerala, PIN 689 597
(Research Scholar in Commerce, Research &Development Centre, Bharathiar University, Coimbatore)

(II) Dr. S. Fernandez

Assistant Professor, Post Graduate Department of Commerce, St. Agnes College for Women, Aluva, Ernakulum (Dist) Kerala, (Research Scholar in Commerce, Bharathiar University, Coimbatore)

An Effective Course Management Framework for Academia using Agile Scrum Methodology

Abstract

Agile Scrum Methodology (ASM) is one of the most successful project or product development model used by the industry. ASM succeeded in attaining a clear advantage over the traditional waterfall framework, since waterfall model needed good knowledge about the end product in the beginning itself. Our academia follows a waterfall kind of model, where all the instructional planning is done in the beginning. Therefore few changes are made in the course content or delivery, based on the feedbacks received during the execution of the course. This is one of the reasons why the academia fails to catch up with the changes that the industry undergoes; this also opens up a gap between the industry and academia. In order to reduce the industry-academia gap, Agile Scrum Methodology is proposed as a course management framework for effective course delivery in academic institutions.

Keywords —Agile Scrum Methodology, Product Owner, Scrum Master, Sprint.

Introduction

Closing the gap between the industry and academia [1] is something that is said and practiced by many people over the years. But the fact is that the gap remains the same or even widened. There exists a cultural difference between the industry and the academia. But there has been a growing trend in industry and academia to minimize or even close this cultural gap. Using the successful practices [2] of industry/academia in academia/industry is one way to address the cultural issue.

Children, these days, grow up acquiring knowledge from many sources. Nowadays educational institutions not only act as interfaces for providing knowledge but also act as avenues for real experiences. If educational institutions fail in providing practical or industry relevant skills to the students, the industry-academia gap will be in serious danger.

Agile Scrum Methodology is an iterative and incremental framework effectively used in the industry. Unlike the waterfall model, ASM uses feedback from the previous sprints to make the system more effective. Most of the course delivery frameworks used in academia give little emphasis on feedback, especially from the stakeholders, for making immediate changes in the course structure.

In such academic frameworks, modifications suggested through will come into effect with significant delay. These kinds of delays are the main cause for the gap between industry and academia. ASM overcomes this problem by incorporating the changes identified during various phases of course delivery.

Existing Academic Framework

Academia follows a course delivery framework that resembles the Waterfall Model of product development. Figure 1 shows the overall view of the course delivery system that starts with course designing where the curriculum is formed. Thereafter in course planning, each faculty plans their course for delivering it in a duration of one semester or one year. Then the course is delivered as per the plan. Course feedback is taken once or twice during the course delivery or by the end of the course.

Some may use suggestions from the feedback and make appropriate changes in the course delivery. But very little changes are made in the original course content. Therefore this framework takes at least 6 months or even a year to make any significant change in the course planning or course design. Attempts are made in the field of academics, especially in online course delivery, using agile methodology [3][4] to modify the course delivery framework.

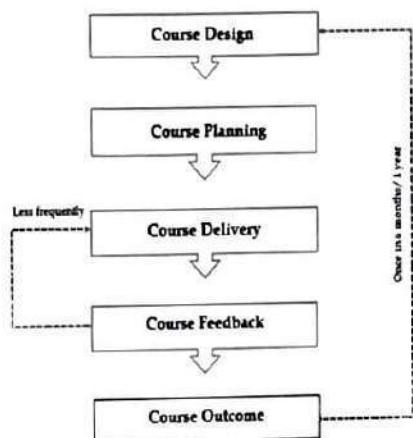


Fig. 1. Waterfall Model in Academia

The Waterfall framework in academia has the following disadvantages:

- Those who are responsible for producing the course (faculty handling subjects in a class) need not interact with other subjects are handled (the methodologists, who handle other faculty, subject completion status, performance of students etc.) in the same class.
- This lack of interaction among the faculty may affect the outcome (results) of the class.
- Work completion (subject-wise) need not be in a uniform pattern at specific period of time of a semester/year.
- Submission deadline of class works/assignments or dates of class tests of different subjects may overlap quite often; this adds more pressure on the students and even reduces the originality of the work they submit and even their performance.
- The scope of incorporating quick changes or policies (based on feedbacks from students) into the existing course plan is very limited.

Proposed Agile Scrum Model

Scrum is one of the popular frameworks that introduces agility into a system. The proposed agile scrum for academic model makes use of the simplicity and flexibility of scrum. This model gives more emphasis on empirical feedback, self-management of teams, delivery of main goal in increments within short terms.

Agile Scrum has only three roles: Product Owner, Scrum Master and Team.

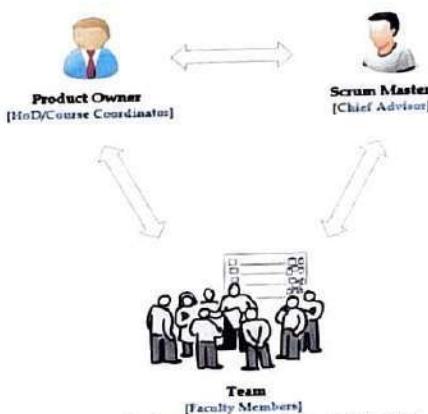


Fig. 2. Roles in Agile Scrum Model

A. How Does Agile Scrum Works

The process starts by collecting course plans from respective faculty handling subjects for a particular class and forming the overall course plan. The Product Owners (PO), shown in Figure 2, then prioritizes contents of overall course plan.

Figure 3 shows the various items in the overall course plan. It includes topics and other works submitted by faculty members. The prioritization of the items in the overall course plan is done by considering various factors. The entire course plan is executed as different sprints called terms. Topics to be completed in a term is selected from the overall course plan based on the academic calendar. The Scrum Master explains the Team about the term and conducts periodical meetings to monitor the progress of the work. The Scrum Master uses a burn-down chart for analyzing the work progress.

