

# INTRAPRENEURSHIP IN THE TIME OF COVID

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## ABSTRACT

For individuals and firms, traditional sources of competitive advantage are being eroded. Competitive advantage today is not built upon product markets, but in upstream markets of expertise, with control of key intangible assets, alongside dynamic capabilities. Intrapreneurship is seen as an important method for organisations to simultaneously nurture existing business while developing new business creatively and strategically. Covid-19 restrictions have forced organisations to look to their 'intangible capabilities' to reassess and redeploy them for transformational, value-added outcomes. An underutilised ally is intrapreneurship, where individuals in an organisation break convention to create opportunities and revenue streams. An intrapreneurial culture can be the foundation of sustainable competitiveness for both firms and their business ecosystems, and even the communities they impact. This paper re-investigates intrapreneurship in this new Covid era as a source of new, sustainable opportunity and competitive advantage; in this time of Covid, a contextual orientation approach to intrapreneurship offers organisations new solutions guided by expertise within the firm. We find that now is the time to foster intrapreneurial processes to leverage internal strengths, resource access and expertise.

## KEYWORDS

intrapreneurship, competitive advantage, intangible capabilities, sustainability, innovation

## INTRODUCTION

Competitive advantage is a state that puts a company in a favourable or enhanced business position. The global Covid-19 pandemic gave rise to responses that included lockdowns, social distancing, home isolation and work-from-home situations; economic disorder varied by industry and sector, but the businesses that survived are operating in the context of a new Covid era. For example, firms that were cash strapped now face shortages in the labour market (Keall, 2021). Many customary and predictable management methods are producing questionable or lacklustre results. Many organisations have struggled to survive and adjust to factors that update over days and even hours; the pace of change and our ability to be resilient in the face of adversity is such that organisational potential often lies in the expertise, creativity and tenacity of people. Managing innovation and change through adversity is so prevalent it has become a constant in growing organisations.

Intrapreneurship in its widest context is an economic driver, an employment creator, and it elevates our personal and professional lives. Since our economy is based on the seeds of intrapreneurship, it would be wise for all of us to know the disciplines of innovative, intrapreneurial thinking that fuel our organisations, in order to restart economic growth as the turbulence of the pandemic wanes.

Searching for the right answers to the new problems we are facing, especially in unsettled sectors such as the airline and travel industries, education, health and medical sectors, logistics and supply chain fields, can create bold, new opportunities. Agile firms that build new mindsets, test assumptions, or assess norms and culture can move beyond 'failure' to become organisations with viable offerings capturing new value (Ciaramella & Dall'Orso, 2021). Perspective can be transformative, and challenging discourse can generate value for firms that are willing to look inward and face the challenges that are ahead (Zaffron & Logan, 2011).

Intrapreneurship uses the existing knowledge management and organisational culture to jump-start into networks, expertise and trusted relationships that can get ideas to markets and competitors. Technological expertise and technologies may already be available to support within-firm innovation.

In some sectors, innovation has largely 'failed to launch'; government intervention and funding often fails to 'pick winners' (Creutzberg, 2011), but policy can shape new opportunities for international connection, capital growth, greater competition and transformative innovation (Conway, 2016). Of late, mature firms are gaining competitive advantage not with product realignments and new markets, but with tacit control of key intangibles and dynamic capabilities where co-operation can be a means to accumulate, pool and disseminate knowledge and complementary assets (Caloghirou et al., 2004).

Intrapreneurship, as organisational innovation or active entrepreneurship while working in a large organisation, can be viewed as small groups generating opportunities and revenue streams within an organisation (Elsbach & Stigliani 2018). Intrapreneurship includes five different streams (Blanka, 2019):

- Individual Level, with operational-level employees and middle-level managers
- Organisational Level, with structure and processes, support, promoters, rewards and culture
- Contextual Level, depending on type of firm, national characteristics and technology
- Outcome Level, including behavioural outcomes, intrapreneurial activity and performance
- Promoter Level, with Individual Level outcome and behavioural processes, entrepreneurial self-efficacy, and developmental support

Intrapreneurship can shift an existing ethos to create a tactical and risk-taking innovative culture where skills are designed and refined, experientially. Intrapreneurship can be a basis for sustainable business, ecosystems and lively communities. The internal commercialisation of a business ecosystem produces valuable knowledge that can be modelled dynamically, with a focus on the people and stakeholders that move through various stages of an entrepreneurial lifecycle (Cantner et al., 2020).

This paper investigates recent intrapreneurial scholarship in light of the new Covid context, as a source of new, sustainable opportunity. Innovation can be learned or sparked with modes and entrepreneurial mindsets, using management methods applied to fuel new opportunities that jump-start economic growth (Kumar, 2012). We begin with methodology, followed by a scoping review of nascent research in intrapreneurship. The competitive advantage borne of intrapreneurship is appraised in order to develop the concept of intangible capabilities. Nascency is evaluated in the context of the uncertainty of the Coronavirus pandemic and seven categorisations are explored. The paper concludes with new mindsets, skillsets and cultures required to establish more sustainable intrapreneurial opportunities.

## RESEARCH METHODOLOGY

A scoping approach was employed with a selection of recent scholarly journals published from 2000 to 2021; this research was undertaken in the field of intrapreneurship, with its foundation built upon extensive entrepreneurship study. This review focuses on intrapreneurship as it relates to innovation, and the creation of new value.

