Team 2

Slide Deck Report

AI-REACH

Meet Our Team

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Agenda

Presenting our agenda....

Executive Summary

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Brief Overview of our Project

Situation

Disability unemployment in Australia stand is compartively low compared to non-disabled unemployment.
As a result, disabled individuals suffer from low income levels, worsening access to healthcare, mental health and eventually cyclical poverty.

Problem Statement

How can we leverage on existing technology to improve the accessibility of employment opportunities for disabled individuals?

Solution

An AI model that improves the JobAccess Website

Quantitative Impact

- Increased Employment of 1,066,000
- Increased GDP of $49.3B
- Decreased Lead-Time for Job Finding
- $14.6B for other services
  ROI: 2.97x

Risks & Limitations

- Limited timeframe to integrate with WatsonDiscovery
- Limited Sources of Data
- Systematic Limitations

Context of Our Citizen Service

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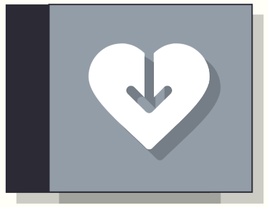
Why this particular citizen service?

1	Disability Landscape in Australia	• 38% of Australians in poverty have a disability, facing not just economic hardship but discrimination, with 44% of human rights complaints stemming from disability. • Now consider, half of our young disabled Australians suffer from poor mental health. **This isn't just a crisis; it's a call to action.**
2	Disparity in Employment	• Currently, 48% (984,000) of disabled individuals are employed compared to 80% (11.4M) of non-disabled individuals. • This presents inequality of working conditions, worsening conditions such as income, access to health services, mental health and skill acquistion.
3	High Government Expenditure of $1.1M	• Australia's government allocated $123.4M to disability services for 2023-2024, with $1.1M set aside for improving support and consultation capacity of DES Central. • By improving employment for disabled individuals, additional $1.1M could be reallocated to other citizen/disability services for effective usage.

What problems will be solved?

Loss of skills: 38% of disabled people found that lacking skills was the second largest barrier to employment

Low-income: 38% of disabled Australians are living in poverty



Health services: 24% of disabled people aged 15-64 wait longer than acceptable to see a GP

Mental health: 50% of disabled aged 15-29 have poor psychological health compared with 8% of non-disabled

Try Pitch

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Problem Definition, Aims and Rationale

Problem Definition

Use existing technology to improve employability of disabled people with human centered design

Problem Aim

How can foundational AI deliver value and employment opportunities for disabled individuals

Problem Rationale

1. 48% of disabled people employed
2. Poor mental health and financial stress
3. Increased productivity and economic benefits if hired

Hypothesis

This was the preliminary hypothesis to guide our research from initial 5 Whys analysis....

Initial Hypothesis: There is a lack of opportunity for disabled individuals to match relevant skills to available jobs in the market.

To explore more about how disabled individuals currently get employed...

1 Current Government Schemes

Initial research was conducted on current government schemes that provided jobs for disabled workers.

2 Primary Public Scheme

Conclusion was made that DES was the primary public scheme that aided disabled individuals in finding jobs.

3 Function of DES

DES provided both employment support such as training, resume building etc. as well as linking employees with employers

4 Performance of DES

Research was conducted regarding the performance of DES.

Findings

What did we find from our research?

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1. DES Central staff are relatively young
2. Allocation to nearest DES providers regardless of preferences
3. DES prefers not to upskill due to emphasis on lower labour costs

5 Why Analysis was then utilised to get to the crux of the problem... afterwhich redirection of our approach helped arrive at an improved hypothesis

Why 1	Why are employment rates low for disabled people?	There is a preconceived notions or bias about their productivity and efficiency.
Why 2	Why are there proconceived notions?	Employers are unaware about current skills that disabled individuals possess.
Why 3	Why are they unaware?	DES Central staff are matching incorrect skills to available jobs
Why 4	Why incorrect matching?	Lack of understanding or adequate training about disabilities and how they can align with job requirements.
Why 5	Why is there lack of understanding or adequate training?	High turnover rate and low investment in training

Improved Hypothesis: Disabled individuals are unable to find jobs due to high turnover rate and low investment in training

Persona (Pre JobAccess)

To better understand the perspective of disabled individuals....

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Kevin

26 y.o
Brisbane, QLD
Lives with parents
11 mths on DES

"I want to work like everyone else. I am searching for a provider who cares and listen. Sometimes I feel like they shove me into a corner."

