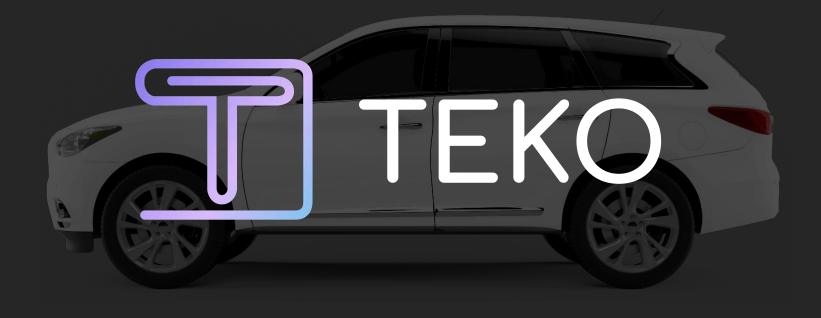
TEAM U.M.

#Accesibility

#AutomatedVehicle

Spring 2022



IACT 370

PROCESS BOOK

Our Team



Alicia Silhavy

Project Lead



Kate Lupica

Visual Lead



K Kim

IXT Lead



Garrett Grainger

Prototype Lead



Leo Cayuela

Research Lead



Problem

Disabled individuals make up fifteen percent of the world's population, yet they face daily struggles finding independent, reliable transportation. Disabled individuals report feelings of distrust in car manufacturers. This distrust is rooted in fact: car manufacturers admit to a lack of inclusive and accessible design processes stemming from a lack of available data on disabled individuals. Disabled populations are ready to share their information in exchange for inclusive transportation.

Solution

Teko is an enterprise solution for accessible automotive user testing. Corporate manufacturing partners gain access to the dedicated user testing audience, create tests and activities, view global data, gain natural language insights, and consult with Teko's certified experts. Complete tests and activities in a gamified format, allowing data to be exchanged for real-world points. These data points are then compiled, resulting in easy-to-understand natural language insights – providing designers with the discoveries, not the data.

Features

Teko Team consulting User Testers Test access Gamified point system Monetary rewards Data privacy insights Enterprise
Test creation
Natural language insights
Business intelligence tool integration
Data visualization
Accessibility certifications



Table of Contents

Preliminary Research User Research

Concept Ideation

User Testing

Final Refinement

PRELIMINARY RESEARCH

TEKO

INITIAL QUESTIONS

How can we make Autonomous Vehicles available to disabled people?

Why aren't they already using AVs?

TEKO

06

Self-driving technology exists, but it isn't being design for disabled populations.

ACADEMIC

Disabled individuals were promised autonomous vehicles but are still waiting.

SOCIAL

Users hold distrust in autonomous vehicles.

MARKET

There are few transportation options catered to the disabled as AV manufacturers do not have them in mind.

"Waiting until a product is 'finished' to start thinking about accessibility is like completing construction of a skyscraper and then tearing part of it down to install an elevator"

Haben Girma



How might we connect disabled people and autonomous car manufacturers to create a mutually-beneficial, inclusive design process?

Cassandra

38, San Francisco Full-Stack Engineer at Invio

FAMILY-FOCUSED

INDEPENDENT

Motivation for a Vehicle

Personal independence and support for her daughter

Why no car?

Does not feel safe or trust vehicle manufacturers



Cassandra

38, San Francisco Full-Stack Engineer at Invio

FAMILY-FOCUSED

INDEPENDENT

Frustrations

- Unsure how to voice problems in an impactful way
- Reliant on partner or public transportation to her to PT and volunteering
- Tired of generic solutions that require extra work on her part to customize and implement into daily life



Walter

69, Evanston Illinois **Head of Engineering + Innovation at Ford**

COMPASSIONATE

STUBBORN

Design Motivation

Creating enjoyable products that connect people

Loyalty to Process

Has worked in the same industry for many years, doing the same process with good results



Walter

69, Evanston Illinois **Head of Engineering + Innovation at Ford**

COMPASSIONATE

STUBBORN

Frustrations

- **Hesitant on bringing new ideas** because he does not want to upset his work-life balance by taking on a large project.
- Afraid of being insensitive to accessibility issues.
- Lacks knowledge about what being disabled is like on a day to day basis. Does not truly understand since has lived his whole life without any disabilities.



MARKET RESEARCH

Uber WAV

Affordable rides in WAV Specially trained drivers through a third party

Non Emergency Medical Transportation

Tools and experience to transport disabled
Only supports going to and from medical appointments



Paratransit / Dial-A-Ride

On-demand, door-to
-door transportation service
Allows travel to medical
appointments, meetings, errands,
Etc.

Volunteer Transportation Programs

Offered by some non-profit and faith-based organization
Drivers provide own vehicles for passengers to get to medical appointments or other important destinations



Helpful in Dire Situations



Relatively Personable



Beneficial for Niche Audience







No Independence Limited Availability Lacks Inclusivity





Inconvenient

Unreliable



CURRENT SOLUTIONS

#Market

Solutions Exist

Majority of transportation accessibility problems can be solved when autonomous vehicles are utilized.

