ONLINE BACKGROUND CHECK SYSTEM FOR E-RECRUITMENT: PRE-EMPLOYMENT SCREENING FOR TURKISH COMPANIES

E-İŞE ALIM İÇİN ÇEVRİMİÇİ ÖZGEÇMİŞ KONTROL SİSTEMİ: TÜRK ŞİRKETLERİ İÇİN ÖN İSTIHDAM TARAMASI

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Abstract
This paper focuses on designing a background check system for pre-employment screening. More firms are using online screening and filtering during processing job applications. In our study we proposed an online background-checking system design that can be utilized during the development of fully functional system. Two types of users were defined within the system. Free users are the employees and powered users are the employers, which will hire employers. The database of the proposed online system will contain all the background information about the employees and the listings of the employers who are registered in the system. A web-based assessment mechanism, based on comments and points coming from the users, is also included in the design of the system's website, The comments will be shown on employee's profile, so when an employer searches for an employee he/she can check the points and comments of the employee to see whether he or she is capable of the job or not. This website was designed and implemented with using ASP.NET, C# and JavaScript.
Keywords: Background check, online recruitment, pre-employment screening, user profile

Öz
Bu çalışma, istihdam öncesi eleme için bir özgeçmiş kontrol sistemi geliştirmeye odaklanmaktadır. Artık daha fazla firma işe alım işlemlerini yürütürken çevrimiçi eleme ve filtreleme yöntemlerini kullanmakta. Çalışmamızda, işe alım sürecinde işverenlere yardımcı olacak çevrimiçi bir özgeçmiş kontrol sistemi önerdik. Sistemde iki tip kullanıcı tanımlanmıştır. Serbest kullanıcılar çalışanlar ve yetkili kullanıcılar, işe alımı gerçekleştiren işverenlerdir. Çevrimiçi sistemin veri tabanı, çalışanlar ile ilgili tüm özgeçmiş bilgilerini ve sisteme kayıtlı işverenlerin iş ilanlarını içerecektir. Sistemin web sitesi, kullanıcılardan gelen yorumlara ve puanlara dayalı bir değerlendirme mekanizması tarafından da desteklenecektir. Bu yorumlar, çalışanın ve kullanıcıların profilinde gösterilecektir. Dolayısıyla, bir işveren istihdam edeceği kullamıcının puanlarını ve yorumlarını dikkate alarak işe yatkınlıklarını değerlendirebilecektir. Bu web sitesi ASP.NET, C # ve JavaScript kullanılarak tasarlanmış ve uygulanmıştır.
Anahtar Kelimeler: özgeçmiş kontrol, çevrimiçi işe alım, istihdam öncesi eleme, kullanıcı profili, web sitesi

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Introduction

Employers often refrain from thorough and accurate employee background checks because of the time required to identify all available information and verify records. A 2015 survey by SterlingBackcheck revealed that only %58 percent of UK companies conducting background screening, "citing time and cost as challenges" (SterlingBackcheck, 2016). Organizations invest heavily in latest cutting edge technology to improve their work processes but the majority of them do not use information technologies (IT) to perform background screening during hiring. An end-to-end background screening system that manages all documentation, all search and verifications, and all reports related to screening would benefit both job candidates and employers. However developing propriety systems or software usually costs more than using a web-based application for screening process.

The Background Checks Industry in United States over the past five years, has grown by 3.8% to reach revenue of $3bn in 2018 (IBISWorld, 2018). In Turkey there is no national database or system that speeds up the screening processes by providing access to all relevant information by all firms and organizations involved with background checks. In European Union (EU), the computerized system European Criminal Records Information System (ECRIS) was established in April 2012 that enables exchange of information on criminal convictions between Member States. EU's ECRIS serve as an electronic interconnection between criminal records databases but only good for criminal checks (Nielsen, 2016).

