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KerjaKarya: An Inclusive Digital Solution to Expand Access for the Disabled Labour Force

Susetiyo Mohaimin[1], Addin Aditya[2*]
[1,2]Department of Information System, Sekolah Tinggi Informatika & Komputer Indonesia, Malang, 65146, Indonesia

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ABSTRAK

Penyandang disabilitas sering menghadapi tantangan signifikan dalam mengakses dunia kerja akibat keterbatasan media informasi yang inklusif dan stigma produktivitas yang rendah. Untuk menjawab permasalahan ini, penelitian ini bertujuan untuk mengembangkan dan menguji aplikasi KerjaKarya, sebuah platform berbasis web yang dirancang khusus untuk memfasilitasi penyandang disabilitas, terutama tuna daksa, tuna rungu, dan tuna wicara, dalam mencari lowongan pekerjaan, mengajukan lamaran, dan membangun komunitas. Penelitian ini menggunakan metode System Development Life Cycle (SDLC) dengan pendekatan waterfall, melibatkan pengumpulan data dari studi literatur, wawancara dengan penyandang disabilitas, serta pengujian menggunakan teknik black box dan uji coba pengguna. Uji coba melibatkan lima pelamar kerja, empat perusahaan, dan satu customer service dengan instrumen kuisioner berbasis skala Likert. Hasil penelitian menunjukkan bahwa aplikasi berhasil memenuhi kebutuhan pengguna dengan antarmuka yang ramah dan fitur-fitur yang relevan, seperti pendaftaran, pengajuan lamaran, dan manajemen lowongan. Implikasi penelitian ini adalah menyediakan solusi praktis untuk meningkatkan aksesibilitas dan partisipasi penyandang disabilitas dalam pasar kerja yang inklusif. Penelitian ini juga membuka peluang untuk pengembangan lebih lanjut, seperti integrasi kecerdasan buatan dan layanan pelatihan keterampilan

ABSTRACT

People with disabilities often face significant challenges in accessing the world of work due to limited inclusive information media and the stigma of low productivity. To address these issues, this research aims to develop and test the KerjaKarya application, a web-based platform specifically designed to facilitate people with disabilities, especially the physically, hearing, and speech impaired, in finding job vacancies, submitting applications, and building communities. This research uses the System Development Life Cycle (SDLC) method with a waterfall approach, involving data collection from literature studies, interviews with people with disabilities, and testing using black box techniques and user trials. The trial involved five job applicants, four companies, and one customer service with a Likert scale-based questionnaire instrument. The results showed that the application successfully met the needs of users with a friendly interface and relevant features, such as registration, application submission, and vacancy management. The implication of this research is that it provides a practical solution to improve accessibility and participation of people with disabilities in an inclusive labour market. This research also opens up opportunities for further development, such as the integration of artificial intelligence and skills training services.

Correspondence Author
Email: addin@stiki.ac.id

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1. INTRODUCTION

In the current era of advances in information technology, the ease of accessing various information through various media sources can be easily done by anyone, especially in finding information about the world of work on website platforms where large companies list various kinds of job offers according to the fields needed. However, the website media is not devoted to providing job information for people with disabilities. The definition that explains about people with disabilities is contained in Law Number 19 of 2011 which contains that people with disabilities are people who have physical, mental, intellectual or sensory limitations for a long period of time who in interacting with the environment and attitudes of the community can encounter obstacles to effective participation based on equal rights. [1]. In addition, the definition of disability according to Law Number 8 of 2016 is every person who experiences physical, intellectual, mental, or sensory limitations for a long period of time who in interacting with the environment can experience obstacles and difficulties in participating fully and effectively with other citizens based on equal rights. [2]. Human rights in the world of work are primary rights inherent in social life, including the right to workplace protection, the right to have decent work, the right to equal pay and the right to freedom of expression. [3], [4]. The lack of attention from various parties for people with disabilities often makes the rights they should get properly neglected, especially in the context of productivity in the world of work, based on research in the 2014 Ministry of Health journal states that around 14.4% of the disabled population in Indonesia do not have a job. The data explains that there are still many people with disabilities who do not have jobs, some of them are dominated by people with hearing impairments, speech impairments, and physical disabilities who have difficulty finding work because of the assumptions of various parties or companies that assess that their productivity levels are much lower. [5].