KEY GAPS #Market (#Pain Point)

TRUST

COMMUNICATION AND MARKETING

TEKO

KEY GAPS #Market #Pain Point

TRUST

+

COMMUNICATION AND MARKETING

= LIMITED USE AND ADOPTION

TEKO

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RISKS







ADOPTION

Users already have distrust, which is challenging to change

LEGAL

Not all users are eligible for a license

ADAPTATION

Challenging to shift existing mindsets, processes, products



Indepence for User in Search



Expanding
Potential
Audiences and
User



Benefit to All People

We believe that we can increase the accessibility and favorable perception of autonomous transit for disabled people.

We may achieve this result by connecting disabled people with autonomous transit manufacturers, simultaneously bridging experience design and marketing gaps.

We will have demonstrated success when the net promoter score (NPS) and adoption rate of autonomous transit options increases in disabled demographics.

USER RESEARCH

TEKO

BROADER QUESTION

What struggles do disabled people currently face with finding independent transportation?

Disability Agnostic

Focus on process, not on implementation

To understand why users feel disconnected from vehicle manufacturers and identify opportunities to bridge gaps.

RESEARCH OVERVIEW

User Interview Survey Response 42 **Expert Interview** Market **Analysis**

RESEARCH GOAL

How do disabled people transport themselves?

How do diasabled people feel about data privacy, in context of connecting user data to companies?



How do disabled people feel about purchasing accessible transportation?

What pain points do disabled people have in transportation?

SURVEY DEMOGRAPHY

23.8%

Disabled Users

62%

Urban, 33% suburban, 5% rural

SURVEY KEY FINDING

Disabled people with a license know the same about autonomous vehicles as the general population.

Disabled people with a license are half as likely as the general population to be okay with data sales to other companies.

Disabled people with a license are about as likely as the general population to be okay with data collection for a company's own use.



SURVEY KEY POINTS

#Data Protection

60%

Disabled Users

users were more prone to use data protection

40%

Non-Disabled,

a significant amount used data protection

SURVEY KEY POINTS

#Sharing Data

70%

Disabled Users

Less of them shared their data

87.5%

Non-Disabled,

More open about sharing data

INTERVIEW KEY POINTS

User want their voice to be heard

Specific feedback on cars was far too unique from person to person

Users are interested in cars and transportation in general

Transportation issues extend outside of cars

Users aren't always familiar with what services they can use as accommodations

Companies are focused on the technology, not the why, taking focus off of users Existing processes
just don't care
about inclusive
design and are
prompting
a "total re-think"

Testing in cars and gathering user opinions is expensive and inaccessible, creating barriers to user research in automotive design

1 BILLION

Total number of disabled population, being 15% of total world population

60.4%

Of disabled population are car owners, potentially 604 million globally



Chuck Konfrst

Director User Experience

@ Cox Automotive Inc.



Accessibility is not a top priority due to the nature of the business



It's not easy to find disabled individuals to test with



Their company could do a much better job of exposing customers to accessible vehicles

"Data would be enough motivation for us to design for accessibility if we could see the information and user need."

commute	scheduling difficulty	Current issues	individal needs	wished for alternative transportation	unpredictable weather	helper uncertainty	uncertainty behind public transport	lack of accessibility prioritization	limited testing audience	Lack of exposure
corporate greed	lack of promise	prioritizing profit	want to be a part of design process	not being heard	avoidance	potential data sharing	Blockers	limitations of current solutions	limited choices	limited personal vehicle use
limited rideshare use	current data sharing	doubtfullness	Data as a Motivator	lack of experience in accessibility design	lack of data privacy knowledge	lack of AV knowledge	limited public transport experience	Driving experience	dismissiveness of corporations	

32 Green Categories

education /knowledg e levels

Lack of transportation experience Negative Corporation Feelings Trust Levels Need for planning need for specific inclusion

Lack of accessibility knowledge

limited opportunities

Vehicle/tra nsportation accessibility

Inconsistencies

limited disability availability

feeling of exclusivity

willingness to provide data

13 Blue Themes

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AFFINITIZATION

lack of education and experience

Limited Trust

Limited Availability

Need for personalization

Need for connection between users and manufacturers Limited access to disabled people

6 Pink Insights



Connect disabled drivers with accessible vehicles?



Provide incentives to car manufacturers to design inclusively?



Connect disabled users' data with car manufacturers?



Educate disabled users on the transportation options available to them?



Provide transparency on the car manufacturing process?



Help disabled users feel that their voice is heard?

CONCEPTION

TEKO



TWO DIRECTIONS





Marketplace Solution **User Data**Solution

Marketplace

Our business researches and scrapes for manufactures actively designing inclusively





Marketplace

We provide end users (disabled people) with vetted car options tailored to their disability through their input

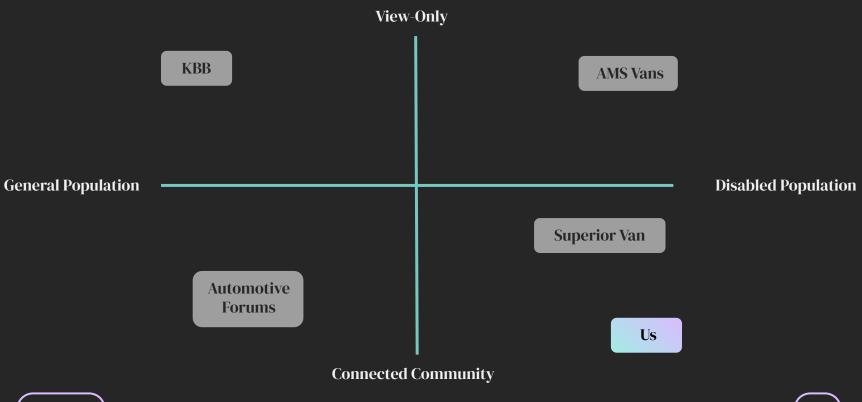
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Marketplace

The website contains ways for disabled users to provide feedback and comments for other users and manufacturers



MARKETPLACE



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#1 How Might We



How might we:

Connect disabled drivers with accessible vehicles?