Largely manual background checks services were transformed by the Internet as many processes were streamlined and automated. Use of the Internet also increased the speed and efficiency of screening as "employers and recruiters can expect results in a matter of a few days or in some cases only hours or minutes thanks to automation and the proliferation of online databases that store countless consumer records" (ESR, 2012). Another impact of the Internet was the public availability of the content created by the individuals through social media and websites. Many individuals now have an online profile and it is tempting to carry out online and social media searches. The assumed advantage of using web and other software tools instead of the traditional screening methods is that "it performs employment screening with very little human interference and therefore, does not waste time and reduces significantly the cost of labor during the screening process" (Muderedzwa & Nyakwende, 2010).

Researchers are under constant pressure to find better employment screening practices to minimize the chances of hiring unqualified employees (Doty-Navarro & Kleiner, 2000). In United States, many flawed computerized background check system designs are unreliable and they produce flawed results (Schmitt, 2011), (Ludlow, 2015). Recently the US Defense Department announced its plans to hire private contractors to develop a $600-million-plus computer system for a new background check agency (Shalal, 2016). In addition to nationwide or standalone online systems, advanced social networking technology tools and techniques can also be harnessed to speed up employment background screening.

Also if we consider employment screening domestically, in Turkey, there are only a few companies that carry out background screening but online technique is not being used. It is very common that companies have agreements with private investigative companies to run a background check for a possible future employee, especially for senior executives (Brody, 2010). CV fraud at senior level are increasingly getting noticed; in 2015 a US-based mid-sized IT company found out that, with help from a background screening firm, its India CEO for six months had presented seven different resumes on various portals (Chaturvedi & Bhattacharyya, 2015). So, online background screening, as we call it "Background Check" will open a new window that provides participated member companies an easier and cheaper way to eliminate insufficient or fraud candidates.

Studies indicate that the presence of a criminal record affects the likelihood of an employment offer negatively, in some cases by 50% (Cavico, Mujtaba, & Muffler, 2014). Since it is often difficult to run some legal background checks (such as criminal background, drug history, driving history, etc.), employment screeners only aim to get a better vantage point to candidate's professional background. Therefore, the main source for background check is often candidate's employment background. With the "Background Check" online service, all of employment data of the member companies will be gathered in a data pool. Also, social media networks can be accepted as another source for screening. Because of the highly popular social media, working-age population joins to social networks such as Facebook, Twitter, or LinkedIn in one way or another. And these social media networks seem to be a big valid data pool.

It became a common practice in some companies for job candidates to also pass a social media background check. For example Social Intelligence, from United States, offers a product for employment background investigation that provides a comprehensive picture of an applicant's complete publicly available online presence in social media. Then it generates a report with examples of professional honors and charitable work, along with negative information that meets specific criteria, such as online evidence of racist remarks; references to drugs; sexually explicit photos, text messages or videos; flagrant displays of weapons or bombs and clearly identifiable violent activity (Preston, 2011).

1. Resources for Employment Screening
Employers and HR departments usually utilize background checks as an important part of choosing the best candidate during hiring. They apply to off-line and/or online resources for screening. The rate of availability of these resources changes based on law and regulations in the country.

1.1. Conventional Resources
The standard background check includes items like driving and financial records, employment history and personal references. These resources are mainly in the form of documents, indexed records, or printed guides, available online and off-line. For example, founder and CEO of Employment Screening Resources (ESR) Lester Rosen's books are hiring guides for employers, recruiters and jobseekers (Rosen, 2017). San Francisco, California, based ESR provides its proprietary

technology solutions for screening process, which is accredited by The Professional Background Screening Association (PBSA). PBSA offers an accreditation program for Consumer Reporting Agencies (CRAs) located in the United States. This program is called Background Screening Agency Accreditation Program (BSAAP) and accredited screening firms are recognized as an agency that meets the highest industry standards (PBSA, 2019).

Private sector's use of polygraphs and voice stress analyzers in pre-employment screening is also prohibited by law in United States (U.S. Department of Labor, 2008) but in Canada, Computer Voice Stress Analyzer (CVSA) device is used as a tool to screen job applicants by public and private agencies (Baines, 2011). Although CVSA tools utilize computing technology, they hardly represent an IT system that can handle pre-employment screening as a whole. Some other standard methods of screening used in the background screening services are, phone screening, fax screening and VoIP screening.