About:

- Kevin has autism and moderate intellectual disability.
- He is currently completing a Certificate III in hospitality, but long-term would like to work in animal care.
- His hobbies include video games and playing soccer with his older brother. He has a love for animals, especially the family dog.

Motivations:

- Living independently within the next two years.
- Finding a fulfilling part-time job, ideally with sports or animals.
- Finding a great provider who is dedicated, proactive, and listens.
- Building life skills to live a productive and independent life.

Needs:

- Learning about his strengths and exploring potential job matches.
- Developing skills, such as interviewing, to improve employability.
- Support tools to make an informed choice when changing service providers.
- Hands-on support, training, and coaching when beginning a new role.
- Support to turn volunteer work into a paid work.

Painpoints:

-Unable to find DES providers who understands autism.
- Unable to find a provider who is committed to helping achieve his full potential.
- Lack of support to finish Certificate III as the classroom-based learning is too fast and difficult.
- High turnover of DES staff impacting ability to form trusted relationships.
- Limited public transport options for commute to work.

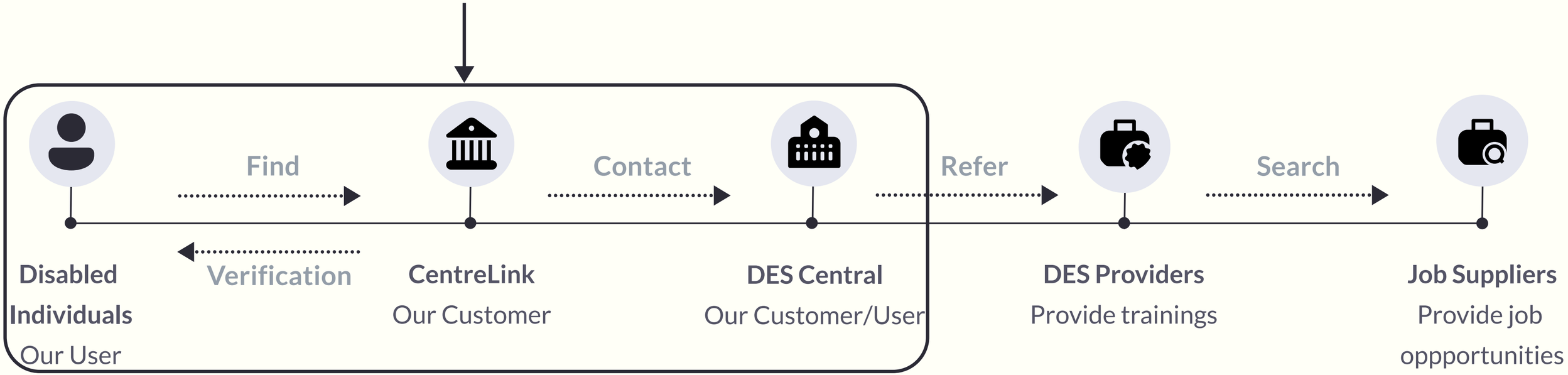
Day in the Life

8am **Wakes up, has breakfast with family** → 11am **Attends fortnightly appointment meetings at DES providers in town** → 2pm **Attends online course for Cert III in hospitality** → 5pm **Plays soccer with friends**

Scope

The process for applying to Disability Employment Services (DES) involves the disabled person getting screened by CentreLink. Once screened, the CentreLink employee contacts DES Central, who can then link the disabled person to one of the many DES Providers. The DES Provider will then search for Job Suppliers for potential employment opportunities.

We will focus on improving the process in the box below



Options Considered

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Divergence of the Double Diamond helped us evaluate different solutions

Solution A

Improving JobAccess Website

Within the framework of this solution, the JobAccess website would be improved to make it easier to use and have the following features:

Not required to use the PDF

Service satisfaction percentage

Filter and sorting mechanism

FAQ section

Text-to-Speech

Solution B

Substituting DES Staff

Within the framework of this solution, automation will be applied to following tasks traditionally handled by DES staff:

Requirement analysis

Training and education planning

Resume/CV writing

Interview preparation

Job matching

Narrowing down

Solution A

Why was solution A pursued and not solution B?

The challenge faced by individuals with disabilities in finding suitable employment services is rooted in a lack of understanding among providers regarding their unique needs, which comes from mismatch of service provider.

A comprehensive solution does not solely involve substituting DES personnel with AI, as individuals with disabilities often require personalised assistance. The human touch proves essential in effectively addressing diverse tasks.

