Conceptual Framwork for Startup Enterpise Evaluation:

Value of the Trust and Soft Information

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Abstract— **The purpose of this study is to suggest ICT based conceptual evaluation model for the investors when to review the startup business. In regards, the conceptual model tried to emphasize the trust network among multi-stakeholders. Since ICT enables all businesses in real time through online channel, building the trust issues has been crucially raised. Under the digital paradigm, Industry 4.0 that maximize the automation and connectivity of information through internet invigorates the Startup business. ICT based startup has latent power of realizing the all digital convergence ideas. However, the possibilities of business succeed are not sufficient information to the investors. While there have been enterprisers achieved huge steps such as Uber, Xiaomi and AirBnB, still large number of startups have been trouble inviting funds for business. The study suggests the issues among startup companies facing the hardness in raising funds. The main issue of soft information is difficulty in analytic such as hard information. This matters to startup enterprise to obtain future funding from Venture Capital (VC) or angel investment. Existing indicators when VC or angel investments to decide investment are mainly centered to hard information (financial circumstance, market condition). Since startup enterprise has no sufficient records of hard information in the beginning, existing indicators need to be revised. Thus the value of startup enterprise should be reviewed based on future performances and capability which can be considered as soft information. In this research, preceding research and case analysis on soft information can be used in decision making process. Research found that data analysis based on SNS and Screen scraping technology in financial institution may transform soft information to objective indicator.**

Keywords—startup enterprise value, soft information, hard information, non-financial information, venture capital investment, trust information communication techonology(ICT)

I. INTRODUCTION

In regard to the industrial 4.0, 2016 World Economic Fourm held in Davos, Spain, emphasized socially-overall ICT development and the digitalization of companies. Decisively, as an opportunity to be free from such limits as physical space is provided, start-up companies grow fast all around the world.

Starting up on the basis of internet and SNS, companies like Uber, Xiaomi and AirBnB have actualized the growth potential of startups, but it is difficult to discriminate gems from pebbles among thousands of startups springing up like mushrooms after a rain, and it is expected that there will be a demand for new changes in the existing evaluation standards of enterprise values. Moreover, such technically innovative business models require trust model since the services solely based on network system and online platform. Therefore, greater transparency options are needed to the business society[1].

Since, as soft information works as an important element used to evaluate the enterprise value of startups, this study proposes a framework that substitutes it for a more objective indicator by using ICT technologies.

In this sense, the study covers the definition of 'Startup' as the background of research. After this, study presents some of the phenomena, which are main issues in the industrial ecosystem. Then, through theoretical backgrounds, this study selects investment paths and extracts main factors to be considered for each target. The next step is to suggest research problems, show the process of research and propose soft factors and ICT that can explain them. Lastly, with conclusions about the research results, this study suggests implications and limitations along with a future research direction.

II. RESEARCH BACKGROUND

The term, 'Startup' used in this study was first used in the U. S. Silicon Valley, and it means a new venture business combining innovative ICT with ideas. Unlike the past venture owners that started up business in garage-remodeled offices, like Jeff Bezos of Amazon, Steve Jobs of Apple and Michael Del of Del, the present ones properly cope with startup promotions in a government and company-level.

The U. S. government leads the establishment of a cooperation network and even supports U. S. startups' global

expansion. Besides, Silicon Valley strongly supports giant global IT companies or private networks such as Goggle and Facebook along with great funds, and each city government supports startups as a linker and assistant[2]. Startup investment streams are happening all over the world including Asia. Based on the policy for ′Public Startup and All People′s Innovation′ announced by State Council in 2015, China provides full support to all the startups. Moreover, the Vietnamese government established ′Vietnamese Silicon Valley′ modeling the U. S. Silicon Valley in June, 2013, based on strategies for ′Innovative Technology Commercialization Ecosystem′, while taking strategic steps to attract foreign investors. Even in Korea, government-level supports are made for startups, and especially, a startup campus was established by the Ministry of Science, ICT and Future Planning.

In addition to government-level startup promotions, global enterprises started leading startup investment in a form of fund raising. Particularly, the U. S. large-sized companies operate their own venture investment firms. In 1991, Intel corporation established an investment-specialized firm called ′Intel Capital′. Since then this capital company has focused on securing new technology and creating synergy effect with the parent company. As a representative IT company in China, Lenovo established ′Startup Investment Fund′ and announced a plan to make investment in startups and secure new technology. Even in Japan, Yahoo Japan is making investment in mobile startups after making a venture capital company worth about 200 billion won, named ′YJ Capital′.