Answer:

By providing easy to access lists of vehicles that meet their accessibility needs.



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#2 How Might We

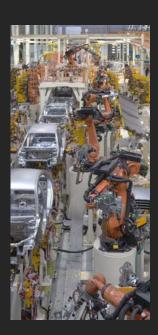


How might we:

Connect disabled users' data with car manufacturers?

Answer:

By creating an open forum that manufacturers can easily research



#3 How Might We



How might we:

Provide incentives to car manufacturers to design inclusively?

Answer:

By promoting cars with accessibility modifications / requirements





User Data

Disabled users are able to enter the platform and complete pre-determined, bulk-created user testing activities

TACT 370)

User Data

Data from these activities are given to car manufacturers



(IACT 370)

CONCEPT #2



User Data

Reward system in place for users

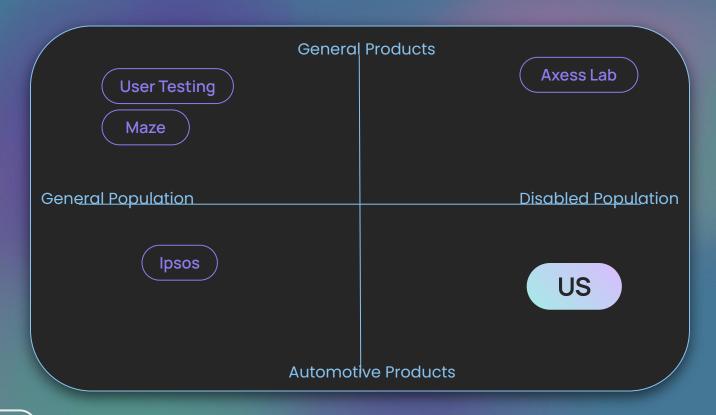
(50)

User Data

Users can see who is collecting data and how their data is being used



ACT 370)



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HOW MIGHT WE

HMW

Connect disabled drivers with accessible vehicles?

BY

By showing them which companies are listening to their data

(59

HMW

Connect disabled users' data with car manufacturers?

BY

By providing activities and testing for users directly within the target audience to complete

ACT 370

HOW MIGHT WE

HMW

Provide incentives to car manufacturers to design inclusively?

BY

By making it easy and accessible

Ideal Direction

A combination of both

Using both user testing to create data and marketplaces to reward manufacturers

Pursuing a user data focused approach

TIES TO THEMES

Education and trust through data transparency

Personalization through connections to real requests Improved usability processes through access to data and feedback

Positive Perception + Trust

Increased
favorable
perception and
trust of automotive
industry in
disabled
populations

Accessibility

More accessible features in mainstream vehicles

Car Ownership

Increased disabled people, who are eligible, owning cars

USER TESTING

TEKO

CARD SORT

Understand what question types we need to offer

5

A/B TEST

Understand and improve our Info Arch and overall UI

13

EXPERT PROBE

Understand how to group and rank data insights for companies

7

iptom}}.	4.571428571
	4.428571429
during {{driving event}}.	4.285714286
	4.142857143
	4
somewhat okay (3) during	4
	4
lisabled user testers who have a	4
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	3.857142857
ensory accommodations.	3.857142857
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ed user testers who have a	3.857142857
areas.	3.857142857
driver's licenses for {{feature}} is	
,	3.833333333
se is 40 years old.	3.428571429
o}} in disabled user testers with	3.428571429
eurological accommodations.	3.285714286
vears old.	3.285714289

USER TESTING

#Methods

Data Expert Cultural Probe

- Asked business and data experts to rank lists of insights
- Applied insights to enterprise-facing data visualizations

Business professionals value most:

Who has a driver's license, has a disability, and who has a car

What symptom(s) people experience

How people feel during specific parts of the driving process

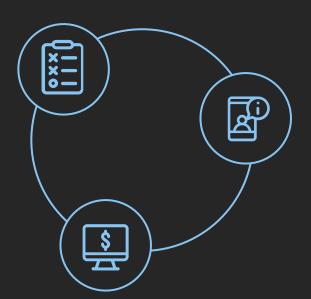
Trend reports (there are more users with x symptom) Net promoter scores for given brands, features, and experiences

DATA EXPERT INSIGHTS

Business professionals value least:

Where users are from

The age of drivers



How users compare features against one another

Users
overwhelmingly
prefer natural
language insights
to raw data

Demographics are important in research

Users want to be able to create their own tests

Users mostly have interest in data that doesn't fall within the disabled/driver's license demographic

