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AN ANALYSIS OF DEVELOPMENT OF VENTURE CAPITAL MARKET IN ASIA

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ABSTRACT

The information represented in the table shows that top 10 criteria with the high mean score of 371 to 346 are most used investment criteria of venture capital providers in India. Based on the study, monetary aspect of portfolio company i.e.' valuation of businesses earning higher rate of return' (mean score 371) is really important for VCs since the primary goal of VCs is actually to make high rate of return. Some key elements related to management as flexibility, trustworthiness and creativeness of senior management (mean score 367), better knowledge relating to the sector of its (mean score 364) and senior management's potential to come together as a group (mean score 361) can also be utilized by venture capital providers as important investment criteria. Indian venture capitalists also need to know whether the industry has the characteristic of development and development in which they wish to put in (mean score 360). Additionally, they also investigate the future prospects of company regarding high internal rate of return (mean score 357). The study even discovered that venture capital providers expect superior venture's business idea from their entrepreneurs than its incumbent competitors operating in exact same sector (mean score 356). As regard with the' product', the patentability of the item (mean score 355) is also important criteria. Along with these criteria market capitalization growth (mean score 353) and leadership traits in management (mean score 348) are great key elements used by venture capital providers in India. The study also found five criteria with lowest mean score of 294 to 234 are actually least preferred investment criteria used by them. These investment criteria are actually:' labour market rigidity',' collaboration of competitors running in the industry with the venture in near future',' geographical location of portfolio company',' time taken to promote the Product/ Service' and' source of reference of entrepreneur' respectively.

KEYWORD: Business, Capitalization Growth, Industry, Development, Company

INTRODUCTION

Statistical analysis was used to recover most of the empirical results. For the current study, data was collected by email questionnaire from a sample of venture capital providers; EXCEL and SPSS were utilized for analysis. Depending on the goals of the study, the main approaches for data analysis have included regression analysis, exploratory factor analysis, and descriptive statistics. The analysis's actual findings are displayed in tables and graphs, and they are interpreted as follows:

GOAL 1: UNDERSTANDING THE CRITERIA FOR INVESTMENT USED BY SAMPLE VENTURE CAPITAL SUPPLIER

Previous academic studies have outlined a variety of investment standards that venture capitalists use to evaluate investment proposals. 42 investment criteria were included in the questionnaire for this study, and the researcher looked at how important these factors are to the venture capitalists in the sample. On a five-point Likert scale, where one represents irrelevant, two less significant, three moderately important, four extremely important, and five very important, respondents were asked to

rank their preferences. The results indicate some significant differences in relative worth of the 42 investment criteria.

The ability of ventures to dominate their sector

Respondents were asked to rank how crucial it is for a business to have the ability to dominate its sector before making an investment in it. The table below displays the statistics in terms of frequency and percentage.

Table no. 4.1: Ventures' ability to dominate its sector

	Frequencies	**%**	**Valid %**	**Cumulative %**
Valid Less important	2	2.5	2.5	2.5
Moderately Important	12	14.8	14.8	17.3
Important	46	58.0	58.0	75.3
Extremely Important	20	24.7	24.7	100.0
Total	80	100.0	100.0	

According to the table, 24.7% of respondents think these needs are really vital, and 58% of respondents agree that the requirements of the venture's dominant ability are truly important. The figure also makes it evident that only two respondents (2.5%) thought it was less important for businesses to be able to control their industry.