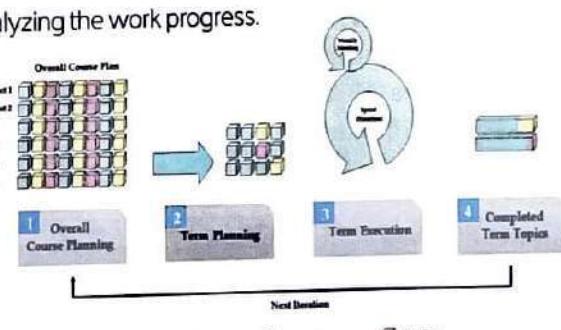


Fig. 3. Burn-down Chart

B. Roles and Responsibilities

The roles and responsibilities of Product Owner, Scrum Master and Team are as follows:

- Product Owner (PO): PO can be any person having a complete understanding about the course, academic schedule, examination pattern, resources available (including the skills of faculty members), expectation of the students etc. The Head of the Dept. (HoD) or a Course Coordinator can be considered as a PO.

The PO collects the course plans of each subject from respective faculty members who handle different subjects in a class. Then the PO scrutinizes the course plans and prepare a master plan for delivering different courses. In the proposed framework, the course is delivered in different sprints, called academic terms or simply terms. The ideal term size proposed is 3.

Term 1: period before 1st midterm examinations.

Term 2: period after 1st midterm & before 2nd midterm examinations.

Term 3: period after 2nd midterm examinations.

- Scrum Master (SM): SM identifies the topics to be completed in a term from the master plan prepared by PO. Topics for a term includes theory topics, assignments, and unit tests for different subjects. SM is considered as the coach for the team, helping the team do the best work it possibly can. Chief Advisor or mentor of a class can take the role of the SM.

- The Team: Faculty handling subjects in a class forms the team. Normal team size is 6 to 8. Each member of the team prepares a detailed course/subject plan of the subjects assigned to him/her for the semester/year. This includes hour-wise topic completion plan, topics/questions for assignments, details about unit tests etc. The team can suggest minor changes in the submitted course plan during or after each term, make changes suggested by the SM etc. monitors the progress of the term using a burn-down chart, conducts periodic meetings (weekly or bi-weekly), make changes in the master plan (if needed) based on the feedback.

C. Burn-down Chart

A burn-down chart is a graphical representation of the outstanding work or backlog (Y - axis) with respect to time (X- axis). The burn-down chart is a good indicator of the work progress and it even predicts the completion time of the work. In the proposed Agile Scrum for Academia, the burn-down chart shows the status of the work after or during different terms.

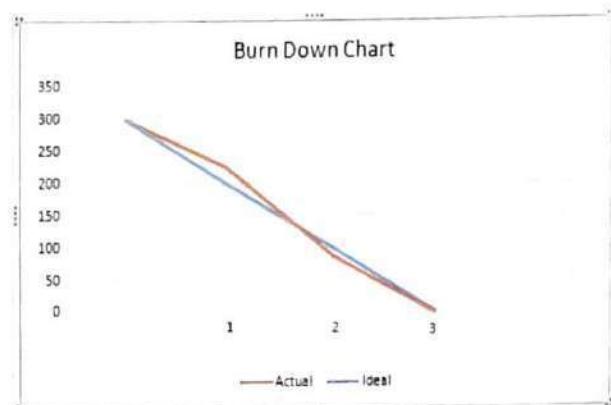


Fig. 4. Proposed Agile Scrum Model for Academia

Figure 4 shows the burn-down chart corresponding to a sample course plan prepared for 300 hours (50 hours each for 6 subjects). This burn-down chart is based on the data shown in table 1. Table 1 shows the ideal and actual working hours planned for 3 terms of a course consisting of 6 subjects of 50 hours each. Data in table 1 shows that the actual work remaining after term 1 is lagging behind the ideal work planned. Table 1 also shows that after term 2 the actual work remaining is leading the ideal work. These two scenarios are to be avoided for the smooth and effective delivering of a course. The burn-down chart gives an early indication of these scenarios to the Scrum Master, so that the SM can utilize his resources appropriately to overcome the above mentioned scenarios.

Table 1: Sample Course Plan

Ideal (Total Work Estimated in hours)	300	200	100	0
Actual (Total Work Remaining in hours)	300	225	85	0
Term	0	1	2	3

D. Uniqueness of Agile Scrum for Academia Model

The proposed agile scrum for academia model has the following uniqueness compared to the existing academic models:

- Agile Scrum for Academia (ASA) framework considers the performance of students in a class (e.g. Semester 3 EEE) as the product.
- ASA framework provides better transparency and coordination among faculty members handling different subjects in a class.
- Faculty members feel a collective responsibility as far their class is concerned.
- All faculty aim for a common goal, which seems to be missing in the current waterfall framework, and each faculty will have a short term (sprint) goal too.
- The product backlog will give the product owner a complete idea about the work to do done for a class in a

particular semester/year. The product owner can ensure uniformity in the planning done by each faculty.

- The burn-down chart will give the chief advisor (scrum master) a better view of the work left with respect to time. This helps in normalizing the content delivery and ensures that the progress of each subject will be uniform at any period of time.
- Changes can be incorporated in the course plan during or after each term (sprint) of work.

CONCLUSION

In order to solve our country's developmental problems both industry and academia must go hand in hand. Industry and academia should complement each other's best practices. This paper proposes a framework, which is popular and successful in the industry, to the academia. Agile Scrum methodology will add more dimensions to the course planning and delivery system, and also expect to bring more agility into the academic environment. Setting targets for terms and making modifications in the course design and planning based on the needs of the stakeholders will definitely match the fast-changing industry needs.

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(I) **Riji N. Das**, Knowledge Officer,
ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, India. email: riji.n@ictkerala.org

(ii) **Sreekanth D.**, Knowledge Officer,
ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram, India. email: sreekanth.d@ictkerala.org

Hadoop – A great choice for reskilling for IT professionals

Abstract

One of the most desirable skill sets in the market today is mastery in data science. This is a specialized field that requires multiple skills, and demand for data scientists far exceeds the supply. Hadoop is the technology to learn to become a highly sought-after data scientist.

