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A 3D Involvement Comprehension Model for the Digital Innovation Fostering Initiatives of the Financial Services Industry

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ABSTRACT

The financial services industry word-wide is active not only in financing the innovation, but also in creating opportunities for digital innovation take-up that will ultimately lead to economic growth and entrepreneurial success. By analyzing the activities of the four major financial institutions in Greece in the area of innovation support activities, a 3D model is constructed that clearly demonstrates the strategic area that is shaped for initiatives that foster innovation in the financial services industry sector. This model is also useful as a strategic positioning tool as well as a comprehension model for those actors that would like to enter into this area and gain an understanding of the projects and activities already run by the actors in this field.

Keywords: innovation; financial services; comprehension model; positioning tool

INTRODUCTION

The financial services sector plays an important role in fostering economic growth and fueling entrepreneurship. Apart from the traditional banking services providing credit, venture capital and project finance, financial institutions and financial institutions in general have demonstrated over the last decade a significant mobilization towards fostering the innovation, at two levels: one has to do with innovation consumed internally for their own organizational and organic growth purposes, i.e. to achieve their strategic goals, and the other is more of a corporate social responsibility type of actions, where innovation is not only focused to those activities that are related to core financial services activities, but aims at fostering and diffusing digital innovation into society. Of course, the combination of the two approaches is usually the kind of strategy most often pursued for obvious reasons. After all, digital innovation that may be developed by new, innovative ideas lies within the interests of the financial institutions that are constantly researching for new digital products and new types of digital customer experiences.

The roots of the banking appetite to organize and finance innovation can be traced using the PEST (political, economic, social and technological) analysis model. From the economic and social points of view, financial institutions have been trying to accelerate innovation both to create success stories that they will eventually provide credit and payments for, as well as to contribute to economic growth and the reduction of unemployment, in line with their attitude towards being socially responsible as well as generators of new capital flows. From the technological point of view, the proliferation of Application Programming Interfaces (APIs) and

the interconnection of organizations over the internet in web-like digital ecosystems, have boosted the financial industry sector to participate into virtual supply chains as new as block-chain type of international fund transfers and trade finance applications, turning them into much more extrovert organizations, both in mentality, as well as in their information systems' strategy orientation and operationalization. Finally, from a political point of view, compliance obligations coming from e.g. the 2nd Payment Systems Directive which dictates the opening of access to bank accounts and payment services to 3rd parties, the so called payment service providers, has created a new generation a software companies, the fintechs, which unavoidably cooperate with financial institutions, while financial institutions are obliged to offer connectivity capabilities for account information and payments services provision. The cooperation between financial institutions and fintechs has created a new wave of knowledge transfer between the banking sector and other sectors of the economy, collectively known as open banking. However, financial institutions have been moving beyond the passive role of being open banking providers. They have been using this opportunity to call for new ideas that can exploit the opportunities of open banking as well as other technological capabilities of web2.0 (collaborative platforms) and web3.0 (social media enablement) to increase economic activity and support entrepreneurship. Such opening to 3rd parties, in conjunction with the increasing digital literacy of their clients and the internal pressure to get digitally transformed are setting the scene for financial institutions to actively contribute to the innovation management for the societies they operate in.

In such a scene, financial institutions have been successfully organizing hackathons, internal and external innovation competitions, incubators for start-ups, accelerators and testbeds for new ideas, to name but a few of their activities related to innovation management. When discussing financial sector's innovation initiatives, most researchers focus on internal innovation such as product, process or service innovation, as shown in a literature review study [13] and other studies [2], [9] etc.

This study tries to identify how financial institutions are creating an innovation culture in society, how they support value capturing and implementation of innovation and how they manage the interactions and interrelationships of innovative knowledge exchanges between them and the rest of the society in a crowd-sourcing manner [12], using their technological skills, since it has been argued that "information systems is not just an enabler but rather can be a shaper that optimizes open innovation in general and crowdsourcing in particular." [7] For example, they create sandbox environments that simulate financial institutions' information systems environments to provide a testbed for fintech's applications while central banks organize innovation hubs[1].