A Google Scholar search was undertaken using phrases such as 'intrapreneurial theory' and 'strategic intrapreneurship.' A representative, filtered review of sourced papers was undertaken to provide a referenced overview. Relevance to nascent topics in innovation was used, integrated with these factors:

- Dynamic capabilities relating to intrapreneurship were included
- State-of-the-art techniques used in value creation were prioritised
- Technology as a support for an innovative approach was preferred
- Recency of publication was fundamental, especially highlighting the Coronavirus context

Selected management case-studies were also considered, to seek creative mindsets and restorative modes of application, especially in conjunction with in-depth reviews from management experts and using respected management publications. This was done to exemplify applications of leveraged value in innovative intrapreneurial activities, even within conventional organisations.

This paper aims to summarise scholarship around a structure relating to intrapreneurship as a source of inspiration and ideation in uncertain times. This focus allows a basis upon which to scaffold contemporary applied management examples from firms not necessarily considered to be traditional technological firms. Transformative approaches are exemplified that develop intangible organisational capabilities. This methodology permits a contextual review as well as a more progressive and structured approach to intrapreneurship and its processes.

## THEORETICAL BACKGROUND: INTRAPRENEURSHIP

The term ‘intrapreneur’ was coined by Gifford Pinchot in his landmark 1985 book *Intrapreneuring: Why you don't have to leave the corporation to become an entrepreneur*. Pinchot stated that an “intrapreneur may be the creator or inventor but it is always the dreamer who figures out how to turn an idea into a profitable reality” (1985, p. 2). Whereas entrepreneurship is “the activity of setting up a business, taking on financial risks for the reward of profit,” intrapreneurship is “entrepreneurship inside a firm” or “organisational innovation” (Pinchot, 1985, p. 2). The two can be compared and contrasted, as in Table 1 (Cadaru & Badulescu, 2015).

	Distinctions	Parallels
<b>Entrepreneur:</b> A person who sets up a business or businesses, taking on financial risks in the hope of profit.	<p><b>Activity:</b> Creative character.</p> <p><b>Obstacles:</b> Sees only the market as an obstacle – a powerful one.</p> <p><b>Funding:</b> Seeks personal funding at the risk of losing own assets or ownership/control of the start-up.</p> <p><b>Risk:</b> Personal money and time.</p>	<p><b>Innovation:</b> Innovative traits, seen via creation of an original product or service, technological process, or superior management method.</p> <p><b>Value creation:</b> Is a fundamental goal; alteration must be novel.</p> <p><b>Risk tolerance:</b> Is high or view of risk is probabilistic and balanced with the hunt for greater reward.</p>
<b>Intrapreneur:</b> An entrepreneur inside a firm, or an organisational innovator.	<p><b>Activity:</b> Restorative character.</p> <p><b>Obstacles:</b> The company culture is often the main obstacle.</p> <p><b>Funding:</b> Uses the company's time, capital and extensive resources.</p> <p><b>Risk:</b> Company's money and time.</p>	<p><b>SWOT:</b> Views external threats as opportunities and turns internal weaknesses into strengths by various means and partnerships.</p>

Table 1. Parallels and distinctions of entrepreneurship and intrapreneurship.

In some respects, an intrapreneur is like an entrepreneur in that they exploit opportunities and know how to structure business within particular contexts and environments (Jack & Anderson, 2002), or launch a business via recognition and exploitation of an opportunity. The next stage is growth and development via explicit capability (Timmons & Spinelli, 2003), although intrapreneurship often follows a more nonlinear process (Russell, 1999). Therefore, owners of start-ups can be thought of as leaders, who enhance and progress their business until they exhaust their motivation to continue managing a growing company. They may lack expertise needed within the organisation and be unwilling to ‘let go’ of control, as their ability and entrepreneurial intuition begins to falter (Begeç & Arun, 2020).

The entrepreneur as protagonist can be viewed through Schumpeter's production function lens, where managers combine production factors and functions to achieve technical efficiency (Iversen et al., 2008). Entrepreneurs look beyond the production function via innovation (technical or otherwise). The entrepreneur innovates or disrupts the economic system out of equilibrium, by means of new products or service formation, or by utilising novel processes of production. Nowadays a technological twist is used; some mature firms have been disrupted, although technologies and data utilisation can turn the tide for established firms (Ryder, 2018). The process of 'creative destruction' is the Schumpeterian vision that propels economic development (Schumpeter, 1942). Thus, the ability to co-ordinate and reallocate is a behaviour associated with entrepreneurs as well as intrapreneurs. When resources are recombined or used with improved efficiency, the result can be a leap in profitability and/or growth.

Intrapreneurs are often decisive and expert communicators (even if only viewed in a technological or visionary sense) (Zenovia & Maier, 2011). They are influential and skilled at crafting value judgements (Casson, 2003). This allows them to see new sources of value via intelligent use of scarce resources, or waste, beyond a Total Quality Management view of 'muda' (Deming, 2018). Certainly, there is scope for organisations to compete within themselves, and successful firms like Haier have taken this 'to the extreme' using competition within the company (Lewin et al., 2017; Jiang et al., 2019). In this way intrapreneurs can be internal leaders, driving better use of resources such as capital, knowledge and process (Baumol, 2002).