1.2. The New Background Check – Using Social Media to Evaluate Job Candidates

As a result of the open nature of social media that encourages sharing of content produced through digital interactions, different parts of a candidate's life became searchable by hiring managers and HR professionals. Highly dynamic social networking sites "provide utilities designed to help companies locate and attract applicants while they also enable employers to run instant background checks" (Melanthiou, Pavlou, & Constantinou, 2015). Employment screening professionals often facing the question of how-and whether-to perform online background checks on job candidates. Employer searches of social media websites rarely serve to "actively elicit job-related information" purposes (Roth, Bobko, Van Iddekinge, & Thatcher, 2016). Online background check through social media can be very helpful in some cases; but without violating the fine line between exploring a person's online privacy and interfering.

A robust online background-check system should factor in the position, the candidate, the company, and the online activities of candidate for a complete screening. Companies have long used criminal background checks, credit reports and even searches on Google and LinkedIn to probe the previous lives of prospective employees. Blogs, social networks like Facebook and Twitter, and other online activities can paint a more detailed picture of a person and these online activities can be a clear indicator of what kind of employee he or she will be (Jones, 2011).

2017 survey conducted by Harris Poll revealed motives of hiring managers who were using social networks for screening job applicants (McCafferty, 2017). A total of 2,380 hiring and HR managers took part in the research and based on the survey results, 38% of employers who hired individuals after screening their social media pages did so because the candidates' information supported their professional qualifications, while 37% did so because the candidates displayed great communications skills on their social networks. Other reasons for using the social media are:

- To find information that supports job qualifications: 61%,
- To see if the candidate maintains a professional online persona: 50%,
- To learn what other people are posting about the candidate: 37%,
- To find any reason why they should not hire the candidate: 24%

Figure 1. Use of social networks for job screening.

Moreover, results showed that hiring and HR professionals are looking for candidate activities that will lead to a rejection such as (Figure 1):

- Posting provocative or inappropriate photos, videos or information: 39%,
- Posting information about drinking or using drugs: 38%,
- Making discriminatory comments about race, gender, religion, etc.: 32%,
- Bad-mouthing a previous company or fellow employee: 30%,
- Lying about job qualifications: 27%

2. System Design and Implementation

The main objective of this study is to design a model for web-based background check system, which will assist during further development of the full-fledged system. This system design oriented study introduces a preliminary system requirements analysis methodolody, a simple system architecture, and an example of flow chart related to candidate search. In addition to that, developing a proof of concept prototype is a valuable experience because: (1) it will improve our skills of web-based applications integration; (2) when finished helping us to understand the workings of a industry-specific system. On that account, a prototype is also developed and presented below.

2.1. System Requirements Analysis

Before developing the background-check system a system requirements analysis has to be done. This study proposed 5-step methodology to pinpoint requirements relate to job screening system. System requirements analysis methodology is briefly explained below:

1) Research for gathering general information about hiring process and pre-

employment screening. Every aspect of the processes that companies (employers) use and application of pre-employment screening in real life must be delved before identifying the business requirements. Seen important in this step is to include a list of applicable knowledge about hiring practices.

2) Business requirements. A scope is needed to identify business requirements of the screening process, the rules and the order of processes that are going to be implied.

3) Defining the process model. It is a phase to specify the model of the application. During this phase, the major screening processes that interact with the system is diagramed and decomposed into more manageable functions.

4) Defining the major system components. The major two components are database of the application and its interface. The database prototype is designed and since online screening is the goal, a web-based interface is needed.

5) Layout of functional specifications. Where processes, data and interfaces are merged to describe systematically how the users will use the application, and how data will be retrieved, processed and stored.

Following the completion of requirements analysis background checking system development can be initiated. Basic business requirements for the screening process were to provide accurate information on time to the authorized users and to run a screening based on pre-specified hiring policies. Outcomes from system requirements analysis are often taken into consideration for system architecture design. Our model's system architecture is introduced next.

2.2. Background Check System Architecture

In this architecture, job candidates or applicants (A), HR and recruitment firms (B), and employers (C) are considered as user systems. User systems A, B, and C connect to Online Service Hub (G) through web and other networks. Respectively, each user system comprise terminal devices used to log on to, establish an account, establish settings, enter data and retrieve results from Background-Check service server (D) via online hub G. Services server D exchanges data with Background-Check Data Mart (F) and also interacts with social media sites (E) for screening.