Given the technological complexity of innovation these days, significant financing is needed for a new idea to reach the market and become a proper commercial product. As shown by a study in China, the relationship between short-term loans and innovation ability in high-tech firms is insignificant [14]. On the other hand, long-term loans for new ideas that may never materialize, possess a very high risk for financial institutions. Therefore, new approaches to financing innovation are needed, such as those referred to above. Moreover, to be socially fair and create

[1] See this report: FinTech: Regulatory sandboxes and innovation hubs. Available online at: BoS Report on Sandboxes and innovation hubs.docx (europa.eu)

equal opportunities for participation to economic growth, financial institutions have opted for inclusive innovation [10] type of activities, in order to improve the probability of discovering more talent and broadening the scope of innovative ideas.

This study has collected information from the main financial industry actors in Greece which invest time, money and energy into initiatives that support third party innovation, analyzed the similarities and differences among them, and arrived at a taxonomy and, ultimately, a model of comprehension for the strategic space of innovation support and growth. This 3D model allows actors of the financial services industry actors to position themselves appropriately into the field of innovation support and growth.

INITIATIVES OF THE FINANCIAL INDUSTRY IN GREECE TO BOOST INNOVATION

The financial industry is well positioned in selecting good ideas that can be transformed into real business plans and ultimately success business stories, because these skills lay in the core of its reason of existence. Business and corporate banking departments usually finance existing SMEs or corporates. Venture capital companies, either as subsidiaries of major financial services groups, or as independent companies of the financial services sector, finance new ideas, mainly in the digital technologies area.

Apart from offering a simulation environment for fintechs to develop and test new innovative applications using banking application programming interfaces (APIs), financial institutions also organize and finance innovation support initiatives and issue calls for proposals for interested parties in the digital economy area. Let's see how some banks in Greece are managing some of their innovation support projects.

Alpha Bank has organized a fin-tech oriented hackathon, where selected groups of innovators had a three day opportunity to meet mentors, exchange ideas and develop solutions using sandbox and other tools, compete for the three first award winning positions, through a final pitching event. The winners received monetary prizes and support from the Bank to continue their efforts. Alpha Bank has been annually organizing an internal innovative ideas competition (called i3 = inspire, innovate, implement) where employees of the Group submit their ideas, receive mentoring from other colleagues in the Bank and finally present their ideas to a Board of internal and external experts. This is an attempt to create an innovation culture within the Bank and boost inspiration and involvement among its personnel. Seems that this initiative is gaining popularity among staff, as more and more participants are engaged every year. Moreover, Alpha Bank organizes an annual international innovation competition called "Finquest" (www.finquest.gr) that offers bootcamp and workshops, mentoring by internal and external experts, the pitching event and a 5 week acceleration program. In their words: "FinQuest by Alpha Bank, the international open-innovation competition, […] aims to enable innovative proposals and make the Fintech community part of the industry's transformation."[2] And the quest is customer experience. "To achieve high level of customer service, new technological solutions are necessary in order to provide fresh offerings such as: new forms of engagement, new features thanks to emerging technologies, different UX build on data-driven insights. At the same time, technology is the means upon which we must meet needs in a human centric way and bring real added value to the customer. In this Quest, you're challenged to use

[2] Competition | FinQuest

your digital super powers and submit your proposal for a new digital banking experience!"[3] The competitors can by start-ups or established companies in their early steps of product development or market entrance.

Eurobank has created "the egg – enter-go-grow" incubator for start-ups. Established in 2013, "the egg" aims at helping young people stay in Greece and cultivate their entrepreneurial skills before making a bold start on their own. Eurobank has invested more than 12 million years over the previous years by picking ideas and projects from various sectors such as tourism, energy, fintechs, logistics etc. In this incubator, more than 730 young women and men have been hosted there and 100 companies have grown up, some of which are now active internationally. Thirty five of them have attracted 10 million euros in corporate lending to finance their growth. The egg offers the "start-up" platform that seeks for new ideas and nurtures them via education, mentoring and consulting. Next to the "start-up" is the so called "scale-up" platform which aims to be an integrated acceleration framework for new companies that need to speed-up in producing new offering and prepare for entering the market and also work deeper on their business plan in order to receive higher levels of funding. Finally, the Equity Crowd Funding is a new model for funding start-ups and new accelerating companies to reach a maturity level which is good enough for going to the market and become a proper competitor.

