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## Transformative direction of R&D– lessons from Amazon's endeavor

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### ABSTRACT

Amazon jumped up to the world's top Research and Development (R&D) firm in 2017.

Such a rapid and notable increase in R&D investment has raised the question of a new R&D definition in the digital economy, which Amazon insists includes both “routine or periodic alterations” (traditionally classified as non-R&D) and “significant improvement” (classified as R&D), as Amazon transforms the former into the latter during its R&D process.

A convincing answer to this question will give rise to insightful suggestions regarding a new concept of R&D in the digital economy.

### 1. Introduction

There is a crucial dilemma between R&D expansion and productivity decline in the digital economy, caused by the two-faced nature of ICT (Watanabe et al., 2015; Tou et al., 2019).

Notwithstanding the fear of such a dilemma, Amazon has been accomplishing notable performance by rapidly increasing R&D (Galloway, 2017), which has raised two questions.

First, the definition of R&D in the digital economy. Amazon's rapid and notable increase in its R&D prompts the possibility of a structural change in the concept of R&D which Amazon insists on “technology and content” (Amazon.Com, Inc., 2018).

Second, there is the question of a disruptive business model that provides a reasonable solution to the above dilemma.

To date, a significant number of studies have attempted to analyze its notable performance and unique business model (e.g., Kenney, 2013; Knott, 2017; Galloway, 2017). In addition, a number of questions were raised about its R&D model, such as, is it really R&D (e.g., Fox, 2018; Green, 2018)? However, much has remained unveiled inside the black box of its unique model.

Some exceptions can be seen in the analyses from the viewpoints of co-emergence of innovation with its counterparts (Ritala et al., 2014; Colin, 2016; Khan, 2017).

Inspired by these pioneer analyses, further elucidation has become urgent concerns.

### 2. Amazon's unique R&D model

Amazon has been endeavoring to be an R&D-driven company since its inception in 1994. This culture has led to Amazon establishing its fundamental business principle.

Most of Amazon's profits come from its high-tech division which have been reinvested in its business and employees, not in dividends and buybacks. That strategy is reflected in spending on R&D activities, which has led to Amazon becoming the world's top R&D firm over a short period of time.

Notwithstanding such an increase in expenses for business activities generally described as R&D, Amazon insists on describing them as “technology and content.” While the former focuses on business activities for “significant improvement,” the latter encompasses those for “routine or periodic alterations.” Amazon has invested considerable resources in extremely innovative business areas such as AWS, Kindle, Alexa and Amazon Go for the former improvement. In parallel with such forefront innovation, it is endeavoring to absorb external innovation resources, particularly soft innovation resources (Tou et al., 2019) from external markets and assimilate them into its business model, which transforms the latter business activities into the former during its R&D process.

This transformation depends on its high level of assimilation capacity, which can be attributed to the rapid and notable increase in its R&D investment (Watanabe et al., 2002), and also to the absorption of broad innovation resources based on its growing retail chain and big data collection system, together with the deployment of architecture for participation that harnesses the power of its users (Colin, 2016).

### 3. Amazon's concept of R&D

Amazon has been pursuing identical innovation endeavor by expanding investment for “technology and content.” It manages the total investment for these activities collectively as investments being made on behalf of its customers (Gregersen, 2015).

It insists that its business model encourages simultaneous research, design, development, and maintenance of both new and existing products not separating activities by type as classified in the traditional accounting standard (Fox, 2018).

The Accounting Standards Codification (ASC) of the Financial Accounting Standards Board (FASB) defines *Research and Development* (FASB-ASC, 2018). While the former (*Research*) corresponds to activities contributing to significant improvement, the latter (*Development*) corresponds to activities contributing to routine or periodic alterations.