Users are interested in both mean- and mode-based averages

USER TESTING

#Methods

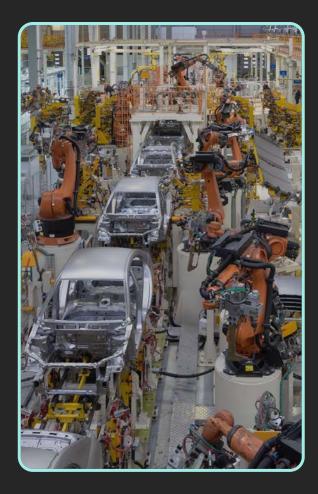
Card Sort

- Asked users to sort common questions by difficulty, importance, and answer modality
- Applied insights to test creation options and pre-sets

Ranking is best for understanding brand opinions Check all that apply work well for sensory support needs and for diagnosis and symptoms

Users prefer fill in the blank for demographic related questions

Car ownership status can best be determined by a multiple choice question Short answer free response was perceived as being the most difficult across question categories



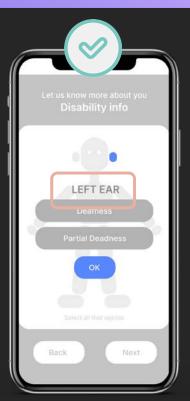
USER TESTING

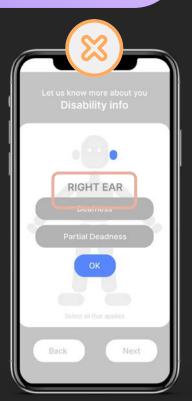
#Methods

A/B Testing

- Gave users pairs and sets of screens
- Took votes and notes to find preferences
- Applied preferences directly

Users want convenience over logic.





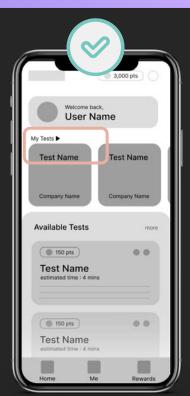
IACT 370

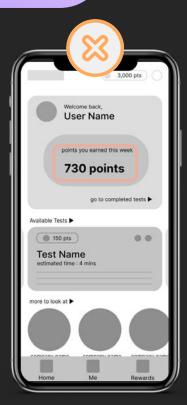
75

. . .

Test relevance is more valued than test history.









76

Users would all like to keep track of test progress, preferably by questions remaining.







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Users prefer tagging as a granular way to classify information.





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Users can be motivated by point system.

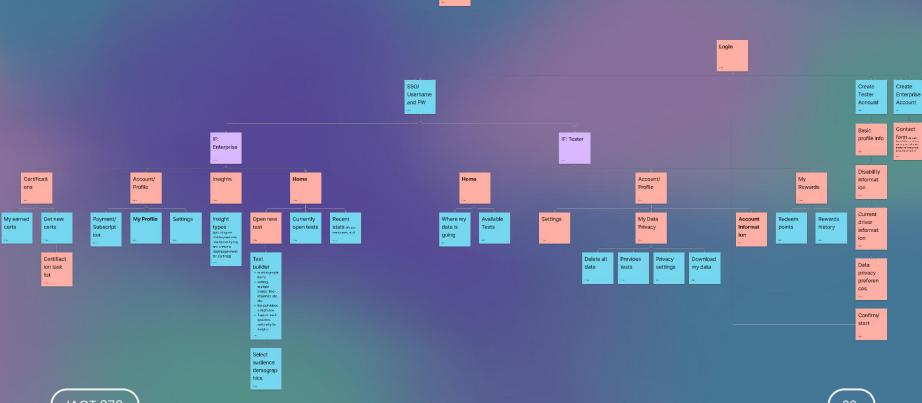
Participants feel data security/ privacy is not relevant since information can be easily found on other platforms.

Old/Test history should be available but not necessarily a top level item.

People care about helping small businesses.

Users do not want repetition.

BLUEPRINT



PAGES

Bold = default

page

PAGE

ELEME

NTS

DECISION

IACT 37

05 #LOOK BOOK #POSTER

FINAL REFINENT

TEKO



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ACT 370 (83)



