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# INFORMATION SYSTEMS EDUCATION JOURNAL

## Editor Comment:

We are pleased to present our first issue of 2024, including papers on AI in and out of the classroom. We are also delighted to welcome Dr. Kevin Mentzer to the editorial team this year, joining Dr. Dana Schwieger as Associate Editor, along with Drs. Ira Goldstein and Michelle Louch as Cases & Exercises Co-Editors. Thank you to each of these individuals, to our reviewers, and to our Publisher, Dr. Tom Janicki.

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# Investigating FinTech Education and Training in Australian Universities

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## Abstract

For more than a decade, the Financial Technology (FinTech) industry has been growing, and it has reshaped how payments were made and brought new financial service products to the market. FinTech has created innovative disruptions to traditional, long-established financial institutions (e.g., banks and investment firms) in financial services markets. The worldwide blooming of FinTech has caused universities around the globe to teach their students (particularly those in the IT and finance disciplines) about practical and contemporary knowledge on FinTech. This paper discusses our recent survey study to investigate the status quo of offering FinTech education and training by Australian universities. Our study involved two rounds of online data collection (one in November 2021 and the other one in June 2022) from 41 sample universities in Australia. Among our various findings, we observed that, although Australian universities are increasingly aware of the importance of and the demand for FinTech studies, FinTech has still not yet become a mainstream study discipline. This observation indicates that, in Australia, FinTech studies have generally gone through the inception stage and entered the growth stage.

**Keywords:** financial technology, FinTech, disruptive technology, business innovation, university-industry collaboration, tertiary education.

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# Investigating FinTech Education and Training in Australian Universities

## 1. INTRODUCTION

From a business perspective, *Financial Technology (FinTech)* refers to a collection of technologically enabled financial innovations that result in new business models, applications, processes, or products in financial markets and institutions (Lechman & Marszk, 2019; Leong & Sung, 2018; Mention, 2021). Nowadays, FinTech has become a set of emerging and disruptive technologies in the financial services industry (Alt, Beck, & Smits, 2018; Gomber, Koch, & Siering, 2017; Iman, 2020; PwC Australia, 2017; Vermeulen, 2017; Zabolokina, Dolata, & Schwabe, 2016). FinTech, such as automatic teller machines (ATM), Bloomberg, and the SWIFT (Society for Worldwide Interbank Financial Telecommunications) system have been around for decades, but only over the last few years they have revolutionized the way people interact with financial services (Mention, 2021; Pousttchi & Dehnert, 2018; Puschmann, 2017). Artificial intelligence (AI), big data, blockchain, cloud computing, Internet of Things (IoT), open source software (OSS), software-as-a-service (SaaS), serverless architecture, no-code (or low-code) development platform, and hyper automation are often described as the most disrupting technologies in FinTech (Fong, Han, Liu, Qu, & Shek, 2021).

As of July 2023, public traded FinTech firms represented a market capitalization of \$550 billion (McKinsey & Company, 2023). Also, as of the same period, there were more than 272 FinTech unicorns, with a combined valuation of \$936 billion, representing a sevenfold increase from 39 firms valued at \$1 billion or more five years ago (McKinsey & Company, 2023).

Due to the tremendous growth of FinTech, many universities around the globe have recognized the need for FinTech preparedness of their students, and have responded by offering related education and training (see endnote 1) (Earls, 2019; Poon, Pond, & Tang, 2024; Sung, Leong, Sironi, O'Reilly, & McMillan, 2019; University of Sussex, 2021). (To avoid verbosity, when appropriate, we will collectively refer to education and training as "study" or "studies".) In the U.S. and the U.K., driven by student and industry demands, leading business schools in top-tier educational institutions (e.g., Harvard University, Stanford University, New York University, Columbia University, University of Pennsylvania,

Massachusetts Institute of Technology, University of Cambridge, University of Oxford, Imperial College London, London School of Economics, and University College London) are now offering FinTech studies to their students. In the past, students were longing to go into investment banking or in the trading side, but now many of them are more interested in business innovation (e.g., FinTech) (Irrera, 2017).

Australian universities are no exception. Nowadays, a number of Australian universities have started to offer FinTech studies to catch this "tech wave". This paper describes our recent survey to investigate how Australian universities offer FinTech studies with a view to equipping our society with the related skills and knowledge.