The intrapreneur can be viewed as a charismatic enigma, making independent decisions within the confines of an organisation in rapidly changing environments, with dogmatic persistence, expertise and leadership personality; this can clash within organisational settings (Johnson, 2001). Pinchot uses the phrase 'intra-corporate-entrepreneur' (Pinchot, 2010, p. 2), as one who:

- Gives full credit to people with similar personality to innovate quickly in large organizations
- Values individual and/or team action to reinforce entrepreneurial behavior independently

Intrapreneurs are proactive; they create novel ventures and businesses, often with novel product, service and process innovations. They redefine risk taking within the cloak of the company and by turning risk into viability (Antoncic & Hisrich, 2003). Hathway suggests they are more than 'freeholders' that grab intra-property and intra-money; they are highly committed (Hathway, 2009). Likewise, intrapreneurship can be facilitated by external entrepreneurs and agents; franchising, subcontracting and strategic alliances can begin the external search for new sources of finance (Chang, 2001). 'Frantreneurs' are intrapreneurs that exploit the process standardisation of a franchise; this can perpetuate a limiting mindset, but the approach can expose innovative opportunities (Hathway, 2009). New value is found in the mindset of sustainability intrapreneurs (Badulescu & Badulescu, 2016); as climate action accelerates, a counter view is that "the world is not exactly lacking ... big ideas about what other people should do, or who think technology can fix any problem" (Gates, 2020, p. 5).

We can develop the skills of intrapreneurship. We know the processes; we can quantify the time inputs (Puech & Durand, 2017). Intrapreneurship is an under-utilised but powerful tool that can be learned, cultivated and emboldened through process. The new opportunities created can even transform the very idea of why and how we work (Prats & Kislenko, 2015). Process models begin with recognition:

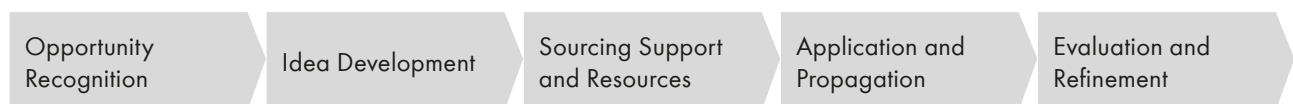


Figure 1. Five-step Process Model for Organisational Intrapreneurship (Hecker, 2017).

Intrapreneurship has been linked to seven characteristics in the research, linking it to particular models: innovativeness, risk-taking, proactiveness, autonomy, new business venturing, self-/strategic renewal and competitive aggressiveness. The traits link to strategic intrapreneurship, and are desirable and key for organisational



growth and even survival, especially in times of upheaval and change (Guven, 2020). For organisations that have an agile culture, intrapreneurship is a more viable option.

Perhaps the ultimate opportunity that distinguishes organisational intrapreneurs is ‘suitability,’ because the resources and capabilities within an organisation, as well as their availability, are known to be a critical factor in intrapreneurial uptake. There must also be ‘space’ within the culture of the organisation for the approach to succeed (Urbano et al., 2013). Dynamic capability is “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece, 2009, p. xxiii). Contemporary dynamic capabilities frameworks can be used as tools for managers to improve cultivation and management of intrapreneurial proficiency (Table 2).

Contributions to intrapreneurial capabilities scholarship	
<b>Spill-over theory</b> relating to labour mobility for holistic picture of value of context, knowledge and networks for intrapreneurial capabilities	Audretsch, D. B., Lehmann, E. E., Menter, M., & Wirsching, K. (2021)
<b>Corporate venturing</b> as used in selection and funding of intrapreneurial start-ups; finding that clarity and concise description is critical	Masucci, M., Parker, S. C., Brusoni, S., & Camerani, R. (2021)
<b>Environmental uncertainty and institutional forces</b> relating to dynamic capabilities; agendas and normative practice are time-wasting barriers	Honig, B., & Samuelsson, M. (2021)
<b>Absorptive capacity</b> at individual/group level as predictors and effects on innovation and performance within an organisation	Yildiz, H. E., Murtic, A., Klofsten, M., Zander, U., & Richtner, A. (2021)
<b>Capability comparison</b> with direct and indirect effects on outcomes at university, entrepreneurial outcomes via massive open online courses	Guerrero, M., Heaton, S., & Urbano, D. (2021)
<b>Capabilities development</b> using an empirical model on open-source ecosystems and network ties with open-source ecosystems	Faridian, P. H., & Neubaum, D. O. (2021).
<b>Innovative behaviour</b> on an individual level, with self-leadership strategies as well as perceived organisational innovativeness	Kör, B., Wakkee, I., & van der Sijde, P. (2021)

Table 2. Intrapreneurship linking dynamic capabilities (Teece, 1990; Klofsten et al., 2021).

Even for small business, it is imperative to practice intrapreneurship, to help evolve, be more agile and more competitive (Aguilar et al., 2019). Consequently, in the new Covid era, the mantra ‘innovate or die’ is a realistic and necessary disposition, rather than a manifesto, because alignment with strategic goals is vital when implementing new products or services, particularly in turbulent times.

Even when a culture of agile intrapreneurship is not prevalent in an organisation, intrapreneurial champions with expertise and drive can be activated, especially because resources must be husbanded. New products often originate from innovative side-teams within organisations (Chaston, 2014). Such methods can smooth out the stress of change in the marketplace (Prieto et al., 2020). For many firms, engagement of employees is a bonus that intrapreneurship can deliver; the psychological lift and capital gained within organisations is increasingly important in modern retention schemes (Pandey et al., 2020). Companies that employ intrapreneurship can better survive threats and obstacles, often with improved company performance, with growth and profitability upshots (Aina & Solikin, 2020).