Instead of replacing staff with AI, the focus should be on optimising the matching process. This entails connecting individuals with disabilities to service providers equipped to meet their specific needs. Improving this strategic aspect has the potential to significantly enhance the employment prospects for individuals with disabilities. Solution A will be discussed in more detail in the upcoming slides.

Current Way of Finding The Provider

The DES Job Access website plays a crucial role in connecting users with service providers. However, the current user experience presents challenges, particularly in locating service providers. The system requires users to manually search through a list of service providers to find the relevant information, impacting efficiency and user satisfaction.

Costs:

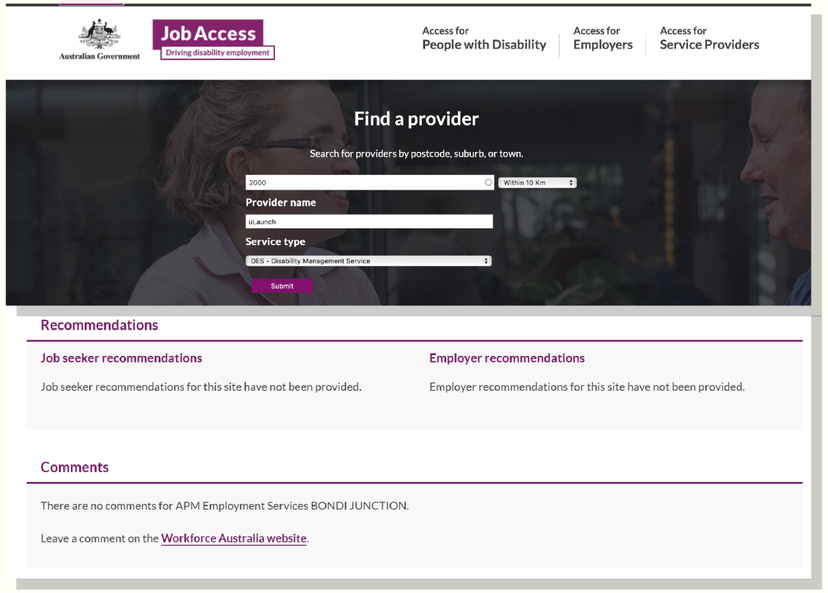
- Cumbersome Process: Users are required to sift through a comprehensive list of service providers.
- Time-Consuming: The current method of searching for service providers lacks efficiency, leading to increased time investment for users.
- Lack of Precision: Users struggle to locate specific service providers due to the absence of a targeted search mechanism.

Find a provider from the list

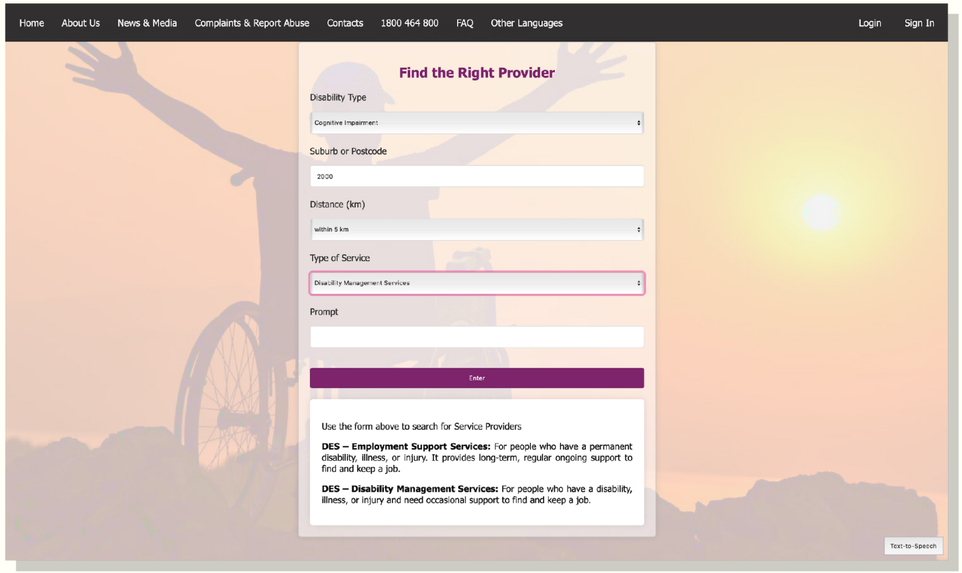
Disability Employment Services (DES) Provider list as at 21 August 2023