## 2. LITERATURE REVIEW

Milner, Thomas, Kobbe, Fowler, Cardon, and Marshall (2023) performed a study in the U.S. They found that most U.S. universities/colleges did not offer undergraduate or postgraduate FinTech education despite 95% of survey respondents reporting that they considered students had a great interest in FinTech education. Milner et al. (2023) also found that most FinTech classes are taught by the Finance departments at the surveyed universities/colleges, followed by Information Systems departments.

An alumni survey found that: (a) many U.S. business schools do not teach FinTech at all, and (b) for those schools teaching FinTech, they do not teach well (Barrett, 2018). A major reason contributing to this phenomenon is that many business schools have a misunderstanding of FinTech — they think that FinTech is really just about writing apps (Barrett, 2018). Such misunderstanding causes these business schools simply steer clear of FinTech.

Earls (2019) observed that the majority of the existing university FinTech programmes in the U.S. have focused on regulation, security, and understanding the impact of technology on the market. This "high-level" approach does not cover individual technologies in detail, leaving students to learn on the jobs or pursue additional elective coursework.

### 3. STUDY SETTINGS

#### Research Questions

Our study focused on the following six research questions:

**RQ1:** How many Australian universities are offering FinTech studies?

**RQ2:** For those Australian universities with FinTech studies, what are their offering modes and levels?

**RQ3:** For those FinTech education programmes, what are their entry requirements?

**RQ4:** For those FinTech education programmes, what are their programme outcomes?

**RQ5:** What are the underlying support mechanisms and infrastructures in those universities with FinTech studies?

**RQ6:** Who are the industrial sponsors or partners associated with the university's FinTech studies?

For the rest of the paper, universities which offer FinTech studies will simply be referred to as "offering universities".

#### Sample Universities and Data Collection

Our study covered all the universities in Australia but excluded the University of Divinity, which only focuses on offering education on theology, philosophy, and ministry without any relationship with FinTech. After filtering this university, 41 sample universities remained in our study (this includes the Carnegie Mellon University's South Australia campus). Their geographical distributions across different regions (states and territories) of Australia are shown in Table 1 (see endnote 2):

| Region                             | Numbers of Sample Universities |
|------------------------------------|--------------------------------|
| Australian Capital Territory (ACT) | 2                              |
| New South Wales (NSW)              | 10                             |
| Northern Territory (NT)            | 1                              |
| Queensland (QLD)                   | 8                              |
| South Australia (SA)               | 5                              |
| Tasmania (TAS)                     | 1                              |
| Victoria (VIC)                     | 8                              |
| Western Australia (WA)             | 5                              |
| National (NAT)                     | 1                              |

**Table 1: Geographical distributions of sample universities**

Information about FinTech studies and research was collected online from each university's website twice (first in November 2021 and then in June 2022) for detailed analysis (see endnote 3). We found that both sets of information were the same with respect to the six research questions (RQ1 to RQ6) stated above.

### 4. DESCRIPTIVE STATISTICS

#### RQ1: Number of Offering Universities

Among the 41 sample universities, 16 (39%) of them are offering FinTech studies to various extent. When counting, we adopted the following guidelines:

- A unit (see endnote 4) would only be considered as FinTech-related if it involves teaching technologies in the *specific context of finance or financial services*. If, however, a unit teaches technologies (such as AI, blockchain, or big data) only in a general business context, it would not be considered as FinTech-related.
- A unit would only be considered as FinTech-related if at least a large part of it (rather than just one or two single topics) is related to FinTech.

Across Australia, more than one-third (39%) of the sample universities have recognized the importance of FinTech and responded with this by offering FinTech-related studies. The breakdown of these offering universities into different regions is shown in Table 2.

| Region | No. (%) of Offering Universities | Region | No. (%) of Offering Universities |
|--------|----------------------------------|--------|----------------------------------|
| ACT    | 0 out of 2 (0%)                  | TAS    | 0 out of 1 (0%)                  |
| NSW    | 4 out of 10 (40%)                | VIC    | 7 out of 8 (88%)                 |
| NT     | 0 out of 1 (0%)                  | WA     | 1 out of 5 (20%)                 |
| QLD    | 3 out of 8 (38%)                 | NAT    | 1 out of 1 (100%)                |
| SA     | 0 out of 5 (0%)                  |        |                                  |