## ANALYSIS OF FINDINGS

Considering the Coronavirus context, a Google Scholar search of ‘Intrapreneurship and Coronavirus,’ including the year 2020 and January 2021, yielded 316 results in seven broad categories (Figure 2).

Intrapreneurial interest increased in the education sector because of Covid-19, perhaps because ‘survival via innovation’ became a key organisational problem to solve, with urgency (Guerrero & Urbano, 2021). It is noteworthy that intrapreneurial links to workforce support were sizeable; although ‘business survival’ was newsworthy, researchers still connected intrapreneurship with ‘people, planet and profit’ or ‘social, sustainable and profitable’ solutions in business. Digitisation was so prevalent it was given its own category; if rightly combined with innovation and models, it would have become the foremost category for scholarship linked to intrapreneurship and the pandemic – an interesting finding.

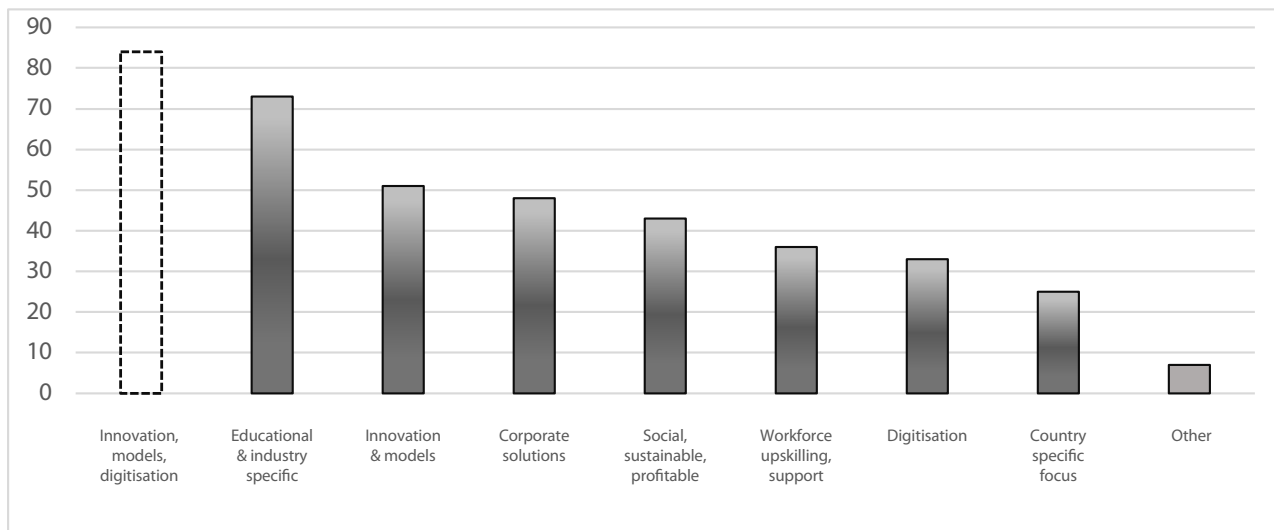


Figure 2. Prevalence of categories linking intrapreneurship in the Coronavirus context.

**Digitisation and innovation** can be accelerated with intrapreneurial disciplines, modes and models. Our economy is based on entrepreneurship (Drucker, 1984), so it would be wise for businesses to pilot intrapreneurial initiatives now; uncertainty has surpassed risk as a barrier to proactive performance. With training and sustainable processes, organisations can reboot and restart their economic growth (Timmons, Spinelli, & Tan, 2004) (Figure 3).

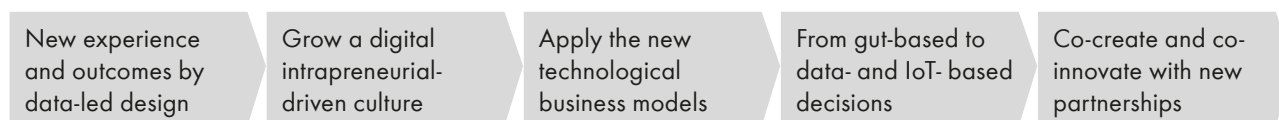


Figure 3. Five steps to begin an intrapreneurial data-driven organisational transformation (Wang, 2020).

Dynamic capabilities can be exploited with digitisation. Most new and incumbent firms are drowning in potential data sources; some are erratic, but data-driven decisions are fuelling transformation that leaves competitors behind. Applied data insights drive dynamic pricing models, novel products and customer experience, and detect supply-chain opportunities. Intrapreneurs are the drivers, rethinking resource allocation and team work with data and technology (Wang, 2020). Big data must come under organisational control; it is ‘real time,’ automated and high volume (Cherrington et al., 2019a, 2019b). Using data to drive decisions can create proprietary and innovative models with new paths for growth (Airehrour et al., 2020). Consumption is shifting; products and service are now shifting to Internet of Things outcomes.

