A Hiring Story: Experiences of Employers in Hiring CS Graduates in Software Startups

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ABSTRACT

Software startups develop products under extreme conditions of uncertainty. Therefore, in this study, we perform an interview study through semi-structured interviews with 11 employers of software startups in a developing country (Bangladesh). We find out about employers' experiences and practices while hiring CS graduates. Our findings reveal several aspects of the hiring process such as showing bias toward candidates of particular institutions and giving more priority to technical skills rather than communication skills. We uncover that employers give additional effort to hire suitable candidates impeding their productivity. Further, we elaborate on notable similarities and differences in trends in the hiring process by comparing our findings with existing literature.

CCS CONCEPTS

• **Human-centered computing → Empirical studies in HCI**.

KEYWORDS

Hiring; User Study; Interview; Employers; Startups

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1 INTRODUCTION

Startup companies pursue the goal of creating innovative products and expanding their businesses. However, it is well established that startup organizations face several organizational challenges such as limited human resources, the priority of immediate results over long-term investments, etc. [13]. In Bangladesh, startup companies are increasing day by day, yet, there is a lack of research on software startups [15].

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Therefore, in this study, we specifically focus on the experiences of the employers of software startups and uncover their unique challenges in hiring CS graduates. To do so, we perform semi-structured interviews with 11 employers of software startups. We find out how they approach CS graduates for hiring, how they select suitable candidates for their startups, the challenges they face in the steps of the hiring process, and their expectations to mitigate those challenges. Thus, we investigate two research questions - **RQ1:** How do the employers of the software startups of Bangladesh approach CS graduates for hiring? What are the steps of the hiring process the employers follow?, **RQ2:** What are the challenges these employers face in their hiring practices? What are their expectations to reduce those challenges?

Our study presents an in-depth look into the conventional practices as well as the challenges of the employers of software startups in the hiring process. We also find out how the hiring process aligns and differs from previous related studies. These findings will help the HCI community to better understand the experiences and issues of the employers of software startups and implement technological solutions for startups to attain adequate support in the hiring process.

2 RELATED WORK

Koivunen et al. [8] find that expected qualities between the employer and candidates call for deliberation throughout the decision-making process. The enterprise with a higher employer brand image indeed has a higher organizational attraction of candidates [3]. When evaluating job candidates a principal goal of the employer is to accurately evaluate applicants' job-relevant knowledge, skills, and other characteristics for selection decisions [2]. Behroozi et al. [1] provide a set of guidelines to help employers improve their hiring practices such as providing candidates with constructive feedback after their interviews and bringing salary transparency and long-term career discussions. Chua et al. [4] show how employers take into account social class backgrounds in their hiring practices. Employers regularly search for job candidates for the software industry using social media profiles of the candidates in real life [12]. Similarly, some studies [5, 10] also found that employers use social media to access large pools of active job seekers. Employers pointed to specific cues provided on candidates' GitHub profiles that led them to make form impressions about a candidate's technical skills, motivations, and values [11]. Stepanova et

al. [16] found that the hiring process steps for CS graduates are aligned with traditional hiring steps, with an additional emphasis on technical and coding tests.

Morales et al. [13] agree that most software startups deal with uncertainty when developing a product and look for rapid growth. These software startups face several challenges including lack of resources, uncertainty, small team, low-experience team, new company, little work experience, high risk, rapidly evolving, etc [13]. Startups also have limited support for such operational processes such as hiring employees [6]. Klein et al. [7] find that hidden biases of employers are holding back startups from hiring in a more meritocratic manner, therefore limiting diversity. The researchers [7] recommend hiring based on skills relating to the actual execution of the role. However, research on the hiring process and related challenges specifically in the startup context are rare. Therefore, in this study, we investigate the experiences of employers of startups in hiring CS graduates.

3 METHODOLOGY

We frame our study to understand the experiences and practices of the employers of software startups in the hiring process. Therefore, we conduct semi-structured interviews with 11 employers of software startups who had previous experience in hiring CS graduates. We asked participants about their experiences in recruitment methods broadly, and also about dealing with other aspects of challenges they face in the hiring process. The study was approved by the Ethics Committee of the institution of the authors. Additionally, we ensured the confidentiality and anonymity of the participants. We recruited our employers of software startups by sending the details of the interview to their publicly available email addresses on their profiles. We selected 11 employers from the respondents. Interviews were conducted over phone calls or Zoom meetings, depending on the preferences of the participants. Each interview lasted between 30 minutes to 40 minutes. Table 1 shows the demographics of the interviewed employers. Employers are presented throughout the paper with codes (R#) to protect their identities.