Several previous studies have been reviewed to add empirical justification related to this research. The first research conducted by [6] has several supporting methods, namely the use of the usecase diagram method to describe the system workflow and the use of the waterfall method as a system maintenance stage. The purpose of this research is as an information processing tool for job vacancy providers and as a medium to connect people with disabilities with job providers in Pasuruan Regency. The gap contained in this website is the use of display colours that are too striking and the advantages contained in this system are neat menu displays and make it easier for users. Furthermore, research by [7] offers an idea entitled DISKA, this concept is a job seeker platform with gamification methods as assessment, training and storefronts to promote works such as design, painting, applications and coding to be marketed. Furthermore, research conducted by [8] aims to analyze whether the Brawijaya University Center for Disability Services (PSLD) in Business Career Development for Deaf Labor Candidates utilizes guidelines sourced from the International Labour Organization (ILO). As a result, PSLD UB has provided services in lecture operations such as volunteers in assignment work, translator services and book digitisation services. However, on the other hand, there is still no job training in accordance with the majors and study programs of each student. The form of training provided is limited to job interview training and curriculum vitae making and has not targeted pre-employment training and character training.

Of the various factors that affect people with disabilities in finding work, the factor that is experienced by many people with disabilities, especially the deaf and the disabled, is the absence of website media that accommodates valid job information for people with disabilities. the lack of media facilities and the limited abilities of people with disabilities make them include people who need special attention in obtaining their productivity rights. The purpose of this research is to create a website-based system to fulfil and help solve the problems faced by people with disabilities. The need for special attention for those who have various physical limitations, makes this website-based system made with a display that can facilitate its use. Disabled people, especially the deaf or disabled, can easily find or search for jobs according to their talents, they can also easily socialise and create a community or discussion forums through additional features on the website.

2. RESEARCH METHOD

2.1. Research Flow

In the development of an application or information system, the application of models has a crucial role in designing a framework that suits the expected goals and benefits [9]. The model chosen to build the

system will greatly affect the end result, the quality of the product, as well as the various needs and costs required. One commonly used approach is the System Development Life Cycle (SDLC), which is a series of processes covering the creation and modification of systems, including the models and methods applied in their development [10], [11]. SDLC is also a common stage in system development. Common phases that SDLC has include: 1. Planning; 2. Analysis; 3. Implementation; 4. Maintenance.

The waterfall method, also known as the Linear Sequential Model, is so named because the process flow is described as flowing sequentially from the beginning to the end stages, resembling a waterfall (see Figure 1). This method is an example of a planning-based development approach, where all activities must be thoroughly designed and scheduled before work begins [12], [13]. Some of the main stages of the waterfall model used in this research are as follows:

a. Require Analysis

   At this stage, the data and information needed to define software requirements are collected. Data collection is done by conducting literature on trend data for workers with disabilities from the Central Bureau of Statistics and the Ministry of Manpower.

b. System Design

   This stage focuses on system design to define the hardware requirements needed in software development. In addition, this stage also includes designing the database system that will be used.

c. Implementation

   At this stage the programme is complete and ready to be tested. In this research, the application will be tested on people with disabilities in Malang City.

d. Testing

   At this stage the application will be carried out a series of tests to assess whether the application meets the criteria and system requirements. The tests that will be used are functionality tests and user tests where test data will be collected in the form of questionnaires. Black box testing is used in application testing because of its focus on system functionality without examining internal code or programme structure. This method ensures that the application runs according to predetermined specifications and fulfils user needs.

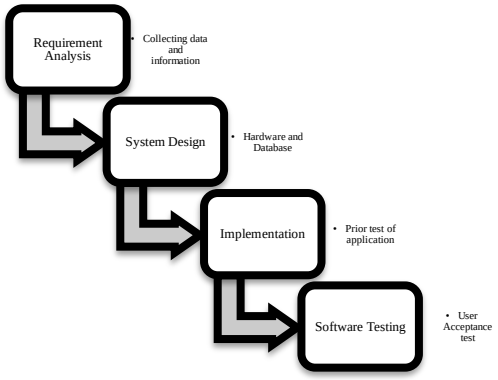

Figure 1. Research Flow

2.2 Problem Statement

This stage was carried out by identifying problems related to the employment system for people with disabilities by reviewing three literature studies that discuss similar issues. In addition, statistical data published by the Central Bureau of Statistics was used to strengthen the analysis. As a further step, data from direct interviews with several people with disabilities, particularly the physically challenged, were analysed to gain a more in-depth perspective. This approach allowed the authors to better understand the challenges faced by people with disabilities in access to and availability of employment.