TWO AUDIENCES

#Producer

#User

ENTERPRISE

USER TESTERS

TEKO

ENTERPRISE

Create Tests



Complete To-Do Lists for Certificates

Earn Points towards Certificates for Interaction



View Data in Insights

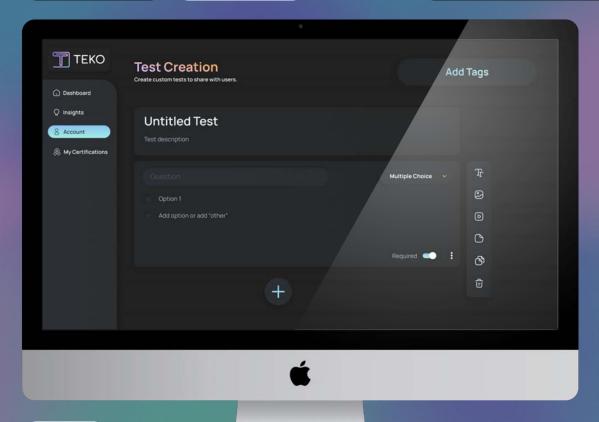
USER TESTERS

•••

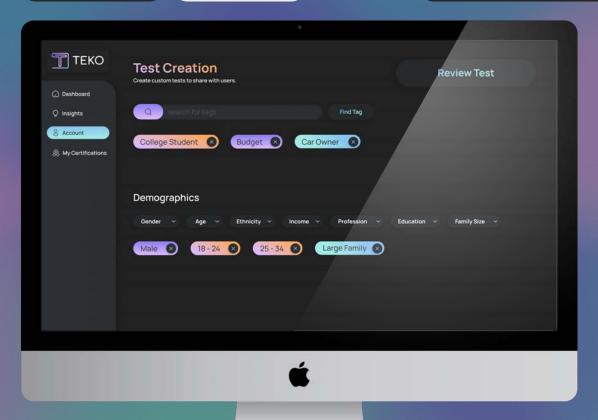
Complete Tests for Points

View Which Companies are Using Their Data

Redeem Points for Gift Cards



User create new test

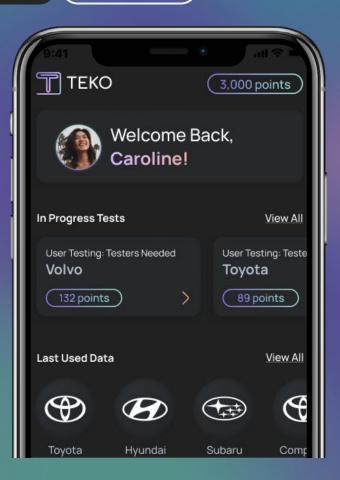


User tag each question

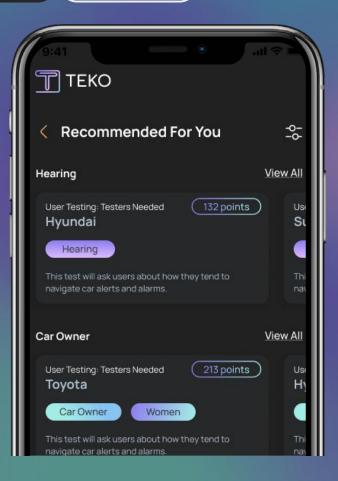
User set demographics and send for input



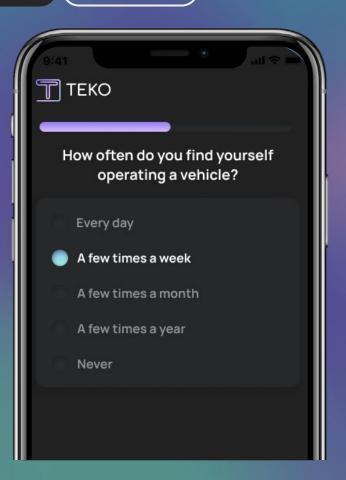
User gather insights in data lakes and insights



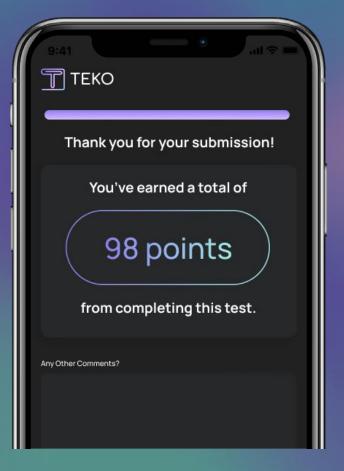
User open the app



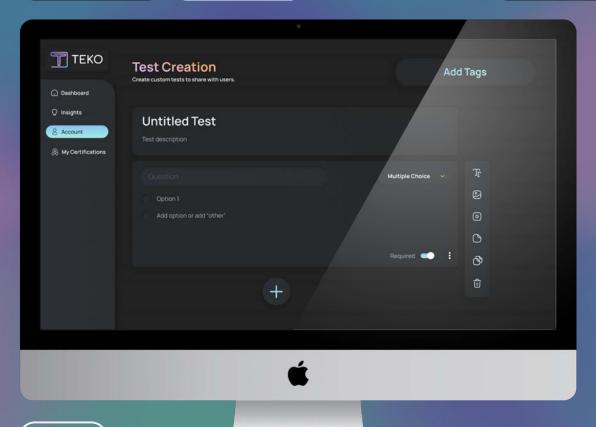
User finds a test recommended for them



User answers the questions in test provided



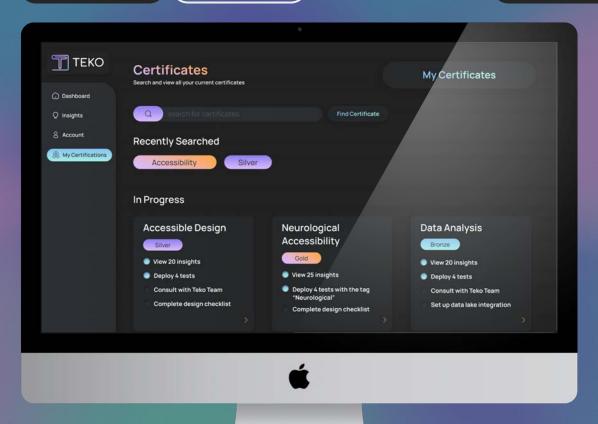
User earns points as reward of participation