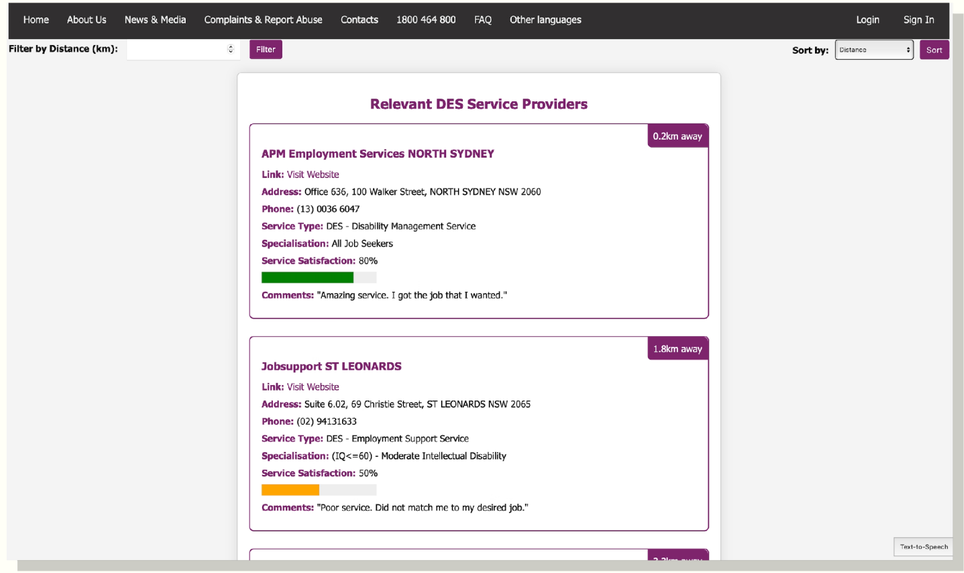
No.	DES Provider Trading Name
1	Access Community Services Limited
2	Jobs Australia Enterprises
3	AFFORD Employment
4	Barkuma Employment
5	Bizlink Incorporated
6	Autism Association of Western Australia (Inc)
7	Essential Personnel
8	Breakthru
9	APM Employment Services
10	BEST Employment
11	Axis Employment
12	Community Bridging Services (CBS) Inc.

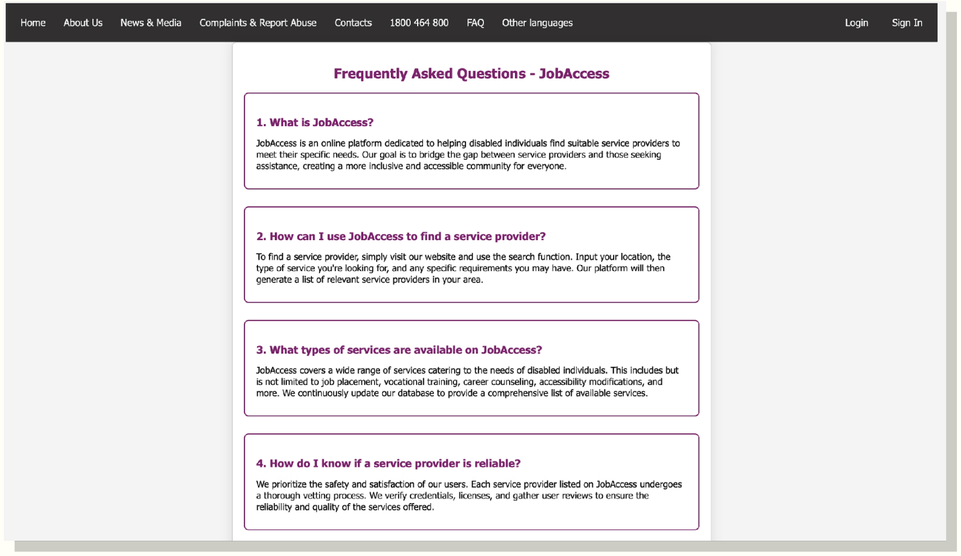
Enter the provider's name



Improved Way of Finding The Provider (Prototype)







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Prototype Features Explanation

No PDF

Elimination of the PDF navigation process and a more streamlined search based on disability type

Service Satisfaction

Integration of intelligent algorithm for a service satisfaction percentage with each service providers

Filter Mechansim

A filter option that enables users to narrow down providers based on their desired distance

FAQ

The FAQ section in the prototype guides the user through the process of finding the right provider

Sorting Mechanism

The Sort by option allows users to prioritise providers based on proximity if location is a primary concern

Text-to-Speech

The Text-to-speech assistive technology reads digital text aloud to the user

The walkthrough video below goes through the features on the left:

https://www.youtube.com/watch?v=gHtY-hbCLSI

Prototype Benefits Over Original Implementation

Time Saving

The elimination of PDF navigation significantly reduces search time, especially beneficial for DES central workers handling multiple daily applications. This enhancement streamlines workflows, leading to substantial time savings and increased operational efficiency in their processing tasks.