According to the Venture Capital Report announced by Dow Jones, 111 venture capital funds were established only in the first quarter of 2016 in the U. S, attracting as much as $13.26 billion, which was 62% higher than the previous quarter, as illustrated Fig.1 [3].

Due to government and enterprise-level interest and supports, startups are being more worth then ever. According to the 2016 List of World Unicorn Startups announced by Fortune which summarized in Fig.2, an American business magazine, there are a total of 174 startups whose enterprise value is worth over one billion dollars.

Despite multilateral startup promotive attempts made by governments and enterprises, startups have constantly caused controversy. It is still reported that some startups are established and increase profits by using tax-based subsidies through an expanded governmental support policy beyond investment. As typical cases in Korea, Elkiesoft of Xerox attempted to take investment and a governmental subsidy through a false vaccine, and Rain D was called ′Zombie Mentor′ and had its accelerator operation organization qualification canceled because of a faithless government-support project.
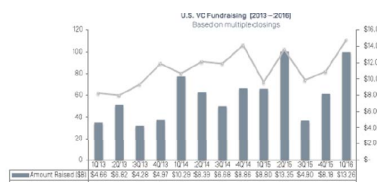
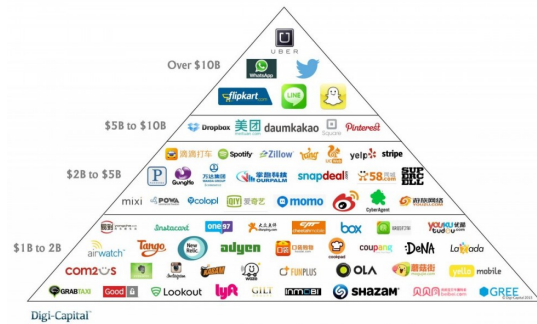Fig. 1.   Graph that shows the remarkable growth in venture capital fundraising in U.S.

Fig. 2.   Pyramids figure putting startup companies in order of enterprise value.

As there were not sufficient objective indicators about startups, much of the investment in startups was not properly managed, which caused a recession of the startup ecosystem.

For instance, there were 173 newly-established venture investment funds in the first half of 2016 in China, which was 14% lower than the same period of 2015. The total fund raised by them was 78.9 billion yuan, which was 14% lower than that of the previous year, and the number of cases that all the Chinese venture funds made investment during the same period was a total of 1,264, which was two thirds of the previous year. All the investment amount of 1,052 cases whose investment scale was open to the public was 58.5 billion yuan, which was 13% lower than the previous year.

According to Preqin, a Britain market research company, the investment scale of Chinese venture capitals in the second quarter of 2016 is 4 hundred million dollars, which is the lowest record for 3 years consecutively. It is only one thirds of the same period of the previous year. According to Venture Capital Report announced by Dow Jones, the graph in Fig.3, the amount of funds invested by venture capitals in the first quarter of 2016 in the U. S. was $13.9 billion, and the number of investment targets was counted as 884, which was 6% lower than the previous quarter.

The Wall Street Journal analyzed that the zeal for venture investment cooled down out of sudden because investors found it more difficult to discriminate gems from pebbles among thousands of venture companies. It means that it takes more time to judge the value of startups, further making many startups terminate their projects because they failed to secure sufficient funds.
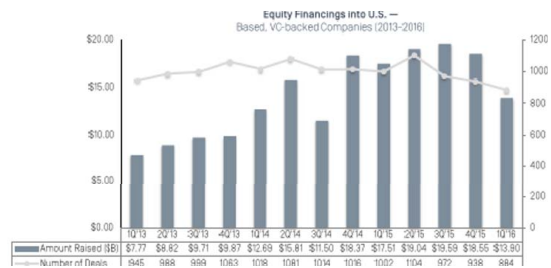
To solve such a problem, it is necessary to extract indicators objective enough to supplement and substitute the present soft data. Through such indicators, national subsidies, funds and venture capitals can be used for startups with growth potentials, and they will be also used as good indicators used to judge what factors a venture company is short of.

As a matter of course, an organization's capability and growth potential are not direct evaluation indicators used to judge its financial performance, but such non-financial factors are still worth as leading indicators when predicting an organization's financial performance[4].

Technical developments would provide companies with an opportunity to convert into a value judgment standard based on soft information[5]. Most of the previous studies clarified that the financial circles like banks have utilized soft information as a partial reference indicator[6]. Specifically, it is used when the scale or characteristics of a company are examined, or when a certain company brings out a question about the final credit rating. By referring to not only the existing quantified and objectified data but soft information used to judge a company's value, they have evaluated and rated companies so far. As limitations of utilizing soft information, individuals' subjective opinions and bias against companies are not exactly free from being involved in the process of mutually delivering information. Thus, perceiving how valuable soft information is, this study aims to investigate a structural model that can judge it more objectively.

