Digital Future Society

Exploring gender-responsive designs in digital welfare

A programme of

GOBIERNO DE ESPAÑA
VICEPRESIDENCIA TERCERA DEL GOBIERNO
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About Digital Future Society

Digital Future Society is a non-profit transnational initiative that engages policymakers, civic society organisations, academic experts and entrepreneurs from around the world to explore, experiment and explain how technologies can be designed, used and governed in ways that create the conditions for a more inclusive and equitable society.

Our aim is to help policymakers identify, understand and prioritise key challenges and opportunities now and in the next ten years in the areas of public innovation, digital trust and equitable growth.

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Digital Future Society

Contents

Executive Summary

Digital transformation within governments has been posed as an inevitable occurrence, to keep up with the times and effectively address the needs of its digitally enabled citizens. A cornerstone of this transformation is the digitisation of social protection programmes, which lately has been flagged by civil society and academia because of the irrevocable harm these programmes pose for the most vulnerable through the dehumanisation of the systems that support them. These digital poorhouses,[1] as described by political scientist Virginia Eubanks, are high-tech iterations of long-standing institutions that can all too often criminalise the poor.[2]

This report is the second half of a two-report series. The first report, published in July 2020 and titled Towards Gender Equality in Digital Welfare, highlights that within the context mentioned above, little attention has been given to the impact these automated systems have on gender. Women as a collective are on the front line to receive the potential harms of the digitisation of welfare systems. They are more likely to experience poverty than men due to a number of factors including low employment rate; higher engagement in unpaid labour such as care duties of children, elderly and other dependent family members; and lack of access to property. Digital welfare systems, by design, reinforce the structural gender inequalities inherent within the welfare system and exacerbate these biases.[3]

Building upon the first, the objective of this second report, Exploring Gender-Responsive Designs in Digital Welfare is to highlight that there is still time to address and rectify the gendered harms of these systems. In light of the 25th anniversary of the Beijing Platform for Action, this report maps a way forward in which design plays a fundamental role in envisioning a future where digital welfare services contribute to a more gender-equitable future.

Part I of this report illustrates how efficiency has been the main driver of the digitisation of public services, pushing aside women's roles and needs. Two case studies exemplify this, which demonstrate the various factors that end up shaping the design and application of these automated services. The report reflects further on the need for the public sector to adopt different frameworks to address the intersectionality of its women users. Part II then draws on specialised knowledge from experts and designers, in which we showcase three design concepts. These concepts address the different pain points that women face as users and claimants of these systems in order to envision a reality where digital welfare empowers women.

The implementation of automation has been mostly a two-sided conversation between policymakers and technologists. We have seen how this approach has not really taken into consideration the implications of digitising old ways of working and inherited social structures. By adopting the concept that design is a culture and practice to obtain a desired reality, governments can gain a clearer understanding of how to implement participatory practices and a gender-responsive approach to build public services that lead to a more equitable society for all.

[1] Poorhouses were US institutions where those living in extreme poverty could work in exchange for food and shelter. More commonly known as workhouses in the UK.

[2] Eubanks 2019

[3] Digital Future Society 2020

Glossary

Agile methodology

A way of managing projects based on dividing the work into a series of small tasks and using regular feedback at each stage to inform the processes of all subsequent stages.[4]

Automated decision-making system

A system that uses automated reasoning to aid or replace a decision-making process that would otherwise be performed by humans. Despite this, humans are ultimately responsible for how a system receives its inputs, how the system is used and all system outputs.[5]

Co-design

Creativity of designers and people who are not trained in design working together in the design development process.[6] Co-design is often used as an umbrella term for participatory, co-creation and open design processes.[7]

Data institute

A data institution is an organisation, community or society that dedicates itself to a specific cause or initiative based on how data is collected, sorted and shared, and its narratives are constructed. That cause tends to be public, educational or charitable in nature.[8]

Design framework

Set of shared assumptions, categories, standards and guiding principles applied by a multidisciplinary team that works collaboratively in the ideation, definition and implementation of products and services.

Design research

Set of activities aiming to produce design knowledge, i.e. design research produces the knowledge needed in order to design more efficiently.

Digital era governance (DEG)

Shift in New public management (NPM) paradigm, coined by Margetts and Dunleavy. They characterise digital-era governance as involving three themes: reintegration (putting corporate hierarchies back together), needs-based holism (agile governance, and efforts to simplify, re-engineer, transform and change agency/client relationships), and digitisation (electronic channels as genuinely transformative).[9]

Digital transformation

The customer-driven strategic business transformation that requires cross-cutting organisational change as well as the implementation of digital technologies.

Digital welfare

The use of data and digital technologies to administer systems of social protection and assistance. The use of digitally administered welfare systems is increasing in countries around the world.

Digitalisation

Use of digital technologies to change a business model and provide new revenue and value-producing opportunities.

Digitisation

Process of changing from analogue to digital form.

[4] Macmillandictionary.com, n.d.
[5] AlgorithmWatch 2019
[6] Sanders and Stappers 2008
[7] Chisholm n.d.
[8] Hardinges 2020
[9] Dunleavy et al. 2005
[10] Women's Budget Group 2018

Financial abuse

A pattern of coercing and controlling behaviour that controls a partner or family member's ability to acquire, use and maintain economic resources.[10]

Gender-responsive

Policies or work that not only acknowledge gender issues but elaborate proposals to address them.

Intersectionality

Coined in 1989 by legal theorist Kimberlé Crenshaw. The interconnected nature of social categorisations such as race, class, and gender, regarded as creating overlapping and interdependent systems of discrimination or disadvantage.[11]

New public management (NPM)

A public services management approach inspired by the private sector. It focuses on budget optimisation, increasing competition (between the private and public sectors, and among third-party providers) and framing citizens as users.

Participatory design

Design methodology in which the future users of a design participate as co-designers in the design process. It is motivated primarily by an interest in empowering users, but also by a concern to build systems better suited to user needs. Expert designers act more as facilitators and expert advisors to a group of people who own the process and the outputs.[12]

Proof of concept (POC)

Evidence, typically deriving from an experiment or pilot project, which demonstrates that a design concept, business proposal, etc. is feasible. A POC is a small exercise to test the design idea or assumption. The main purpose of developing a POC is to demonstrate the functionality, and feasibility, and to verify a specific concept or theory that can be achieved in development.

Robotic process automation (RPA)

Software that can perform the kinds of administrative tasks that otherwise require stop-gap human handling. An example of these types of tasks is transferring data from multiple input sources like email and spreadsheets to systems of records like enterprise resource planning (ERP) and customer relationship management (CRM) systems. Calling it robotic, however, emphasises the utility of a machine that can stand-in for a worker and handle disparate, discrete chores. (One "robot" equals one software license and, in general, one robot can perform structured tasks equivalent to two to five humans.)[13]

Universal design

The design of an environment so that it might be accessed and used in the broadest possible range of situations without the need for adaptations.

Use case

A specific situation in which a product or service could potentially be used.

User-centred design

A framework of iterative processes that focuses on the users and their needs in every phase of the design process. It is a multi-disciplinary activity not restricted to interfaces or technologies. In the classic user-centred design process the user is a passive object of study, and the researcher brings knowledge from theories and develops more knowledge through observation and interviews.

Waterfall approach

Linear project methodology, in which work goes through a series of sequential phases. Work cannot begin on a stage until the completion of all work on the stages that came before it.[14]

[11] Oxford English Dictionary n.d.

[12] Encyclopedia.com n.d.

[13] Lacity and Wilcocks 2015

[14] House of Commons Public Administration Select Committee 2011

Introduction

Over recent decades, often driven by austerity measures, governments have been swept along by digital transformation in the search for more efficient and streamlined processes. Under the premise that automation can cut costs by up to 30%, national digital strategies have pushed their agencies to digitise both their internal processes and citizen-focused services to reduce the administrative burden and offer a faster, more personalised service to the population.[15] The use of automated decision-making systems (ADMS) is key to this transformation. Growing in use, ADMS is implemented with the intention to remove human error and increase efficiency by automating repetitive tasks.[16]

Contrasting with this position of governments, however, civil society organisations have raised the alarm on the negative impact ADMS can have on the citizens they are meant to serve, especially those who are most vulnerable. In 2019, former special UN rapporteur, Philip Alston, stressed how automation in the context of digital welfare punishes and surveils the poor.[17] Centred on a deep-rooted mistrust of claimants, the use of these technologies have perpetuated "a culture of cruelty that leaves vulnerable individuals disenfranchised, isolated and excluded."[18]

The potential harm that digital welfare technologies inflict on claimants is well documented including infringement on privacy and putting their dignity and self-determination into question.[19] However, there is little discussion about the gender biases of the applications. Our report, Towards Gender Equality in Digital Welfare, illustrates the need to understand how automation, can exacerbate existing gender inequalities, particularly as these services are essential in helping women out of poverty and getting them the aid they need.