A web-based assessment mechanism, based on comments and points coming from the users, is also included in the design of the system's website. The comments will be shown on employee's profile through service server (D), so when an employer searches for an employee he/she will be able to check the points and comments of the employee to see whether he or she is capable of the job or not. Proposed web-based assessment mechanism is similar to a referral system, here points are used instead of references. Points system can be inconclusive by itself, therefore comments are also accepted by the assessment process. Referring to social media (E) is also considered as an important step during the assessment of candidates.
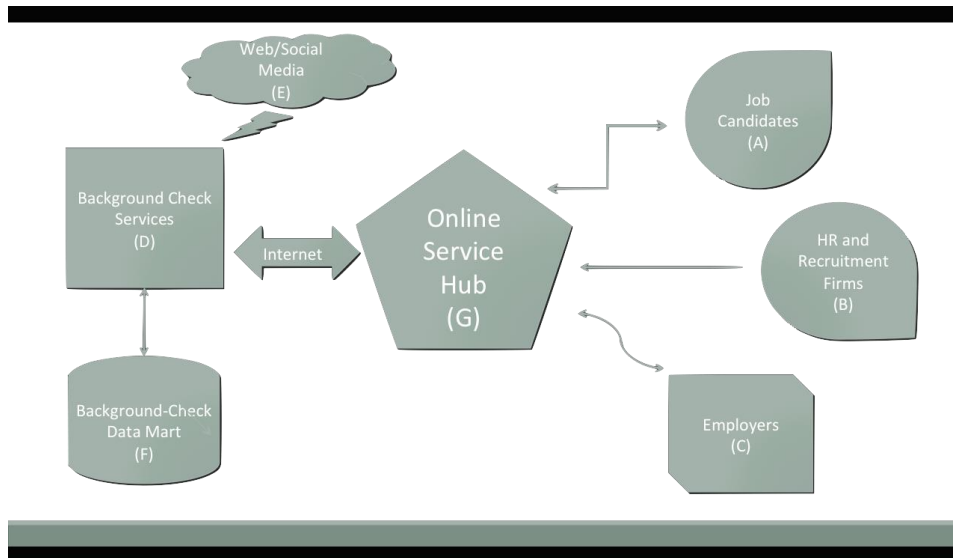
Figure 2. Background-check system architecture

Online Service Hub "G" comprises one or more networks facilitating bidirectional communication between the users (A, B, C) and service providers (D). Online service hub G may include the Internet, local area networks, wide area networks, infrared communications networks, other wireless networks, and/or satellite networks operated by a single telecom service provider or through a consortium. Because of the heavy mobile phone user penetration and increased data speeds over 4G in Turkey, mobile networks are very important for online hub so as the participation of cellular network providers.