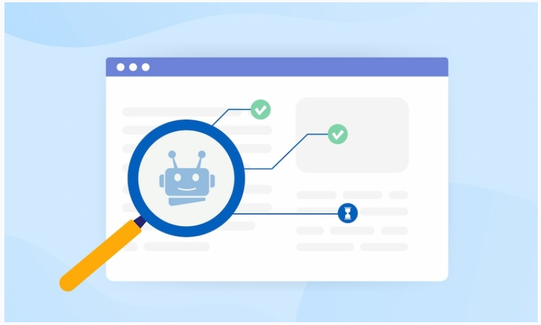
Human-Centred Design

Incorporating features like the filter and sorting mechanism, text-to-speech functionality, and an FAQ section reflects a commitment to a human-centered design approach. These elements enhance usability, cater to diverse user needs, and provide quick access to relevant information, collectively ensuring a more inclusive and user-friendly platform.

Making Better Decisions

The service satisfaction metric and comments are anticipated to assist users in making more informed decisions when selecting the appropriate service provider.

Core technologies behind this prototype



Web Crawl

A web crawler is utilized to retrieve information of DES providers from various sources on the internet, and indexing any data relating to individual DES providers.

Generative AI

With the information gathered through web crawling, generative AI could be utilized to generate comments reflecting the sentiment relating to each DES provider.

Automatic Fitness Calculation

Our prototype also calculates the probability of service satisfaction of users based on the inputs. The matching probability is calculated by leveraging sentiments through web crawl, as well as user feedback.

Persona (Post JobAccess)

How will our AI Model target Kevin's painpoints?

Kevin

26 y.o
Brisbane, QLD
Lives with parents
11 mths on DES

"I want to work like everyone else. I am searching for a provider who cares and listen. Sometimes I feel like they shove me into a corner."

Painpoints:

-**Unable** to find **DES providers** who **understands autism**.
- Unable to find a provider who is **committed** to helping **achieve his full potential.**
- Lack of support to finish Certificate III as the classroom-based learning is too fast and difficult.
- **High turnover of DES staff** impacting ability to form **trusted relationships.**
- **Limited public transport options** for commute to work.

Solutions provided by our AI Model:

1 Service satisfaction: Algorithm of DES providers align Kevin to satisfactory workers or DES providers well-versed with his disability.

2 Website Integration: By integrating our model with DES' current provider finding website, it allows individuals and DES Staff to rely on our model for accurate information even in events of high turnover.

3 Filtering & Sorting Mechanism: Filtering mechanism provides Kevin with DES Providers closest to his location. Sorting Mechanism allows him to prioritise distance proximity to DES Providers along with service satisaction.

Value Proposition Canvas

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Gain Creators

- Database of previous employment results from provider sessions. Information will be fed back into the AI to accurately assess which providers are the best

Gains

- Reliable providers: Determine whether providers are relevant if they have consistently high probabilities over time
- Social value: Disabled can contribute more to society as they are working
- Financial independence: Less reliance on Government welfare

Product

AI Model

Pain Relievers

- Satisfaction probability between disabled and providers

A percentage was included for the quality of providers based on information given by the disabled person

- Reduced need for extensive research on providers

The list of DES providers was included in our model

Pains

- Discrimination: Getting rejected from potential job placements
  - Relief: Match individuals with providers who understand their disability
- Skills & job mismatch: Inadequate providers did not understand what jobs to recommend
  - Relief: Relevant providers will recommend jobs that are useful for disabled people
- Financial instability: Disabled people are at a high risk of poverty as they earn less income
  - Relief: Can earn more income
- Misinformation of providers: There are many providers listed on the DES website
  - Relief: Automatically generates a list of providers based on information from the individual

Jobs to be done

Skills and interview training to increase chances of being hired

Quantitative Impact Analysis

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A closer look into potential impacts would explain the scale of our solution...