The simple truth about software professionals is that they need to have multiple skills. If they don't reskill themselves, they will become redundant. Employees themselves must take the initiative to update their tech skills if they want to remain valuable to the company. Otherwise the specter of downsizing, layoffs, or workforce reduction is always hanging over an IT professional's head, especially the case of mid-level managers who seem to have lost their ability to code, and haven't updated their skill sets. This paper discusses how the 'hadoop technology' acts as an alternate skill set for IT professionals.

What is Hadoop and why does it matter?

Hadoop is an open-source Java-based programming framework that enables large data sets to be processed in distributed computing environments. It was created by Doug Cutting, who named the framework after his child's favorite toy - a stuffed elephant. Hadoop was inspired by Google's MapReduce, which allows an application to be broken to a number of small blocks and run these small blocks on any node in the cluster.

How do companies use Hadoop?

Hadoop offers a powerful distributed platform that can efficiently store and manage big data. Businesses can really start thinking big with Hadoop because it removes the

constraints on storing and processing humongous amounts of data. Businesses and government organizations find use for Hadoop in research, statistical analysis, and performing quick calculations leading to real life applications such as developing better cures for diseases, reducing bureaucracy, and even using satellite information for defense purposes. At a more routine level, it can help businesses sell more and gain more customers.

Gartner's "Predictions 2015: Hadoop Will Become A Cornerstone Of Your Business Technology Agenda" predicts that "Hadooponomics" will be a must have for large enterprises because of its ability to scale both storage and processing of data.

Important features of Hadoop

Hadoop is a big deal, really. Here are some of its salient points that change the dynamics of large-scale computing.

Cost effectiveness

Hadoop allows businesses to significantly reduce the cost of data storage by bringing parallel computing power to commodity servers.

Scalability

You can add new nodes as and when you need without having to change data formats, the way in which jobs are written, or even other applications in the environment.

Fault tolerance

Even if you lose a node, Hadoop has the ability to redirect the work to a different location and continue with the processing without disrupting anything.

Flexibility

Since Hadoop has no schema, it can take in any type of data from any number of sources, regardless of its structure. Even data from different sources can be aggregated in multiple ways in order to deeply analyze it, and gain more insight than is the analysis of just a single system.

Hadoop-as-a-Service market is expected to reach \$13.9 billion by 2017, and the big data market is expected to hit \$23.8 billion in the same year.

This is why Hadoop matters for businesses, and therefore, for potential job aspirants..

Market predictions for Hadoop in 2015

Here are the key points from predictions made by Computer Business Review.

Estimated market growth rate of \$2.2 billion

According to MarketAnalysis.com, the Hadoop MapReduce market will grow to \$2.2 billion with a compound annual growth rate of 58%. In the last few years, This growth is expected to happen because of the growing amounts of data that is being collected and stored and analyzed by large enterprises. Most of the current vendors offer solutions that are quite expensive.

Continued evolution

Hadoop is evolving continuously with its active community development. We can expect to see more innovations happening this year.

Viable alternative to traditional databases

Hadoop will respond to the demand for being more transactional and real-time, thus becoming a suitable alternative for traditional databases such as Oracle MySQL.

Not ALL companies are going to jump into the bandwagon

While Hadoop makes large-scale real-time processing financially viable, it will need to be integrated with the existing tools in order to extract meaningful insights. Also, Hadoop specialists are expensive nowadays, which will add to the company's costs. Research by IDC expects 45% of European organizations to use Hadoop by the end of the year.

Emerging market leaders

The market leader in big data processing will be someone who provides an easy interface to work with and on top of Hadoop. Marklogic and Cloudera are expected to build on the existing foundations and emerge as market leaders.

Alternatives to Hadoop

We can also expect to see alternatives emerging. For example, there is a rising use of Apache Spark where timeliness is the key element. However, it remains to be seen whether the other tools will be able to match the power and cost effectiveness that Hadoop offers.

A rising number of Hadoop professionals

At the moment, Hadoop consultants are quite expensive because they are highly in demand. Though the demand will continue over the next few years, the skills shortage is expected to disappear as existing developers of enterprises will pick up Hadoop skills. Experienced professionals are lining up to gain proficiency in Hadoop, while at the same time, both the open source community and vendors are busy at work building tools that make it easier to use Hadoop.

Self-service analytics

As Hadoop is expected to become mainstream and easy to use, people at all levels within the organization will be able to gain useful information in real-time, thus opening up all of the organization's data to a much wider group of audience.

Large-scale deployment

The early adopters of Hadoop, who used it for isolated projects will start larger scale deployments that are driven by strategic requirements to increase data storage, processing, and analysis.

SQL will be the app to watch

The data querying tool used by developers, SQL, is expected to become the most commonly used app in the Hadoop ecosystem, according to Forrester. Many professionals already know SQL and there are several existing technologies that already interface to it.

Career prospects for Hadoop professionals

With many enterprise giants considering Hadoop to be an important aspect of their data architectures, developers with the right skillsets will be highly in demand. Companies like IBM, Cloudera, Cisco, HortonWorks, Yahoo, Google,

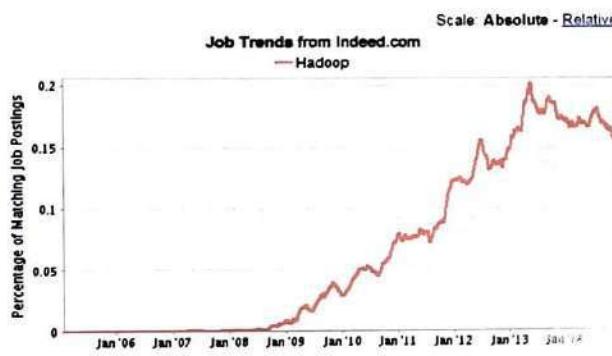
Amazon, Microsoft, and many others need a number of Hadoop professionals - both experienced and freshers. Many companies are looking for data scientists and analysts who have Hadoop as the main skill.