**Table 2: Geographical Locations of Offering Universities**

If we ignore the NAT region with only one (offering) university (Australian Catholic University (ACU)), Table 2 shows that the two regions with the highest percentages of offering universities are VIC (88%) and NSW (40%). A plausible reason for this observation is that Melbourne and Sydney are the two largest Australian cities and financial hubs (Heussler, 2017), and they are located in VIC and NSW,

respectively. Thus, it is not difficult to see why relatively high percentages of universities in VIC and NSW are offering FinTech studies. With respect to Table 2, we can generalize our observation as follows: ***If a city (or region) has better financial development, those universities in that city (or region) are more likely to offer FinTech studies.***

### RQ2: Offering Models and Levels

Among the 16 offering universities in Table 2, we analyzed in detail about their offering modes and levels. Only two of them (one in VIC and one in QLD) offer short professional/executive *training* courses on FinTech to industry practitioners. The design of these two training courses is largely different as shown in Table 3.

| Offering University | Course Duration | Target Students  |
|---------------------|-----------------|--|
| The one in VIC      | 24 weeks        | Anyone who is interested in FinTech  |
| The one in QLD      | 3 days          | Managers who are currently working in the FinTech area or are interested to start the FinTech career |

**Table 3: Professional/Executive Training Courses on FinTech**

All the 16 offering universities provide FinTech *education* at least at one of the following three levels: unit, specialization (or minor), and degree (or major). Table 4 shows the number of universities offering FinTech education at the specialization and degree levels. This table shows that, overall, only small percentages of the offering universities provide FinTech education at the specialization (= 2/16 = 12.5%) or degree level (= 4/16 = 25.0%).

| Region | No. of Offering Universities | No. (%) of Universities Offering FinTech Education at: |                         |
|--------|------------------------------|--|-------------------------|
|        |                              | Specialization (or Minor) Level                        | Degree (or Major) Level |
| NSW    | 4                            | 1 (25%)  | 1 (25%)                 |
| QLD    | 3                            | 1 (33%)  | 2 (66%)                 |
| VIC    | 7                            | 0 (0%)   | 1 (14%)                 |
| WA     | 1                            | 0 (0%)   | 0 (0%)                  |
| NAT    | 1                            | 0 (0%)   | 0 (0%)                  |

**Table 4: FinTech Education at Specialization and Degree Levels**

Table 4 shows that only four FinTech degrees are offered in Australia. Furthermore, all these four degrees are at the master's or graduate-diploma level (see endnote 5). We further observed that all but one offering university provide their FinTech master's degrees and graduate diplomas on-campus or in a blended mode. Only one offering university offers an entire online master's degree and graduate diploma in FinTech.

The need and effectiveness of online studies are often subject to debate (Cacault, Hildebrand, Laurent-Lucchetti, & Pellizzari, 2021). Those proponents of online study argue that online students participate in exactly the same classes as on-campus students, so the learning outcomes of online study should not be inferior to those of on-campus study. These proponents also argue that, without online study, many students will be unable to receive college education due to their full-time jobs. However, other people argue that students studying for a degree involving a significant "technical" component (e.g., FinTech) need hands-on practice in a (FinTech) laboratory in the university campus, and acquiring this practice is not feasible for online students.

### RQ3: Entry requirements

For three out of the four FinTech master's degrees (and their associated graduate diplomas) offered in Australia, the only prerequisite of entrance is a recognized undergraduate degree of *any* discipline (i.e., not necessarily finance or IT). In some sense, this "generic" prerequisite is not consistent with the fact that FinTech is an interdisciplinary area between finance and IT. Whereas for the remaining master's degree/graduate diploma:

- either the applicants must have a recognized undergraduate degree in Finance and/or IT; or
- the applicants must have a recognized undergraduate degree in any discipline and have successfully passed the Level I examinations for the Chartered Financial Analyst (CFA) program administrated by the CFA Institute.

### RQ4: Programme Outcomes

We analyzed the programme outcomes of the four FinTech master's degrees and their associated graduate diplomas. The programme outcomes of most of these degrees/diplomas tend to lean to the business aspect rather than the technology aspect. Consider, for example, the following programme outcome of the FinTech postgraduate study offered by an offering university:

"... provide you [students] with the confidence to *lead and innovate teams, start-ups and businesses* ... will also gain an *understanding of relevant frameworks* and what it means to be an ethical professional in a disruptive and innovative industry, and establish a competitive career advantage within this lucrative and evolving industry (UNSW, n.d.)."