Factors	Quantitative Measures	Metrics
1 **Increased Employment**	• By utilising service satisfaction and speciaility functions, individuals experience increased ease of choosing providers • This results in decreased probability of cyclical poverty and reduced systemic inequality,	1. Job conversion rate by percentage change
2 **Increase in GDP**	• As shown above with increased employment, this would contribute to increased workforce productivity, leading to increased GDP of approximately $49.3B.	1. Annual wage per individual before taxes
3 **Lead Time Reduction**	• By including location filters, individuals are able to locate nearest DES providers, decreasing average end-to-end job finding time.	1. Lead time for job finding process
4 **Increased Cost Efficiency**	• In an optimistic case, $1.1M could be allocated to other disability services. • Consideration of taxable income from increased employment, an additional $14.5B could be obtained for the government. • This results in ROI of approximately **2.97x.**	1. Cost savings per individual 2. Govt. budget for DES

Qualitative Impact Analysis

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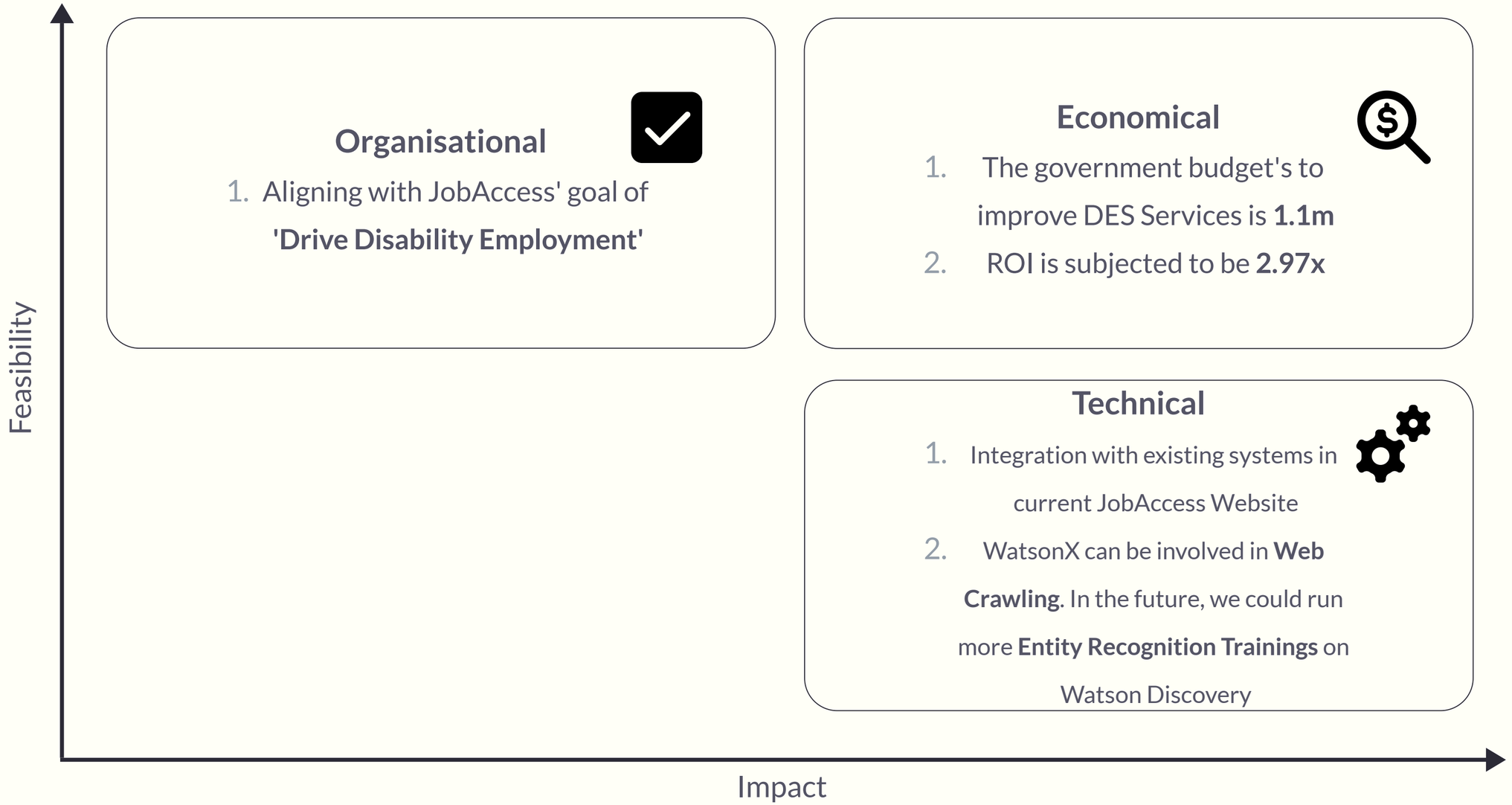
Additionally, qualitative impacts measured...