**Educational and industry solutions** are in demand. Vis-à-vis dynamic capability, intrapreneurs are often mavens, strategically producing, circulating and creating knowledge in organisations. They break down silos and barriers

to productivity (Perez-Uribe et al., 2018). The diversity offered in organisational asset pools can be critical to co-creation and co-capture for intrapreneurs (Faridian & Neubaum, 2021).

Intrapreneurship is a means for employees to stay relevant as others are made redundant (Chamorro-Premuzic, 2020); they can use the valuable skills gained within a safe organisational environment to become their own boss, entrepreneurially. They can build their own firm's dynamic capabilities, underpinned by organisational routines and managerial skills, even integrating and reconfiguring internal competencies to realign with former networks (Pace & Cherrington, 2020).

**Corporate solutions** are now initiated with future-thinking tools. Organisational growth is no longer a certainty; intrapreneurship sparks a use of unproductive resources with innovative or data-driven transformation (Cherrington et al., 2020). Since 2010, 61% of Fortune 500 companies were acquired, merged, bankrupted, or fell in rankings, frequently due to digital disruption (Wang, 2020). Digitisation can create new products and transform growth with new business models, pricing models, experiential offerings and strategic differentiation. In new sustainable supply chains, the marketing cachet is enormous. Companies who prepare and invest will gain exponential capabilities.

**Sustainability and climate-change** policies are being mandated by stricter policy; targets and deadlines are looming. There are calls for organisations to hit the Covid restart button so that solutions become sustainable opportunities. Intrapreneurship can help (Dentchev et al., 2016). Key benefits are:

- Competitive advantage and resilience, brand identification and increased stakeholder loyalty.
- Increased business capability alongside compliance, with better productivity or cost reduction.
- Redeployment of assets, efficiency gains and reduced waste or 'waste as an asset' initiatives.

Intrapreneurial factors such as proactiveness, risk taking and autonomy can connect to sustainability, to exploit latent, synergistic economic, environmental and social innovation (Widya-Hastuti, 2016). This can also be instigated with the often-unappreciated tools of process innovation and experimentation, and small-team thinking can support a green, circular economy (Zhukov & Cherrington, 2020).

**Workforce upskilling** and support can stave off competition. Intrapreneurial creative and restorative traits in intrapreneurs are vital. Organisations cannot afford to turn over their workforce; they must hire great people and take them on transformative journeys. Intrapreneurship can support the culture shift required. Intrapreneurship can use under-allocated resources in novel and relatively low-risk ways, while the profit-generating heart of the business continues to operate (Kocjancic & Bojnec, 2013). Even as businesses redefine themselves, struggle to keep employees, or mitigate cashflow or supply chain issues through a global pandemic, intrapreneurship can generate differentiation and create newsworthy marketing and public-relations possibilities.

**A country-specific focus** is vital. Coronavirus impacts are affecting resource acquisition with growing uncertainty; new winners and losers are being created and the major factors shifting business are not made with years of data but now, with 'a single data point' (Zhao et al., 2021). When organisations are forced into recency and survival mode, valuable effort, resources and people can get lost in the tumult.

**The disciplines of intrapreneurship** can mitigate key concerns. Small, agile experiments can tolerate failure as a pathway to success; they are the stuff of intrapreneurial DNA. Partnership can lower costs, and collaboration is behind some of the greatest global technological companies (Wang, 2020).

## CONCLUSION

The changing demands and uncertainties of business have never been greater; the last great pandemic was a century ago and this pandemic has created upheaval. Organisations must envision innovative, sustainable and technological transformation while evolving existing business models. Ultimately, a generative intrapreneurial culture will seek innovation and entrepreneurial ecosystems to influence government, industry, universities and



society. The particular structures and dynamic processes of sustainable innovation are fluid; additional research and experimentation is needed in this discipline.

In this time of Covid, firms are searching to reorient themselves with technological solutions, or market reorientation, or process innovation. Intrapreneurship is often transformational, as an untapped source of opportunities; if agile organisational practices and design-thinking expertise exist within a firm, internal solutions can be exploited in the face of external instability and uncertainty.

An intrapreneurial culture is atypical, yet expertise within a firm and technological support take the risk out of intrapreneurship. When firms are cash strapped, intrapreneurship is an easier and less costly means of growing more sustainable initiatives that are customer-centric, with community focus. The intrapreneurial process correlates with this era, and it can be a liberating organisational strength.