You can expect to be hired to be positions of:

- Hadoop developer
- Database administrator
- Software tester
- Product manager
- Data architect
- Systems engineer
- Hadoop administrator
- Big data consultant

Here's a snapshot of the job trends on Hadoop from Indeed.com. It is most definitely on an upward path.

Hadoop Job Trends



Indeed.com searches millions of jobs from thousands of job sites.
This job trends graph shows the percentage of jobs we find that contain your search term.

Broad profiles and expected skills

Hadoop developer: Knowledge of SQL, core java, and other scripting languages. Knowledge in Hive, Flume,

HBase etc. can be an added advantage.

Hadoop administrator: Knowledge of PIG, HBase, Sqoop, Hive. Ability to administer Linux and Unix.

Data Analysts and Scientists: Experience in languages like Java, Ruby, Python, and machine learning techniques.

Salaries for Hadoop professionals:

According to PayScale, salaries can range from above Rs. 4L per annum to above Rs. 16L per annum for Hadoop professionals.

Job	National Salary Data (?)	Rs. 0	Rs. 600K	Rs. 1.2M	Rs. 1.8M
Senior Software Engineer 51 salaries	Rs 791,138				
Software Engineer 40 salaries	Rs 566,702				
Data Scientist, IT 29 salaries	Rs 616,736				
Software Developer 22 salaries	Rs 404,422				
Technical Architect 18 salaries	Rs 1,649,854				
Sr. Software Engineer / Developer / Programmer 16 salaries	Rs 650,000				
Lead Software Engineer 14 salaries	Rs 1,450,000				

Source: PayScale | Currency: INR | Updated: 10 Jan 2015 | Individuals Reporting: 391

Hadoop is definitely one of the hottest skills sought after by the IT industry today. As an IT professional looking to keep his or her job, the onus is on to arm individuals themselves with the right tech skills. Make the right choice. One simply cannot go wrong with Hadoop.

Rajan Singh, CEO
CourseBrew, Technopark, Trivandrum, email: rajan.singh@coursebrew.com

Cloud Computing and Security

Abstract

Cloud computing is an emerging technology that may help enterprises meet the increased requirements of lower total cost of ownership (TCO), higher return on investment (ROI), increased efficiency, dynamic provisioning and utility-like pay-as-you-go services. However, many IT professionals are citing the increased risks associated with trusting information assets on the cloud as something that must be clearly understood and managed by relevant stakeholders. This paper details Cloud Computing and then discuss security in cloud computing.

What is Cloud computing ?

As per National Institute of Standard and Technology (NIST)'s Special Publication 800-145 the definition of Cloud computing is " a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks,

servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction". NIST defines cloud computing by describing the five essential characteristics, three cloud service models and four cloud deployment models. They are summarized in below diagram.

The Five essential characteristics:

- **On-demand self-service**—computing capabilities can be provisioned without human interaction from the cloud service provider (CSP).
- **Broad network access**—Computing capabilities are available over the network and can be accessed by diverse client platforms.
- **Resource pooling**—Computer resources are pooled to support a multitenant model.

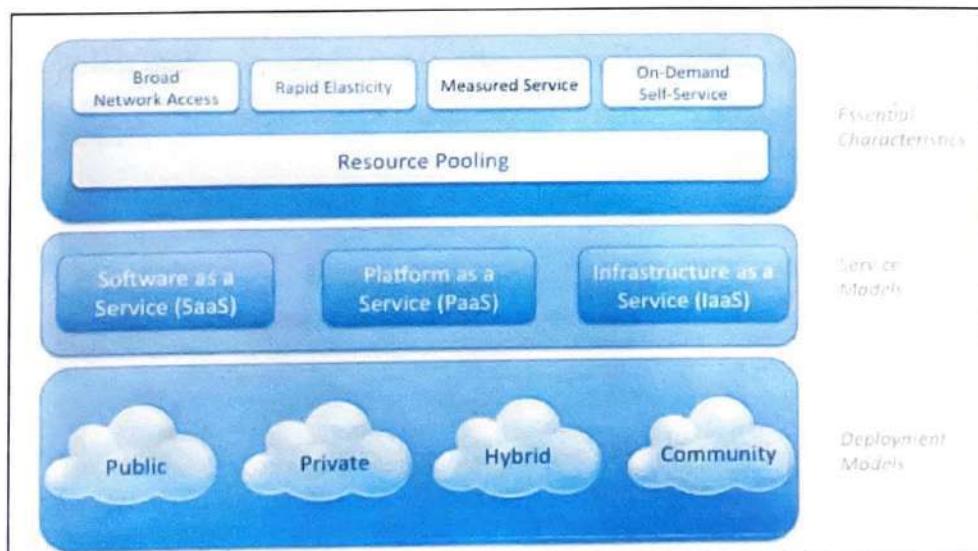


Figure 1 – NIST Visual Model of cloud computing definition (SOURCE -CSA Guide V3.0 from Cloud security Alliance)

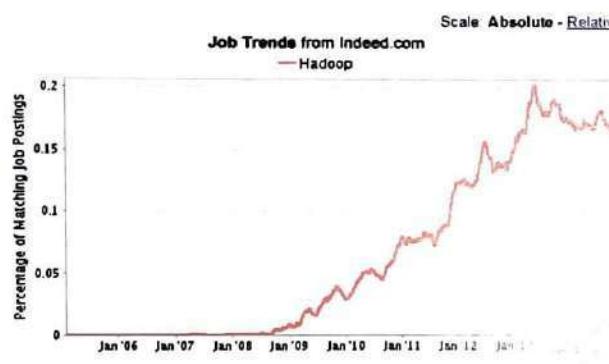
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- **Rapid elasticity**—Resources can scale up or down rapidly and in some cases automatically in response to business demands.
- **Measured service**—Resource utilization can be optimized by leveraging charge-per-use capabilities.