Amazon claims that the boundary between the two types of activities has been blurring in the digital economy, and also that it is difficult

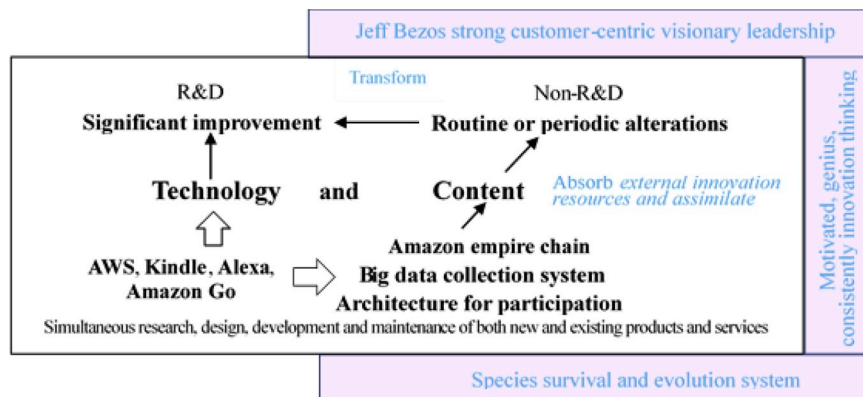


Fig. 1. Scheme of Amazon's unique R&D model.

to separate them as its R&D has been conducted in transforming routine or periodic alterations into significant improvement during the R&D process.

#### 4. Amazon's R&D inducement dynamism

Amazon's business model and its endeavors have developed its empire chain, big data collection system, and also the architecture for participation.

These chain, system and the architecture have enabled Amazon to absorb external innovation resources extensively and assimilate them into its indigenous business.

Given that this model deploys a full-fledged function, it may transform routine or periodic alterations into significant improvement. However, Amazon is cautious of these activities as they often result in enhancements to existing products and services (Colin, 2016).

Such a pressure leverages Amazon to maintain its strong points, such as having excellent customer service and ensuring complete customer satisfaction through such species survival and evolution systems as comprehensive self-assessment and disruption analysis (University of Toronto, 2013).

Thus, Jeff Bezos, founder and CEO of Amazon, has characterized the company as an invention machine and inspired its workers to invent and continue to come up with innovative ideas (Soper, 2016). The staff within Amazon are geniuses in their respective fields (Izogo and Ozo, 2015).

Under such a distinct CEO's policy and strong leadership thereof, at Amazon, experimentation is always occurring, initiated by employees in broad fields throughout the company, and ideas are constantly being presented to Bezos. Motivated employees understand that these ideas are going to be altered in many ways (Rivet, 2017). Consistent innovative thinking is another resource that Amazon has exploited advantageously (Malczewski, 2011; Izogo and Ozo, 2015).

Scheme of this unique R&D model is illustrated in Fig. 1.

#### 5. Conclusion

It was identified that Amazon, based on R&D as a culture, has been promoting companywide experimentation to cause customers obsessed with making purchase decisions. This has enabled Amazon to deploy an architecture for participation harnessing the power of users. Such user-driven innovation accelerated a dramatic advancement of the Internet that, in turn, accelerated the co-emergence of soft innovation resources in the marketplace. This emergence activated a self-propagating function inducing supra-functionality beyond an economic value that satisfies a shift in customers' preferences (Watanabe et al., 2018). While this system depends on the assimilation capacity of soft innovation resources, Amazon has developed a high level of capacity, supported by a rapid and notable increase in R&D investment. Such a sophisticated

management system has operated well because of strong inertia induced by the strongly customer-centric visionary leadership of Jeff Bezos, together with motivated, brilliant and consistently innovative employees equipped with self-assessment and disruption analysis systems. These efforts function as a virtuous cycle, leading to the transformation of routine or periodic alterations into significant improvement during the R&D process.

These findings give rise to the following insightful suggestions for reconstructing the R&D model in the digital economy.

- (i) The system of neo open innovation should be specified.
- (ii) Dynamism in increasing assimilation capacity via user-driven innovation, M&A and big data collection systems should be elucidated.
- (iii) The development of assimilation capacity should be explored further.
- (iv) The accounting principle of R&D in the digital economy should be reviewed.
- (v) The sophistication of Amazon's R&D-driven business model against the new monopoly in the digital economy should be further generalized.

Thus, lessons from Amazon's endeavor provide new insights for shedding light on exploring a new concept of R&D in the digital economy.

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