User create tests, earning points



User view data insights, earning points



User complete certificate-specific tasks, earning points

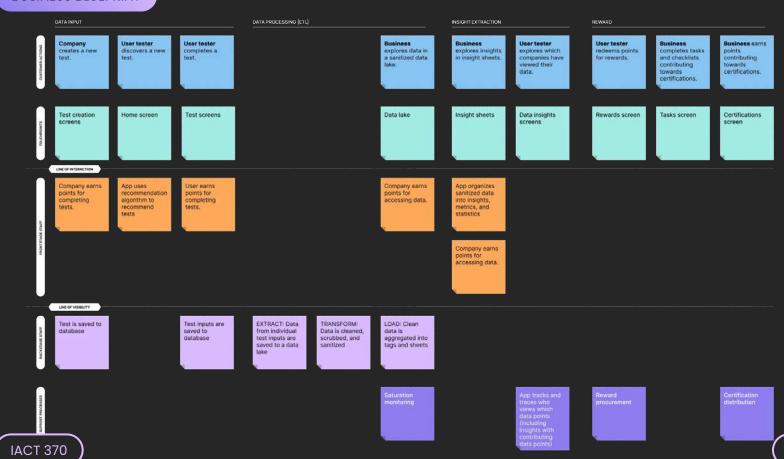
#SERVICE BLUEPRINT

#PRICING MODEL

BUSINESS MODEL

TEKO

BUSINESS BLUEPRINT



		Test Creation + Data Lake	Test Creation + Insights	Test Creation + Insights + Data Lake	Certifications
SIZE	< 10 Users	Enterprise: \$15/ user/month Global: \$17/	Enterprise: \$17/ user/month Global: \$19/	Enterprise: \$25/ user/month Global: \$27/	\$750 per cert
		user/month	user/month	user/month	
	10 - 99 Users	Enterprise: \$13/ user/month	Enterprise: \$15/ user/month	Enterprise: \$23/ user/month	
		Global: \$15/ user/month	Global: \$17/ user/month	Global: \$25/ user/month	
	-				-
CONTRACT SIZE	100 - 999 Users	Enterprise: \$11/ user/month	Enterprise: \$13/ user/month	Enterprise: \$21/ user/month	\$1,000 per cert
၁၁		Global: \$13/ user/month	Global: \$15/ user/month	Global: \$23/ user/month	
	1,000 - 9,999 Users	Enterprise: \$9/ user/month	Enterprise: \$11/ user/month	Enterprise: \$19/ user/month	\$3,000 per cert
		Global: \$11/user/ month	Global: \$13/ user/month	Global: \$21/ user/month	
	10,000+ Users	Enterprise: \$7/ user/month	Enterprise: \$9/ user/month	Enterprise: \$17/ user/month	\$5,000 per cert
		Global: \$9/user/ month	Global: \$11/user/ month	Global: \$19/ user/month	

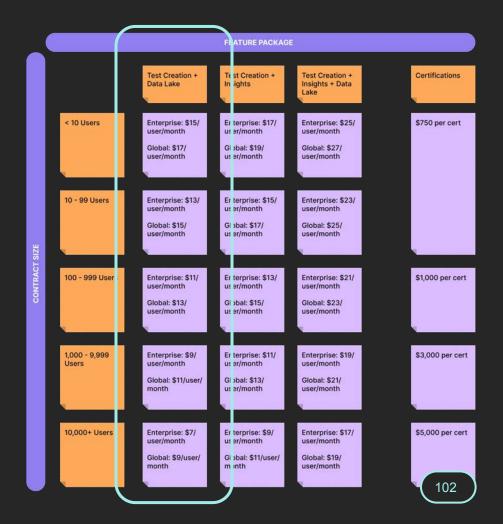
Product Tiers

Test Creation + Test Creation + Test Creation + Certifications Insights + Data Data Lake Insights Lake < 10 Users Enterprise: \$15/ Enterprise: \$17/ Enterprise: \$25/ \$750 per cert user/month user/month user/month Global: \$17/ Global: \$19/ Global: \$27/ user/month user/month user/month Enterprise: \$15/ 10 - 99 Users Enterprise: \$13/ Enterprise: \$23/ user/month user/month user/month Global: \$15/ Global: \$17/ Global: \$25/ user/month user/month user/month 100 - 999 Users Enterprise: \$11/ Enterprise: \$13/ Enterprise: \$21/ \$1,000 per cert user/month user/month user/month Global: \$13/ Global: \$15/ Global: \$23/ user/month user/month user/month 1,000 - 9,999 Enterprise: \$9/ Enterprise: \$11/ Enterprise: \$19/ \$3,000 per cert user/month user/month user/month Users Global: \$11/user/ Global: \$13/ Global: \$21/ month user/month user/month 10.000+ Users Enterprise: \$7/ Enterprise: \$9/ Enterprise: \$17/ \$5,000 per cert user/month user/month user/month Global: \$9/user/ Global: \$11/user/ Global: \$19/ month month user/month 101