Much like the digital poorhouses, referenced by Eubanks,[20] digital welfare has also become a repository of historical gender discrimination, an automation of our patriarchal past. By design, digital welfare services fail to consider the realities of the women beneficiaries they should be helping. If not appropriately addressed, the digitisation of the service will only serve to entrench these biases further. In this way, blindly driving for efficiency could lead to a technologically bureaucratic and administrative nightmare further down the road.

Contrary to this argument, digital government projects stress technology's democratising effect. Technology has been hailed as the solution to make services more personalised by taking advantage of real-time data or accessing remote populations. Although this rings true, we must not disregard the many digital projects that fail to be effectively inclusive and blatantly disregard gendered disadvantages in digital services, all because of the solutionist approach to technology. As Virginia Eubanks and former UN rapporteur for extreme poverty, Philip Alston, have stressed in their work, the redesign of such systems can do little if there is not a fundamental change in policymaking itself. The problems that automation expose are institutional and will only further engrain inequalities if left untouched.

As the risks of digitising welfare services go beyond the technology driving the automation, this report explores how design can play a critical role in highlighting system blindspots and can encourage practices that foster gender responsiveness.

[15] Andersen et al 2020
[16] Digital Future Society 2019c
[17] Alston 2019
[18] Coles-Kemp et al 2020
[19] Alston 2019
[20] Eubanks 2019

In this project, we have used design as academic Ezio Manzini defines it: "Design is a culture and a practice concerning how things ought to be in order to attain desired functions and meanings. It collaborates actively and proactively in the social construction of meaning."[21]

This report seeks to find common ground for design and research. In dedicating this report to an exploratory exercise, Digital Future Society seeks to spark conversations in how we can go beyond research and interviews, by giving expert practitioners a space in which they could ask fundamental questions.

Now more than ever

At the time of writing this report, during the Covid-19 crisis, the pandemic has exposed gaps in our social welfare systems, reflecting society's deeply embedded patriarchal values. Women, on the whole, are the primary caregivers of children and the elderly. School closures have significantly impacted the lives of mothers and female caretakers given that they, on the whole, assume care responsibilities that their male counterparts do not. They are often on the frontline, overrepresented in certain sectors that have been most affected by the virus, such as care and hospitality. Women are also more likely to engage in informal work. Lockdown measures have led to a rise in gender-based violence and have exacerbated the lack of access to information and support services.[22] Governments are trying to respond and compensate for these gaps. With this report in mind, however, the design concepts presented in Part II speak to the need to design for gender from the outset. How can these systems be designed to anticipate and accommodate the most vulnerable in times of crises, so that women are not the first to suffer?

Beijing Platform for Action

2020 marks the 25th anniversary of the Beijing Platform for Action, also known as the international 'Bill of Rights' for women. The platform asked "governments and other actors to mainstream a gender perspective into all policies and programs."[23] In an evaluation carried out in 2015 for the Committee on Women's Rights and Gender Equality (FEMM) of the European Parliament of the Platform stated that, "overall progress on the implementation...has been slow, uneven and limited."[24] Set to convene in the autumn of 2020, we can expect a similar message especially in light of the pandemic, as some argue that we are experiencing the "biggest setback in gender equality for a generation."[25] This is devastating news, considering that, before the crisis, the World Economic Forum predicted that it would take 257 years to reach economic parity between women and men.[26] It is within in this challenging context that governments are currently pushing to automate services, including welfare, in the name of efficiency.

[21] Manzini 2015

[22] Ajayi and Heinemann 2020

[23] UN 1995

[24] European Parliament 2015

[25] Sprechmann 2020

[26] Jackson 2020

The signatories of the Beijing Platform for Action committed themselves to promote ICT in achieving social equality and human rights objectives. Considering that since 1995 digital technologies have played a role in tackling the gender digital divide[27] but have also, unintentionally, diminished women's autonomy,[28] governments need to take a stronger and clearer stance in implementing a gender perspective in their digital strategy.

Foregrounding gender in digital strategies can help governments provide a vision of how digital technologies can play a role in creating a gender-equitable future. However, vision alone is hard to act on. This report serves as a bridge to explore how crafted paths towards gender-responsiveness can materialise when preparing to implement automated decision-making systems in the context of digital welfare.

Utilising the concept of strategic intent, the report shows how there is space and value to include design in a digital and gender-equitable future. The Helsinki Design Lab describes strategic intent as the "glue that translates the motivating force of a grand vision into principles that can be used to make choices on a more discrete level."[29] Design, therefore, is able to act as a culture and serve as a channel in which women's rights, emerging technologies, and policymaking can search for "outcomes that are balanced and opportunistic, grounded in the real world but driven by human aspirations."[30]

About this report

This report is part of a two-part series, on the impact that digital welfare systems have on women. The first, titled Towards Gender Equality in Digital Welfare, published in July of 2020, highlights the historical exclusion of gender perspectives from welfare systems and illustrates the peril of not including this perspective when implementing digital welfare services. Building upon the former, this report addresses the current challenges governments face in implementing inclusive digital services. It also focuses on how design processes should facilitate gender-responsive ADMS by going beyond inclusive principles and guidelines and showing how these systems would operate in practice.

The report starts with a brief recap of the gendered disadvantages illustrated in the first part of the series. Later, the report provides context on digital transformation within government, referencing management models, New Public Management (NPM) and Digital Era Governance (DEG), to illustrate the complex journey that digital governments have faced in implementing large-scale projects.

[27] OECD 2018

[28] Digital Future Society 2020

[29] Boyer et al. 2011

[30] Ibid.

The report focuses on the trend towards greater automation in light of austerity measures and governments seeking greater efficiencies despite the challenges they face in designing inclusive services. By looking at two examples of digital welfare management, we gain a better understanding of how policy and digital strategy shapes the design of these welfare services, and the overall lack of a gender perspective results in the various points in which the service fails its women beneficiaries. Part I ends with examples of digital projects consciously and successfully addressing the intersectionality of their users and using technology to reach the outliers of the population.

On this note, the second part of the report showcases three design concepts of gender-responsive ADMS in the context of digital welfare. These concepts touch on the main challenges that women face as users and claimants of these systems: lack of gendered data sets and the lack of an intersectional approach in their design. Three teams of designers and technologists conceived the design concepts as part of a two-week design challenge. All designs share the main objective of finding ways to reduce the impact that digital welfare systems have on women, thus, empowering women, making them participatory in the automated decision-making process.

Scope

For the purpose of the report, we take on the use of ADMS in digital welfare to provide a specific context for the design solutions. This particular use of ADMS, however, is just one tool and context in which public sector agencies may consider revisioning in order to be more gender-responsive. All algorithmic-driven applications and digital services implemented by the public sector need to seriously consider the challenges that women face in being equally represented in the digital sphere.

In writing this report, Digital Future Society recognises that women are, by no means, a homogenous group. When referring to women, this report alludes to the way welfare services identify the female gender. We acknowledge that women experience various forms of discrimination in different ways, depending on age, place of birth or residence, race and ethnicity, religion, economic or social status, disability, and sexual orientation.[31] Given the context of welfare systems, we acknowledge that this report is limited as these systems rely on a heteronormative, binary definition of gender. At this time, welfare systems do not account for different realities such as trans or gender-diverse persons, or lesbians, whose biological female sex does not automatically grant them the same rights as heterosexual women.[32]

[31] UN High Commissioner for Human Rights 2017

[32] Le Monde 2020

Gendered disadvantages

In order to build a gender-responsive digital welfare system, policymakers must address the realities women face in the digital era. This involves addressing the quality of data relating to gender and understanding the intersectional disadvantages women claimants face by interrogating the design of three components of the ADMS: datasets, decision-making models and design processes. The first report in this two-part series of reports, Towards Gender Equality in Digital Welfare, provides a detailed analysis of these three components. Below is a short re-cap on how these three components of ADMS adversely impact women.

Datasets

Digital welfare applications process large quantities of data from different public sources in order to, among other uses, automate payments, predict future need, detect welfare fraud and sanction non-compliant beneficiaries. According to policymakers, data-driven automation will increase fairness through the elimination of bias and reduce human labour costs.[33] Although the premise is that governments can better serve their citizens with real-time data, we have seen how data-driven systems do not always work in favour of the claimants' interest.