From the identification results, several key issues were found. Firstly, there is very limited information on employment for people with disabilities, particularly the deaf, the speech impaired and the physically challenged. Secondly, there are not enough media that serve as intermediaries between persons with disabilities and employers. Thirdly, limited access to information is a significant barrier for people with disabilities to find

employment opportunities that suit their abilities. These findings suggest the need for more inclusive solutions to bridge the needs between companies and people with disabilities.

2.3 Analysis and Design

In this research, the Unified Modelling Language (UML) is used as a tool in carrying out the design and design stages of the application. UML was created to provide the tools needed by software developers in analysing, designing and implementing software-based systems [14]. At this stage, the business processes of the system will be defined. Business processes can be understood as a collection of activities that can define business events and work performed by a system to convert inputs into value-added outputs for users [15], [16].

In the application design and design stage, a use case diagram will be used to define what activities will be carried out by the system. Figure 2 shows the activities of job applicants. In the development of this application, there are three main actors involved, namely users or job applicants, customer service, and companies or job vacancy service providers.

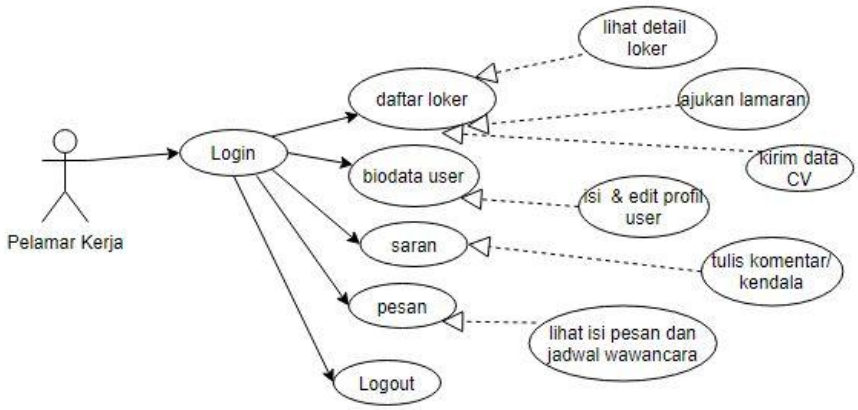

Figure 2. Use-Case Diagram for Job Applicants

The job applicant menu on an application or website provides various features to facilitate users in finding a job. The **registration** feature is used as the first step to access the dashboard, while **login** allows users to enter the system and logout serves to exit. Job applicants can use the **locker list** feature to view job vacancy information and details, and **submit applications** to send applications to companies. In addition, there is a **send CV** data feature that allows users to upload their CV to be submitted to companies. Users can also **manage their profiles** through the profile content feature, view interview schedules set by the company, and provide comments or report problems related to the application or vacancies to customer service. If necessary, applicants can use the **send evidence** feature to submit supporting documents related to the obstacles experienced. All of these features are designed to increase the ease and efficiency of the job search process for users.

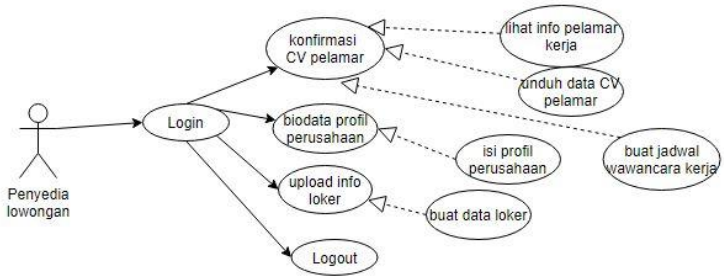

Figure 3. Use-Case Diagram for Company

The company menu provides various features that make it easier for companies to manage the labour recruitment process. As shown in Figure 3, the registration feature is used as the first step for companies to access the dashboard, while **login** allows the company's Customer Service to enter the system, and **logout** is

used to exit the application. Companies can **view incoming applicant** data through the view job applicant info feature, which provides direct access to accepted applicant information through notifications on the dashboard. In addition, the **CV data download** feature allows the company's Customer Service to download CVs that have been submitted by applicants. The recruitment process is further supported by **the create job interview schedule** feature, which is used to arrange interview schedules for applicants once their applications are confirmed. With these features, companies can more efficiently manage job applications and run the selection process in a more organized manner.