FEATURE PACKAGE

Product Tiers

All comes with Test Creation + Deployment



Product Tiers

All comes with Test Creation + Deployment

User can pick

DATA LAKE ONLY

or BOTH

DATA INSIGHT ONLY

FEATURE PACKAGE Test Creation + Test Creation + Test Creation + Certifications Data Lake Insights Insights + Data Lake < 10 Users Enterprise: \$15/ Enterprise: \$17/ Enterprise: \$25/ \$750 per cert Global: \$17/ Global: \$19/ Global: \$27/ user/month user/month user/month 10 - 99 Users Enterprise: \$13/ Enterprise: \$15/ Enterprise: \$23/ user/month user/month user/month Global: \$15/ Global: \$17/ Global: \$25/ user/month user/month user/month 100 - 999 Users Enterprise: \$11/ Enterprise: \$13/ Enterprise: \$21/ \$1,000 per cert user/month user/month user/month Global: \$13/ Global: \$15/ Global: \$23/ user/month user/month user/month \$3,000 per cert 1,000 - 9,999 Enterprise: \$9/ Enterprise: \$11/ Enterprise: \$19/ user/month user/month user/month Global: \$11/user/ Global: \$13/ Global: \$21/ month user/month user/month 10.000+ Users Enterprise: \$7/ Enterprise: \$9/ Enterprise: \$17/ \$5,000 per cert user/month user/month user/month Global: \$9/user/ Global: \$11/user/ Global: \$19/ month month user/month 103

Product Tiers

All comes with Test Creation + Deployment

User can pick

DATA LAKE ONLY

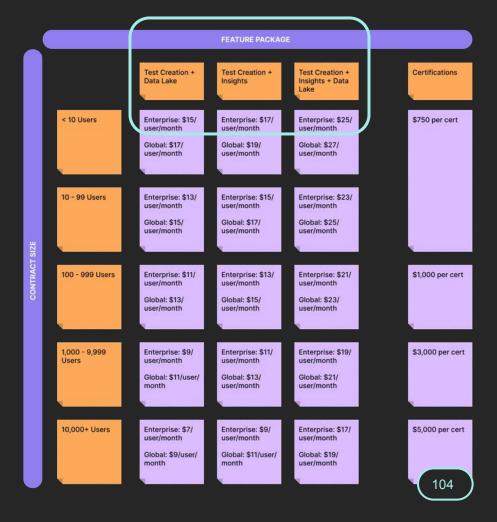
or BOTH

DATA INSIGHT ONLY

User can pick

MY INSIGHTS ONLY

GLOBAL + MY INSIGHTS



Product Tiers

All comes with Test Creation + Deployment

Additionally,

PURCHASE CERTIFICATES

Hire TEKO TEAM DSGN CONSULTANT

- Specific Certificates
- · Monthly retainers
- Custom projects

FEATURE PACKAGE Test Creation + Test Creation + Test Creation + Certifications Data Lake Insights Insights + Data < 10 Users Enterprise: \$15/ Enterprise: \$17/ Enterprise: \$25/ \$750 per cert user/month user/month user/month Global: \$17/ Global: \$19/ Global: \$27/ user/month user/month user/month 10 - 99 Users Enterprise: \$13/ Enterprise: \$15/ Enterprise: \$23/ user/month user/month user/month Global: \$15/ Global: \$17/ Global: \$25/ user/month user/month user/month 100 - 999 Users Enterprise: \$11/ Enterprise: \$13/ Enterprise: \$21/ \$1,000 per cert user/month user/month user/month Global: \$13/ Global: \$15/ Global: \$23/ user/month user/month user/month 1,000 - 9,999 Enterprise: \$9/ Enterprise: \$11/ Enterprise: \$19/ \$3,000 per cert user/month user/month user/month Global: \$13/ Global: \$11/user/ Global: \$21/ month user/month user/month 10.000+ Users Enterprise: \$7/ Enterprise: \$9/ Enterprise: \$17/ \$5,000 per cert user/month user/month user/month Global: \$9/user/ Global: \$11/user/ Global: \$19/ month month user/month 105

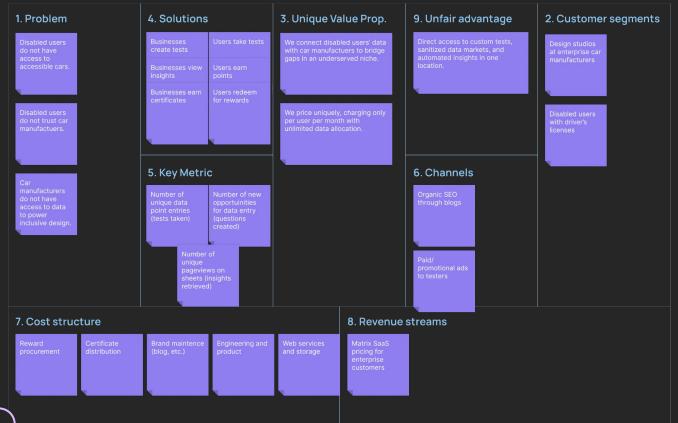
Product Tiers

All comes with Test Creation + Deployment

All pricing is done on a scalable model **based on company size**



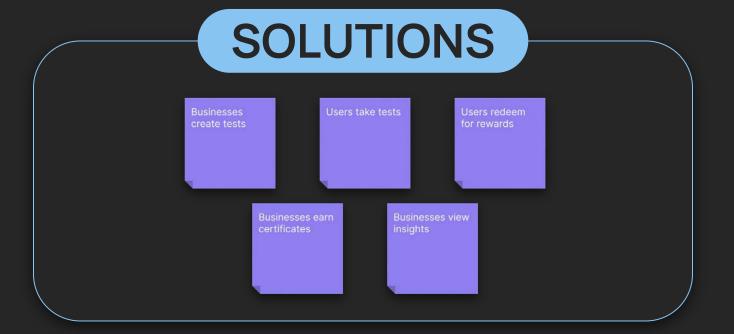
LEAN CANVAS



PROBLEM

Disabled users do not have access to accessible cars. Disabled users do not trust car manufactuers.