National Banking of Greece supports innovation through the NBG Business Seeds program. Having organized four "bootcamp" events in four different cities in Greece, NBG aimed at identifying and supporting new ideas at their birth. So far, 6 million euros have spent which resulted in 13 companies whose share capital includes the NBG business seeds and 90 winner companies that have received a total of 441.000 euros. Of the 112 proposals received, 54 have to do with e-business, 36 with the environment and technology and 22 with civilization and technology. The statistics of this initiative count 15 cooperators, 30 institutions, 35 speakers, 109 mentors, 9 funds and 14 follow-up meetings. Giving start-uppers a chance to move forward, the National Bank has opted for offering free of charge or at very low rates some of their banking products lending, collections and card payment service.

Moreover, Piraeus Bank has developed a list of Innovation Eligibility Criteria for providing finance to existing Small and Medium Sized and Midcap Enterprises[4].

INNOVATION INITIATIVES FOR THE HUMAN CAPITAL FACTOR

Greece records a high percentage of university degree holders among its youth, however youth unemployment remains at almost 30% levels. Linking education to professional skills that are need in society and particularly in the digital economy of the 21st century is a necessary prerequisite for preparing properly people for becoming useful to the economy and ultimately contributing to innovation. After all, human brain is the only fuel of innovation. It is for these reasons that Pireaus Bank has launched successfully the "Project Future" initiative. In a nine month period, university degree holders are offered the opportunity to get on the job training and face real life problems that need to be solved using the academic knowledge they have gained in their university studies. Having successfully run for more than a year, "project future"

[3] The Quest | FinQuest
[4] /el/sitecore/media library/gr/companies-and-professionals/files/eligibility-innovfin-en

has achieved a significant success level: six out of ten men and women who completed this program, are now employees at companies of their choice and some of them are start-uppers. Piraeus Bank has focuses mainly on the local market mostly looks for, i.e. software development, digital marketing and sales, data science & analytics, etc. At the two first calls, a thousand and one hundred degree holders were chosen among the six thousand and five hundred applicants and the numbers are growing.

A TAXONOMY OF INNOVATION SUPPORT INITIATIVES OF THE FINANCIAL SERVICES INDUSTRY SECTOR

The organization and configuration of the innovative support activities of the financial services sector can be analyzed along three axes, x, y, z.

- X: The maturity level of the entrepreneurial idea or process,
- Y: the technology-readiness level of their ideas or venture,
- Z: degree of the financial institution's involvement into the entrepreneurial endeavor.

The first axis, X, consists of the following quanta: the idea, the formation of a team that works on an idea, the incorporation of the team, the joint-venture of the idea makers with experts and/or investors, the proper business functioning of a corporate institution. Lower levels of maturity need facilities, physical assets, provision of consumables, leadership, guidance, mentoring in order to grow up, usually offered by incubators and accelerators, depending on their configuration. Higher levels require less of them and more of the direct financing type of support and sometimes stock market entry (IPO) guidance and financial undertaking.

The second axis, Y, has to the do with the technology-readiness (TRL) level of the idea or product of the innovators. TRL was initially devised by NASA and has been used ever since, in many variations; but nowadays, it is has been shaped in the following format by the research programs of the European Commission [6]:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

So, each innovation support initiative, let it be a hackathon, a competition, an incubation, an accelerator etc. has to clearly define the TRL or TRLs it would like to address, in order to receive appropriate proposals. It is obvious that the lower TR levels attract risk capital, such as seed finance, business angels, venture capital type of investments, whereas the higher levels attract proper corporate lending, project finance other types of long-term investments.