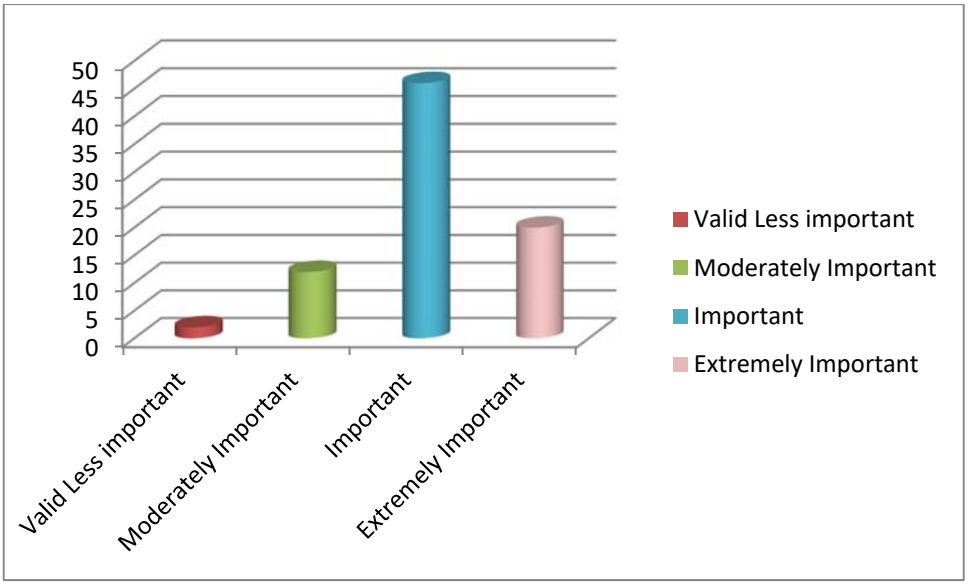


Figure no. 4.1: Ventures' ability to dominate its sector

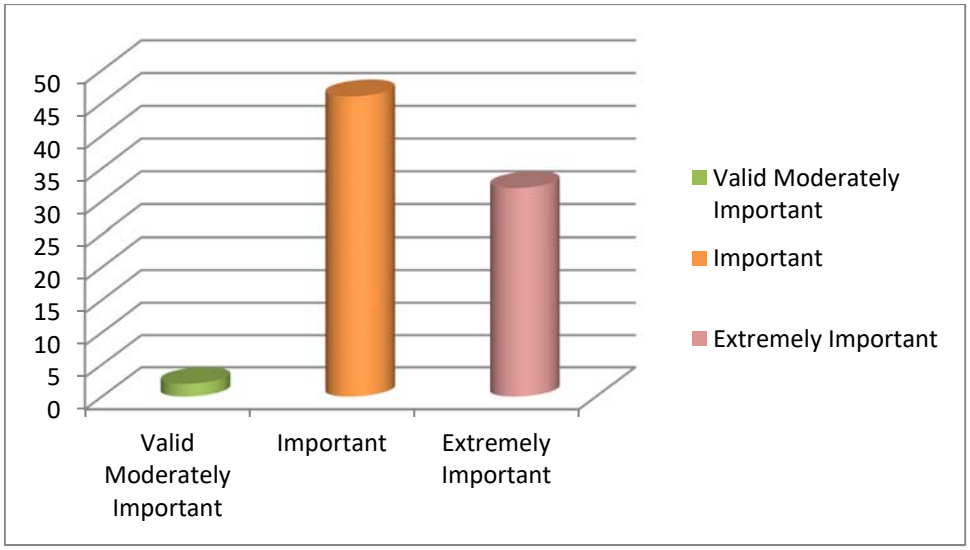
Therefore, it can be concluded that 82.7 percent of the sample venture capital providers view this criterion as essential to a venture investment since it gives the company the opportunity to compete with companies in the same industry.

The adaptability, inventiveness, and dependability of senior leadership

Based on the answers given by sample venture capital providers, Table No. 4.2 displays the senior management's remote relative values for adaptability, reliability, and creativity. 2.5 percent of respondents find it to be somewhat significant, 46 percent deem it to be an important criterion, and 33 percent believe it to be an extremely important criterion for investing. When they are making investing decisions, they carefully consider this analysis.