We speculate that the main reason for the above phenomenon is that the curricula of most FinTech master's degrees/graduate diplomas are primarily designed for (non-technical) business or finance professionals who want to start or advance their FinTech career. This explains why the programme outcomes of these master's degrees/graduate diplomas tend to lean to the business aspect. For those technical-oriented students or professionals who want to study for a degree related to FinTech, they may prefer a more technical one such as a Bachelor of Blockchain Business or a Master of Cybersecurity. Although blockchain and cybersecurity are two core technologies underpinning FinTech, a degree specializing in these technical areas is not considered a FinTech degree in this study.

#### **RQ5: Underlying Support Mechanisms and Infrastructures**

We analyzed this research question in three aspects: (a) the establishment of a professorship in FinTech; (b) the establishment of a FinTech research center; and (c) the setup of a FinTech supporting laboratory.

Among the 16 offering universities, we observed the following:

- None of them has established a professorship in FinTech. We argue that, if a university takes FinTech seriously, it will establish a professorship to lead the development (in terms of teaching and research) of this discipline.

Note that we only counted "full" professorship, which is a level-E academic position in Australian universities. Visiting professors, emeritus professors, adjunct professors, and professorial fellows were excluded.

- Only three (one in QLD and two in VIC) offering universities have established a research center focusing on FinTech.
- Only two (one in QLD and one in VIC) offering universities have established a FinTech supporting laboratory. The offering

university in VIC with a FinTech supporting laboratory is Monash University. This university collaborates with The Hong Kong Polytechnic University (in Hong Kong) and CollinStar Capital (a leading Melbourne-based institution and a FinTech expert in Australia) to establish a university-industry joint research laboratory on blockchain and cryptocurrency technologies.

#### **RQ6: Industrial Sponsors or Partners**

Business firms are often struggling to attain a competitive edge in this global market fostered by new economies of scale (Alonso, de Soria, Orue-Echevarria, & Vergara, 2010). To overcome this organizational challenge, many firms collaborate with universities as an imperative instrument to make the firms more innovative in business ideas (Awasthy, Flint, Sankarnarayana, & Jones, 2020). On the other hand, universities are also actively looking for industrial collaboration to ensure that their programmes stay relevant and leading edge (Ahmed, Fattani, Ali, & Enam, 2022).

Undoubtedly, when universities and the industry work together to push the frontiers of knowledge, they become a powerful engine for economic growth (Maddocks, 2020; Science/Business Innovation Board, 2012). Silicon Valley in the U.S. is a prominent example. Obviously, the merits of university-industry collaboration also apply to FinTech (IMC, 2023).

Among the 7 offering universities in VIC, we observed such university-industry collaboration in Swinburne University of Technology (SUT) and Monash University. SUT offers a Graduate Certificate and a Master of Financial Technologies. These two postgraduate programmes are co-developed and/or co-delivered with Bendigo Bank, Judo Bank, IBM, and Tableau. In both programmes, these industrial partners will host events, provide platforms and content, pose real-world challenges and applied projects, and bring in practicing professionals as speakers or guest lecturers. Also, as mentioned in our discussion of RQ5 above, Monash University has a partnership with CollinStar Capital when establishing its FinTech supporting laboratory.

A similar university-industry collaboration also exists in the University of New South Wales in NSW. This university is the only one in NSW which offers a Graduate Certificate, a Graduate Diploma, and a Master of Financial Technology, and these programmes are co-developed with industry experts in financial services.



### Key Highlights from RQ1 to RQ6

All in all, we have two major observations:

- (a) 16 (39%) of the samples are offering universities. This indicates that FinTech studies have generally gone through the inception stage and entered the growth stage (see endnote 6).
- (b) Among the 16 offering universities, only few of them offer FinTech education at the specialization or degree level, and even fewer of them have an underlying support mechanism and infrastructure.