When it comes to women, the problem is two-fold:

1. They are more exposed to poverty than their male counterparts[34] and therefore further subject to the potential harms of the automation of decision-making processes as main beneficiaries.

2. Women run the risk of being misrepresented through data.

Welfare systems, by design, are biased to a normative view of women and families, and automating of these systems, under the commonly mistaken claim that data is neutral, tends to replicate and amplify the system's existing blind spots. This is partly because technology and AI applications are male-dominated sectors. The creators' biases, conscious or not, condition the whole process of data collection and assessment, as well as how previously collected data and new data are fed into the algorithm.

Furthermore, automated decision-making systems rely heavily on statistical or quantitative data, which is not enough to evaluate a woman's need for assistance or support effectively. Such is the case for programmes like Universal Credit (UK) or ParentsNext (Australia), means-tested programmes that require claimants to undertake tasks to receive their benefit. Should claimants not comply with requirements they risk having their payments suspended, reduced or cancelled.

[33] Digital Future Society 2020

[34] – there is a higher risk of poverty for single mothers, elderly women, and long-term unemployed

By recognising that current statistics and data do not accurately reflect the reality, public servants in charge of deploying ADMS need to contextualise data within broader cultural, socio-economic realities, to avoid generic data subjects. As the design concepts show later on, creating gender-relevant datasets and statistics will permit data-driven applications to adequately assess the impact women face as a collective in their implementation.

Decision-making model

Eubank's Automating Inequality illustrates how automated decision-making systems fundamentally shape casework. As previously mentioned, ADMS is, in part, implemented in a spirit of mistrust, of both caseworkers and claimants. Automation removes human discretion, which many equate with human bias and also eradicates points of corruption that arise from personal relationships in casework.

Although human discretion in casework can be biased and reflect societal prejudices, it is not true to believe that automating removes human discretion. Automation merely transfers human discretion to engineers and programmers.[35] These human decisions, taken by technologists, greatly affect the outcome of a system, as they are the ones who decide which variables to include and the weight given to variables in an algorithm. Illustrating this point, the COMPAS system, designed to predict felon recidivism calculates a higher risk score for women than men, despite lower levels of criminality among women.[36]

Transferring human discretion to technologists and later to an automated system is, as mentioned earlier, not only in place to eliminate bias, but to dissuade corruption. There is a perception that the old ways of working in which caseworkers spend time developing close relationships with claimants are open invitations to fraud. Severing the human ties in welfare management poses another series of problems, however, which are born out of the overall dehumanisation of the process.

Translating rules and regulations into code contributes to automating prescriptive aspects of the law, which do not account for the different realities and particularities of each case. Furthermore, breaking welfare applications into discrete tasks carried out by different people prevents any one worker processing a case from beginning to end. This engenders a rigid application of rules, and often lacks clarity relating to the decision making process. Automated decisions such as suspending benefits because of suspicion of claimant fraud, can result in a life-altering outcome, as they do not consider the many challenges that beneficiaries face throughout the process.[37]

The restructuring of decision-making in digital welfare does not solve the problems present in the old ways of doing casework. Rather, it adds an extra layer of technological complexity to the system and policy that already has its inherent prejudices. One main issue, regarding gender, is the little we know about how these changes affect women applicants due to the lack of gender impact assessments. The first report in this two-part series, recommends taking on gender mainstreaming from the policy planning phase to reduce the likelihood of problems

[35] Eubanks 2018

[36] D'Ignazio 2020

[37] Eubanks 2019

in the implementation phase.[38] The design concepts in Part II of this report, take different approaches in addressing the issues presented in this section, looking for ways to mitigate human bias while at the same time maintaining the human quality lost in the automation of welfare systems.

Design

Designing where and when humans should intervene in ADMS processes is always a challenge for policymakers and those delivering ADMS. When put into practice, these applications push the administrative burden onto the welfare recipients. The frontline workers' role becomes secondary as the ADMS alleviates their responsibilities but, in such systems where claimants need to perform, the lack of empathy these systems can show for the sensitive situations the most vulnerable find themselves in can be devastating. Having payments suspended without notice could plunge many claimants into extremely precarious situations in the immediate term.

> **"When public servants design a service, they have to think they one day might be the very person who needs to access that service. It requires a level of empathy to understand that some public services have become a painful life event for the user. If the state cannot go through the exercise to understand the level of trauma and sensitivity, and furthermore does not apply that empathy to design, it is giving a bad service."**
>
> **Daniel Abadie - former Digital Secretary of Argentina**

The system design assumes that claimants will fall neatly into categories and leaves little room for frontline worker discretion. Nor does it consider structural barriers that hinder female claimants' compliance, such as affordable childcare or limited job security. Case in point, as shown in report one of this series, 85 percent of ParentsNext beneficiaries, of which 95 percent are women, had payments suspended despite having a valid reason for not complying with participation requirements.[39] In other applications, such as the algorithmic profiling of job seekers used in Austria, the algorithmic assessment is legal because it only offers a second opinion, however, there is no incentive for caseworkers to contest the decisions, and decisions may in fact legitimise caseworker bias.

These examples are reflective of systems designed for a population and not with a population. Claimants generally complain of poorly designed and difficult-to-follow user interfaces on system portals and vague or little communication. In addition, a lack of transparency about these systems contributes to general confusion relating to the decision making process and the processes for contesting final decisions. The design concepts in Part II, illustrate possible ways to improve these systems, not only addressing the usability of the interfaces, but also implementing mechanisms to ensure that the claimant understands the logic behind the processes of the systems. The concepts also address ways to promote co-design and implement feedback mechanisms in order to inform and calibrate the ADMS consistently.

[38] Digital Future Society 2020

[39] Henriques-Gomes 2019

1

Digitisation to digital transformation

How we got here? An efficiency-driven design for government

Welfare has been described as an optimal entry point for governments to digitise not only because of the potential cost-saving effects and its impact on a large population but also because it can be presented as a "noble enterprise" to ensure citizen well-being.[40]

The effort from public agencies to keep up with the times and modernise infrastructure and processes is not simply a shift from analogue to digital, nor does it mean that services will become more inclusive once digitised. As we have already seen, digital tools are not neutral and it is important to understand the very intent of digitising services within the socio-political context. Philip Alston stresses that often, digital transformation is framed as a neutral, inevitable progression. Seeing it this way undermines the politically-driven character of such innovations and can be used to absolve governments from accountability.[41]

ADMS can revolutionise government, yet they cannot do so without participatory design, which requires involving the users of the systems they will be administrating. A lack of such design at the inception stage could lead to further expensive technological inefficiencies of which governments already have a long history.

The use of digital technologies in government has come a long way from the 90s and early 2000s. Before then, it was mainly used in the automation of administrative operations, reinforcing machine bureaucracies. Later on, with the surge of the internet, technology for the public sector was defined by external providers and inefficient procurement processes, which in turn, created a fragmented experience for end-users and public servants.[42]

This fragmented experience is in part a result of New Public Management (NPM) policies in place, which shifted government focus to market-based competition, using business incentives for public agencies, eventually leading to a disaggregation of departments. Although the modernisation of the public sector varies among countries, NPM variants greatly influenced the role of technology in the public sector through the outsourcing of projects to agencies and service providers, which in turn, lead to the eventual stripping of digital expertise within public agencies. The consequent lack of internal knowledge on the deployment of IT projects put the public sector at the hands of private consultants, with little leverage on how/when projects should be implemented.

The Institute for Government, in its report System Error, attributes these problems to a traditional linear approach, like the waterfall- and v-model, which allow for very little changes once a project has started. "Specifications are drawn up in advance, 'solutions' are procured, and then delivery is managed against a pre-determined timetable."[43]

[40] Alston 2019

[41] Ibid.