## REFERENCES

- Aguilar, S., Vengrouskie, E. F., & Lloyd, R. A. (2019). Driving organizational innovation as a form of intrapreneurship within the context of small businesses. *Journal of Strategic Innovation and Sustainability*, 14(3), 25-28. <https://doi.org/10.33423/jsis.v14i3.2103>
- Aina, Q., & Solikin, I. (2020). Entrepreneurship and intrapreneurship: How supporting corporate performance. *Review of Integrative Business and Economics Research*, 9, 288-297.
- Airehrour, D., Cherrington, M., Lu, J., Dunn, I., Cameron-Brown, D., & Stokes, K. (2020). Innovative models and partnership contribution for sustainable economic growth. In H. Hamerton & C. Fraser (Eds.), *Proceedings of the 2020 ITP Research Symposium* (pp. 74-82). Toi Ohomai Institute of Technology. <https://itpresearch.ac.nz/wp-content/uploads/2020/11/2020-ITP-Research-Symposium-Proceedings.pdf>
- Antonicic, B., & Hisrich, R. D. (2003). Clarifying the intrapreneurship concept. *Journal of Small Business and Enterprise Development*, 10(1), 7-24. <https://doi.org/10.1108/14626000310461187>
- Audretsch, D. B., Lehmann, E. E., Menter, M., & Wirsching, K. (2021). Intrapreneurship and absorptive capacities: The dynamic effect of labor mobility. *Technovation*, 99, 102-129. <https://doi.org/10.1016/j.technovation.2020.102129>
- Badulescu, A., & Badulescu, D. (2016). Entrepreneurship and local resources. In D. Leslie (Ed.), *Tourism enterprises and the sustainability agenda across Europe* (pp. 169-186). Routledge.
- Baumol, W. J. (2002). Entrepreneurship, innovation and growth: The David-Goliath symbiosis. *Journal of Entrepreneurial Finance*, 7(2), 1-10. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1027.202&rep=rep1&type=pdf>
- Begeç, S., & Arun, K. (2020). The bottleneck of intrapreneurship: Are social positions and held expectations constraints in organizations' entrepreneur process? A conceptual view. *Journal of Entrepreneurship in Emerging Economies*. <https://doi.org/10.1108/JEEE-08-2019-0120>

- Blanka, C. (2019). An individual-level perspective on intrapreneurship: A review and ways forward. *Review of Managerial Science*, 13(5), 919-961. <https://doi.org/10.1007/s11846-018-0277-0>
- Cadar, O., & Badulescu, D. (2015). Entrepreneur, entrepreneurship and intrapreneurship. A literature review. *The Annals of the University of Oradea, Economic Sciences*, 2(XXIV), 658-664. [https://www.researchgate.net/publication/289125304\\_ENTREPRENEUR\\_ENTREPRENEURSHIP\\_AND\\_INTRAPRENEURSHIP\\_A\\_LITERATURE\\_REVIEW](https://www.researchgate.net/publication/289125304_ENTREPRENEUR_ENTREPRENEURSHIP_AND_INTRAPRENEURSHIP_A_LITERATURE_REVIEW)
- Caloghirou, Y., Kastelli, I., & Tsakanikas, A. (2004). Internal capabilities and external knowledge sources: Complements or substitutes for innovative performance? *Technovation*, 24(1), 29-39. [https://doi.org/10.1016/S0166-4972\(02\)00051-2](https://doi.org/10.1016/S0166-4972(02)00051-2)
- Cantner, U., Cunningham, J. A., Lehmann, E. E., & Menter, M. (2020). Entrepreneurial ecosystems: A dynamic lifecycle model. *Small Business Economics*, 1-17. <https://doi.org/10.1007/s11187-020-00316-0>
- Casson, M. (2003). *The entrepreneur: An economic theory*, 2nd edition. Edward Elgar.
- Chamorro-Premuzic, T. (2020, March 26). Why you should become an "intrapreneur." *Harvard Business Review*. <https://hbr.org/2020/03/why-you-should-become-an-intrapreneur>
- Chang, J. (2001). Intrapreneurship and exopreneurship in manufacturing firms: An empirical study of performance implications. *Journal of Enterprising Culture*, 9(02), 153-171. <https://doi.org/10.1142/S0218495801000092>
- Chaston, I. (2014, April 30). Entrepreneurship research – issues and research opportunities. Presented at the University of Auckland Business School, Auckland, New Zealand.
- Cherrington, M., Airehrour, D., Lu, J., Xu, Q., Wade, S., & Madanian, S. (2019a). Feature selection methods for linked data limitations, capabilities and potentials. *BDCAT '19: Proceedings of the 6th IEEE/ACM International Conference on Big Data Computing, Applications and Technologies*. (pp. 103-112). <https://doi.org/10.1145/3365109.3368792>
- Cherrington, M., Lu, J., Airehrour, D., Thabtah, F., Xu, Q., & Madanian, S. (2019b). Feature selection: Multisource and multi-view data limitations, capabilities and potentials. *2019 29th International Telecommunication Networks and Applications Conference (ITNAC 29)*. IEEE. <http://toc.proceedings.com/54174webtoc.pdf>
- Cherrington, M., Lu, Z. J., Xu, Q., Thabtah, F., Airehrour, D., & Madanian, S. (2020). Digital asset management: New opportunities from high dimensional data – A New Zealand perspective. In A. D. Ball, L. Gelman, & B. K. N. Rao (Eds.), *Advances in asset management and condition monitoring* (pp. 183-193). Springer.
- Ciaramella, A., & Dall'Orso, M. (2021). How can we drive innovation? In *Urban regeneration and real estate development* (pp. 37-53). Springer.
- Conway, P. (2016). *Achieving New Zealand's productivity potential*. NZPC, Te Kōmihana Whai Hua o Aotearoa.
- Creutzberg, T. (2011). *Canada's innovation underperformance: Whose policy problem is it?* Mowat Centre for Policy Innovation
- Deming, W. E. (2018). *Out of the crisis*. MIT Press.
- Dentchev, N., Baumgartner, R., Dieleman, H., Jóhannsdóttir, L., Jonker, J., Nyberg, T., Rauter, R., Rosano, M., Snihur, Y., Tang, X., & van Hoof, B. (2016). Embracing the variety of sustainable business models: Social entrepreneurship, corporate intrapreneurship, creativity, innovation, and other approaches to sustainability challenges. *Journal of Cleaner Production*, 113, 1-4. [https://www.researchgate.net/publication/317973089\\_Embracing\\_the\\_variety\\_of\\_sustainable\\_business\\_models\\_Social\\_entrepreneurship\\_corporate\\_intrapreneurship\\_creativity\\_innovation\\_and\\_other\\_approaches\\_to\\_sustainability\\_challenges](https://www.researchgate.net/publication/317973089_Embracing_the_variety_of_sustainable_business_models_Social_entrepreneurship_corporate_intrapreneurship_creativity_innovation_and_other_approaches_to_sustainability_challenges)
- Drucker, P. F. (1984). Our entrepreneurial economy. *Harvard Business Review*, 62(1), 58-64.
- Elsbach, K. D., & Stigliani, I. (2018). Design thinking and organizational culture: A review and framework for future research. *Journal of Management*, 44(6), 2274-2306. <https://doi.org/10.1177/0149206317744252>
- Faridian, P. H., & Neubaum, D. O. (2021). Ambidexterity in the age of asset sharing: Development of dynamic capabilities in open source ecosystems. *Technovation*, 99, 102125. <https://doi.org/10.1016/j.technovation.2020.102125>