All the interviews were conducted in the local language, i.e., Bengali. The interviews were audio-recorded with the permission of the participants. The audio data were then transcribed and translated into English prior to our analysis. We used a qualitative approach in our analysis grounded on the experiences of the employers. We performed inductive coding in our qualitative analysis [14] and maintained an open and flexible approach [17]. For example, we coded instances of approaching CS graduates across different contexts, such as institutional context, direct application context, referring context, etc. We examined how much effort employers expended, and other considerations they make in the hiring process. Eventually, we uncovered four themes (Table 2).

4 RESEARCH FINDINGS

We structure our findings related to the four themes uncovered from the interviews.

4.1 Approaching CS Graduates for Hiring

The purpose of hiring new candidates is generally for the growth of the startups or for starting a new project. Employers posts about the job circular on LinkedIn or social media such as Facebook so that potential candidates can know about the opening. Often employers collect the email addresses or phone numbers of the potential candidates and contact them. Interestingly, some often target specific institutions, as R4 says, *'In our startup, we sometimes target a specific institution. It means that we try to call last semester's students for interviews before their final examination.'* Additionally, candidates from a specific institution are prioritized subconsciously based on the institution of the existing employees. Thus, biasing toward candidates is prevalent. Graduates from certain institutions are prioritized due to their enriched undergrad curriculum. Employers inherently feel that candidates from that specific institution will be manageable.

4.2 Procedure of the Hiring Process

Employers filter out the applicants based on the resumes emailed to the employers' or apply section of the website of the specific startup to select candidates for further screening. In the screening process, various types of priorities are set within the startups. In this regard, R5 says, *'We take three levels of interviews where the first level interview is regarding the basics of java which is used in our main product. In the second level, we give some coding problems with some tweaks. Then the last level is HR which is only for behavioral tests.'* IT/CS graduates are expected to appear in technical interviews almost in every startup while going through the hiring processes, as R11 mentions, *'In the case of a technical post, a short 1-2 days assignment is sufficient for primary evaluation. After that, the shortlisted one who does it properly or moderately gets called for an interview. In an interview, the main emphasis is on the candidate's technical ability and other basic things.'* Most of the interviewees face the basic CS questions. Data structure and Algorithms are prioritized in some companies as they think choosing the right algorithm or data structure is a must for the system's efficiency. Often after asking basic questions or in another level of interview, candidates are asked about organizations' domain-specific questions, as R7 says, *'Since our product is related to networking, we prefer to ask interviewee networking layers, threading, IP, TCP, UDP basics to make sure the candidate has the proper concept of these topics.'* Along with the technical skills and relevant background of a candidate some other things are related to selecting a candidate. Employers ask a few questions to ensure that they can fully utilize the candidate's talent. For that, they query about the interviewee's future plan, how long he/she wants to stay in the organization, or what is his/her expectation to gain from the organization by playing their role in the job position.

4.3 Challenges in the Hiring Process

Employers report that they face several challenges and often have to adopt ad-hoc workarounds to address those challenges. After getting the Resume, in most cases, HR or senior employees manually filter out the applicants and then call for an interview which is a time-consuming process. Employers often give priority to skills. This sometimes leads them to encounter communication gaps and reluctance in the teamwork of the selected employees. Some employees miss out on meetings. In this regard, R2 mentions, *'Once I recruited a fresh graduate with good programming skills, but eventually, I had a quite bad experience with communicating with him as he was not a good team player.'*

Name	Experience (Years)	Position	Gender	Age
R1	2	Junior Software Engineer	Male	25
R2	3	Software Engineer	Male	26
R3	4	Software Engineer	Female	28
R4	2	Software Engineer	Female	25
R5	5	Senior Software Engineer	Male	29
R6	2	Software Engineer	Male	25
R5	5	Senior Software Engineer	Male	29
R6	7	Senior Software Engineer	Male	31
R7	5	Senior Software Engineer	Female	30
R8	3	Software Engineer	Female	27
R9	9	Senior Software Engineer	Male	32
R10	2	Software Engineer	Male	26
R11	5	Senior Software Engineer	Female	30

Table 1: Demographics of interviewed employers (n=11)

Themes	Description
Approaching CS graduates for hiring	How and when the employers approach the CS graduates for hiring
Procedure of the hiring process	The steps that are followed in the conventional hiring process.
Challenges in the hiring process	The problems and issues employers face in the conventional hiring process.
Expectations to mitigate the challenges	The expectations employers have to mitigate the challenges of the conventional hiring process.