[42] Brown and Thompson 2014

[43] Stephen et al. 2020

In past implementations of IT projects, the rigid approach mentioned previously would set up projects for failure because they did not account for an environment where priorities change rapidly. In the UK, the Child Support Agency's IT system purchased from Electronic Data Systems (EDS), was implemented to improve performance. Plagued by errors, the IT system only processed half of the applicants, causing a delay in payments for thousands of single parents.[44] This blunder eventually ended in the termination of the agency.[45] In the US, one of the "modernisation waves" of the Internal Revenue Service's Business System Modernization program, a plan to collect taxes, audit returns and help taxpayers with questions, was over budget by 40 million dollars and three years late.[46, 47]

Digital transformation

From the 2000s, a new model of "bureaucracy" breaking up the siloed approach of NPM[48] began to take shape. "Digital era governance"[49] (DEG), driven by austerity measures, consisted of "shutting down change programmes, expelling consultants, squeezing contracts, renegotiating public-private partnerships."[50]

Under DEG, digital projects shifted from being an outsourced translation of analogue processes to the digital sphere, to transforming the back-end of how government operates to be more efficient. This new approach seeks to repair the fragmented past characteristic of IT projects but continues with the underlying management thinking.[51] As described by Public Digital, a consultancy firm focused on guiding the public sector through digital transformation, this goes beyond digitising services. Digital transformation implies a radical change in how the organisation works, so it can "survive and thrive in the internet era."[52]

Analogue government
Closed operations and internal focus, analogue procedures

→

E-government
Greater transparency and user-centred approaches, ICT-enabled procedures

→

Digital government
Open and user-driven approaches, process and operational transformations

Figure 1: Image source: Digital Future Society. Based on OECD (2014) Recommendations of the Council on Digital Government Strategies

[44] BBC News 2004
[45] BBC News 2006
[46] Laudon 2019
[47] WIRED 2005
[48] OECD 2016
[49] Dunleavy and Margetts 2013
[50] Ibid.
[51] OECD 2016
[52] Public Digital 2020

The trend to gain control over digitising government services has led governments to encourage the complete digitisation of their systems and the reorganisation of services around the "digitally-enabled citizen."[53] A drive to cut administrative costs is behind this digital by default strategy, that also encourages a move towards automation and AI applications. Pushing citizens online becomes a main priority in justifying the cost of the move to digital, "It is necessary to achieve around 80 percent online users in order to realise the greatest economic benefits from digital transactions and information-seeking replacing phone, paper or in-person transactions."[54]

What is sometimes described as the 4th wave of the digital revolution presents an additional challenge, the pressure to grasp opportunities that emerging technologies present to governments often overrides the need to implement projects from the ground up effectively. Swept in the fury of the digital, government agencies end up digitising the old ways of working, often "skipping stages in their digital journey."[55] Inadequately addressing genuine user perspectives and experiences at the design stage of new automated decision-making systems represents another dangerous example of this often repeated and costly mistake. Part II of this report, however, will explore possible ways for governments to avoid this eventuality, relating to gender.

Digital government teams work against a political backdrop and, to that effect, the technology that they procure, build or implement amplifies and, at times, distorts the decisions taken at a policy and institutional level. Therefore, unless a digital transformation strategy does not radically rethink how things work, those excluded in traditional government services will continue to be so.

Who is the user in digital government strategies?

The dominant narrative around public services shared by many digital governments (UK,[56] US,[57] Denmark,[58] Sweden[59]) states that going digital will be more inclusive and personalised. User-centred design methodologies will make services friendlier, faster and more accessible for the population. Although this vocabulary seems to describe automation as an opportunity to become efficiency- and user-oriented, the tools and methodologies used, describe something different. Despite the increased complexities faced by the public sector, these methodologies mirror the private sector, with the same efficiency-driven approach that sees key performance indicators as to whether the service has uptake and is cost-effective.

[53] Dunleavy and Margetts 2015

[54] Dunleavy and Margetts 2013

[55] Peixoto and Córdova 2019

[56] GDS UK, n.d

[57] State.gov 2020

[58] Danish Ministry of Finance 2016

[59] Government Offices of Sweden 2020

The gender-neutral "user"

The question is whether a streamlined digital welfare service can effectively meet the needs of women, its most significant user, through "user-centred" design. The emphasis on the "user" in digital government policies serves as a blanket term to ensure inclusivity, and hardly, more like never, mentions the diversity of the populations they seek to serve, nor in this case, the vulnerable context of women claimants.

> **"In our social security system, we have just made a lot of changes that have made it worse for women. For me, this demonstrates how easy it is to lose the little bit of progress you make. When you are in a patriarchal system, choices for women are highly constrained. And even when systems are designed to give the user more choices, they often put the burden on women to make tough decisions - for example, if she wants to receive universal credit separately from her partner, she has to make a case for doing so, – she does not get it as of right."**
>
> **Janet Veitch - Women's Budget Group, UK**

In an attempt to provide a universal design, digital welfare services promote a gender-neutral perspective that in the end, neutralises instead of addresses what makes their users different. One researcher claims that, "the lack of gender awareness in the DTO's (Australia's) policy matrix suggests that its gender-neutral end user may be a convenient and cost-effective policy construct, rather than one that will necessarily achieve its declared aims of ease and user-friendliness."[60] The lack of gender awareness in strategy, causes design and technology teams to overlook the intersectional dimension of women and favour something much closer to the male perspective as default.[61]

Here are a few examples, to illustrate the emphasis on the user, from the Digital 9 (nine leading digital governments).[62] In Denmark, "Digital services are becoming increasingly more adaptable to the needs of the individual... more user-centric."[63] While Estonia's 2020 Digital agenda, "seeks to make the whole of government accessible for individuals and businesses, which means, "easy-to-use and non-burdening services that are... co-designed with different parties."[64] In the UK, the Government Digital Service (GDS) states, "users...are at the centre of everything we do."[65]

The same rings true for National AI strategies. In Portugal, "designing AI ...should address in a human-centred approach."[66] Sweden's strategy says little regarding the involvement of its citizens in the approach but says that "the use of AI algorithms must be transparent and comprehensible."[67]

[60] Martin and Goggin 2016

[61] Ibid.

[62] Leading Digital Governments 2020

[63] Danish Ministry of Finance 2016

[64] Government of the Republic of Estonia 2018

[65] GDS UK, n.d

[66] AI Portugal 2030

[67] Government Office of Sweden 2020

"We took a lot of inspiration from the commercial world in the beginning. So, when we started digitisation, we were looking for customer journeys, 24/7 services, smart looking websites etc. but when you are talking about user-centred you are already talking about a product, it is all about pushing your service to the citizen. When you look at human-centred, you look at how the person is living, what is happening in their life, what is important to them, and how can I help?"

Esmeralde Marsman – Innovation manager, City of Rotterdam

There is also the possibility that current public sector definitions of user-centred design might not offer a suitable approach for the public sector. Given that private sector methodologies have defined public sector transformation, user-centred design, with its original usage for commercial products, may lack the complexity required.[68] Designing for the public sector requires an understanding of the complex situation in which the service is being implemented and should include, policymakers, public servants, service administrators, communities, civil society organisations, citizens, etc. A commercial product for the private sector does not have to deal with such a diversity of perspectives.[69]

We will later see how the design concepts in Part II, propose methodologies to challenge the gender-neutral approach and consider the intersectionality of women users. How can automated systems be informed of the outliers who do not fit categorically into the binary logic of the system? How can we maximise on the knowledge of the different stakeholders mentioned above?

Access is not enough

The emphasis on access, in terms of internet connectivity and content, found in digital strategies is attributed to the digital inclusion strategies from the roll-out of the internet in the late 90s.[70] When it comes to digital inclusion, national strategies conceive of services that are accessible and easy to use. For example, according to the Denmark digital strategy, user-centricity and empowerment mean that digital solutions allow individuals, "easy access from home, or in their local area, to services and information of high quality, regardless of where in Denmark they live..." This statement goes further to explain that with, "digital welfare solutions, citizens can become 'co-players' in delivery of their welfare services." The GDS's digital service handbook conveys similar concepts,[71] as does New Zealand's focus area for digitalisation,[72] and Uruguay's 2011-2015 digital strategy.[73]

[68] Lee 2015

[69] Ibid.

[70] Digital Future Society 2019b

[71] GOV-UK 2020

[72] New Zealand Digital government 2020

[73] Uruguaydigital.uy 2015

Although access is a precondition to inclusion, the digital divide is much more, especially in the case of gender. The first part of the series, Towards Gender Equality in Digital Welfare poses a few examples on the gendered barriers in access and uptake, that delve into other factors such as age, country of birth and socio-economic status. One such example illustrating the complexity of the gender digital divide is research done on digital skills among low-income mothers in Amsterdam. The majority of them possess "splinter skills", which means they might know how to access their email, but not how to write and send one. Although they may own devices, they do not have a home internet connection.