***It can be concluded that, in the Australian university sector, FinTech has still not yet become a mainstream study per se. Instead, FinTech currently only serves as a "spin-off" discipline of some other traditional disciplines such as finance and financial services.***

### 5. FURTHER OBSERVATIONS

Besides the findings discussed in Section 4, we further noted the following two interesting observations that are worth mentioning.

***FinTech-related units:*** In Table 4, we analyzed the numbers and the percentages of sample universities which offer FinTech education at the specialization and degree levels. Here we focus on FinTech education at the unit level. Among all the FinTech-related units offered, more of them are at the postgraduate level than at the undergraduate level. Consider two examples. First, the 7 offering universities in VIC altogether offer a total of 4 and 13 FinTech-related units at the undergraduate and postgraduate levels, respectively. Second, the 4 offering universities in NSW only offer FinTech-related units at the postgraduate level. This observation is consistent with the general view that the curriculum and content of a postgraduate degree are more focused and specialized than an undergraduate degree (Maddocks, 2020).

***Hosting schools:*** In almost all the offering universities, their FinTech education (at the unit, specialization, and degree levels) and training are offered or hosted by the business schools (e.g., finance) rather than by technical-oriented schools (e.g., information technology). This can be understood as FinTech is not a purely technical area, so people generally think that its teaching should be delivered by business-focused or financial-focused faculty members, who are often resided in business schools rather than in IT

schools. However, Barrett (2018) observed that many faculty staff members of business schools find themselves not technically competent enough to teach the "technology" aspect of FinTech (which is new and ever-changing).

This above issue was also confirmed in our study, where several business faculty staff members involving in teaching FinTech told us that they often found it difficult to teach the "technical" aspects of FinTech (e.g., AI, machine learning, virtual reality, big data, blockchain, cryptography, cloud computing, and smart contract) because they do not possess sufficient technical knowledge for teaching. Some studies (Corbacho, Minini, Pereyra, González-Fernández, Echániz, Repetto, Cruz, Fernández-Damonte, Lorieto, & Basile, 2021; Jackson, Dunbar, Sarkis, & Sarnie, 2023) reported that "traditional" higher education structures with specialized disciplines hinder interdisciplinary collaboration. In any case, as FinTech education develops and matures, it would be wise for teaching collaboration between the business and IT faculties (Hendershott, Zhang, Zhao, & Zheng, 2021; Thomas & Milner, 2023).

### 6. RECOMMENDATIONS

Although FinTech is blooming, it is also facing a shortage of skills. Bridging or closing this gap requires a dedicated effort from both FinTech startups/incumbent firms and universities to make FinTech as visible and accessible as possible. Thus, not only Australian universities should offer more FinTech-related studies, but these studies should be co-developed and supported by industrial partners. There are several merits of this arrangement. First, it makes the content and the curriculum of a FinTech course more industrially relevant and, hence, increase the employability of the graduates. Second, the industrial partners can send in some of their employees to serve as guest speakers, and can bring in some of their real-life projects for the students to work on. Third, the industrial partners can offer internship opportunities to FinTech students.

Recently, we observed that AI and machine learning has been widely used in various financial services applications such as fraud and compliance (Buchanan & Wright, 2021). This FinTech business model is known as *Regulatory Technology (RegTech)*, which refers to the application of emerging technologies (e.g., AI, machine learning, and big data) to improve the way firms manage regulatory compliance (Becker, Merz, & Buchkremer, 2020; Institute of

International Finance, 2015). RegTech is argued to be a new and vital dimension of FinTech (Butler & O'Brien, 2019). Compared with other current innovations, RegTech is at an early stage of development in the industry (Institute of International Finance, 2016). Because RegTech involves a legal and regulatory element (Mallia-Dare & Meyer, 2020; Wang, 2019), some law faculty staff have been engaging in RegTech research/teaching. For example, the Faculty of Law of Monash University in Australia has established its Centre for Commercial Law and Regulatory Studies, whose one of its focuses is RegTech (Monash University, 2018). Thus, a comprehensive FinTech curriculum should have RegTech as one of its components, and teaching RegTech should be a joint effort among faculty staff members from the IT, business (including finance and accounting), and law disciplines (Al-Hudithi & Siddiqui, 2021; Karkkainen, Panos, Broby, & Bracciali, 2018; Molnár, Tarcsi, Baude, Pisoni, Ngo, & Massacci, 2020).

