The Innovation Game Theory

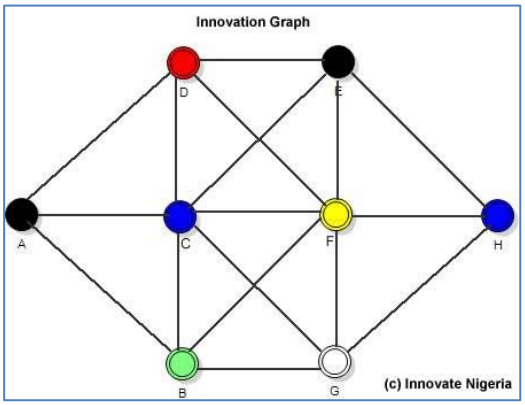
By Adefokun, Tomiwa M. and Adefokun, Tayo C.

Introduction

The Innovation Game Theory (IGT) is designed to help businesses, organizations and communities approach their innovation activities as a form of scientific game. In this case, leaders, growth managers, research and development teams, theorists and innovators visualize the processes of overcoming challenges their businesses face as a form of game where all strategic actions and resources involved in tackling the challenges are expressed in terms of quantifiable values which are ultimately tied to certain competitive reward mechanisms.

The Game

Innovation is a game of *dots* and *connections*, which is a form of discreet mathematics branch known as Graph Theory, where the dots are known as nodes (vertices) and the connections are known as edges. The *player* is on a mission to identify an *obstacle* through his (her) journey to a *targeted destination* along a highly prized *coast*. The player, thus, derive series of paths (a set of connected dots) to connect a finite number of dots so that he creates a bridge (*a better route*) which bypasses the identified obstacle or possibly eliminates it.



A player *selects* from a pool of dots, but only the ones which, by definitions, can be *connected*, *accessible* and *affordable*. The *value* of a dot is measured by the sum of the values of other dots it can *eliminate* or displace from the graph, after which connectivity is still preserved. The initial value of a dot is naturally determined by the number of possible connections (known, in graph theory as the degree of the vertex, $d(v)$, where v is the vertex).

Multiple players may participate in a game instance. Although, players may have *similar* or different destinations there is only one pool of dots (resource pond) from which they all seek what best suits the conditions they face in the game. Dots can hereby be traded, the cost of which, of course, is determined by its value and the weight of its demand. Two or more players can as well form a team and *collaborate* to share dots and connections in any way that it may benefit one another, even if they have different missions.

There could be many possible successful outcomes for a particular mission, but the *winning* outcome is that, which has the shortest traverse *time* to the destination, with *minimal* use of dots.

This is the Innovation Game Theory. More details on the formulation of the theory will be discussed in this and many of our subsequent notes on the Innovate Nigeria's Innovation Notes

website at http://blog.innovate.org.ng, as we continue to understand how to play the game of innovation better, win often and become a master at it, in the journey to activating our culture of innovation.

Let's Play

Innovation is the process of turning an idea into value. A process is a sequence of activities which, at every stage, consume one or more resources to convert inputs into outputs. These outputs then serve as inputs for the next stage until a known goal or end result is reached.

Process designers combined different ideas to create a functional process flow. Effectiveness of a process is maintained by continual improvements, which are initiated by newer ideas. Therefore, ideas are essential components of innovation – as this is true for any process – much more so, because ideas are critical raw materials in innovation. So we need ideas!

The Idea-Mine is the human mind. Great ideas are not usually surfaced by erosion, they are dug. Opportunities are created when a miner has reached an idea in the Mine – when people who own an idea are connected to appropriate resources of those who are in need of the ideas. An idea is mined and refined; then we begin to see the value. Yes, that is **innovation**.

You can gamify the process by applying the innovation game theory, in which innovation game players within your organization or community are motivated by a reward mechanism that is directly associated with their contributions towards the strategic outcome.

Ideas, which are the foundation for innovation; the people who own ideas and those who source for them; the passion to drive a vision; skillsets and knowledge required to find a connection point for an idea; and all other independent resources that can become useful when tapped, are the **dots** that require a viable **connection** for an innovation process to achieve a successful outcome.

The dots are of little or no usefulness in isolation. However, when they are networked into a class of connected paths, they become applicable and thus synergize for a common purpose. This is goal of the player – the innovator or manager of an innovation process. It is his goal to identify a problem domain (an **obstacle)** obstructing the community, business or organization from achieving set goals – in this case, the player's corporate **envisioned destination** – along the **coast** of success, where the cooperate rewards and fulfillments are attained.