The concept of inclusiveness is about more than just access and usability. Not considering other factors undermines the larger structural inequalities at play that affect women as users of digital welfare services. The Digital Future Society report, Measuring the Margins, defines digital inclusion as the "elimination of the digital divide by ensuring access, the skills and ability to use digital devices and content confidently, safely and effectively."[74] This not only includes a minimal level of understanding to use a given technology but also critical and analytical skills to navigate digital content. Particularly in the context of automation, which sees digital tools used to "target disproportionately those groups that are already more vulnerable and less able to protect their social rights."[75] Such was the case of the Netherlands' System Risk Indication (SYRI), an automated system to detect management fraud, mainly used in low-income neighbourhoods.[76]

As we will see in the design concepts in Part II, to effectively empower women in the digital space, it is vital they can effectively use a service and most importantly, understand how these tools can impact their lives. All of this depends on whether they possess digital understanding, "how the digital service functions beyond the operational level or user interface."[77] Sasha Costanza Chock, communications scholar and author of Design Justice, states, "Those people who are most adversely affected by design decisions – about visual culture, new technologies, the planning of our communities – tend to have the least influence on those decisions and how they are made."

[74] Digital Future Society 2019b

[75] Constanza-Chock 2018

[76] Digital Future Society 2020

[77] Ibid.

Automation in digital welfare

When addressing the overarching trends of NPM and DEG management models' influence in the digitisation of the public sector, we can also see the same trends unfold for welfare policy. "Welfare policy went through a gradual shift from welfare (providing support to citizens who meet certain criteria, because it is their right) to workfare (conditioning benefits with specific activation and conditionality requirements) over the last 30 years."[78] Completely reversing the traditional notion that the state should be accountable to the individual.[79]

According to policymakers, when digitised, ADMS become integral in making welfare more efficient and consistent, better at optimising data from different agencies and cost-effective through the automation of administrative tasks. The potential of digital transformation, in this sense, has been exploited mostly in terms of efficiency. However, efficiency does not affect all parts of society in the same way.

The following cases of automation in digital welfare, exemplify this very top-down approach applied to public services: The UK's Universal Credit, an ambitious national project to digitise and combine payments into one system and Trelleborg's use of robotic process automation (RPA) used at a municipal scale to speed up casework decisions and encourage claimants to find work.

Both are implemented under the pretence that the economic and human cost of administrative tasks burdens government and that the welfare state is not sustainable in the long term.[80, 81] In both examples, we can see a common message, of using technology to provide a more simplified, universal service and emphasising the need to streamline these services to enable better ways of investing taxpayers' money.

One of the main challenges in assessing the impact these services have on gender, as explained in the first report in this series, Towards Gender Equality in Digital Welfare, is the general lack of impact indicators to consistently assess the effect the deployment of digital services have on women.[82] Thanks to charities and advocacy groups, however, there are clear and direct examples that aid the understanding of the discrimination women suffer on various fronts, which the report discusses later relating to the UK's Universal Credit case. Mostly, however, the inference is that these tools have been built for a majority. They do not take into consideration the intersectionality of women users and the barriers they face when interacting with these systems, as seen in Trelleborg.

[78] Deeming and Smyth 2015

[79] Alston 2019

[80] Sanandaji 2018

[81] Taylor-Goodby and Taylor 2014

[82] Digital Future Society 2020

Case Study #1

Trelleborg model – Municipality of Trelleborg, Sweden and 36% of municipalities in Sweden

Context:

Since the 90s, municipalities in Sweden have been delegating decision making power to welfare distribution cases. In 2017, the municipality of Trelleborg along with support from the Department of Labour and Valcon Consultants, a consulting company on digital transformation, implemented Robotic Process Automation (RPA). The municipality began using RPA, a rule-based automation, to handle applications to receive state aid for child, disability or unemployment support. The system determines the eligibility of applicants and detects potential fraud. Primary motivations behind implementing the RPA is to save time and allocate resources. Strategy around state aid follows a trend in welfare programs in the EU, shifting to helping beneficiaries get employed rather than continue receiving benefits.[83] Municipalities argue that they have considerably reduced the number of people receiving social benefits.[84] So far, Trelleborg is the only municipality that has fully automated its welfare services, but other municipalities are quickly following suit, seeing the advantage. The model has been hailed as a win for the public sector.[85]

How does it work?

Applicants meet a caseworker for the first appointment. They must then reapply every month with subsequent decisions to grant payments automated.[86] The agency cross checks new applicants with data from housing support and the tax agency. The RPA compares income and expenses with previous months and then calculates for consecutive months. In total, the system gathers data from 7 different agencies, such as tax, income statements and student loans (it uncovers additional information checking whether the applicant is an active job seeker, fulfilling their obligations for support). Should the case differ drastically, a human caseworker intervenes. The system itself compiles a final report for internal use, to show which of the citizens who applied received payments and which ones did not.

Response to the initiative:

There are two lines of discourse regarding the benefits and risks of the Trelleborg model. As mentioned previously, some hail the Trelleborg model as a success story on behalf of the public administration. According to Patrik Möllerström, manager at the labour market administration, 450 welfare beneficiaries went from receiving aid to being employed in 2017.[87] There is a pilot project to export automation to 14 additional municipalities.[88] In addition to cost-saving benefits, the municipality advocates for a tech-based approach because it is neutral and objective, which in turn will aid in eliminating human bias. However, the RPA software was constructed based on social worker processes, exposing a risk to copying norms already in the system.

[83] Allhutter et al 2020

[84] Sundin 2018

[85] Wisterberg 2018

[86] Trelleborg.se 2020

[87] Wisterberg 2018

[88] Lind and Wallentin 2020

On the other hand, we see the common pain points regarding the use of automation in the public sector as played out in Trelleborg. Transparency of the ADMS has been contested by unions and journalists, stating that it is still unclear how the ADMS makes decisions. The risks are not only external, as some social workers see it as a threat to their profession.[89] There are now only three caseworkers, down from 11, representing a significant loss in expertise, and there now seems to be a new discrepancy about what falls under caseworker responsibility. Furthermore, IT systems for social work have been the subject of criticism and surveys have identified social workers as the group that is most negatively impacted by IT.[90]

Impact on gender

Sweden, on an international scale, has a high employment rate among women and men. Intersectionally speaking, however, there are experiential differences to note. For example, the difference between the employment rate for women born in Sweden (87%) and those born in another country (66%). Also, on average, a woman's pension in Sweden is only 69% of that received by men.[91]

Although hailed as a success, there are several red flags that hint at potential gender discrimination from the service. Firstly, the cause is unclear whether the drop in welfare applicants is due to the organisational shift from social welfare to employment, or simply a general reduction of welfare applicants as applications shifted to digital. Given the lower employment rate of foreign-born women on a national scale, the system should consider how digitisation has negatively impacted this collective. Also, the big drop in caseworkers handling cases comes to question whether sensitive cases get the attention they require. These types of case include those who experience barriers to using digital tools, such as older generations of women, women whose first language is not Swedish, those who do not have easy access to digital devices, etc. Thirdly, the direct translation from social caseworkers pattern of working to software, without consideration of implicit biases in the "traditional" way of working, highlights the naiveté in the deployment of software and can only heighten further risks of discrimination as other municipalities in the region pilot the software.

[89] Persson 2020

[90] Nauwerck and Cajander 2019

[91] Statistiska Centralbyrån. 2020

Case Study #2

GDS and Universal Credit – UK

Context:

A proposal from the Centre for Social Justice to try and tackle the larger problem of a perceived lack of incentive for beneficiaries to take on work or to improve their employment led to the design of Universal Credit (UC). The Conservative-led coalition government introduced UC in 2010, arguing that a simpler system with real-time information on earnings would: "1. reduce fraud and error, 2. cut administrative costs, 3. increase adoption because it was easier to understand, 4. increase employment and earning and 5. shift children and adults out of poverty." The coalition enacted the proposal via the Welfare Reform Bill in 2011, which began the design and build process, with the legislation passed in March 2012.[92]

Digital by default:

UC originally started as an outsourced project, given that the government did not have the internal know-how due to the outsourcing of all IT in 90s and early 2000s. The initial idea was to make UC 'digital by default' which meant it would be entirely web-based and require at least 80% of claimants to have a digital connection of some sort.[93] The outsourced project started in April 2013 but lasted only a few months, as it quickly became a risk for failure, primarily because of the lack of knowledge regarding IT projects and contract management. Reacting to pressure, the coalition moved policy quickly during its term in government. The timetable was political, and the policy behind the service was too immature with the coalition still defining it even as work began on building the project.[94]

The coalition called in the Government Digital Service (GDS) to save the project under the leadership of Sir Francis Maude, who envisioned an end to government IT contracts and a plan to build projects internally using agile methodology.[95] Universal Credit, as a large-scale IT project, was an overly ambitious project considering the department had no experience of agile methodology or going digital by default.

The service and its diverse expertise on policy, prototyping, data science, and user research began work on a new UC service built in-house. By adopting a test and learn approach, the GDS built a live service that, to understand how claimants and staff would react, additionally involved frontline staff in the design.[96] Maude used Universal Credit as a flagship example of how to do digital by default.[97]

How does it work?