Figure 3 shows the flow chart of screening method of candidates based on the given architecture above. In this model, the process starts at step 1 when a user (an authorized user of an employer) accesses service server D over network G via one of first, second, or third user systems A, B, or C, respectively. For purposes of example, we will assume that the user is using first user system B. If this is the first time a user from the employer is accessing the screening system, the user signs up for the screening service at step 2.
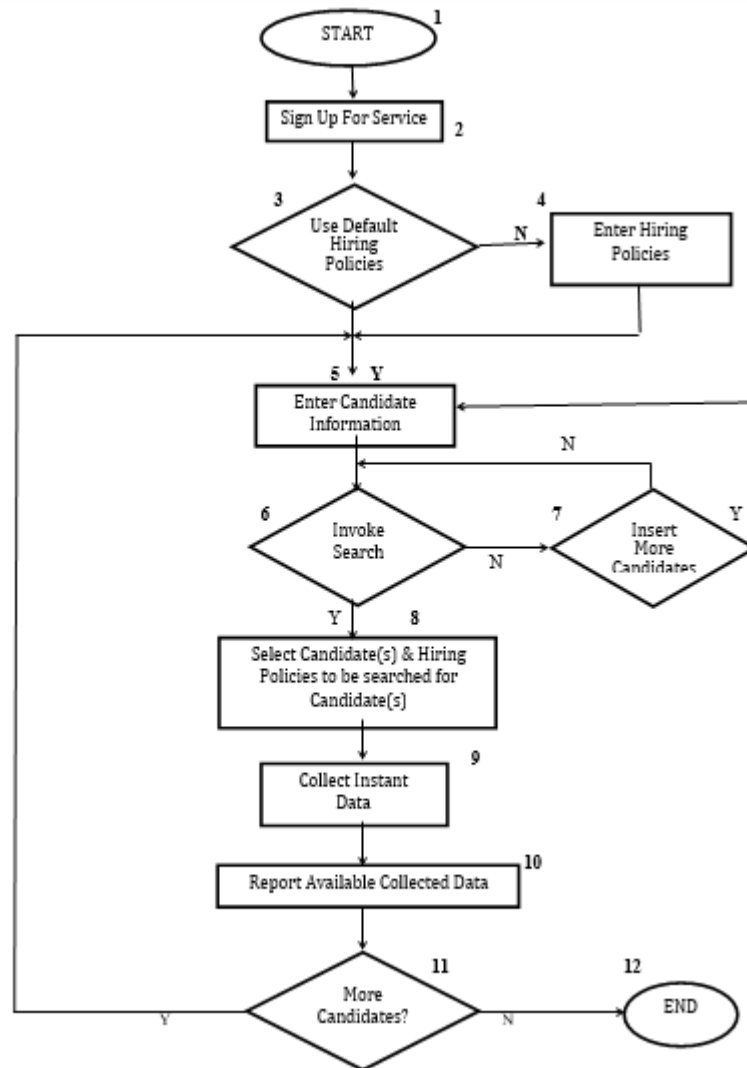
Figure 3. Flowchart for candidate search process.

At step 3, the user is given the choice to use default hiring policies may available on service server E for screening one/more candidates, or to enter hiring policies specific to the employer at step 4. At step 5, the user enters candidate information on first user system B. Candidate information entered may include basic information, such as education, years of experience, and other information needed for the purpose of recording the candidate at instant data source F.

At step 6, the user is given the option by service server E to invoke screening search for the candidate(s) for whom data has been entered. If the user does not wish to, invoke a search, the user proceeds to enter more candidate information on first user system B at step 7. If the user operates to invoke the screening search at step 6, then at step 8, the user selects, using first user system B, the candidate(s) and the respective hiring policies to be used for each candidate for the desired screening search.

Once the user selects one or more candidates and the applicable hiring policy for each candidate, at step 9, service server E communicates with instant data server F at step 9 to

collect the requested screening information for the selected candidate(s). Instant data server F is representative of one or more such servers each having access to one or more databases having information of the type requested by the user for the hiring policy(ies) for the selected candidate(s) residing thereon, and thus readily available to be sent by instant data server F back to service server E. The "instant" is meant to refer to automatic data retrieval.

When screening results are obtained through step 9, those results are made available to service server E as described herein. At step 10, collected data is made available in report form to the user. It is worthy to note that not all requested data for a particular hiring policy may be available to service server E at the same time.

The user is given the opportunity at step 11 to indicate whether additional candidates are to be entered. If more candidates are to be entered, the method proceeds to step 5 for entry of additional candidate information. If no more candidates are to be entered, the process of screening searches for this session for the user ends at step 12. At step 12 the process ends and the user can get the result he wants.

2.3. Coding and Application Implementation for the Prototype Development

Microsoft Visual Studio is an integrated development environment (IDE) and it is used to develop console and graphical user interface applications for the proof-of-concept prototype. Alongside IDE, Windows Forms applications, web sites, web applications, and web services in both native code together with managed code for all platforms supported by Microsoft Windows, Windows Mobile, Windows CE, .NET Framework, and Microsoft Silverlight were the tools chosen for such development.

Microsoft SQL Server is also utilized to store and retrieve data for the system. MsSQL manages data traffic between software applications, and also allows data flow between computers within a network (including the Internet). Other languages used to develop the background checking system were C#, ASP.NET, JavaScript, and Ajax.