Table 2: Themes and associated descriptions

However, some employers express they can mitigate this challenge with a workaround. But there introduces a trade-off which is- if the startup wants to lower the communication gap and enrich the fresh graduated employees' teamwork capability along with accountability mentality, the organization needs to provide a training period. However, this training can go in vain if the employee leaves the organization earlier. That is why employers mention having a fixed probation period and several policies. Additionally, employees also face resource constraints in the hiring process, as R10 mentions, *Due to scarce resources and a limited number of members, conducting an interview leaves less time for their work and responsibility. This substantially hampers some employers' work schedules.*

4.4 Expectations to Mitigate the Challenges in the Hiring Process

Some employers also reported that due to limited support they face those challenges, as R10 articulates, *'When the company structure gets bigger and more organized, then the hiring process would be much easier. But of course, due to lack of funding, this is hardly possible. So the challenges will prevail for now.'* Employers showed eagerness for technological solutions to address their challenges. It depended on their faced problems and preference. Employers express that the primary selection of candidates from the large pool of applicants for the post is the most tiresome task. Many organizations do this manually without any technological method such as machine learning. Therefore, they felt that an automated system is required to help them in this task. Both fully automated or a human-in-the-loop automated system to help them in this task were mentioned by the employers. Further, filtering systems to find deserving candidates from the applicants is essential as mentioned by the employers. Online-based tests to validate multiple skills that are essential for an organization can also be designed to help employers to choose their preferred candidates.

5 DISCUSSION

Employers of software startups follow up with potential candidates for entry-position jobs using specifically designed social media for jobs (e.g. Linkedin), personal social media (e.g. Facebook), campus recruitment, phone calls, and email. These contribute to prior work [5, 10] which portrays employers' use of social media to interact with potential candidates. However, we find that employers of startups are not substantially dependent on social media to interact with the candidates. They mainly use social media to post job circulars. In a prior work [7], hidden biases of employers of the startups were explored. We extend this work as we find that, most employers of startups target CS graduates of specific institutions while hiring. However, in contrast with the prior work [7], we uncover that our participant employers are aware of this institutional bias. Some of the employers feel that this is less time-consuming for them as they already have low resources being a startup organization. It implies that employers of startups have unique ways to workaround their low resource constraints and they devised a technique to hire candidates in a short amount of time, although this introduced biasing towards the candidates. Thus we find that biasing is common in startups as candidates from specific institutions are given priority while hiring. In this case, institutions from where existing employees belong are prioritized subconsciously as employers feel that candidates from such institutions will be more manageable. These findings extend prior work [4] which shows that employers incorporate social class backgrounds of the candidates while hiring. Employers evaluate candidates based on basic theoretical knowledge about CS with an additional focus on some core topics. They mention that they also evaluate candidates on their specific organizations' domain-specific knowledge which introduces dissimilarities in interviews of different companies. Some mention using automated software to test candidates' CS skills. These findings contribute to prior research [9, 16] which shows hiring steps of CS graduates have additional emphasis on technical and coding tests. In prior work [11], employers are found to focus on specific cues provided on GitHub profiles of candidates to make judgments about a candidate's skill. However, in contrast with this work, we find that employers of startups give less focus on a candidate's resume, and more on screening tests. This can happen because of the limited support employers of startups receive in hiring. Moreover, we find that most employers of startups are concerned that candidates will

leave their organizations after a few days. As a result, they show interest in knowing the future plans of candidates and the estimated time a candidate is willing to stay in their company during interviews of the hiring steps. These findings resemble prior work [1] which portrays long-term career discussions to hire candidates.

Moreover, the hiring process sometimes introduces challenges for the current employees who have to be present in the steps of the hiring process. They face additional responsibilities to hire candidates besides doing their technical tasks. They give their additional effort and time in this regard. This impedes their productivity. The primary selection of candidates from the large pool of applicants for the post is a time-consuming task. Employers feel that manually filtering out candidates in the initial stages can be assisted with a fully automated or human-in-the-loop system. Employers report that they often give more priority to the skill of the candidates. Consequently, employers have encountered employees' communication gaps and reluctance in teamwork while in the job role. This introduces uncertainty in the selection of suitable candidates despite choosing the best-performed candidate in the evaluation steps of the hiring. As a result, they feel that the selection of the perfect candidate often depends on luck. Thus, we find that there is uncertainty in hiring candidates in startups. This contributes to prior work [6] where challenges of software startups were studied. Additionally, many startups provide a training period that can go in vain if employees leave those startups earlier. This introduces another challenge and the need for several employee retention policies in startups such as contractual employment. Multiple skills including understanding the communication skills of the candidates that are essential for a specific startup can also be designed with technology to help employers to choose suitable candidates.

6 CONCLUSION AND FUTURE WORK

The results provide insights into the hiring process of startups. There exists a severe biasing tendency based on the institutions of candidates in startups. Giving priority to technical skills rather than communication skills in the hiring process introduces substantial challenges for startups. In this context, employers face added responsibilities that require additional time and effort because they have limited support in the hiring process. Thus, developing technological solutions to reduce the challenges specifically in the startup context is a critical need with the rising number of startups. Moreover, to understand the hiring phenomenon in startups understanding all stakeholders of the hiring process is essential. In the future, we plan to include the perspectives from the other user end i.e. employees.

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