Three Service models:

There are three main service models and each represents a different level of involvement of an outsourcing partner or cloud service provider (CSP):

- **Infrastructure as a Service (IaaS)**—In an IaaS solution, the CSP provides cloud users with processing, storage, networks and other fundamental computing resources. Operating systems and applications, however, are the responsibility of the user and are not included in the service offering of the CSP. Examples are: Rackspace®, Equinix®, Softlayer®, iomart Group plc, Amazon Web Services LLC, etc.
- **Platforms as a Service (PaaS)**—PaaS entails the CSP making available infrastructures and platforms on which cloud users deploy their own applications. This requires the CSP to support programming languages, libraries, services and tools. Examples are: Google App Engine™, Microsoft® Windows Azure™, Heroku, OpenShift, Amazon Web Services LLC, etc.
- **Software as a Service (SaaS)**—when opting for SaaS, cloud users not only hire infrastructure and platforms from the CSP, but also run CSP-provided applications on them. Examples are: Computer Services Inc., Salesforce, New Relic®, Logicworks, Apptix®, Google App Engine, Microsoft Windows Azure, Amazon Web Services LLC, etc

Cloud Deployment Models

- **Public cloud**—The infrastructure is made available to the general public (e.g., Google Apps, Amazon Elastic Compute Cloud (EC2™), Apple® iCloud). It is deployed within the CSP infrastructure, offsite to the enterprise infrastructure.
- **Community cloud**—The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from enterprises or interest groups (e.g., vertical industries, schools, researchers, software developers) that have shared concerns. It can be deployed onsite (within the enterprise infrastructure) or offsite (within the CSP infrastructure, also called "outsourced").

- **Private cloud**—The infrastructure can be used only by one single enterprise. As for community clouds, it can be deployed onsite or offsite enterprise premises.

- **Hybrid cloud**—The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community or public) that remain unique entities.

Security in Cloud Computing

The Security responsibility of both the CSP and the consumer greatly differ between cloud service models.

For IAAS – CSP's responsibility for security is up to the hypervisor, meaning they can only address security controls such as physical security, environmental security and virtualization security. The consumer is responsible for security controls related to IT system including Operating system and applications.

For SAAS- The CSP provides the entire stack, means the cloud service provider is not only responsible for physical security but also responsible for security controls on the infrastructure, the applications and the data.

For PAAS- This lies somewhere between IAAS and SAAS where CSP provides security till platform (Operating system) and consumer is responsible for security controls at applications and data.

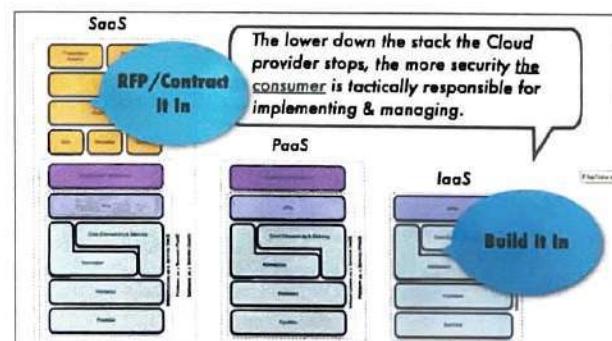


Figure 2- How security gets integrated (SOURCE -CSA Guide V3.0 from Cloud security Alliance)

Some examples of cloud computing risks for the enterprise that need to be managed include:

Enterprises need to be particular in choosing a CSP. Reputation, history and sustainability should all be factors to consider. Sustainability is of particular importance to ensure that services will be available and data can be tracked.

- Third-party access to sensitive information creates a

risk of compromise to confidential information. In cloud computing, this can pose a significant threat to ensuring the protection of intellectual property (IP) and trade secrets.

- Due to the dynamic nature of the cloud, information may not be immediately located in the event of a disaster. Business continuity and disaster recovery plans must be well documented and tested. The cloud service provider must understand the role it plays in terms of backups, incident response and recovery. Recovery time objectives should be stated in the contract.
- The CSP often takes responsibility for information handling, which is a critical part of the business. Failure to perform to agreed-upon service levels can impact not only confidentiality but also availability, severely affecting business operations.
- The dynamic nature of cloud computing may result in

confusion as to where information actually resides. When information retrieval is required, this may create delays.

- Public clouds allow high-availability systems to be developed at service levels often impossible to create in private networks, except at extraordinary costs. The downside to this availability is the potential for commingling of information assets with other cloud customers, including competitors. Compliance to regulations and laws in different geographic regions can be a challenge for enterprises.

More Information to look around for Cloud computing and security in Cloud computing at following links

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*Ashish Sharma, Head
Global Information Security Team, South East Asia, Oracle*

Student to Professional, the Tumultuous Journey in Tomorrow's World

Abstract

The world of the morrow will be indistinguishable of the todays, in that the waves of innovations will overwhelm the lives of the species of this planet. The users and consumers will have a much say in the way their product/services should be. They will come to the centre stage of tomorrow's innovations. The artificial barriers between domains and technologies will be a thing of the past. All these will urge the future professionals to be multi-disciplinary and aspiring individuals truly moored to knowledge accentuated with practical exposure.

The educational system will be challenged to move from abstract requirement from its principal stakeholders to the community. The society and the employers will also face similar challenges.

There will be perceptible differences in which the knowledge is disseminated and consumed within the system. The knowledge delivery will be on a constant barrage of conflicting requirements from the stakeholders. The landscape of learning will be oscillating with the changing requirements.

The faculty, who will be the principal actor in the whole drama, will be called upon to grapple with the challenges of the dynamic environment and equip themselves gamely to stay relevant.

