



# Recycling the unused ideas and technologies of a large corporation into new business by start-ups



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## ABSTRACT

The objective of this study is to investigate how the non-core ideas and technologies (IaTs) of a large corporation can be reused by start-ups. Many IaTs are not deemed valuable or useful for a parent corporation, so for various reasons, these IaTs remain unused and eventually perish as they become obsolete. However, there exists a possibility to create new business from these non-core IaTs. We discovered that an intermediary organization, acting as a catalyst, can be instrumental in bringing corporations with unused IaTs together with interested parties and reduce the information asymmetry between them. A funding mechanism is also crucial for appropriating non-core IaTs. Moreover, the underlying market and economic conditions play a natural role in the transfer of non-core IaTs.

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## 1. Introduction

Large corporations continuously generate a stream of ideas and technologies (IaTs) in order to offer their customers new products and services [29]. In reality, only a fraction of a large corporation's IaTs are launched to the market, with only a few of them being successful [34]. A large corporation accumulates numerous unused IaTs over time, because they are often considered non-core as they do not fit in with the corporation's existing business portfolios [3].

IaTs can be defined in many ways [30]. argue that commercially exchangeable goods, ranging from the immature to the mature stage, can be considered IaTs. Mature IaTs are mostly at the patented stage, whereas immature IaTs remain unpatented. The IaTs of a large corporation can be classified into core and non-core categories. As is the case with core IaTs, non-core IaTs can also range from the immature to the advanced stage. By non-core IaTs, we refer to the ideas and technologies that corporations are unable, or unwilling, to develop and bring to market. There can be several reasons for this. For example, a non-core IaT may lie outside the corporations current strategy. A corporation cannot develop each

and every idea, so it must prioritize certain areas. Some ideas may have simply become obsolete due to changing market conditions or the activities of competitors [28]. All too often, IaTs are doomed because their potential return on investment (ROI) is too low, because it would take too long to see a return, or simply because it is seen to be too risky [22].

In general, non-core IaTs do not contribute to a parent corporation's competitive advantage. Core IaTs, meanwhile, are important to a corporation because it can use them itself, possibly to protect it against competitors. In short, such IaTs are essential for a corporation to maintain a competitive advantage. There are various defined stages for IaTs, such as under-developed, ready for patent application, patent-pending, and ready for market. Immature non-core IaTs are typically less valuable than their mature counterparts [27].

Sometimes corporations consider non-core IaTs to be a burden, and they face a dilemma in how to deal with them. Transferring some of these non-core IaTs outside of a corporation brings no risk for its core strategy, but it may bring considerable benefits to the corporation in other ways, such as by benefitting standardization development. Moreover, these non-core IaTs could be valuable to other corporations, who can develop them further and commercialize them in a different market with a similar or new business model [18].

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Nokia Corporation's outbound open innovation approach is an example initiative that shows how to utilize non-core IaTs within a new ecosystem. Accordingly, this study aims to investigate how the non-core IaTs of a large corporation can be utilized by start-ups. As mentioned earlier, many IaTs are of little value to the parent corporations, as was the case with Nokia, too. In this study, we attempt to find answers to several questions: *How can large corporations distribute their non-core IaTs? What kind of support is needed to distribute these non-core IaTs? How can the transference of a large corporation's non-core IaTs be beneficial to business, and society?* By considering Nokia's model for transferring non-core technologies, this study provides new insight for scholars and practitioners about how to use the non-core IaTs of large corporations. Corporations, policy makers, and governmental organizations may well consider these findings useful.

### 1.1. Literature review

Some studies have explored how large corporations can capture value from their non-core technologies [45,52,53,54]. Even though transforming technologies into commercial goods has been studied from various perspectives [6,10], limited attention has been paid to non-core IaTs. Most studies deal with mature and apparently highly valuable non-core technologies [6]. The existing literature has therefore largely ignored how the non-core IaTs of large corporations can be used appropriately, regardless of the stage (mature or immature) they are in. Indeed, immature non-core IaTs could also be successfully commercialized with the help of a new business ecosystem. With suitable cooperation between various parties—such as state funding agencies, intermediaries, and start-ups—large corporations could adopt outbound open innovation approach [11] to offer their non-core IaTs to other parties.