The reasoning behind Universal Credit (UC), was to encourage personal responsibility by mirroring the world of work. With this aim, policymakers decided on consolidating six benefits into one and issuing a single monthly payment. As part of the government's digital-first

[92] Bennet and Sung 2013
[93] GOV.UK 2012
[94] Timmins 2016
[95] Eggers 2016
[96] Pope 2020
[97] FOI 2019

strategy, the intent is for UC to act as a digital portal in which claimants can report their status in order to receive payments and therefore relieve jobcentre advisors from administrative tasks to deliver more face to face support.

Supposed to be dynamic, the service bases a month's assessment on how much a claimant should receive during a month. This figure is calculated using what they earned from employment, their familial situations and any deductions for sanctions (money owed to third parties, failure to accept a job offer, etc.). All this requires a large number of data points to maintain a claim with all data used to calculate the payment amount.

Response to the initiative:

Universal Credit has received much criticism regarding the responsibility it forces onto the claimant. The service expects the user to take control of their financial management yet does not account for individual situations. It provides a monthly assessment, for example, which makes it difficult for people who are paid weekly and have inconsistent pay throughout the month.[98]

Systemic and design errors, have left people without payment or not knowing how much they will be paid, placing claimants already dealing with difficult situations under a huge "psychological burden". The conditionality of the system requires claimants to comply with commitments, such as dedicating 35 hours a week to search for employment in order to receive payment. Furthermore, penalties are harsher than the old system.

Regarding the design process itself, the GDS is not consistent with transparency, publishing very little on the design iterations and changes implemented. They do not maintain an archive of user interface changes nor disclose the code for the UC calculation.[99] This lack of genuine transparency makes it difficult for civil society organisations to act on behalf of the claimants.

Impact on gender

The Department for Work and Pensions has described the UC policy as gender-neutral, where "men and women are in the same circumstances they are treated equally under Universal Credit."[100] The Equality Act 2010 requires UK public bodies to undertake an Equality Impact Assessment (EIA) to eliminate discrimination and engender equality of opportunity. The Department for Work and Pensions has only carried out two EIAs at the early stages of UC with both found to be simplistic and surprisingly political, building arguments on assumptions.[101]

[98] Schraer 2020

[99] FOI 2019

[100] Department for Work and Pensions 2012

[101] Women's Budget Group 2019

Several women's charities and advocacy groups have raised the alarm on the harms the UC has on women users. The single payment model also receives criticism for minimising women's financial autonomy. By combining payments (housing, unemployment and childcare) that used to be separate, the model grants authority to the primary account holder and thereby unintentionally gives more power to men in abusive relationships.[102] The focus on households rather than individuals, also assumes that resources are shared fairly between couples. When couples share resources, it is often the woman of the household who goes without basic items rather than their partner.

The payment system is far from dynamic as the monthly assessment does not deal well with multiple and frequent changes of circumstances, which are usually the case for low-income families. The welfare to work scheme also imposes a male perspective of labour, by not recognising the unpaid labour that society depends upon, which is mainly carried out by women. The emphasis on paid work requires single parents to comply with job search requirements, putting the burden on lone parents and promoting the view of single mothers as a financial risk.[103] The efficiencies implemented by the UC algorithm exacerbate these gender inequalities by universally enforcing the criteria without providing an avenue for lodging complaints about inequalities.

More of the same

In two very different scales and socio-political contexts, we see how the public sector hides behind the curtain of efficiency and perpetuates a neutral concept of technology in its digital transformation. This is a lost opportunity. ADMS, when adequately designed for the services they will administer and the humans they will service, can revolutionise societies and address generations of harmful, costly and time-consuming bureaucratic mishaps. However, as we have seen, ADMS can also magnify structural inequalities such as those relating to gender.

The aspirational view of digital transformation, recalling Public Digital's definition of fundamentally changing how an organisation works, means in practice that services need to be reorganised "around user expectations, needs and associated requirements rather than internal logic and needs."[104] The skewed development of digital transformation to favour governments' needs is evident in the hybrid examples seen above, in which the opportunities presented by technology to make government more participatory, open and transparent, do not "gel" in digital welfare applications. Efforts in structuring the service around the citizens' needs, are intended but fall short because of the policy and culture behind them.

[102] Women's Budget Group 2018

[103] Coles-Kemp et al 2020

[104] OECD 2016

Removing barriers

As we have seen, implementing digital projects in the public sector is not something that should be taken for granted. Furthermore, the harmful impact that digitised services can have on vulnerable populations should not merely be reduced to the technology behind them. Rather, it is the intent, strategy and culture of the organisation wielding the technology that should come into question. This does not mean, however, that there have been no notable efforts on behalf of the public sector to improve services in an effort to reach more vulnerable populations. What this does speak to, however, is the fact that when using frameworks and methodologies developed in the private sector, they must be adequately adapted to address the complex needs of governments and the populations they serve.

When it comes to building gender-inclusive services, it is important to have a good understanding of the barriers and challenges women users face in adoption. Such is the case of the Crecer Chatbot, created in Argentina in 2015 to help reduce the maternal mortality rate, which at the time was a national concern.[105]

The Chatbot, designed by the Digital Government of Argentina, addressed the challenge of getting pregnant women to their pre-natal check-ups. They did so by creating a Facebook Messenger chatbot to remind them of their appointments. The design team behind the initiative were not only technologists, but professionals from diverse backgrounds: anthropologists, sociologists and medical professionals, and they conducted a 6-month research effort and built user profiles based on interviews.[106]

Another initiative, Get CalFresh, designed by Code for America, sought to close the participatory gap for SNAP (Supplemental Nutrition Assistance Program in California). A government-led programme, SNAP is an integral programme that helps alleviate poverty in the US. Considering the national statistics, women make up 63% of all adult recipients, and single parents head 58% of all households that receive aid with 92% of those single parents being women, participation in food assistance is a huge contributing factor in helping women and their dependants out of poverty. To accomplish this, Get CalFresh sought to understand the barriers preventing eligible users from applying. Treating the intersectionality of the users led the initiative to understand that there was a need to simplify the SNAP application process to encourage participation.[107] Get CalFresh moved the application process to mobile-first, presented it in plain language and reduced the process time from 45 minutes to 8 minutes, to try and meet the needs of those users who have older phones/slow or limited data.

[105] Three times higher

[106] Abadie 2019

[107] Code for America n.d.

"Digitisation of public services in Mexico is an opportunity to democratise and reduce corruption. Government services are a lot more accessible than they were before. A simple process like getting your birth certificate, for example, might have required someone to travel more than six hours to go to an office with all the required paperwork and lose time they could spend working. Not to mention the 4.9 million undocumented Mexicans living in the US, who would have to risk leaving the lives they have built in the US to get access to their birth certificate."

Yolanda Martinez - Former national CIO, Gobierno Digital Mexico

The above cases serve to illustrate the inextricable link between policy and digitisation. Although they represent different applications to the examples shown in the previous section (Universal Credit and Trelleborg are applications that work within a welfare to work policy), both implemented the user-centred, agile approach inculcated by digital teams in government. They did so, however, under a different premise, helping those who are excluded and most vulnerable have access to public benefits they need.

There are important lessons for governments to learn from the Crecer and Get CalFresh examples. To build automated systems effectively requires an understanding of the barriers that exist, preventing populations from participating in them effectively. Without this understanding, excluded and marginal populations can and will simply be alienated further behind added and more rigid layers of technological bureaucracy.

2

Design challenge: Exploring a gender-responsive digital welfare

The strategies, principles and guidelines for digital transformation rarely address the circumstances on the ground for the services and systems governments are transforming. Instead, these complex systems treat participants as neutral, which completely disregards the diversity of the populations they seek to serve. The reality of this type of digital transformation is a reality of automated errors and further alienation of anybody whose experiences differ from the perceived normal built into the system.

Digital transformation is happening yet gender is not a key consideration, and there is little or no regard for the intersectional experiences of female participants. The first report in this series illustrates how digital welfare applications discriminate against gender and defines principles that must be addressed in order to make systems gender-responsive. Now, this report, the second and final part of the series, attempts to put those principles into practice by designing concept scenarios that could facilitate the development and implementation of more efficient and gender-responsive ADMS.

One of the ways to move forward is to address ADMS as tools that reflect the priorities of the environment they "inhabit". How can we affect the impact these tools have by promoting practices that include different voices and address the different needs of women? How can ADMS, in the context of digital welfare be designed in a way so that it could respond to a lack of gendered data sets and impact assessments? How would a gender-responsive ADMS look?