1.0 Real or Fiction

The truck just left for its destination with the cargo carefully secured. Twenty minutes into its journey, as it was approaching the state border, the driver was alerted by a green blink on his dashboard navigation radar. He knew that

he had been passed through the check post. The on board RFID tag had communicated the voyage details of the truck. He had filed his journey plan online at his originating station. And he knows that this would have been unobtrusively communicated to every check point. He also knew, the check point sensor had received the details from the RFID, verified the details with journey plan and had passed him through.

After two hours into the journey, the surveillance system in the state headquarters identified an odd incidence on the National Highway. A truck was deviating from its journey plan. The system immediately flags the truck as "suspect" and conducts a background check immediately. As this is happening, the truck had clearly left the highway and detouring into the wilderness of the forest. The surveillance system which is observing all this, immediately upgrades the flag as "rogue". The system immediately identifies the closest Highway Patrol and radios the message for lookout. The system also sends an electronic signal to the next boom barrier on the road taken by the truck which noiselessly closes the access. The system also despatches a civilian drone to the site of incidence from its nearest base for an aerial reconnaissance. And within minutes the rogue had been apprehended and investigation had started. Using IoT, the system had collected and commenced its analysis of plethora of parameters, the vehicle, its ownership, engine performance, journey performance, average and maximum speeds, driver behaviour etc., to unearth any odd information which would help in the investigation.

In another section of the city, in a hospital, a patient had arrived in a state of unconsciousness. He was picked from

the road as he was falling down. There was no one who was accompanying him. He was a male aged about fifty years, not seem to be a native of the state, at least from the physical looks. As the person was losing conscious, his wearable gadget had taken over.

It had sent a SoS to the ambulance and police services. One of the ambulances which had picked up the signal and using the GPS coordinates reached the spot in minutes. As the driver was getting down, he had actuated the button on his dashboard to swing open the doors and to hydraulically present the stretcher.

The person was immediately taken into the ambulance and whisked away. While this was happening, the wearable gadget had established contact with the on board system on the ambulance and quietly transmitting the medical history and the present condition of the patient.

The on board system in turn began communicating the vital parameters of the patient to the casualty department of the hospital. The video camera inside the ambulance was beaming the real time happenings within the vehicle.

As the ambulance was approaching the hospital, the doctors had known that a patient by name Narendra Gupta, hailing from Bhopal, with a history of CHD and Diabetes mellitus, who had a coronary bypass about 5 months back and on medication, is arriving.

The doctors also knew of all the drugs and treatment he had been put on and the medicines which he is allergic to. The Cardiac Intensive Care Unit had been alerted and the Diabetologist in the hospital had been requested to stand by. The patient's relatives and the insurance had been informed and alerted.

Some of these stories, as it had been narrated might look straight out of Science Fiction. If one were to carefully look at the developments quietly taking place around the world, all these may not be of distant future.

2.0 Waves of changes

The world is witnessing a rare phenomenon of disruptive innovations – Innovations which will directly affect the citizens of the world positively. These changes will transcend the barriers of geography, culture and behaviour. They will be ubiquitous and unobtrusively taking the centre stage of our lives. The distinct contours

of domains and technology are disappearing, replaced with a happy confluence of thoughts and interexchange of ideas.

These disruptive innovations are as far afield as infrastructure, renewable energy, financial services, manufacturing, supply chain management and also the governance.

The current day innovation tsunami is not without its flip side. The new products and services are flooding the consumer market as fireflies, each with unpredictable permanence. These include innovations of radical as well as incremental consequences to the consumers. The unpredictability of such innovations has led to yet another paradigm shift – Social Computing.

Social Computing, which is a current buzz word, is bringing the users' community as an irrefutable partner in the innovation. Social computing at MIT says that they create sociotechnical interventions to better allow people to collectively shape the world around them.

Collaborative imagination not restrictive of and constrained by domains, technologies and geographies will fuel tomorrow's innovation.

This is evident from the fact that all the progressive organisations around the world are eager to engage the people in their innovation journey and their voices are given the importance which they richly deserve.

Another interesting development which is changing the innovation landscape is the development platform for innovation and leaving the innovations itself to the user. Internet of Things, Internet of Everything, Industrial Internet, Mobile platforms, Cloud Computing, Platform as services, Component Engineered products are examples of such an approach, where the user is free to create the solution he desires using the platform available to him.

3.0 Interplay: Learning and Practice

These waves of changes in the horizon will be having upsetting effect on the way educational system responds to the needs of its stakeholders, of which the student community is one amongst many. More importance will be given to: Guided Learning, Peer Learning, Collective Learning, Learning by observation and Learning by practice. The entry into and exit from the educational system by the student will be more

determined by him than by the system itself. Situations will be plenty where students make, a mid-course correction in his pursuit of academic goals. The students may be allowed to go on sabbatical for practical experience and may join the system to complete his academic goals later.

It may not be surprising to see students having obscure combination of specialities which are hitherto unheard of. Adaptability and adoptability are the two eluding virtues which every student will be striving to acquire. He will be required to have his head high and swim in the red ocean when he is ready to enter the profession.

4.0 Faculty – the principal actor

All these, will have a concomitant challenges to the faculty in the way they respond to the needs. From the role of a teacher they may have to metamorphose into a facilitator of

learning. Their worth as a learning facilitator will be determined by the constant updation of theoretical knowledge in consonance with its practical application. The dividing line between the faculty and practicing professionals will be rendered porous, encouraging movement from one to the other. The acceptance and worth of the faculty will be decided by their contribution to the practice of the profession. The Research and Development will itself, more often than not, be determined by the needs of the industry and society. The research scholars will be compelled to align their research pursuits to the societal goals, in order to stay relevant.

These interesting but challenging issues will arrest the attention of all the stakeholders of the educational system in the coming years. And the success of these far reaching changes will decide the future of the country as a credible player in the global arena.

