Disruptive Innovations at the Bottom of the Pyramid

Can they impact on the sustainability of today's companies?

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Abstract

Due to the different dynamics required for organizations to serve the emerging market which contains billions of people at the bottom of the pyramid (BOP) coupled with the increasing desire for organizations to grow and be more multinational, organizations need to continually innovate. However, the tendency for large and established companies to ignore the BOP market and rather focus on existing markets gives an indication of the existence of a vulnerability that potentially disruptive innovations from the BOP will not be recognized in good time for a counter measure. This can be deduced from the fact that good management practice advocates that managers should learn and listen to their customers, therefore majority of the large existing companies continually focus on their main customer/market with sustaining innovations which leaves aspiring new entrants with an underserved BOP market to experiment with.

This paper examines the attributes of BOP innovations that can qualify them as disruptive and the possibilities of tangible disruptive innovations arising from the bottom of the pyramid and their underlying drivers. The paper Furthermore, examines the associated impact of such innovations on the future sustainability of established large companies that are operating in the developed world, particularly those with a primary focus which is targeted towards the market at the top of the pyramid (TOP).

Additionally, with the use of a scenario planning model, the paper provides an evaluation of the possible evolution and potential sustainability impacts, that could emerge from the interplay of innovations at the two pyramidal market level and the chosen market focus of organizations – TOP or BOP. Using four scenario quadrants, the paper demonstrates the resulting possibilities from the interaction between the rate of innovations and the segment focused on by organizations with disruptive era characterizing the paradigm shift quadrant. This paper further extends the ambidextrous organizational theory to propose a recommendation to limit a catastrophic impact resulting from disruptive BOP innovations.

INTRODUCTION

Companies leading in their industry with huge market shares suddenly begins to lose their market position and gradually loses their leading position because a new innovation which they saw but ignored is rapidly soaking away their market and jeopardizing the projected future of their business - this is a typical disruptive innovation scenario. Disruptive Innovations by their very nature induces a reshuffling of the relative positioning of companies across sectors. They are usually seen when evolving but largely underestimated because what they offer at their inception rarely suits the demands of the mainstream market adequately. This is primarily attributed to the fact that they usually start as cheap, unstable & inferior innovations. (Christensen et al., 2001).

On a different but similar pedestal, the bottom of the pyramid (BOP) is characterized as an environment where innovation capabilities are ignored and cheap frugal innovations with inferior offerings thrive. This is typified by the fact that this market segment comprises of people with a low-income earning below 2000 dollars per year (Prahalad and Lieberthal, 1998). The BOP also has challenges and problems that foster creation of new markets (Prahalad and Hammond, 2002) that are not necessarily visible in TOP markets.

This paper is a result of exploring in more details the characteristic fit between attributes of disruptive innovation and attributes of the BOP (Baiyere et al. 2010). It also examines the potential for disruptive innovations to occur at the BOP and the impact of such occurrence on the sustainability of today's developed companies.

Research Approach:

This research paper is a result of a qualitative research involving interviews, analysis of literatures, case studies, academic journals, news articles, and industry publications concerning BOP concepts, disruptive innovation tendencies and potential market drivers. 13 innovation, R&D & management professionals of top companies leading in their sectors were interviewed. 5 of the interviewees have had prior experience working or living in both TOP and BOP countries/markets.

The purview of this paper is focused on the effect of disruptive innovation from the BOPs on companies with established sustainable markets at the top of the pyramid. The paper however does not focus on the process of creating disruptive innovations and it also does not focus on the business dynamics at the TOP market. This research builds on existing research, which provides a framework for the analysis of several perceptions of the ensuing problem statement - *can disruptive innovations at the BOP impact the sustainability of companies in the developed world?*

Research questions:

- Can BOP innovations be disruptive?
- Can they impact on the sustainability of today's developed companies?

THEORETICAL FRAMEWORK

The term BOP refers to the largest, and usually the poorest proportion of the world's population. (Prahalad 2005) According to Prahalad, this group constitutes approximately 65% of the world population and it is estimated that in the next fifty years the world population will grow from 6.2 to 9.1 billion with 90% of the population growth occurring in developing countries of today.