Table No. 4.2: Flexibility, creativeness and trustworthiness of senior management

	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid Moderately Important	2	2.5	2.5	2.5
Important	46	56.8	56.8	59.3
Extremely Important	32	40.7	40.7	100.0
Total	80	100.0	100.0	



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CONCLUSION

In terms of factors influencing the choice to invest, venture capitalists in India rank the "business plan" as the most crucial one. This indicates that they acknowledge the need for entrepreneurs to focus on each section of the business plan and present it in a way that would astonish venture capitalists, as the business plan serves as a roadmap for the business operations that will be carried out in the near future. Venture capitalists view "better business model" as the most crucial factor under the "business plan" variable, which is crucial to the success of business planning. Venture capital providers in India evaluate businesses based on their superior model under the business plan before moving on to a'sector dominance' criterion. It emphasizes that a company can become dominant even in a very competitive field and sustain a distinct and substantial advantage over rivals over an extended period of time. Next to outstanding company model and sector supremacy, winning product-market strategy is another criterion under business plan that Indian VCs take into consideration. This tactic has to do with positioning the company's offering into an appropriate market niche. Accordingly, unique products from the companies could need a different kind of positioning than other standard products. 'Management' is shown to be the second significant variable, based on the hierarchy of factors used by Indian venture capital providers. Under the heading of "management," venture capital firms prioritize gathering detailed information about entrepreneurs and management, as well as their level of industry knowledge. Second, they want a top-notch management group with the capacity to make decisive and effective business judgments. The investigation also revealed that, after assessing the management team, Indian venture capital providers take into account the management team's adaptability, inventiveness, and dependability. The factor of "excellent track record as an entrepreneur" comes in second place to "leadership quality

in management." Subsequent research revealed that Indian venture capital providers rank under management, the entrepreneur's reputation, and information cited by trustworthy sources at sixth and seventh place, respectively.
Venture capitalists assess the company from a management perspective before taking the variable "finance" into account. In this line, the company's current valuation in relation to its ability to achieve a high rate of return is given first priority. In a similar spirit, the company's capacity to earn a high internal rate of return is also assessed. They also acknowledge that the investment range is a crucial factor that should be taken into account when choosing an investment. The report went on to say that profit margin forecast is another important criterion that exit strategies pursue, at least according to venture capitalists in India. According to the investigation, venture capital providers rank the costs of production, marketing, and transportation sixth when making decisions related to the variable "finance." Indian venture capitalists (VCs) assess the tax advantage in financing the venture subsequent to all other relevant finance-related factors.

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ABSTRACT

In this chapter, the details of growth of 2D- semiconductors (MoS2, WS2) and layered g-C3N4 has been described. The working principle and method of data analysis of various characterization techniques adopted in the present work has been described. An account of the procedure followed for device fabrication. 2D- materials exhibit different physical and chemical properties relative to their bulk counterpart. To achieve the required number of layered materials, there is a need to choose a specific growth technique with defined parameters. CVD technique gives us the flexibility to fine-tune different growth parameters to achieve controlled number of layers with a large coverage area and fewer grain boundaries. An optical microscope is used to analyze the grown sample and estimate the size of crystals with their coverage area. FESEM was used to archive images with higher magnification. Raman and photoluminescence (PL) spectra were recorded using a laser Raman spectrometer from the same spot. Spectra were further analyzed to identify the number of layers. The thickness of the grown monolayer sample is obtained using Atomic force microscopy (AFM). For optoelectronic device fabrication, we used shadow masking techniques along with thermal evaporator techniques to fabricate electrodes over the grown sample. The optoelectronic response of fabricated devices is obtained using an electrical probe station attached to the source meter and different laser excitation. All the analytical techniques used has been briefly discussed with their basic features and capabilities along with their working principles.

KEYWORD: Material, (MoS2, WS2) and layered g-C3N4, Semiconductor

INTRODUCTION

Growth of 2D – Materials using Atmospheric pressure chemical vapor deposition (APCVD)

In this section, we have introduced the atmospheric pressure chemical vapor deposition system (APCVD). APCVD processes do not require a vacuum system, they commonly give us the ability to control film growth by widely varying parameters like amounts of precursors, substrate, the position of the substrate and gas flow rates, making CVD unique among other deposition techniques.