The third axis, Z, has to do with how much involvement the financial services industry is determined to make into the entrepreneurial endeavor of the initiative they support. Financial institutions' stance may range from being basic service providers (offer training, insights, space etc.) and organizers (hackathon, competitions, etc.) to lenders, to Board members and/or shareholders. They could also be platform providers, if they choose to facilitate "the creation of knowledge, products and services by online communities of companies and consumers" – the so called open innovation [1] initiatives.

POSITIONING OF ACTORS ON THE 3D MODEL SPACE

Regarding the type of investment needed to support innovation growth according to this 3D model, the closer to the low end of the axes requires a mix of facilities, services, leadership and mentoring skills, whereas the closer to the high end of the axes requires more capital funding. From a risk management perspective, the investment uncertainty is lower at the higher ends of the axes, but the capital invested is usually higher as opposed to the lower ends of the axes. Thus, the overall risk is somewhat the same (areas at the lower ends of axes mean less capital investment amounts but higher uncertainty, whereas areas at the higher ends of the axes mean higher capital investment amounts but less uncertainty); it depends on the total investments amount whether is it more appropriate from a risk management perspective to invest more on the lower or the higher ends of the axes.

If an actor into this innovation support field would like to assess how it compares to others, one has to assess who is covering which areas on this 3D space, based on the scope and the criteria defining the innovation support initiatives of these actors. For example, one player may cover the lower end of the axes, another the medium area, another the higher end of the axes, another my cover combinations of then, etc. Therefore, this 3D innovation comprehension model can be used as a positioning tool for the financial industry services actors into the innovation support initiatives' arena and help them decide how to mobilize and advance their involvement in the innovation forces that are emerging or nascent into an local economy.

Finally, the types of financing offered by each particular financial services industry actor determines the kind of innovation activities that it is willing to support. As explained in [4]:

- Seed finance is provided to research, assess and develop an initial concept before a business has reached the start-up phase
- Start-up financing is provided to companies for product development and initial marketing. Companies may be in the process of being set up or may have been in business for a short time, but have not sold their product commercially
- Later-stage financing is provided for the expansion of an operating company, which may or may not be breaking even or trading profitably. Later-stage venture tends to finance companies already backed by venture capital firms

According to [5], the other three stages of financing are:

- Expansion: Financing provided for the growth and expansion of a company which is breaking even or trading profitably. Capital may be used to finance increased production capacity, market or product development, and/or to provide additional working capital.

- Replacement Capital (Secondary Financing/Purchase): Purchase of existing shares in a company from another private equity investment organisation or from another shareholder or shareholders.
- Special purpose for a mature, privately held company, including leveraged buyouts or the venture purchase of quoted shares.

Some other authors [11] also mention other types, such as Bridge Financing: Financing made available to a company in the period of transition from being privately owned to being publicly quoted.

So, the type of innovation support activities that a financial services player chooses to implement, depends to some extent on which of these financial products this player may offer. The types of available financing is not considered to be part of the 3D model as a forth independent axis, because venture maturity and TRL actually determine which financial tools are appropriate for each particular (x,y,z) innovation support initiative; therefore, the types of financing choices is not an independent variable to the other three variables/axes of the model. Implicitly, however, ability to offer some or all of these type of financial products may lead a financial services industry player towards specific positioning on the areas shaped by the 3D model.

CONCLUSION

The financial services industry is using many different approaches in their attempt to help potential innovators capture value from innovative ideas. It is in the immediate as well as long-term interest of the financial services industry to see economic growth, so supporting innovation is one of the key actions toward this direction, let along its corporate social responsibility dimension and the subsequent indirect increase for demand of their financial products and services. Therefore, it is crucial for them to engage into projects of various types that support innovation and reassess their positioning into this early competition arena. However, it is not easy to comprehend where an organization of the financial services industry stands in the innovation support field and what kind of involvement it could advance to, unless a clear model is provided to this end. This is exactly the contribution of this paper.