Some key screenshots are presented in this section. These screenshots reflect the existing system prototype. The system model is still under development and further analysis will be done as the researchers are seeking to implement continuous improvements to ensure the quality of system outputs.

Next is the "Home Page" of system's website. The "Login" or "Create An Account" buttons are on the right. Through "Login" button users can log in to the website with their own usernames and passwords. If a visitor is not registered with the system then s\he can create a new account and become a member and user of Background Check Process (user type is not selected at this step of registration).

Figure 4. Homepage of background checking system

Screenshot in Figure 5 shows the page called "Register Type". There are 2 types of users available in system's website. The first one of them is "Free User" type. These users have restricted privileges. They don't have privileges for example, to make comment or execute advanced search. They just can see the profiles of other users but cannot take any action on them. The second type is called "Power User". These users have extended privileges like to make comment and use extended search functions. But some restrictions apply to their profiles too.

Figure 5. User type selection

Below is the page of Account Creation. In this page, user have to fill some obligatory information including Name, Last Name, Username, Email, Password, Confirmation of Password, Birthday, Gender and Profile Picture. Other information you see on the screen is not mandatory and user can skip them if s/he doesn't want to fill. If user clicks the

"Reset" button all fields will be blanked, and the page returns to its initial appearance. If user clicks "Next Step" button, selection of the company page comes as next screen. If user doesn't fill all of mandatory fields there will be an error message on the screen.
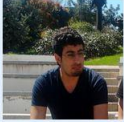

Figure 6. New account creation

This system provides a search function through its "Find Employee" tab on the menu bar. Search pages and the pages showing detailed candidate information are post-login screens.

Figure 7. Search results page

Search results for a candidate is presented through the "Candidate Details" page. Basic search function of the system also lists links to Facebook and Twitter accounts of the candidate.

Figure 7. Basic search page

Results are listed is at the bottom of the screen. If user clicks "FACEBOOK_URL" or "TWITTER_URL" fields, user will be directed either Facebook profile or Twitter profile of searched candidate. If user clicks searched candidate's "NAME" field user will be directed to candidate's profile field in "Background Check". User can change the page via menu bar. If he/she clicks "Company" Link s/he will be redirected to his/her company page.

Discussion and Conclusion

Background check is important for employers to make the right decision during hiring process. Employers can no longer solely rely on candidate interviews so they prefer other tools that are available online. Firstly, there is a need in our country for an integrated online approach that comprehensively screens data. Secondly, law and regulations must be in favor of up-to-date reliable national online databases that can be accessed not only by authorized companies but also by government agencies for the purpose of employment background screening.

This paper is going to be the first in background check field in Turkey. There are some examples of background check systems but they are not web based. It is an opportunity to lead the online background check sector in Turkey with the development of an online system that is integrated with social networking sites. Our proposed system database will be storing background information about the candidates/employees and the listings of the employers who are registered in the system. Such database content can easily be paired with social media data as well as all the transactions information related to job placement thus creating a valuable relational database that can be utilized as a part of a future employment pre-screening knowledgebase.

Almost all pre-employment screening or hiring process is closely related to access and use of personal data, in other words privacy of candidates and registered users of the system is a matter of concern. This study is more about system design, however any type of screening cannot be done without collecting candidate/employee data in compliance with the law. Same is true for the data and information provided by the employers and other third parties. In Turkey, personal data is protected by Turkish Personal Data Protection Law no. 6698, which is enacted on 2016. As a deliverable for Tubitak Ardeb 3001 (Ar-Ge Başlangıç) Project our system design study was completed before the enactment of the 6698. In fact, privacy legislation are usually subject to changes in the form of amendments or repeal therefore such externality is out of scope for our study.

However database design and all data collection methodologies for a pre-screening and hiring system must satisfy legal data collection practices and abide with the law, in other words, privacy protection should be integrated to the system to the greatest extent. Our recommendation for a future study is to have more focus on design iterations that also takes privacy protection regulations into consideration. Another add-on for the system can be the inclusion of processes that provides more flexibility related to opt-in and opt-out features of data usage.

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