Nowadays, university job fairs have become regular events on campus. These events provide an excellent opportunity for students to interact and connect with the industry. It is recommended that more FinTech firms should participate in these job fairs. It is even better that more "specialized" job fairs should be organized exclusively for FinTech. This will make FinTech more visible to students.

Teaching FinTech is best supported by a laboratory or hub facility. Take Bond University in QLD as an example. Its business school has established a FinTech hub with 40 Bloomberg terminals and other trading facilities. Students have 24-hour access to Bloomberg's live financial market data. Students can also gain practical experience in executing deals, managing portfolios, and trading financial securities. Our survey found that only few Australian universities have established such laboratories or hub facilities to support their FinTech studies. Thus, it is recommended that more such facilities should be set up to complement FinTech studies.

In 2019–2020, there was a Savvy FinTech Scholarship open to all undergraduate and master's students majoring in commerce, banking, marketing, finance, accounting, actuarial studies, economics, or business studies. Similarly, since 2017, Spotcap (a FinTech firm offering digital-business lending technology to financial institutions) has been offering its FinTech scholarship to alleviate the talent shortage in the FinTech industry by fostering more home-grown expertise (Alois, 2018). But

despite this, generally only a very limited number of FinTech scholarships are available and they come from the industry. It is advised that universities should also offer their own FinTech scholarships to promote FinTech education and to attract high-calibre students to this discipline.

## 7. STUDY LIMITATIONS

Ideally, all the data should be collected within a very short period in each of the two rounds for more accurate comparison and analysis. However, due to the large number of sample universities and related course/unit web pages, data collection spanned about one month to complete in each round (in November 2021 and June 2022). In principle, though unlikely, some changes could have happened in the course/unit web pages amidst our data collection work. We have, however, already made our best effort to shorten the data collection periods in order to minimize any effect that may invalidate the results of our study.

In addition, our study was solely based on the online data collected from the sample university's websites. It is possible that the contents of some of these websites are not up to date. We, however, argue that since our study involved two rounds of online data collection with an eight-month time gap, outdated web pages in the first-round data collection might have been updated by the relevant universities before the start of the second-round data collection. Nevertheless, even if there exist some web pages which were not updated in both rounds of data collection, our results still paint an overall picture of the current situation and development of FinTech studies offered by Australian universities.

## 8. CONCLUSION

In this paper, we have discussed our recent survey to investigate the current situation and development of FinTech studies offered by Australian universities. Our survey covered all Australian universities, except one which solely focuses on offering education on theology, philosophy, and ministry. On the one hand, our findings show that Australian universities are increasingly aware of the importance of and the demand for FinTech studies. On the other hand, FinTech has still not yet become a mainstream study discipline. Our findings also indicate that, in Australia, FinTech studies have generally gone through the inception stage and entered the growth stage. We recommend that more work and effort need to be put in by Australian universities and industrial partners to promote

FinTech studies and to equip our students with the necessary skills and knowledge for career opportunities in the growing FinTech industry.

## 9. ACKNOWLEDGEMENTS

This work was approved by the Human Research Ethics Committee at Central Queensland University (reference: 0000023455).

## 10. ENDNOTES

1. We use the term “education” to refer to studies leading to a formal academic qualification (e.g., a bachelor’s degree, a graduate diploma, or a master’s degree), and the term “training” to refer to short professional seminars or courses without leading to a formal academic qualification.
2. The geographic distribution of a university is determined based on the location of its head campus. Among these universities, the Australian Catholic University (ACU) does not have an explicit head campus in Australia. For the sake of analysis, we create a new region “national (NAT)” and assign ACU to this region.
3. We performed two rounds of data collection for our another FinTech project with the intention to investigate how FinTech studies offered by the Australian universities evolve over time.
4. In this paper, a *unit* is a syllabus item offered by a university (similar to a subject that students study at high school).
5. In most Australian universities, postgraduate students can choose to only study all the Year-1 units of a master’s degree (which often involves two full years of study) and earn a graduate diploma as an exit path.
6. The inception stage roughly corresponds to the first (Innovators) and second (Early Adopters) adopter categories as defined in Rogers’ Diffusion of Innovations Theory (DIT), whereas the growth stage roughly corresponds to the third adopter category (Early Majority) of DIT (Rogers, 2003).

## 11. REFERENCES

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