On this premise, Digital Future Society asked nine designers and technologists,[108] divided into teams of three, to respond to this challenge, and imagine how governments could automate their services without leaving women behind. This section focuses on three design concepts proposed by the three design teams. Straddling between speculative and practical, the design teams had to rethink these systems in order to address the specific challenges and barriers that women face when interacting with these systems.

The design challenge began with a working group where each team received the conclusions of the first report, and a group of experts helped them define the issue their team was going to address. Over the following two weeks, the teams met periodically to define their issue further and develop a design concept that could attempt to illustrate how welfare services that incorporate ADMS into their operations could be more gender-responsive.

[108] Annex I

Figure 2: Image source: Digital Future Society.

Context

The following section explains three design concepts that respond to the three main issues, identified during the working group, that women face as a collective, as impacted by automated decision-making systems. These are, as mentioned in the introduction, being misrepresented by data, not having their situations considered in the decision-making models or exclusion as active agents during the design processes of services that address them.

1 **DefaultsMatter** is a proposal to create a data institution that addresses the need for governments to engage with civil society organisations to fill in the gaps regarding inclusion. It proposes a data institution focused on trust-building through the secure handling of sensitive data and explores alternative data governance models more resilient to political changes.

2 **Who are we missing?** proposes a design process that responds to the lack of diversity at the creation stage of ADMS, and how that directly impacts the data collection process and in turn, the functioning of an algorithm.

3 **Human says yes!** conceives a digital service that includes an interface in which caseworkers and claimants can feel empowered to contest the automated decision, by helping both to visualise other cases and possible areas of discrimination.

Concept 1: DefaultsMatter

Design team: Chuk Ikéh, María Izquierdo, Nerea Luis.

(Please see Annex I for more information about the design team)

Problem definition

Quality gender data is crucial to create more inclusive policy and in turn, public services. Gender-responsive systems could help improve the quality of datasets but must take into account the context women find themselves in and the "sensitive" nature of data that could feed into these systems. This point is most relevant as digital welfare, in its current state, has become an opportunity for many governments to surveil rather than serve the poor.[109] A point echoed by Shoshanna Zuboff, in her book Surveillance Capitalism, technology presents an opportunity for institutions to become more transparent but is more often used to keep tabs on citizens. As Philip Alston argues: "In such a world, citizens become ever more visible to their governments, but not the other way around."[110]

Along with the challenge of information asymmetry, public administrations face an additional challenge in preserving citizens' privacy, anonymity, and legislating third-party access to information and infrastructure. The skills gap that hinders administrations meeting the requirements to handle data sufficiently highlights the need for reliable, solid infrastructure and drives governments to form partnerships with the private sector. In cases such as the NHS contract with Google[111] or the Palantir case,[112] we can see situations in which citizen trust is at stake when governments are not clear about how they are using or sharing their data.

Design concept: DefaultsMatter - Nourishing data-driven systems with understanding and trust

The first design concept proposes a data governance model supported by a human-centric experience framework that empowers vulnerable women while preserving their privacy. Building upon the experience of existing charities and organisations, the design concept unfolds around the following questions:

- What if a non-profit social enterprise could take a data-first approach to its work?
- What if it held richer information about people in a way that still preserves their privacy?
- What if the enterprise were the intermediary in situations where people are vulnerable, overwhelmed or scared of interacting with the government?

[109] Pilkington 2020

[110] Ibid.

[111] McGoogan 2017

[112] Waldman et al. 2018

DefaultsMatter is a data institution[113] that works independently from the government to help women in vulnerable situations access benefits.[114] Its greater goal is to contribute to a better national data infrastructure and improve policies around benefits that disproportionately affect women. To explore what a data institution would look like in this area, the DefaultsMatter concept uses a welfare payment program similar to Universal Credit as a scenario. The concept aims to address ADMS' lack of flexibility and diversity by nourishing the system with human relationships and trust to build a fairer ecosystem.

DefaultsMatter:

- Helps women understand and challenge automated decisions.
- Collects better data about women to inform and improve government policy.
- Holds government accountable and ensures transparency.
- Builds trust by handling sensitive data securely.
- Ensures anonymity.

How does it work?

Behind each application, there are lives, hopes and ambitions. An incorrect rejection from an ADMS can have devastating consequences. How do you empower people that the system overlooks and equip them to seek justice?

DefaultsMatter offers three key services to women:

- *Talk to someone* offers women an opportunity to talk to a professional with (gender-related) experience. They listen and point people in the right direction.
- *Get support* offers practical and on-demand support to understand and navigate government services.
- *Have their collective voice heard* aggregates data. Women beneficiaries can have their collective voice heard, therefore advocating for change in welfare services, policy and government to evolve and include everyone.

As a data institution, DefaultsMatter offers access to aggregated data from women in order to improve the ADMS. Figure 3 shows the type of data that DefaultsMatter handles:

[113] A data institution is an organisation, institution, community or society that dedicates itself to a specific cause or initiative.

[114] Concept adopted from the Open Data Institute, https://theodi.org/

Data Infrastructure

Type of data	Details	Use
False positives	Applications that have been successfully challenged.	For internal use only, could be anonymised for other uses (see figure 5).
Anonymised false positives database	Data that is sent to the Government as feedback for ADMS to improve its decision-making process.	Data highlights missteps in system, informs government to push for changes in policy, and turns data outliers into clusters, improving minorities representation in the ADMS.
Open Data	Aggregated false positives, collected upon consent of the users.	For third parties or journalists to widen access to information about how benefit services are working and how they could be improved.
Audit log	A recorded track of data accessed or used.	Allows claimants to understand when their case file has been accessed.
Temporal read-only codes	Temporary codes generated to "de-trace" sensitive information from the government application from the one stored with DefaultsMatter.	Only accessible by charity workers or applicants in order to check who and when access their data (see figure 6).
Rejections	Cases that aren't initially eligible for benefits by the Government.	Cases that are not initially eligible for benefits are aggregated to inform caseworkers of trends that may go undetected (see figure 7).

Figure 3: Image source: Digital Future Society.

Use Cases:

The following section shows two scenarios that explore how such a data institution could look. The purpose of these scenarios is to provoke further explorations and attempts to find different ways of looking at the problem.

- The first scenario shows a support system for claimants, to address the need for beneficiaries to understand the reasonings behind a decision and the steps they can take to contest.
- The second illustrates how the institution can use data to inform policy and compensate for a government agency's lack of transparency and accountability.

Scenario 1: How DefaultsMatter helps Afsa access benefits:

Afsa is a mother of two who arrived in the UK 15 years ago as a refugee. She lost her main teaching job three months ago and is currently only teaching part-time. What she earns is not enough to make ends meet. Afsa decides to apply for state aid through the Universal Credit (UC) online application system. She meets all eligibility requirements and is surprised when the system denies her application for benefit. Her employer paid her earlier this month because she had to pay for her children's school supplies, and this indicated she did not need aid that month. The system detected she was paid twice in the month and therefore adjusted the calculation on what Afsa receives each month.

She decides to contest the decision, but after posting in her UC journal and calling the hotline, she hits a wall.