Car manufacturers do not have access to data to power inclusive design.



UNIQUE VALUE PROP

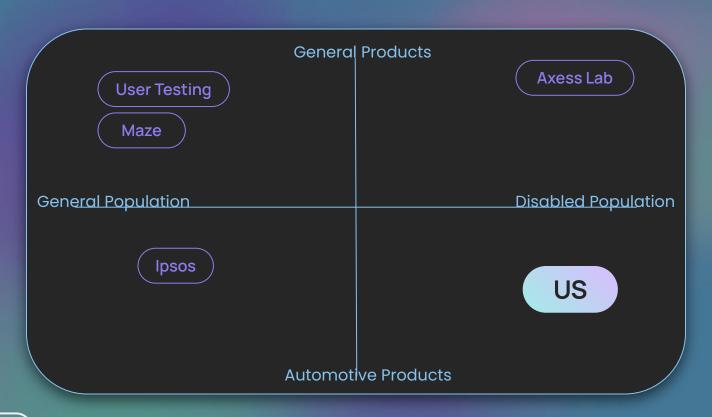
We connect disabled users' data with car manufactuers to bridge gaps in an underserved niche. We price uniquely, charging only per user per month with unlimited data allocation.

UNFAIR ADVANTAGE

Direct access to custom tests, sanitized data markets, and automated insights in one location.

KEY METRICS

Number of unique data point entries (tests taken) Number of unique pageviews on sheets (insights retrieved) Number of new opportuinities for data entry (questions created)



(113

PRICING COMPARISON

	OTHERS	TEKO	
User Testing	\$30~\$100 (per Tester)	\$7 ~ \$27 (per User + Month)	
Surveys	\$0.1~\$10 (per Respondent)		
Business Intelligence Tools	\$0 ~ \$200 (per User + Month)		
Design Consulting	\$10~1000 Million	\$150 (per Hour)	\$100 (per Hour with certificate)
Certificate	\$10~100 Thousands (per Cert)	\$750 ~ \$5000 (per Certificate)	

HMW

Connect disabled users and their data with car manufacturers?

BY

Providing direct and easy to access channels to crowdsource, view, and process user testing data

(115 ()

HOW MIGHT WE

HMW

Provide transparency into the car design/manufacturing process?

BY

Sharing which companies are using specific types of data

(116 ()

HOW MIGHT WE



Provide incentives to car manufacturers to design inclusively?

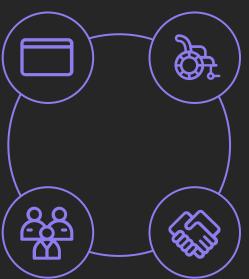
BY

Promoting companies that use data and earn certifications

(117 ()

EXPECTED OUTCOME

number of disabled users eligible for driver's' licenses owning cars



number of accessible features in mainstream cars

market size for accessible vehicles



trust and NPS in car manufacturers from disabled populations **POSTER**





Problems

Disabled individuals make up fifteen percent of the world's population, yet they face daily struggles finding independent, reliable transportation. When searching for their own accessible vehicles to own, disabled individuals report feelings of distrust in car manufacturers and feel that their individual needs are not accounted for in mainstream practices. This distrust is rooted in fact: car manufacturers admit to a lack of inclusive and accessible design processes stemming from a lack of available data on disabled individuals. We know disabled populations are ready to share their information in exchange for inclusive transportation, but they don't have the channels to do so.

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Solutions

Teko provides the infrastructure to connect data to delivery. Teko is an enterprise solution for accessible automotive user testing. Corporate manufacturing partners can partner with Teko to gain access to the dedicated user testing audience, create tests and activities, view global data, gain natural language insights, and consult with Teko's certified experts. Teko's users, comprised of both disabled and non-disabled individuals, complete tests and activities in a gamified format, allowing data to be exchanged for real-world points. These data points are then compiled and cleaned through a proprietary ETL (extract-transform-load) process, resulting in easy- to-understand natural language insights – providing designers with the discoveries, not the data.

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Data Privacy

As a data-driven business, Teko provides ultimate transparency and control to its user testers, giving testers confidence in their submissions and brand opportunities for promotion. User testers can see which brands are viewing their data points and how their responses are contributing to global product insights. Car manufacturers also have the opportunity to earn Teko Certifications to display and promote their inclusive design processes. Certifications are earned through data analysis, interaction on the platform, and certification-specific checklists. Manufacturers aren't alone in this process, either – our Teko Team of accessibility experts is ready for hire to personally analyze any certificate, process, or product.

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EXECUTIVE SUMMARY

#FEATURES

Enterprise

- Test creation
- Natural language insights
- Business intelligence tool integration
- Data visualization
- Accessibility certification
- Teko Team consulting

User Testers

- Test access
- Gamified point system
- Monetary rewards
- Data privacy insights

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