- Gates, B. (2020). *How to avoid a climate disaster: The solutions we have and the breakthroughs we need*. Knopf.
- Guerrero, M., Heaton, S., & Urbano, D. (2021). Building universities' intrapreneurial capabilities in the digital era: The role and impacts of Massive Open Online Courses (MOOCs). *Technovation, 99*, 102139. <https://doi.org/10.1016/j.technovation.2020.102139>
- Guerrero, M., & Urbano, D. (2021). The entrepreneurial university in the digital era: Looking into teaching challenges and new higher education trends. In U. Hytti (Ed.), *A research agenda for the entrepreneurial university* (pp. 143-167). Edward Elgar.
- Güven, B. (2020). The integration of strategic management and intrapreneurship: Strategic intrapreneurship from theory to practice. *Business and Economics Research Journal, 11*(1), 229-245. <https://doi.org/10.20409/berj.2020.247>
- Hathway, D. (2009). *A blueprint for strategic intrapreneurship* [Unpublished master's dissertation]. University of Warwick.
- Hecker, A. (2017). The intrapreneurial nature of organizational innovation: Toward a new process model. *International Journal of Innovation: IJI Journal, 5*(3), 375-398. <https://doi.org/10.5585/iji.v5i3.208>
- Honig, B., & Samuelsson, M. (2021). Business planning by intrapreneurs and entrepreneurs under environmental uncertainty and institutional pressure. *Technovation, 99*, 102124. <https://doi.org/10.1016/j.technovation.2020.102124>
- Iversen, J., Jørgensen, R., & Malchow-Møller, N. (2008). Defining and measuring entrepreneurship. *Foundations and Trends in Entrepreneurship, 4*(1), 1-67. <https://doi.org/10.1561/03000000020>
- Jack, S. L., & Anderson, A. R. (2002). The effects of embeddedness on the entrepreneurial process. *Journal of Business Venturing, 17*(5), 467-487. [https://doi.org/10.1016/S0883-9026\(01\)00076-3](https://doi.org/10.1016/S0883-9026(01)00076-3)
- Jiang, S., Hu, Y., & Wang, Z. (2019). Core firm-based view on the mechanism of constructing an enterprise innovation ecosystem: A case study of Haier group. *Sustainability, 11*(11), 3108. <https://doi.org/10.3390/su11113108>
- Johnson, D. (2001). What is innovation and entrepreneurship? Lessons for larger organisations. *Industrial and Commercial Training, 33*(4), 135-140. <https://doi.org/10.1108/00197850110395245>
- Keall, C. (2021, June 13). Out of workers: Skills shortage is the new pain-point for technology sector. *New Zealand Herald*, B1. <https://www.nzherald.co.nz/business/out-of-workers-skills-shortage-is-the-new-pain-point-for-technology-sector/72IZACRCOSD2WQG4I2TZNTHRA4/>
- Klofsten, M., Urbano, D., & Heaton, S. (2021). Managing intrapreneurial capabilities: An overview. *Technovation, 99*, 102177. <https://doi.org/10.1016/j.technovation.2020.102177>
- Kocjancic, J., & Bojnec, S. (2013). Intrapreneurship, competition and company efficiency. *Managing Global Transitions, 11*(2). [https://www.fm-kp.si/zalozba/ISSN/1581-6311/11\\_161-179.pdf](https://www.fm-kp.si/zalozba/ISSN/1581-6311/11_161-179.pdf)
- Kör, B., Wakkee, I., & van der Sijde, P. (2021). How to promote managers' innovative behavior at work: Individual factors and perceptions. *Technovation, 99*, 102127. <https://doi.org/10.1016/j.technovation.2020.102127>
- Kumar, V. (2012). *101 design methods: A structured approach for driving innovation in your organization*. John Wiley & Sons.
- Lewin, A. Y., Välikangas, L., & Chen, J. (2017). Enabling open innovation: Lessons from Haier. *International Journal of Innovation Studies, 1*(1), 5-19. <https://doi.org/10.3724/SP.J.1440.101002>
- Masucci, M., Parker, S. C., Brusoni, S., & Camerani, R. (2021). How are corporate ventures evaluated and selected? *Technovation, 99*, 102126. <https://doi.org/10.1016/j.technovation.2020.102126>
- Pace, B., & Cherrington, M. (2020). Analytics for managers. *Scope: Contemporary Research Topics (Learning & Teaching), 9*, 58-65. [https://www.thescopes.org/assets/scopes/SCOPE\\_WHOLE-ISSUE\\_LT9.pdf](https://www.thescopes.org/assets/scopes/SCOPE_WHOLE-ISSUE_LT9.pdf)
- Pandey, J., Gupta, M., & Hassan, Y. (2020). Intrapreneurship to engage employees: Role of psychological capital. *Management Decision*. <https://doi.org/10.1108/MD-06-2019-0825>
- Perez-Urbe, R., Salcedo-Perez, C., & Ocampo-Guzman, D. (Eds.). (2018). *Handbook of research on intrapreneurship and organizational sustainability in SMEs*. IGI Global.
- Pinchot III, G. (1985). *Intrapreneuring: Why you don't have to leave the corporation to become an entrepreneur*. Harper & Row.
- Pinchot, G. (2010). *The Pinchot perspective. In search of a future worth living*. <http://www.pinchot.com/2010/01/back-to-intrapreneuring.html>