This strata of the pyramid is characterized by many assumptions and attributes that makes this market group to usually be ignored by most leading companies. Therefore, in defining the BOP market for the purpose of this paper it is important to understand the different perspectives with which the market is defined. According to Prahalad et al. (2002), the perspectives of most companies has been shaped by the following set of *assumptions* attributed to the BOP market. They:

- have no purchasing power and do not represent a viable market
- are not brand conscious
- are hard to reach
- are unable to use and are not interested in advanced technology

Another perspective of viewing this market after stripping of the assumptions is the BOP *reality* as observed by Prahalad (2002). They:

- constitute a large market of about 4 billion people

- are in the developing world where there are 400 cities with population of more than 1 million, of which 30% are poor
- willing to pay premium for access to goods and services
- are highly brand and value conscious
- have sophisticated technology inclination.

With this underlying assumption and attributes with which the BOP landscape is perceived, it then becomes logical for most companies to pay little attention to its inherent business value. Additionally, the existing capabilities of firms targeting the top of the pyramid do not transfer easily to the bottom of the pyramid (London & Hart, 2004). While, the other way around capabilities acquired in the base of the pyramid can have an impact by 'moving up the market'(Christensen et al., 2001).

Innovations at the Bottom of the Pyramid

A logical question that can arise when considering innovation, especially for a group like the BOP is - *can the BOP strategy be a source of innovation?* This question will be examined in this section.

Necessity – the mother of Innovation

Necessity is said to be the mother of innovation, if there is anything the BOP has in abundance it is pointedly needs (Banerjee & Duflo, 2006). Therefore if having a need is a propellant for innovation, it suffices by extension to note that the BOP is a platform for innovation. Tidd and Bessant (2009) present a diagrammatic representation of stimuli which can kick-start the process of innovation. A selected number of innovation drivers from their diagram is presented in figure 1.

Figure 1: Sources of Innovation

Examining these identified innovation sources in the light of the BOP markets can give more insight into how the BOP can indeed be a source of innovation.

Need Pull: This is basically an extension of the concept of necessity being the precursor to inventions and innovation as highlighted above. An instance is Nokia filling the lack of constant electricity by incorporating a flashlight into their phones in India. (India Knowledge@wharton,2007)

Lead Users: When users take the drivers' seat of innovation. This can be propelled by a desire for a particular individual or group in the BOP to realize that the products available does not perfectly

suit their intended objectives or desires and they therefore take the initiative to modify the product and invent what suits their goals. (Hippel, 2005) This is a characteristic feature to be expected in a BOP environment where products are trickled down from the TOP without targeted modification to the BOP users.

Exploring Alternatives: Innovations in this category are born out of the need for organizations to make efforts at tailoring existing products or services to suit the conditions of the BOP market. These are innovations driven by questions like - *how do we make this cheaper?*

Watching Others: Entrepreneurs at the BOP can also be part of the innovation in this area. An example is entrepreneurs at the BOP innovating by observing how things are done at the TOP market level and creatively adapting such offerings to the BOP level. This is driven by questions like - *how can we make a waterless detergent that is suitable for use in the desert?* (Witkkin, 2009)

Drivers of Innovation at the BOP

Innovation at the BOP can be influenced by a number of factors that define the populace and the environment at that position in the pyramid (Prasad & Ganvir, 2005). From the configuration of the BOP one can deduce a number of factors as possible drivers of innovation at this level. The following three BOP innovation drivers will be examined:

- Low income level
- Globalization
- Population

Low income level: To serve a market where the people live below the 2 US dollar income level, will obviously pose a challenge to the cost structure with which organizations have targeted the TOP (Pantulu, 2009). To heed Prahalads' call for multinational corporations to serve the BOP, will not only push organizations to innovate around costs but will require innovations to make products, services and distribution processes cheaper (Vachani & Smith, 2008). Considering the income level of the BOP, will be a major factor pushing for the search for efficient, lean and cost effective approaches to delivering value. This is the major driver for what is termed frugal innovation.