Soundar Rajan E

Eternal Learner & Expert in Management & Technology and a Consultant, email:soundare@gmail.com

Unleashing creativity in you

Abstract

Has this ever happened to you? You're out for a jog, completely relaxed, your mind a pleasant state; then all of a sudden the solution to a problem you've been pondering over for week's pops into your head. You can't help but wonder why you didn't think of it before. We tend to think of the moment of insight and creativity in sudden and surprising terms: the bathtub overflowing (Archimedes), the apple beaning off the head (Newton), the bolt of lightning trembling the key at the end of a kite (Franklin). In the common imagination, ideas come full-formed in a flash of brilliance, raining down like sustenance from some deity of inspiration. Many layman still view creativity as purely a product of individual talents and traits. For a long while, most creativity researchers seemed to hold the same view. This article attempts to find out how creativity can be unleashed from within us and also looks into various techniques for enhancing creativity.

Key words: Creativity, Multiple Intelligence, Mind mapping, Six Thinking hats

Creativity is a phenomenon whereby something new and in some way valuable is created. It can be a new literary work, a new business idea, inventions, music composition etc. The definitions of creativity includes a gathering of approaches involving several disciplines; science psychology, education, philosophy (particularly philosophy of science). Reid and Petocz (2004) mention that creativity is viewed in different ways in different disciplines: in education it is called "innovation"; in business "entrepreneurship"; in mathematics it is sometimes equated with "problem-solving", and in music it is "performance or composition".

People are capable of creative achievement in some areas

of activity, provided that the conditions are right and they have acquired the relevant knowledge and skills. The traditional theory of IQ goes with Howard Gardner's concept of Multiple Intelligence. Creativity has been shown to be distinct from intelligence (children scoring high on intelligence tests are not necessarily highly creative). As per Howard Gardner in his book *Frames of Mind* (1983) "An intelligence is the ability to solve problems, or to create products, that are valued within one or more cultural settings. This suggests that thinking, problem solving, and creating are valued differently depending on the family and community in which individuals live, learn and work. Based on the criteria that he developed, Howard Gardner identified the following eight intelligences:



Figure 1- Eight types of intelligences by Howard Gardner

Each individual has the capacity to display all of these intelligences, but some intelligences are more highly developed than others on some individual.

To combine these variety of definitions, we can say that creativity involves the generation of new ideas or the recombination of known elements into something new or providing valuable solutions to a problem.

Creative problem solving process

The most prevalent creative problem solving process was developed by Isaksen, Dorval, and Treffinger (2000). It consists of four components:

- 1) Understanding the problem
- 2) Generating ideas
- 3) Preparing for action
- 4) Planning the approach

Acquiring creative problem solving skills

Gomez (2007) argued that creative students show certain characteristics such as originality, persistence, Involvement, independence etc. that make them unique from their peers, and these characteristics can be boosted through computer technology and multimedia, especially the capability to use graphics more than text to express meaning and provide links.

Creativity Techniques

There are many suggestions in literature as to how to develop creative abilities from childhood to adulthood. Some of the creative techniques are mentioned below.

1. Mind maps

What is a Mind Map?

This concept was developed by Tony Buzan(1996). A Mind Map is a graphical representation of ideas and aspects around a central idea or theme, showing how these aspects are related to each other. This brings structure and give an overview and clarity of the problem. Mind maps can be a very good tool in primary planning of project idea and creating new ideas or exploring uncharted possibilities. This helps in systematically emptying of abstract thoughts and notions.

How to Use a Mind Map?

Starting Point

The starting point of a Mind Map is a central theme, for example a problem or an idea.

Expected Outcome

The outcome of a Mind Map is a structured overview of

ideas and thoughts around a concept or a problem, represented visually.

Possible Procedure

- 1) Write the name or description of the theme or main topic in the center of a piece of paper and draw a circle or image around it.
- 2) Expand from the each major facet of that theme, placing your thoughts on lines drawn outward from the central thought like roads leaving a central junction. The main theme should radiate outwards from the central theme. These main themes are called Basic Ordering Ideas (BOIs) are similar to the chapter headings in a book
- 3) Add branches to the lines as necessary. Lines can be made thicker or thinner showing the importance of topics.
- 4) Use additional visual techniques –It is said pictures are worth a thousand words and it helps in better recall for example, different colors for major lines of thought, images, circles around words or thoughts are used . Thicker lines should indicate the importance
- 5) Study the Mind Map to see what relationships exist and what solutions are suggested.
- 6) Reshape or restructure the Mind Map if necessary



Figure Two- A sample map –Technique developed by Tony Buzan

2. Lateral Thinking

Edward de Bono writes in "Serious Creativity", how he became interested in the sort of thinking that Computers could not do: creative and perceptual thinking. Lateral thinking is about moving sideways when working on a problem to try different perceptions, different concepts and different points of entry. He is of the view that rather

than approaching problems in same way , we need to look to the problems laterally .The term covers a variety of methods including incitements to get us out of the usual line of thought.

Early in the 1980s Dr. de Bono invented the Six Thinking Hats method. The Six Thinking Hats tool is a powerful technique used to look at decisions from different points of view. This helps us move away from traditional habitual thinking styles and towards a more holistic view of a situation. There are six different imaginary hats that can put on or taken off. Each hat is a different color and represents a different style of thinking. In de Bono's words it "separates ego from performance". This technique allows the necessary emotion and skepticism to be brought into what would otherwise be purely rational decisions, thus opening up an opportunity for creativity within decision making. It also helps, for example, persistently pessimistic people to be positive and creative.