Imaginary obstacles can also be considered since your destination is quite a distance and you cannot foresee everything lying ahead from your own viewpoint. Typically, this is a situation where you think ahead to foresee the problems that your organization may face, only in the future, and you decide to seek for solutions right away. This may lead to discovery of new business solutions that will accelerate the growth of your organization, thereby placing it on

more **efficient path** towards its goals and vision. Common obstacles would be an existing concern in one of your business processes, a quest for improvement or **aspiration** to create a disruptive technological breakthrough or thirst for new a business venture.

Having identified the obstacle, the player then deploys his knowledge of the problem domain—his team's expertise and their experiences—which are the edges that connect the dots and hence create a solution graph network. It is essential that this network is strong enough to withstand the effect if not completely eradicate any obstacle. Therefore, the player seeks to identify the most suitable dots to achieve the best outcomes in terms of value. This should be the most important part of the game. The player needs to **select** and harness the capabilities of the most resourceful talents – both internal and external, his brightest idealists, most faithful customers, most efficient tools, technologies, processes and resources that are within his reach and them make them all work together as seamlessly as possible to attain the best outcomes.

Ideas, great talents and vast resources are concentrated in various **clusters** in our societies… even in various organizations. We can say that people who are looking for these ideas are exposed to the resources that are within the confinement of their environment – the next 'eureka' moment may not happen in your "box", because the idea or the dot that your need to make the 'next big thing' connection may exist in another box. So, you need to reach out to other boxes for other useful ideas to be **accessible**. You need to determine the viability of a dot but you may not be able to do this until it is assessed and you have determined that it has one or more points where it can be stringed to the other dots – so you need to give every idea and resources that are accessible to you a chance to be evaluated, fairly. Hence, to determine that a piece of idea or resource is useful, you need to confirm that it is **connectable** to a stream of other ideas and resources, and it would serve one or more specific purposes. An idea or resource that can be useful to many streams at the same time will naturally add a higher **value** to your business objective as it makes your strategy more coherent – it will **eliminate** smaller units of solutions that you struggle to integrate and still renders their overall value plus more.

The game of innovation is played by so many. Organizations and businesses strive to grow beyond their competitors; communities, also, need initiatives that will foster development in their social-economic infrastructures. Growth and development are achieved when people innovate. Many organizations have dedicated people for innovation but smarter organization now make innovation the duty of all their stakeholders. This strategy has evolved from the growing demands for the best dots, and the time allowed to make useful connections and reach the destination is also shrinking much faster than ever – the coast gets smaller as other organizations in **similar** business domains record resounding successes – so organizations struggles to be the first to own a place on the coast of success. Getting all hands to be on the deck is the way to go. The next transformative idea can come from anyone and the resources to make it work may be derived from another. Teams, businesses or organizations with the same, similar or inter-dependent visions may **collaborate**; this is a suitable complementary strategy where the outcome of their synergy may contribute to achieving their collective or independent goals.

You Win!

There is a very exciting reward in winning an innovation game, though to stimulate motivation, rewards can feature at different points in the process. But essentially, when you win the game, members of your organization or community are proud to be associated with the success. Everybody is happy that they had the chance to contribute. But winning can be tricky, because a mission can have many successful outcomes.

You have derived a graph of connected dots and the obstacle has been overcome so you have a smooth pathway to your destination on the coast of success. Yes, it may be the time for celebration – you deserve to and you should, but for how long? Other players are still at the game – they would not give up. They have learnt some lessons from your achievement, which have even made them stronger, they are now busier, and their outcome may soon send a torrent across the sea and the calm at your coast would be disrupted. This is the point where you evaluate your innovation process and determine if your innovation can stand the storm of time. According to the history of previous players who also won at one time or the other, the answer would be "No".

So, What's Next?

Performance optimization is the lifeguard for a process. You are able to **minimize** the resources used, and the **time** it takes to complete the delivery of innovation – as you know, resources are scarce and time is a constraint. As the celebration subsides, you should ask yourself: if you have to recreate your outcome, would you complete it quicker and be able to use fewer dots since the winning outcome is that, which has the shortest traverse time and minimized the use of dots? This is the question that should lead you to begin another game.

ABOUT THE AUTHORS

Adefokun Michael Tomiwa is a Business Analyst, Application Developer and Innovation Enthusiast. He currently works with one of the "Big 4" professional services firms. He is the founder of ReinSys, Africa's first web based application development and delivery platform, EduPeer and Innovate Nigeria. Adefokun Charles Tayo is a lecturer in Department of Computer and Mathematical Sciences, Crawford University.

First publication: http://blog.innovate.org.ng/2013/10/31/the-innovation-game-theory/