Globalization: As the TOP and old markets are gradually getting saturated (Hart, & Christensen, 2002), organizations have been concerned about how to extend their reach to the international marketplace and find new ones (Levitt, 1983). By extension the search for new markets and the desire for growth and stakeholder satisfaction implies that the reach of these organizations can extend to the BOP's. However, entering into the BOP market as analyzed above, will drive organizations to innovate in ways that meets the peculiar needs of serving and competing in the BOP market.

Population: With a market of a growing potential of 4 billion consumers, reaching a significant number of this group and reaping the associated benefits of economy of scale, has the tendency to push the innovation frontiers of production and distribution. Organizations planning to shift from the TOP market with fewer people, to this massive population will need to innovate and rethink their processes, in order to efficiently harness the dividends at the BOP.

Can BOP Innovations be Disruptive?

What makes an innovation disruptive? When an innovation is regarded by existing companies as unfit and unsuitable for its mainstream customers but yet disrupts the business model of such companies, it can be referred to as a disruptive innovation. According to Christensen (1997), it basically describes innovations where a product or service initially begins with simplistic applications at the bottom of a market and then gradually but relentlessly surges 'up market', and

can develop with a potential to eventually displace established competitors (Christensen, 1997).

What unique attributes do BOP innovations have that can qualify them as disruptive? Firstly, disruptive innovations have a reputation of starting cheap. Innovations targeted towards the BOP should of necessity, logically stem from meeting the needs and adapting (Jaiswal, 2007) to the peculiarities of that target group. The low income attribute of BOP will demand innovations that challenges cost and offers cheap goods and services (Landrum, 2007).

Since disruptive innovation usually start with a focus on an underserved market, and the BOP fits well into this definition, this indicates that the potentials that innovations aimed at the BOP will be equally disregarded remains high. Furthermore disruptive innovations promote products and services whose impact on the market cannot be easily predicted (Christensen, Craig & Hart, 2001). This can be deduced from the fact that the large existing companies will rather focus on their main market with sustaining and incremental innovations which leaves aspiring new entrants with an unexplored BOP market to experiment with.

Furthermore, the fact that 65% of the world population spread across 300 countries constitute the BOP (Prahalad & Hammond, 2002) implies that there are different pockets from where disruptive innovations can creep from. This holds true, particularly because a reason given for the successful penetration of disruptive innovations, is that the big companies listen and depend primarily on what their main customers says and want, therefore the more they listen to their customers the lesser they will consider the tendencies of BOP innovations to be disruptive. (Christensen, Craig & Hart, 2001). These points of fit between the concept of disruptive innovation and BOP are presented diagrammatically in figure 2.

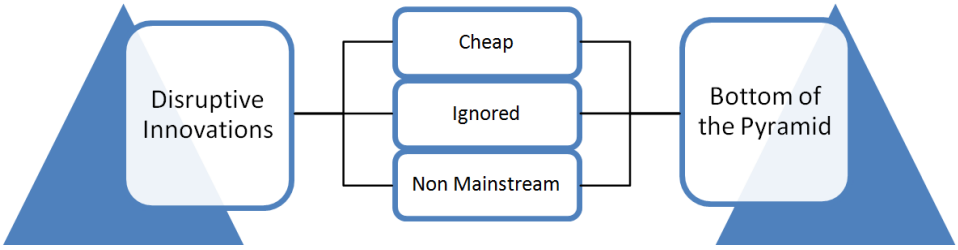

Figure 2: Similar characteristics of BOP and Disruptive Innovations

To further illustrate how innovations emerge from the bottom - up, three examples will be considered: Ryanair case (innovative cost structure), Japan case (epitome of disruptive innovation) and Tata example (typical BOP driven innovation).