A. Venture Investment

Venture capitalists means investors who provide funds to venture companies that have great risks as well as technology and future potentials and even startups with growth potentials in the initial state of development, while supporting their growths.

Many of the previous studies were conducted to find out what information is important one for a decision-making process. In decision-making process 6 domains are considered: founders' individualities, their experiences, product and service features, market characteristics, financial states and venture teams, for investment decision elements[7]. At the same time, there are different perspectives on those regarded 6 domains, such as management teams, product and service features, industrial market characteristics and financial characteristics, for important investment decision elements[8]. The literary review results show that enterprisers' and teams' competences, product and service excellence and market and competitors' actual states are presented as venture capitals' investment decision elements[8]- [11].

B. Angel Investment

Angle investment means playing a role in increasing the value of a company through management supports like funds and human networks in the initial stage for the purpose of financial profits.

	BUSINESS FACTORS	SIGNIFICANCE	PERCENTAGE (%)
1	Fidelity	0.181	18.1
2	Authenticity	0.159	15.9
3	Leadership	0.117	11.7
4	Managing Capability	0.100	10.0
5	Social Network	0.095	9.5
6	Dedication	0.091	9.1
7	Perseverance	0.084	8.4
8	Creativeness	0.081	8.1
9	Enterprise Experience	0.053	5.3
10	Risk Sensitivity	0.039	3.9

This kind of investment plays an important role in raising funds needed for the initial stage of startup and increasing the company's value through management participation. By using experiences and networks investors have, it plays a role as a mentor for a company and supports its technology, marketing and management, etc. ultimately helping the company grow and increase the company's value.

Andrew L, et. al classified the previous studies on several elements used to judge angel investors' investment intentions. As a result of examining investment intention decision factors, he classified them into products, market states, entrepreneurial characteristics, financial states, organization's structure and experiences, organization members' education levels and pictorials, organization's technology, investors' roles and whether to have an external audit, etc[12s].

III. RESEARCH QUESTION

The research background provides the needs of new investment model for the startups which mainly rely on the enterprise values that are considered as soft information. The study proposes following research questions based on background study of the startup investment ecosystems:

A. What are factors used to weigh the enterprise value of a startup?

Characteristics	Factors
Team Characteristics	Social Network
	Team Work
Enterprise Characteristics	Dedication
	Workmanship
	Fidelity
	Perseverance

B. What is the problem that the existing soft information-based investment standard has?

C. Is objectified ICT-used soft information able to supplement and substitue the existing evaluation standard?

IV. RESEARCH PROCESS

The research intends to focus on objectifying and quantifying subjective selection standards through previous researches and a case study and suggesting a ground to diagnose them.

Venture capitals' investment targets are selected through ordinary business feasibility evaluation standards, such as a company's technology, marketability, profit structure, reliability, and CEO's competences, but experts' subjectivity or intuitive decisions may be involved in an actual investment evaluation process. More importantly, since the selection standard and process is a unique domain related to each venture capital's investment project operation, it is difficult to objectively evaluate the appropriateness and rationality[13].

Therefore, through previous studies and a case analysis, this study extracted some factors affecting investment in startups. Particularly, it was difficult to discriminate all the factors in reality, so this study extracted some of the factors that could be explained by being substituted most of all. Then, this study carried out a case analysis that explained every factor by substituting them. Lastly, by analyzing relevant cases, this study attempted to find out what ICT was used for each factor and how to objectify soft information.

V. ANALYSIS RESULTS

Through the previous researches, this study extracted the existing factors used to judge the enterprise value of startups. Every factor is arranged in Table n above. Most of the factors used to judge angel investors' investment intentions and venture capitals were found to be qualitative ones. However, they are important factors used to judge investment intentions, but they showed a limitation that they were difficult to evaluate objectively.

Thus, through a case research, this study investigated a way of explaining them by substituting these qualitative factors for objective elements and analyzed how to utilize ICT during the process.

It is possible to explain human network by analyzing social networks. A social network analysis refers to a method to express interpersonal relations through graphs and comprehend social phenomena and structures[14]. By using the social network analysis, it is possible to create and analyze social graphs connected with nods and links and measure relations, intimacy, group classification and connection strength between people[15].

As an objective element, team atmosphere can be explained by analyzing people's participation in SNS. When a team organization faces many tasks and has to improve team achievements, it is necessary to obtain mutual and organic corporations between team members and the team[16]. In this aspect, SNS supports smooth communication within the organization, not as an individual user-centered medium, and helps make decisions promptly based on various ideas or opinions from the organization members[17].