3. RESULT AND DISCUSSIONS

The information system for providing special employment services for people with disabilities, KerjaKarya, is an information system that was created and designed as a place for information about various job vacancies specifically for people with disabilities, especially for people with disabilities who are disabled, deaf, and also for the speech impaired. Where in this application users who register can freely explain the uniqueness they have or can describe themselves so that it can become their special biodata when applying for work. In addition, on this website, the maker of vacancy information is not limited to companies, but can come from MSMEs that are in need of employees from job applicants with disabilities.

Figure 4. Landing Page

Figure 4 displays the landing page of the KerjaKarya application, which is the first page that users see when accessing the application. On this page, users are presented with a friendly and informative interface. At the top, there is the KerjaKarya logo that emphasises the identity of the application. The navigation menu is strategically placed to facilitate access to important features such as Registration, Login, and Job Vacancy List.

In the centre of the page, there is a main banner with images or illustrations that describe the app's mission, such as matching job seekers with disability-inclusive companies. Promotional text or attention-grabbing slogans are also displayed to invite users to join or explore further features. There are also call-to-action buttons such as ‘Register Now’ or ‘Find Vacancies’ that are designed to stand out so that users are encouraged to start the job search or registration process. Brief information about the advantages and benefits of using KerjaKarya may be displayed in the form of icons or bullet points for easy understanding. At the bottom of the page or footer, additional links such as Contact Us, About Us, Help, and links to KerjaKarya's social media accounts are provided. Information regarding privacy policy and terms and conditions are also usually placed here for transparency to users. Overall, KerjaKarya's landing page is designed with a modern and responsive aesthetic, ensuring optimal user experience on both desktop and mobile devices. This page serves as the main gateway that directs users to the various services offered by the app.

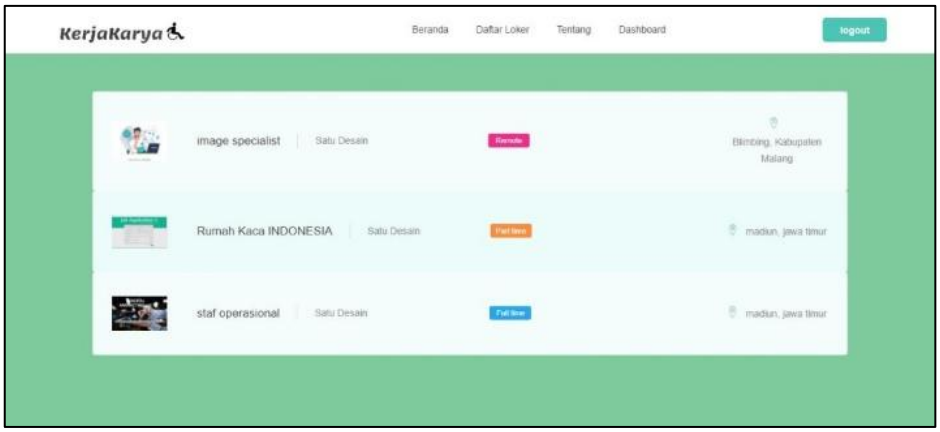

Figure 5. Job Vacancy List Page

Figure 5 shows the interface of the Daftar Loker feature in the KerjaKarya application, which is designed to make it easier for job seekers to find information on job vacancies. This page presents a list of various job vacancies in an organised manner, complete with important details such as company name, position offered, job location, and salary range (if available). Each vacancy is displayed in the form of a list, which contains a brief summary and a button to view more details. When users click on one of the vacancies, they will be redirected to a detail page that includes the job description, requirements, and information on how to apply. To make navigation easier, a bookmarking feature may be provided, so that users can save interesting vacancies to revisit at a later date. The interface of these job listings is designed to be intuitive and responsive, ensuring ease of access on both desktop and mobile devices. With a clean and structured look, this page is one of the key features of the KerjaKarya app in supporting a more efficient and informative job seeker experience.