Ryanair Case (Innovative Cost Structure): *"Only by continuously challenging accepted conventions and questioning costs can we continue to lower costs and fares, while improving our customer service"* – Micheal O'Leary, CEO Ryanair (2010). This statement underscores the core focus that drives the Ryanair business strategy. Ryanair has developed an innovative cost structure to operate in the air transport industry. Before the emergence of Ryanair and other low cost airlines, the costs of travelling by air was quite high (Laber, 1969) and it could be perceived as a service reserved solely for the people right at the TOP.

Where the disruption begins to occur is not just the effect of the cheap cost structure adopted by Ryanair but the associated fact that they are increasingly mounting pressures on the competition by increasing and even surpassing their quality levels (Ryanair 2010). This is apparent from the statistics in table 1.

Considering the fact that Ryanair serves majorly Europe one can arguably say it's market is not the BOP. However, the concept of targeting the underserved holds true in the Ryanair case. Additionally, the term BOP is not representative of geographical locations. If we consider every country or region to be a pyramid, there will always be a BOP representing the bottom of that

Customer Service Statistics September 2010		
On time flights:	83%	
Complaints (per 2000 passenger)	0.49	
Baggage complaint (per 1000 passenger)	0.29	
Complaints answered within seven days	99%	
On time major airlines in Europe		
Airline	**Ranking**	**%**
Ryanair	1	**93**
Lufthansa	2	85
Air France	3	83
British airways	4	83
Major airlines with fewest lost bags		
Airline	**Ranking**	**Baggage lost (per 1000 passengers)**
Ryanair	1	**0.36**
Lufthansa	2	11
British Airways	3	16
TAP	4	17

Table 1: Ryanair Customer Service Statistics (Association of European Airlines, 2009)

specific pyramid. Therefore, by inference Ryanair created an opportunity for students and people with low budget who would have been constrained by the cost of flying, to benefit from the advantage of air travel in Europe. By extension, this same principles are the defining characteristics of the general BOP. Therefore, it can be infered that the Ryanair example is a snapshot of the kind of innovations that can begin from the core BOP.

Japan Case (epitome of disruptive innovation): Between the periods of 1960 to the mid 1980's the growth rate of the booming Japanese economy, has been regarded as a phenomenal stride in modern times. (Christensen et al, 2001). According to Christensen et al., this phenomenon can best be explained by the disruptive innovations that characterized the Japanese industries at that time. Their innovations created new growth opportunities in the dominant American and European industries they entered and caused existing firms to falter by allowing less-skilled and less-affluent people to perform things previously carried out only by expensive specialists. In essence, they ended up offering consumers cheaper, better, and more convenient products and services, than ever before.

Some typical examples of these innovations includes, the introduction of the Toyota Corona model which attacked the lowest tier of the American automobile market in the 1960's. The cars started as very simple but increased in reliability till they became second cars for middle income Americans. (Christensen et al. 2001)

Another example is the Sony transistor radio. The battery powered pocket radio was a disruptive technology relative to the existing vacuum tube technology. The output of this radio was burdened by static noises yet because it started with the teenagers market who were just interested in the rock and roll sounds, they could gradually move up the market until they displaced dominant radio producers relying on vacuum tubes for larger and higher quality. A similar examples that emphasizes the disruptive innovations that kick-started the phenomenal growth of Japan is the slow but cheap table photocopiers introduced by Canon which eventually disrupted Xerox's market dominance and leading position (Christensen et al. 2001)

This case brings a number of indicators to the topic of BOP and innovations. Summarily, the Japan case does not only emphasize the point that innovations can occur from the bottom of the market to the top, but it illuminates the fact that by effective disruptive innovations, nations can change their position in the lattice of the pyramid.

Tata Case (typical BOP driven Innovation): The Tata groups car – *Nano* is a classic example of an innovative product produced with the BOP in mind, with affordability being a core element in its design, development and business model. The BOP innovation of making this car involved reducing

the cost structure elements associated with producing a car, preparing to accept lower-than-standard gross margins (Wentz 2010) and aiming at selling the Nano in large volumes, essentially to the BOPs' market of first-time car buyers.