Substrate preparation and cleaning

Substrate preparation is an essential step in any growth process, such as the selection and cleaning of the substrate surface is a preliminary part of the growth process, 285 nm SiO2/Si wafer (nanoshel) was used as a substrate for the growth of two –dimensional layered materials. The substrate was cut into the required dimensions. Substrate cleaning is necessary to avoid contamination and to obtain the desired properties in the grown sample [238]. For every set of experiments, the substrate was cleaned sequentially, using the isopropyl alcohol, deionized water and ethanol through the sonication bath process for 15 minutes each. After sonication, the substrate was washed with deionized water and then dried using an argon gas gun and was put inside the hot oven at 100 ℃ for 10 minutes.

Description of Custom made APCVD

Fig. 2.1(a) shows the single zone custom made atmospheric pressure chemical vapor

deposition (APCVD) system developed at BIT Mesra, Ranchi India. It has been used for the growth of MoS2 and WS2 for the present work. In this CVD setup, the tubular furnace with a quartz tube length of 120 cm and an outer diameter of 4.5 cm was used.

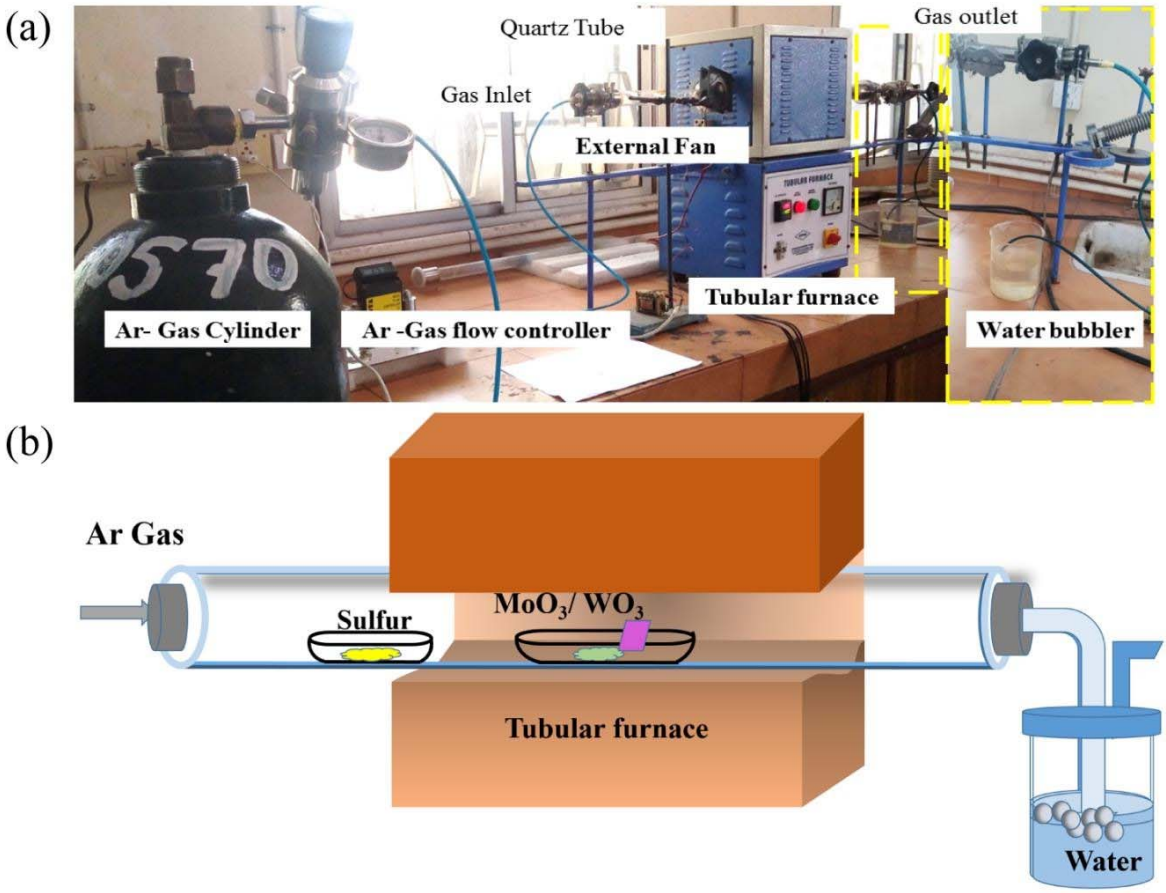

Figure 2.1: (a) Self–assembled Atmospheric pressure chemical vapor deposition setup for Two- dimensional growth. (b) Schematic diagram of APCVD with the arrangement of precursors.