- Prats, M. J., & Kislenko, S. (2015). Empowering growth from within: Cultivating conditions for intrapreneurship to thrive. In J. Canals (Ed.), *Shaping Entrepreneurial Mindsets* (pp. 59-80). Palgrave Macmillan.
- Prieto, L. C., Phipps, S. T., & Kungu, K. (2020). Facilitating a culture of intrapreneurship: An employee involvement approach. *Strategic HR Review*, 19(2), 93-95. <https://doi.org/10.1108/SHR-04-2020-181>
- Puech, L., & Durand, T. (2017). Classification of time spent in the intrapreneurial process. *Creativity and Innovation Management*, 26(2), 142-151. <https://doi.org/10.1111/caim.12214>
- Russell, R. D. (1999). Developing a process model of intrapreneurial systems: A cognitive mapping approach. *Entrepreneurship Theory and Practice*, 23(3), 65-84. <https://doi.org/10.1177/104225879902300305>
- Schumpeter [blog]. (2018, January 4). 2018 will be the year that big, incumbent companies take on big tech. *The Economist*. <https://www.economist.com/business/2018/01/03/2018-will-be-the-year-that-big-incumbent-companies-take-on-big-tech>
- Schumpeter, J. (1942). Creative destruction. *Capitalism, Socialism and Democracy*, 825, 82-85.
- Teece, D. (1990). *Firm capabilities, resources and the concept of strategy*. Economic analysis and policy working paper EAP, 38. University of California.
- Teece, D. J. (2009). *Dynamic capabilities and strategic management: Organizing for innovation and growth*. Oxford University Press on Demand.
- Timmons, E., & Spinelli, S. (2003). Entrepreneurship for the 21 St Century. *New Venture Creation*, 3, 249-256.
- Timmons, J. A., Spinelli, S., & Tan, Y. (2004). *New venture creation: Entrepreneurship for the 21st century* (Vol. 6). McGraw-Hill/Irwin.
- Urbano, D., Alvarez, C., & Turró, A. (2013). Organizational resources and intrapreneurial activities: An international study. *Management Decision*, 51(4), 854-870. <https://doi.org/10.1108/00251741311326617>
- Wang, R. R. (2020). *How to lead a data-driven digital transformation* [Harvard Business Review webinar]. Alteryx. <https://pages.alteryx.com/webinar-HBR-Digital-Transformation-on-demand-ty.html>
- Widya-Hastuti, A., Talib, N. B. A., Wong, K. Y., & Mardani, A. (2016). The role of intrapreneurship for sustainable innovation through process innovation in small and medium-sized enterprises: A conceptual framework. *International Journal of Economics and Financial Issues*, 6(35). <https://www.econjournals.com/index.php/ijefi/article/view/2615>
- Yildiz, H. E., Murtic, A., Klostfen, M., Zander, U., & Richtnér, A. (2021). Individual and contextual determinants of innovation performance: A micro-foundations perspective. *Technovation*, 99, 102130. <https://doi.org/10.1016/j.technovation.2020.102130>
- Zaffron, S., & Logan, D. (2011). *The three laws of performance: Rewriting the future of your organization and your life* (Vol. 170). John Wiley & Sons
- Zenovia, C. P., & Maier, V. (2011). Entrepreneurship versus intrapreneurship. *Journal Review of International Comparative Management*, 12(5), 971-980. <https://EconPapers.repec.org/RePEc:rom:rmcimn:v:12:y:2011:i:5:p:971-976>
- Zhao, H., Merchant, N. N., McNulty, A., Radcliff, T. A., Cote, M. J., Fischer, R. S., Sang, H., & Ory, M. G. (2021). COVID-19: Short term prediction model using daily incidence data. *PloS one*, 16(4), e0250110. <https://doi.org/10.1371/journal.pone.0250110>
- Zhukov, Y., & Cherrington, M. (2020). Modelling sustainability for a green circular economy. *Scope: Contemporary Research Topics (Learning & Teaching)*, 9, 9-15. [https://www.thescope.org/assets/scopes/SCOPE\\_009-Zhukov-Cherrington\\_LT9.pdf](https://www.thescope.org/assets/scopes/SCOPE_009-Zhukov-Cherrington_LT9.pdf)

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