For Tata to achieve this, they had to re-engineer the process of designing, manufacturing and distributing a car to meet the BOP market. It also redefined the supplier strategy employed by opting to outsource a huge portion of the car's parts and to engage lesser number of vendors to reduce the effect of transaction costs (Wentz 2010). With this approach, Tata has been able to unfold a strategy that brings a car that would have otherwise remained a luxurious product for the TOP and the middle income earners only, to the BOP. This logically makes Nano an affordable and choice product for millions of first time car buyers in the BOP.

DISCUSSION

Consequence for Today's Companies.

A scenario based evaluation

From the foregoing analysis, let's re-examine our foundational question - *can Bottom of the Pyramid innovations be disruptive for companies in the developed world?* In order to deduce this, 13 innovation, R&D & management professionals of top companies leading in their sectors were interviewed. From the interviews almost all the respondents acknowledged the potential for innovations occurring at the BOP. However, about 77% of the respondents considered BOP innovations or markets to be of major significance to their market. This reveals a potential vulnerability that if a disruptive innovation should occur at the BOP it likely will be largely unnoticed at inception. Therefore considering the analysis of the various attributes of the BOP and the factors that stimulate innovations at this level, a plausible deduction is the revelation that such innovations can have disruptive impacts on companies in the developed world.

To further consolidate the foregoing analysis, a scenario model has been developed to highlight the possible evolution routes and impact of innovation at the BOP, for companies in the developed world. (See figure 3.)

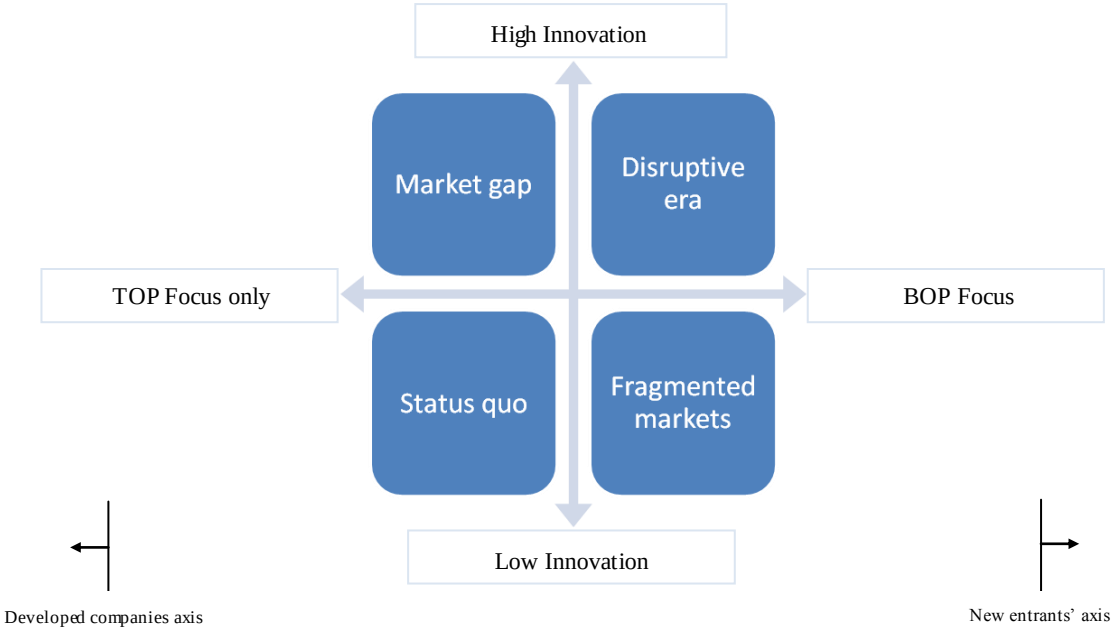

Figure 3. Scenario evaluation of innovations relative to the BOP market.

From figure 3, the two defining parameters are level of innovation and market focus of companies

(TOP/BOP). Firstly, to what degree are innovations taking place? Secondly, which market group are these innovations targeted at?

The position of a company at a particular point in time on this plot, will invariably indicate the likely impact the prevailing market dynamics can have on it and its market position. Furthermore, the interaction between the innovation and the segment focused on will equally determine the status of the BOP in the future pyramidal structure.