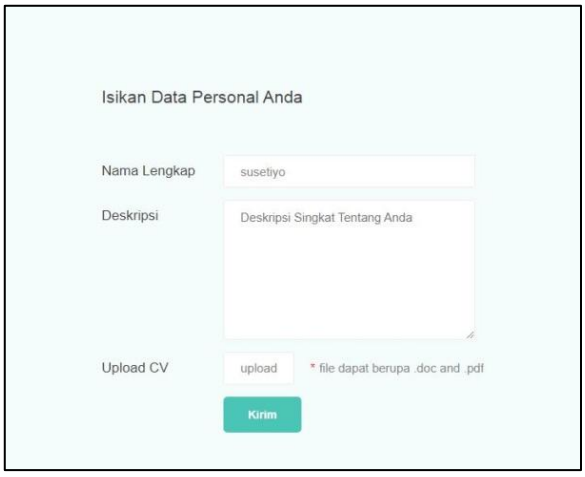

Figure 6. Job Application Submit Page

Figure 6 shows a view of the job application submission process page designed specifically for job applicants in the KerjaKarya application. This page is an important step for applicants to submit their application directly to the company that opened the vacancy. The interface of this page includes several main elements, such as job vacancy information, including the position applied for, company name, and other relevant details. In the centre, there is a form or button to upload application documents, such as CV, cover letter, or portfolio, which must be completed before the submission can be made. Once all the data is filled in, applicants can click the Apply button, which is usually accompanied by a notification or confirmation message that the application has been successfully submitted. For user convenience, a submission history feature or a link to a list of submitted applications may also be provided on this page, allowing applicants to track the status of their applications at a later date.

The information system for providing special employment services for people with disabilities, KerjaKarya, is designed as a platform to bridge job seekers with disabilities and employers. It was specifically developed to accommodate the needs of individuals with physical, hearing, and speech impairments by offering a user-friendly interface and accessibility-focused features. In comparison to other job portal applications, KerjaKarya offers several unique features that differentiate it from existing solutions:

1. **Inclusivity-Focused Features**: Unlike conventional job-seeking platforms such as **JobStreet** or **LinkedIn**, which provide generic job listings, KerjaKarya is designed exclusively for individuals with disabilities. It provides features allowing users to highlight their skills and unique attributes, ensuring that job seekers are matched with employers willing to accommodate their needs.
2. **Community and Networking Support**: While platforms like **DISKA** incorporate gamification elements for skill-building and engagement, KerjaKarya includes a **community-building feature** where users can share experiences, seek advice, and receive mentorship from fellow disabled professionals.
3. **Customizable Employer Involvement**: Many job platforms limit job postings to registered corporations. In contrast, KerjaKarya allows **both MSMEs and large companies** to list job opportunities, thus expanding employment prospects for people with disabilities.
4. **Simplified Job Application Process**: The **interface of KerjaKarya** is designed with accessibility in mind, featuring **voice-assisted navigation, text-to-speech options, and an intuitive layout**. This differs from platforms like **PSLD UB (Center of Disability Service, Brawijaya University)**, which mainly focus on university career development and lack a job application system tailored to disabled job seekers.
5. **End-to-End Support System**: Existing platforms such as **BKK Online** (vocational job portals) and **DisabilitasKerja** (a disability-focused job board) mainly function as **job listing** platforms. KerjaKarya goes beyond that by incorporating **training, career guidance, and direct employer engagement**, ensuring a holistic support system for users.

3.1. Functional Testing

Black box testing is used in application testing because it focuses on the functionality of the system without examining the internal code or programme structure. This method ensures that the application runs according to predefined specifications and fulfils user needs. By testing inputs and outputs without regard to the internal workings of the application, it is effective for detecting bugs in key functions, data validation, and integration between features [17], [18], [19], [20]. Black box testing also facilitates testing from an end-user perspective, as its approach reflects the way the application will be used in real life. In addition, this method is easier to implement by testers who do not have a technical background, so it can be done collaboratively with various parties. The method is carried out to test whether each process in each user access right is successfully carried out in accordance with its function or there are still errors.