Factors	Qualitative Measures	Metrics
1 **Reduced discrimination**	• Contact with providers who can find disabled individuals jobs that are accepting to them • Employment would reduce societal discrimination since they are not considered a burden.	1. % increase in workplace diversity 2. User satisfaction surveys
2 **Workplace accessibility**	• More physical disability accessibility features in workplaces (e.g. wheelchair access, screen readers)	1. Number of accessibility features per workplace
3 **Employee satisfaction**	• Satisfaction rates for disabled individuals before and after starting a new job	1. NPS > 8
4 **Increased competition between providers**	• Incentive for providers with a lower matching probability to improve service quality	1. % increase in service satisfaction over time

Feasibility



Organisational

1. Aligning with JobAccess' goal of **'Drive Disability Employment'**

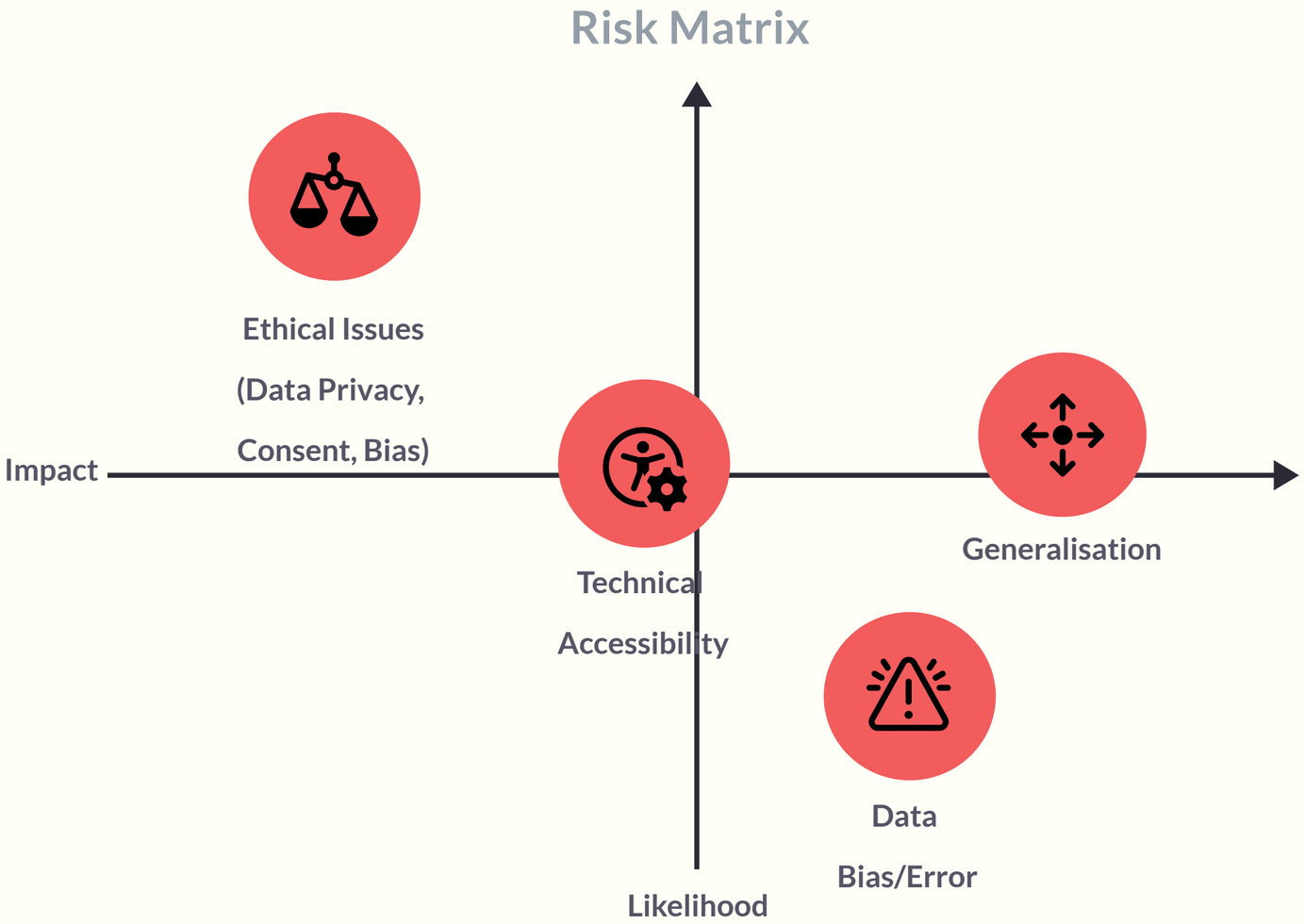
Economical

1. The government budget's to improve DES Services is **1.1m**
2. ROI is subjected to be **2.97x**

Technical

1. Integration with existing systems in current JobAccess Website
2. WatsonX can be involved in **Web Crawling**. In the future, we could run more **Entity Recognition Trainings** on Watson Discovery

Risk and Mitigations



Risks	Mitigations
Ethical Issues	Collect personal information (e.g. name, address, employment status) under the *Privacy Act 1998*
Technical Accessibility	Seek assistance from higher-level expertise (e.g. Access in WatsonDiscovery)
Data Bias/Error	Perform rigorous testing and validation processes
Generalisation	Manually monitor the model in the starting period when there is discrepancy between data and real-world population

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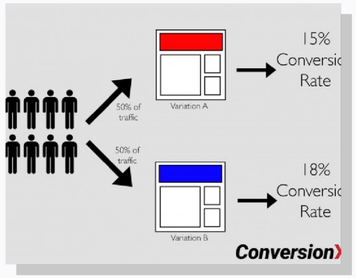
Limitations when designing the prototype

Impact (From most to least)	Limitations	Description
1.	Limited Data	We will be able to mitigate by gathering reliable data from our users in the future
2.	Systematic Limitations	When allocating providers, DES central staff might have other incentives such as bonuses
3.	Time Constraint	Very limited timeframe to explore how WatsonDiscovery could help improve the process

Further Implementation Options

IBM WatsonX integration

IBM WatsonX Discovery offers options to web crawl and search keywords from websites. We suggest crawling jobAccess, google reviews and other review websites for detailed information for each provider.