Scenario 1 – Market Gap: In this scenario, companies are creatively innovating and their focus is primarily on the TOP market. The impact on the developed companies is a translation of innovations to business growth where added value is brought to existing customers at the TOP. This will result in a wider void between the offerings available for the TOP and the BOP such that crossing the gap will require considerable effort.

Scenario 2 – Status quo: This is the situation that occurs when there is relatively no significant innovations and the companies maintain their TOP focus. This refers to a situation where things remain the way they are without any noteworthy change in the structure of the pyramid or its effect on the developed companies.

Scenario 3 – Fragmented Market: This is a scenario whereby developed companies, BOP entrepreneurs and new entrants provide products to the BOP market without any major creative innovation of a disruptive capacity. This scenario represents a point when developed companies retain their main TOP market focus can also extend their offerings to the BOP but without any major creative change or necessary BOP related innovation. Since this scenario represents an axis with low level of innovation, BOP companies will be characterized by mediocre adaptations of TOP products for the BOP market as a means of competing with the trickling down products of the developed companies into their BOP domain. Thereby resulting in a TOP market dominated by the developed companies and a non disruptive BOP market with BOP-focused small companies.

Scenario 4 – Disruptive Era: This is the scenario that represents a *paradigm shift* in the interplay between developed companies focusing at the TOP and the others - usually new entrants (Christensen, 2007) focusing on the BOP. In this scenario, companies in the developed world remain stuck to creating sustaining innovations for their customers while the innovations from the new entrants emerging from the BOP disrupts their market balance. This is the scenario with which developed companies need to pay particular attention to because the impact of disruptive innovations can spell catastrophe for top organizations in disrupted TOP markets and for some it might just mean a fall from their esteemed market position.

Recommendation

The sporadic nature of the occurrence of disruptive innovations makes it difficult for organizations to have a routine process of handling them (Bower & Christensen, 1995). Furthermore, the tendency exists that innovations targeting the BOP will increase, however developed companies of today focusing on the TOP will have good reasons to maintain just their TOP focus, because good management practice advocates that managers listen to and follow their customers (Christensen & Anthony, 2007), hence they will likely not see potential disruptive innovations coming from the BOP before it is too late.

Following the arguments presented for adopting an ambidextrous organization (O' Reilly, 2004) in literatures, a recommendation to curtail a catastrophic effect of BOP disruptions on developed companies is to adopt an *ambidextrous approach* (Leifer, et al. 2000). The ambidextrous approach offers the advantage of looking at the future without losing focus of the present (Daniel, 2006). With this approach organizations can leverage BOP as a catalyst for innovation by dedicating resources for BOP related innovations and simultaneously observe trends (Christensen & Anthony, 2007) in order react accordingly to emerging disruptive signals (Christensen, 1997).

CONCLUSION

With the observed similarities and fit between the characteristics of disruptive innovations and BOP, it becomes apparent that there exists a tendency that disruptive innovations can be initiated by organizations focusing on this sector of the market. A general phenomenon with disruptive innovations is their potential to reshuffle the positioning of companies whenever they occur. In many cases most leading companies in an industry affected by disruptive innovation either falter or cease to exist completely. This has brought attention to this form of innovations, however, due to the little significance accorded to the BOP market segment it reveals the potential for disruptive innovations occurring at this level to have a resounding impact on companies affected.

Additionally, existing capabilities of companies focused on the TOP do not transfer easily to the BOP (London & Hart, 2004). However, capabilities acquired at the BOP can move up the market which can also have implications for the firms in the developed world, as new techniques and disruptive offerings have the potential to become mainstream.

A scenario planning evaluation of this concept based on the interaction between rate of innovation and pyramidal market focus gives an indication that a disruptive era is a likely occurrence when there is high level of innovation by organizations dedicating attention to the BOP market. In addition to adopting an ambidextrous organizational approach, exploring opportunities of being active in BOP markets could also be considered by firms as a possibility to detect early innovations with disruptive tendency in their industry.

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