It is also possible to explain activeness by analyzing people's activities with social network services, such as Facebook. In case of Fidor Bank, they have different interest rates for customers' accounts on the basis of their likes about the bank homepage articles by connecting to the bank's Facebook page. On the basis of 2,000 likes, they add the interest rate as much as 0.05%, and customers can obtain 0.35% more interest through 4,000 likes, which can increase the interest rate up to 0.5% at last[18]. In other words, by evaluating activeness, which is difficult to estimate, through the recommendation function of SNS, they can extract objective numerical values.

Experience can be explained by analyzing the FinTech payment database. Start-up experience can be judged with individuals' portfolios, but personal experience is difficult to measure. However, personal experience, especially where and how long each individual has participated in, can be understood by analyzing their FinTech payment history. The payment database is composed of payment history, category and budget, and by analyzing the database, it is possible to analyze dates, card companies, amount of money and places exactly[19].

Trust can be explained by analyzing financial information and non-financial information through the scraping technique. Integrity can be figured out by analyzing the national pension payment history, credit card statement and delinquent payment, etc. In Korea, FinTech, Inc. rates credits by confirming real-time sales and income reported for private operators and analyzing financial information, such as income information, bank transaction history, card statement and communication bills for ordinary workers.

Soft information is a factor used to judge the enterprise value of startups, and ICT is used to make it utilized as an objective indicator. They can be arranged as seen in Fig. 4.
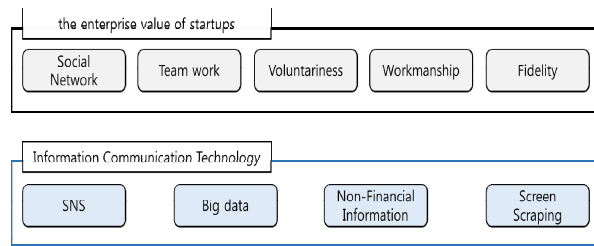
Fig. 4. Examples of how the startup values that are considered as soft information are transformed as objectified indicators through various techniques used in ICT.
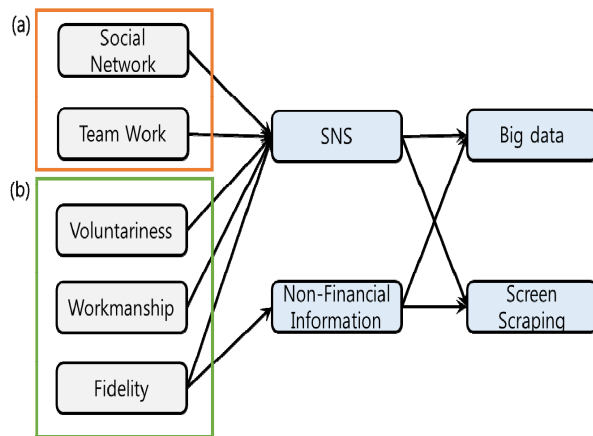

Fig. 5. Example of hardening soft information-processing model that can be considered to the investors

VI. CONCLUSIONS

When reviewing the enterprise value of a startup, such hard information as a financial state greatly works, but due to their characteristics, they may not have sufficient hard information because they were established not long ago. This may also cause trust issues. As a result, utilizing soft information is required in sense of the process that share trust. Since soft information is difficult to assess as much as hard information, analyzing the enterprise value of a startup needs reconstruction.

Thus, this study proposes a model that can compare soft information by using ICT, especially when the enterprise value of startups.

As factors used to judge the enterprise value of startups, this study extracted human network, team atmosphere, activeness, experience, trust and integrity by analyzing previous researches. As mediators working as substitution factors for each factor, this study extracted social network service, financial information and non-financial information through a case research. ICT used for this process was social network analysis, FinTech, Big Data and scrapping.

When it comes to limitations of the model proposed by this study, firstly, as the importance or enterprise value of startups may differ in range, depending on the industry, but this model cannot suggest it by characteristics. Secondly since this study was conducted on the basis of a model that is commonly used in the U. S. or by specific companies at present, this model has a limit on explaining the platform in terms of technology. Besides, it cannot but measure business-applicable information only through SNS-based information, yet.

Nevertheless, this study has significance in extracting soft information and converting it into objective indicators through ICT, which was not impossible to mutually compare with each other before, especially in judging the enterprise value of startups.

Further studies should be conducted to analyze in detail how significant results explanatory variables can show for each factor. Also, the research discusses the new investment model that converging soft information that can explicitly demonstrates the capabilities of startup enterprises.

To do so, the model needs the participation from the information providers such as the government, firm, and the individuals. For further study, this model needs to be studied as more systematic perspective that all stake-holders included.

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