By analyzing the attributes of the many innovation bolstering initiatives taken by the major Financial institutions in Greece, this paper introduces a 3-D involvement comprehension model for innovation initiatives, involving the maturity degree of the entrepreneurial form, the TRL and the type of involvement the financial institution actor chooses for the innovation support initiatives. The instruments for financing these innovation initiatives are not recognized as an independent axis to the model, but as a derived one. The proposed model also serves as a strategic positioning tool, to help financial services' organizations assess the scope their activities and level of engagement.

Frameworks that "enables firms to continuously adjust their operations in order to optimize digital innovation efforts" [8] can be found in the research literature so as to internally reassess their position against properties of digital innovation processes, but a model for positioning against activities for innovation support and growth, such as the one proposed, has not yet been proposed to the best of our knowledge; such a model can be particularly useful in charting the map for innovation enablement activities. Further taxonomies could be also devised as next

steps into this research, which will revel new areas of positing of the financial services industry actors into the digital innovation competition field.

References

Bughin, J., Chui, M. and Johnson, B., *The next step in open innovation*. The McKinsey Quarterly, 2008, online magazine.

Consoli, D. *Systems of Innovation and Industry Evolution: The Case of Retail Banking in the UK*, Industry and Innovation, 2008, 15:6, 579-600, DOI: 10.1080/13662710802550893

Directive 2015/2366/EU of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC. Available here: https://ec.europa.eu/info/law/payment-services-psd-2-directive-eu-2015-2366_en

Engberg, E., Tingvall, P.G. & Halvarsson, D., *Direct and indirect effects of private- and government-sponsored venture capital*. Empirical Economics, 2021, 60, 701–735. https://doi.org/10.1007/s00181-019-01770-w

Heukamp, F. H., Liechtenstein, H. V., & Walkeling, N., *Do Business Angels Alter the Risk-Return Equation in Early Stage Investments? : Business Angels as Seen by Venture Capitalists in the German Speaking Countries*. 2007. The Journal of Private Equity, 10(3), 67-86.

HORIZON 2020 – WORK PROGRAMME 2014-2015 General Annexes (Extract from Part 19 - Commission Decision C(2014)4995). *Annex G. Technology readiness levels (TRL)* Available online at this address: https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

Majchrzak, A., and Malhotra, A., *Towards an information systems perspective and research agenda on crowdsourcing for innovation*, The Journal of Strategic Information Systems. 2013, Volume 22, Issue 4, 2013, pp. 257-268, ISSN 0963-8687, https://doi.org/10.1016/j.jsis.2013.07.004. (http://www.sciencedirect.com/science/article/pii/S0963868713000528)

Nylén, D. & Holmström, J., *Digital innovation strategy: A framework for diagnosing and improving digital product and service innovation*. Business Horizons. 21014, 58. 10.1016/j.bushor.2014.09.001.

Obeng, A. Y., & Boachie, E., *The impact of IT-technological innovation on the productivity of a bank's employee.* 2018. Cogent Business & Management, 5(1), 1470449.

Papaioannou, T., *How inclusive can innovation and development be in the twenty-first century*?, Innovation and Development, 2014, 4:2, 187-202, DOI: 10.1080/2157930X.2014.921355

Sazonov, S. P., Ezangina, I. A., Makarova, E. A., Gorshkova, N. V., & Vaysbeyn, K. D., *Alternative sources of business development: Mezzanine financing*. Scientific papers of the University of Pardubice. Series D, Faculty of Economics and Administration. 37/2016.

Simula, H. and Ahola, T. *A network perspective on idea and innovation crowdsourcing in industrial firms, Industrial Marketing Management*, 2014, Volume 43, Issue 3, 2014, Pages 400-408, ISSN 0019-8501, https://doi.org/10.1016/j.indmarman.2013.12.008.

Tipu, S.A.A., *Academic publications on innovation management in financial institutions (1998–2008): A research note*, Innovation, 2011, 13:2, 236-260, DOI: 10.5172/impp.2011.13.2.236

Zhu, Y. *Financial institutions' Governance and Innovation: Evidence from the Listed Firms in China*, Emerging Markets Finance and Trade, 2019, 55:11, 2409-2424, DOI: 10.1080/1540496X.2018.1483229