With many non-core IaTs, it is also profitable for the parent corporations to transfer them outside the company [17]. However, there are limited transactions for IaTs, even though there is evidence that this is growing [43]. Non-core IaTs can emerge in a number of ways, such as through: (a) the output of a project that turns out to be irrelevant to the current business focus; (b) a project that is cancelled before reaching its final stage; (c) the loss of a project's main driver; (d) an unintended discovery; (e) a change in management and business strategy; (f) mergers and acquisitions; (g) downsizing; and (h) the divestment of a business area.

The value of a non-core IaT largely depends on its position in a maturity chain, complementary assets, effective matching, rivalry, user reproducibility, the business model, and the organizations it is embedded in Refs. [9,16,36]. IaTs at the immature stage may not be worthy of patenting [30], and they may not offer any value or benefit for internal use.

Many large corporations—such as DuPont, Dow Chemical, Hitachi, Procter & Gamble, and Texas Instruments—have active licensing policies to earn revenue from their non-core IaTs [44]. Licensing is where a licensor transfers technology to licensees, giving them the right to exploit this technology in the long term in exchange for some agreed fees or royalties [54]. However, many non-core IaTs lack the value for licensing, but they can still be valuable to other ventures if they are modified or applied with a different business model.

Corporations have several options when dealing with their non-core IaTs. To name a few popular options, they can “put them on the shelf,” discard them for good, or donate or license them to another party. Non-core IaTs can be taken outside a business through creating a spin-off, selling off a division, or making various licensing arrangements. The emergent concept of open innovation emphasizes the transfer of technologies outside a corporation's boundaries [8]. Outbound open innovation represents an outward

technology transfer and suggests that corporations should explore the external environment when looking to commercialize technologies [11]. Corporations tend to prefer taking out their IaTs when the uncertainty of the transaction is low and the transaction cost is high, whereas they tend to prefer selling them when the opposite conditions prevail [50].

A key medium for the external use of non-core IaTs is licensing. A study by [46] found that nearly 75% of the intellectual property (IP) managers surveyed believed that they could increase licensing revenue without harming their competitive advantage. However, alongside the difficulty of finding licensees, a reluctance among business units [46] and conflicts within a corporation are often the chief causes of inefficient licensing [55]. Studies show that around a third of US corporations' patent portfolios remain unexploited [54], and a third of patents in Europe have not been applied in products [48]. Furthermore, [47] found that 10% of the patent portfolios of research-oriented corporations are being underexploited, so these corporations could increase their operating incomes by five percent through licensing.

The extent of the cooperation between an idea's owners and its adopters is a crucial element in the licensing process of non-core IaTs [23]. The commercialization of non-core IaTs by external corporations can generate value in many ways [4]. For example, a corporation can gain financial value and develop the ecosystem at the periphery of their core products, thus boosting the business ecosystem in which they operate. Non-core IaTs also provide opportunities to create new businesses, so customers can benefit from innovative products and services. Timing is important for a technology transfer, although the existing literature lacks any research into the timing of a technology transfer [35].

The licensing of non-core IaTs requires a high level of engagement on the licensor's part. Some corporations have a dedicated unit for their non-core IaTs, whereas others only consider it occasionally [49]. However, involving third parties in the evaluation of non-core IaTs for licensing can also be a feasible option [37]. For example, there is evidence that the internal units of corporations often have significantly different opinions to external experts when it comes to valuing non-core IaTs [31]. Additionally, a corporation can join with other corporations and establish common platforms and joint ventures when non-core IaTs are being centrally evaluated for licensing. Corporations can also use intermediaries to facilitate a match-making process with potential licensees. Recently, many intermediaries have emerged to connect technology and innovation developers with interested parties. Intermediaries such as InnoCentive, Yet2.com, IdeaConnection, and Innoget play a significant role in technology licensing and the idea business [19]. Consequently, the utilization of non-core IaTs is receiving more attention from scholars, practitioners, and policy makers.

### 1.2. Research methods

This is an explorative study with a qualitative approach, because this provides an opportunity to understand the context and benefits of the underlying phenomenon being studied. We considered a single case study approach to allow a deeper kind of understanding for a specific phenomenon [14], because the case study approach is generally suitable for answering the “why” and “how” types of questions [41]. Specifically, this single case study aims to establish how the non-core IaTs of a large corporation can be transferred to external companies, specifically start-ups [42]. argues that it is rational to choose a single case study when the studied phenomenon is unusual, rare, critical, or revelatory. We are confident that this study is concerned with a rare phenomenon that has received limited attention in the existing management literature.

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