Table 1. Functional Testing Report

Scenario	Testing	Expected Result	Testing Result
Registration	Registering new user	To create a new user for new applicant	**Pass**
Login	Doing user login to applicant	To create a success login process using new user	**Pass**
Filling the Profile	Filling or updating the personal information of the applicant	Successfully save the biodata changes in the job applicant's access rights	**Pass**
Viewing the Job Vacancies	Retrieving the list of job vacancies	Successfully displayed a list of lockers available in the system with job applicant access rights.	**Pass**
Applying the Job	Choosing and applying the job	Successfully register and upload files on the ‘submit an application’ menu	**Pass**
Sending feedback to customer service	Sending the feedback to customer service	Successfully sending the message to customer service	**Pass**

The test results show that all scenarios tested on the application have run according to the expected results. The process of registering new job applicants, logging in, and managing biodata was successfully carried out without any problems, ensuring that the access rights of job applicants function properly. The features to view the locker list and register for job vacancies also ran according to specifications, including the ability to upload application files. In addition, the communication feature with Customer Service through sending suggestions or messages was successfully tested with satisfactory results. Overall, the application has fulfilled the main functionality standards, providing an optimal user experience and in accordance with the designed requirements.

3.2. User Acceptance Test

The user trial stage is the final process that determines whether a system that has been designed and created can successfully meet the target objectives set in the previous design. This user trial was carried out by 15 job applicants, 4 companies, and 3 customer service by trying various features that already exist on the system, then filling out a questionnaire. The answer choices are represented with: 3 (strongly agree); 2 (less disagree); 1 (disagree).

Table 2. User Acceptance Test Result

Role	Items	Answers			Total
		3	2	1	
Job Applicant	The appearance of the website presented has attracted user interest	15	0	0	15
Job Applicant	Overall, the features on this website are suitable for applicants with disabilities.	14	1	0	15
Job Applicant	The features provided already provide clear information	15	0	0	15
Job Applicant	The features provided by the application are quite helpful in the process of applying for work	15	0	0	15
Job Applicant	The features provided by the application have provided complete facilities and contents in accordance with my condition as a person with a disability	15	0	0	15
Company	Website display is easy to understand	4	0	0	4
Company	The features available are interesting and informative	4	0	0	4
Company	The application can help companies in loading job vacancy information for people with disabilities	3	1	0	4
Company	Job vacancy features are appropriate and make it easier for companies to post job vacancies	4	0	0	4
Company	Application features can facilitate the process of selecting and confirming and scheduling job interviews	4	0	0	4
Customer Service	The appearance of the system presented is attractive	3	0	0	3
Customer Service	The features available on the application are adequate	3	0	0	3
Customer Service	The process of recapitulating job applicant data has become easier thanks to this application	3	0	0	3
Customer service	The message confirmation feature has helped in handling user feedback	3	0	0	3

Based on the test data in Table 2, the KerjaKarya application was tested by job applicants, companies, and customer service through various features in the system. The test results show that most users gave positive responses with the highest scores on interface appearance, informative features, and the ease of the registration and job application process. All job applicants stated that the app's features helped them with their needs as people with disabilities, while employers felt that the job vacancy features made the recruitment process easier, although there was a slight note on the clarity of information. Customer service also reported that the app supported the data recapitulation process and handled feedback effectively. These findings indicate that the app has optimally met most stakeholders' needs.

4. CONCLUSSIONS

The conclusion of this research is that the KerjaKarya application has successfully achieved its main goal of providing an inclusive and user-friendly web-based platform for people with disabilities to find job vacancy information, submit applications, and access additional features such as community building. Application testing shows that this system meets the needs of job applicants with disabilities, companies, and customer service, with features that help the recruitment process efficiently and informatively. The implication of this research is that it provides a tangible solution to the employment challenges faced by people with disabilities, while strengthening their position in an inclusive labour market.

Future research opportunities include the development of artificial intelligence-based features to personalise job vacancies according to applicant profiles, as well as the integration of the app with skills training services to increase the capacity of people with disabilities. Further research could also explore the

social and economic impacts of implementing this system on increasing the participation of people with disabilities in the workforce, as well as expanding the scope of its use to wider regions or specific industry sectors.

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