Six distinct directions are identified and assigned a color. The six directions are

1. White hat - neutral - (think of white paper) Information
2. Red hat - Feelings, emotion, intuition, hunches,
3. Black hat - Caution, morality, legality, judgment,
4. Yellow hat – Positive, paybacks, optimism,
5. Green hat – New ideas, options, opportunities
6. Blue hat – Control of the process, conclusions, action plans

Benefits of Six Thinking Hats Method

- Decisions seem to made themselves
- Focused thinking
- Improved exploration
- Improved creativity & innovation
- Foster collaborative thinking
- Provides a common language
- Help people work against type, preference
- Removal of ego from decisions (reduce confrontation)
- Allows a switch in thinking without threatening ego.
- Saves time

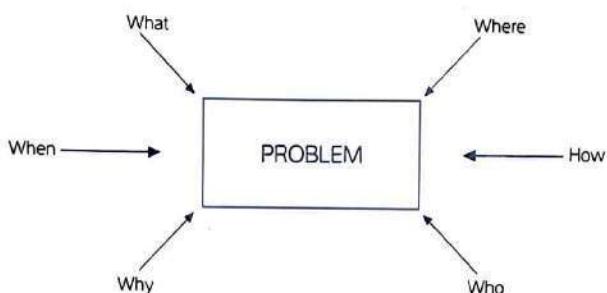
3. The Six Universal Questions 5 Ws and One H

The Five Ws and one H, or the Six Ws are questions whose answers are considered basic in information-gathering. They are often mentioned in journalism, research, and police investigations . They constitute a formula for getting the complete story on a subject

- Who did that?
- What happened?
- When did it take place?

- Where did it take place?
- Why did that happen?
- How did it happen?

The questions help to generate ideas, get clarity, evidences or suggestions from a problem or an idea. Rudyard Kipling once told" I keep six honest serving men. They taught me all I knew: Their names are What and Why and When And How and Where and Who"



4. Classical Brainstorming

The term Brainstorming has become a commonly used word in the English language as a broad term for creative thinking. The brainstorming process encourages all members of the team engage equally and presents a non-hostile settings for the generation and collection of ideas. The generation phase is separate from the judgment phase of thinking. Basic rules for Brainstorming are:

- 1) All the ideas are recorded by the facilitator on a large sheet of paper or board
- 2) The participants call their spontaneous ideas as a reaction on the problem definition
- 3) All ideas are encouraged .There is no room for criticism of each other's ideas
- 4) Build off each other's ideas
- 5) Get to the point

5. Scamper

The SCAMPER technique is a checklist that will assist in thinking of changes that can be made to an existing product to create a new one. These changes can be used either as direct suggestions of change or as starting points for lateral thinking.

'SCAMPER' stands for the following seven kinds of potential product changes

- S – Substitute – mechanisms, resources, people
- C – Combine – mix, integrate, combined with other assemblies or services,
- A – Adapt – alter, change utility, use part of another component
- M – Modify – increase or reduce in scale, modify attributes change form
- P – Put to another use;

- E – Eradicate – remove elements, simplify, reduce to core functionality
- R – Reverse – crack inside out or upside down.

Start by isolating the product or subject that will be the focus. Next ask for the seven SCAMPER topic questions about the product or subject. Continue asking "How can....?", "What else....?", "How else...?" for every idea.

5. Method 635

Method 635 (Löwgren and Stolterman 2004) is a variant of brainstorming which promotes problem solving process to generate new and unusual ideas in a group of people. Here the six participants gain a thorough understanding of the task at hand and them separately writes three rough ideas for solution. These three ideas are then passed on to one of the other participants who read and add three additional ideas or modifications. This process continues until all participants have expanded or revised all original ideas. Six participants, three ideas, five rounds of supplements, 635. The session comes to an end when each participant has had each sheet to work on – in other words, after half an hour.

Method 635 subjects the participants to considerable creative stress: they have to come up with a great many ideas while working against the clock. This can be an incentive to mental productivity, though in some cases it may prove inhibiting.

5. Story boarding

It is a creativity technique for strategic and scenario planning, based on brainstorming and used mainly by the design industry. A storyboard is like a comic book. It is used in the design industries to visualize an experience using a sequence of images. In engineering and design industries, storyboards are used to preview a product experience. By visualizing a sequential story, the reader becomes immersed in the experience. This puts everyone on the same page, literally, and provides a great opportunity for discussion. There are other benefits to storyboarding. During the development of a storyboard, the designer needs to think like the user, which helps them understand the ins and outs of the product experience. This is why a storyboard can be helpful through the creative process, whether it is intended for ideation or collaboration.

It requires a leader, a secretary and takes place in a group of 8-12 people. The leader arranges the ideas generated by brainstorming in a logical order on a white board creating a story. This technique allows identify the interconnections of ideas and how all the pieces fit together.

The story boarding process includes four phases:

- a) Planning
- b) Ideas
- c) Organization
- d) Communication.

Each phase includes a creative session (it takes 45 minutes) and a critical session, in which participants critique their story board. Through the process, visual graphics to summarize or present relevant points are presented by the leader. These might be strategic models, places or things (Higgins 1996).

8. Forced Connections

When it comes to the field of science, making connections between those dots of knowledge seems to be just as important. In the Art of Scientific Investigation, by Cambridge University professor W. I. B. Beveridge(1957) wrote that successful scientists "have often been people with wide interests," There is nothing totally new in this world. The difference between innovators and non-innovators is simply the fact that innovators make better connections that are of value. Lots of great writers, artists and scientists have talked about the importance of collecting ideas and bits of knowledge from the world around us, and making connections between those dots to fuel creative thinking and new ideas. Leonardo da Vinci forced a relationship between the sound of a bell and a stone hitting water, enabling him to make the connection that sound travels in waves.

Conclusion

Creativity is an important human characteristic. It is perhaps best thought of as a process, requiring a mixture of ingredients, including personality traits, abilities and skills. Neuro science and psychology have proven that all human beings unless his or her brain is seriously damaged can be become creative. One can develop their creativity by working a creative environment, undergoing creative training, curious about the world, applying different creative techniques etc. A more nuanced understanding of effectiveness of different creativity techniques needs advanced research which hopefully will offer better prediction of the techniques and will allow for a more representative assessment of human abilities.

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Pradeep. S, Knowledge Officer,
ICT Academy of Kerala, Technopark Campus, Thiruvananthapuram - 695 087, email pradeep.s@ictkerala.org

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