Further testing

Further testing such as a/b testing or other user experience testing should be performed to ensure the functionality and improve user experiences using the principals of human centred design.

Database Integration

Allows centralised data access, as well as improved data consistency. This increases the scalability as more organizations join DES. Furthermore, this reduces the risk for unauthorized access of user credentials and identifying information due to better management of permissions.

Accessability integration

Additional accessibility features could also be added to target users with different disabilities. We suggest the following to assist different types of disabilities:

- Speech-To-Text
- Adjustable fonts & colour
- Assistant bots

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Appendix

ROI Deduction Top Down Approach		
Return		
Govt. Budget for Improving DES	$	1,100,000.00
Cost		
Implementation of Watson Discovery	$	5,000.00
Salary of IBM Website Designer	$	5,833.00
One-time fee of Website Design	$	20,000.00
Monthly Total Cost	$	30,833.00
Annual Upkeep	$	369,996.00
ROI for 1 year		**2.97**

Assumptions
1. Cost of Implementation of Watson Discovery is $5,000 2. Salary of IBM Website Designer is $70,000 annually, hence a one-month service from IBM is $5,833 3. A one-time service fee for Website Design is $20,000

Figure 1: ROI Deduction

Increase in Employment Rate Top Down Approach	
No. of Disabled individuals unemployed	1,066,000

Assumptions
1.No of employed disabled individuals is 48% (984,000), therefore additional employable disabled individuals is 52% (1,066,000).

Figure 2: Increase in employment rate

Bottom Up Approach		
Total increase in GDP	$	**49,328,254,560.00**
Total Tax Earnings	$	14,478,412,000.00

Assumptions
1. Assuming 249 working days annually, 8 hour shifts, 5 days a week at minimum wage of $23.23 2. Total taxable income for an individual earning $67,000 is $13,592. Therefore Total Tax earnings is $13,592 * 1,066,000

Figure 3: Increase in GDP

Strike gold with the right approach

Our findings reveal that few AI projects deliver the financial value shareholders expect. In fact, average ROI on enterprise-wide initiatives is just 5.9%,—well below the typical 10% cost of capital.

Figure 4: ROI Comparison

Ashoori M et al, 'Generating ROI with AI', *IBM*, viewed 31st January 2024, available at: https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/ai-capabilities