Monolayer MoS2 growth parameters

Growth of MoS2 monolayer was done using highly pure molybdenum trioxide MoO3 (99.9% Sigma Aldrich) and sulfur powder (99.9 % Sigma Aldrich) was used as precursors. Fig. 2.1(b) shows schematic of the CVD setup. The temperature profile of both precursors (MoO3 and S powder) during the complete cycle of growth has been shown in Fig. 2.2(a). Fig. 2.2(b) shows gas flow rate for the entire experiment duration. The polished surface of SiO2/Si substrate faces downward to the precursor above the MoO3 powder. Precursors and substrate were placed inside the CVD furnace as schematically shown in Fig. 2.1(b) separated at 19 cm. Growth was carried out at 750 °C for 5 minutes using a single zone CVD furnace at atmospheric pressure. During growth, the amount of MoO3 was varied in the range of 10 mg to 30 mg referred as SET-I keeping the gas flow rate constant at 100 sccm and the weight of sulfur at 200 mg. In SET-II, weight of the second precursor sulfur was varied in the range of 100 mg to 500 mg keeping other conditions like weight of MoO3 (15 mg) and gas flow rate

(100 sccm) fixed. The carrier gas flow rate (Argon) was varied in the range of 50 sccm to 300 sccm referred to as SET-III, while keeping the other two factors MoO3 and sulfur fixed at 15 mg and 200 mg respectively. Finally, the variation of growth time duration from 5 to 15 minutes with an interval of 5 min, keeping other optimized parameters like MoO3 (15 mg), Sulfur (200 mg) and gas flow rate (100 sccm) at 750 °C referred to as SET-IV. All the SET of experiments are listed in tabular form Table 2-1 below.

CONCLUSION

Electrical measurement of nano-scale devices and structures requires skills and hardware

to make nano-contacts. Such measurements have been difficult for number of laboratories due to cost of probe station and nano-probes. We demonstrated feasibility of assembling low cost probe station using USB microscope (US $ 30) coupled with in-house developed probe station. The effect of shape of etching electrodes on the geometry of the microprobes developed were elucidated. The variation in the geometry of copper wire electrode was found to affect the probe length (0.58 mm to 2.15 mm) and its half cone angle (1.4° to 8.8˚). As developed probes were used to make contact on micro patterned metal films and was used for electrical measurement along with semiconductor parameter analyzer. These probes show low contact resistance (~ 4 Ω) and follows ohmic behavior. These probes has potential to be used at laboratories involved in teaching and multidisciplinary research activities and scanning probe microscopy. 2D Semiconductors growth using Single zone Atmospheric pressure chemical vapor deposition (APCVD) technique for the first time, we have been able to demonstrate possibility of growth of monolayered semiconductors using single zone APCVD. Prior to this work, two-zone or, multiple zone CVD systems were used for growth of MoS2 and WS2. CVD system was custom designed and assembled making it one of the cost effective system.

C. Growth of monolayered MoS2 and WS2 with crystallite size ~ 80 □m and coverage

area > 92 % The various governing factors like metal and chalcogen weight fractions, carrier gas flow rate, growth duration and temperature affecting nucleation and growth were systematically varied to achieve monolayered MoS2 and WS2 with large coverage area. The metal precursor concentration was found to be responsible for the self-seeding process and it decides the nucleation site and coverage area. Self-seeding nucleation and its amount was found to decide the nucleation density. The chalcogenide precursors (Sulfur) result in the increase of coverage area for 2D monolayer growth. Sulfur was found to play no role towards creation of nucleation sites, but higher concentration of Sulfur accounts towards formation of multilayered structures.

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