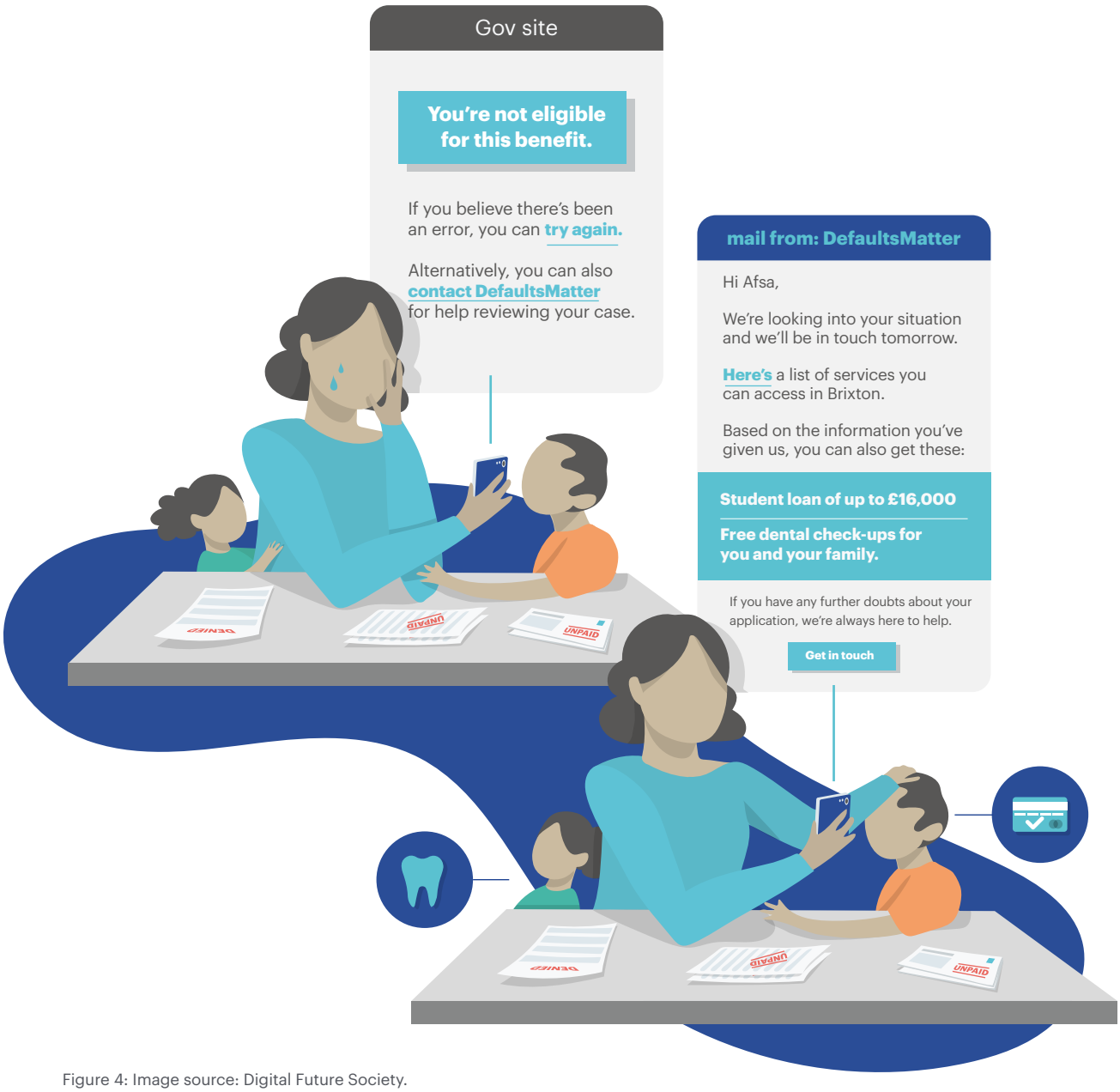

Figure 4: Image source: Digital Future Society.

Afsa sees that in UC's message, they refer her to DefaultsMatter and also recalls a friend once telling her about how the social enterprise helps women with UC cases. Afsa books an appointment with the social enterprise and is impressed by the schedule flexibility, she usually has a hard time booking appointments because of her commitments at home, and her work schedule. She has her first call with the assigned caseworker and provides the code given to her by UC so that the caseworker can look further into her claim. She receives a message from UC services notifying her that the caseworker has accessed her case. Afsa provides the caseworker with more information to help make her claim, and the caseworker informs how DefaultsMatter works and how they will treat her data. At first, Afsa is apprehensive about having a third party access her personal information but is relieved when she can verify the stage her caseworker is at during the process.

DefaultsMatter is then able to query the ADMS run by the public agency. It checks Afsa's eligibility and uses the additional data she provided to make a case for her unique circumstances and contest the system's decision. DefaultsMatter also recommends other relevant benefits for which she could be eligible.

Some weeks later, Afsa receives her first welfare payment as a direct result of the work done by DefaultsMatter in helping her review her case and challenge the initial claim rejection.

Scenario 2: How DefaultsMatter helps inform policymakers with up-to-date data:

One of the main challenges for the public sector when it comes to the implementation of automated decision-making systems is establishing feedback loops in order to understand impact, in this case on gender, and inform policymaking. Cases like Afsa's provide beneficial information, and when aggregated and anonymised, they can reinforce transparency and hold public agencies accountable. It also serves as an evaluation tool to give the caseworkers the information they need to detect trends that may go undetected. Below are some examples of how DefaultsMatter could make better use of data.

1 DefaultsMatter offers a dashboard with up-to-date, anonymised data, open for journalists or any third party.

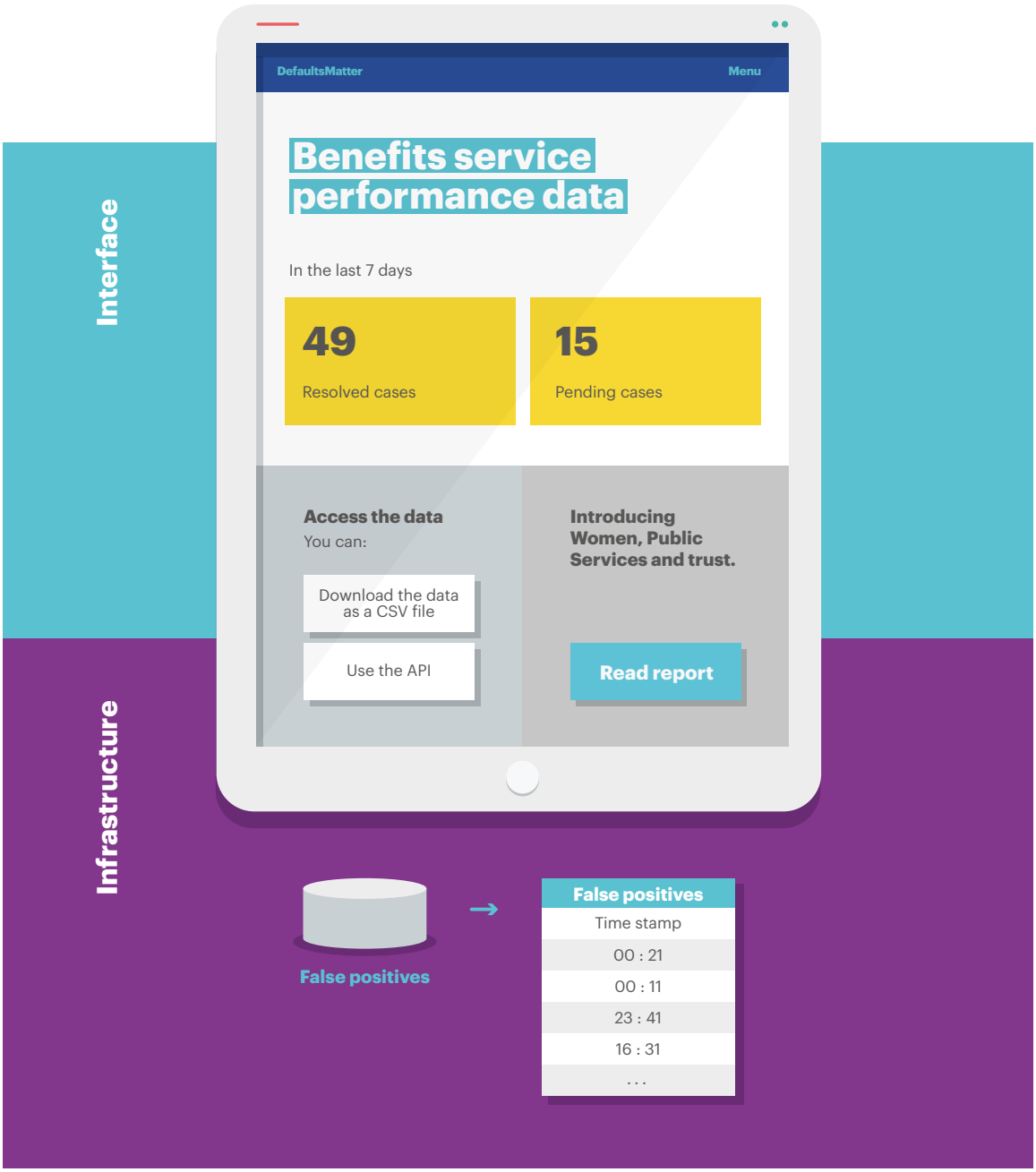

Figure 5: Applications that have been successfully challenged can be used to incentivise the government to push changes in policy. The aggregated false positives are open data. They are collected with the consent of the users and are available for third party use. Image source: Digital Future Society

2 Using the same data, DefaultsMatter creates a different view for the department in charge of delivering the service.

Figure 6: DefaultsMatter internal dashboard for caseworkers. Image source: Digital Future Society.

3 When DefaultsMatter has a high enough volume of cases, it will be able to detect patterns in the data and flag cases that need a staff member's attention.

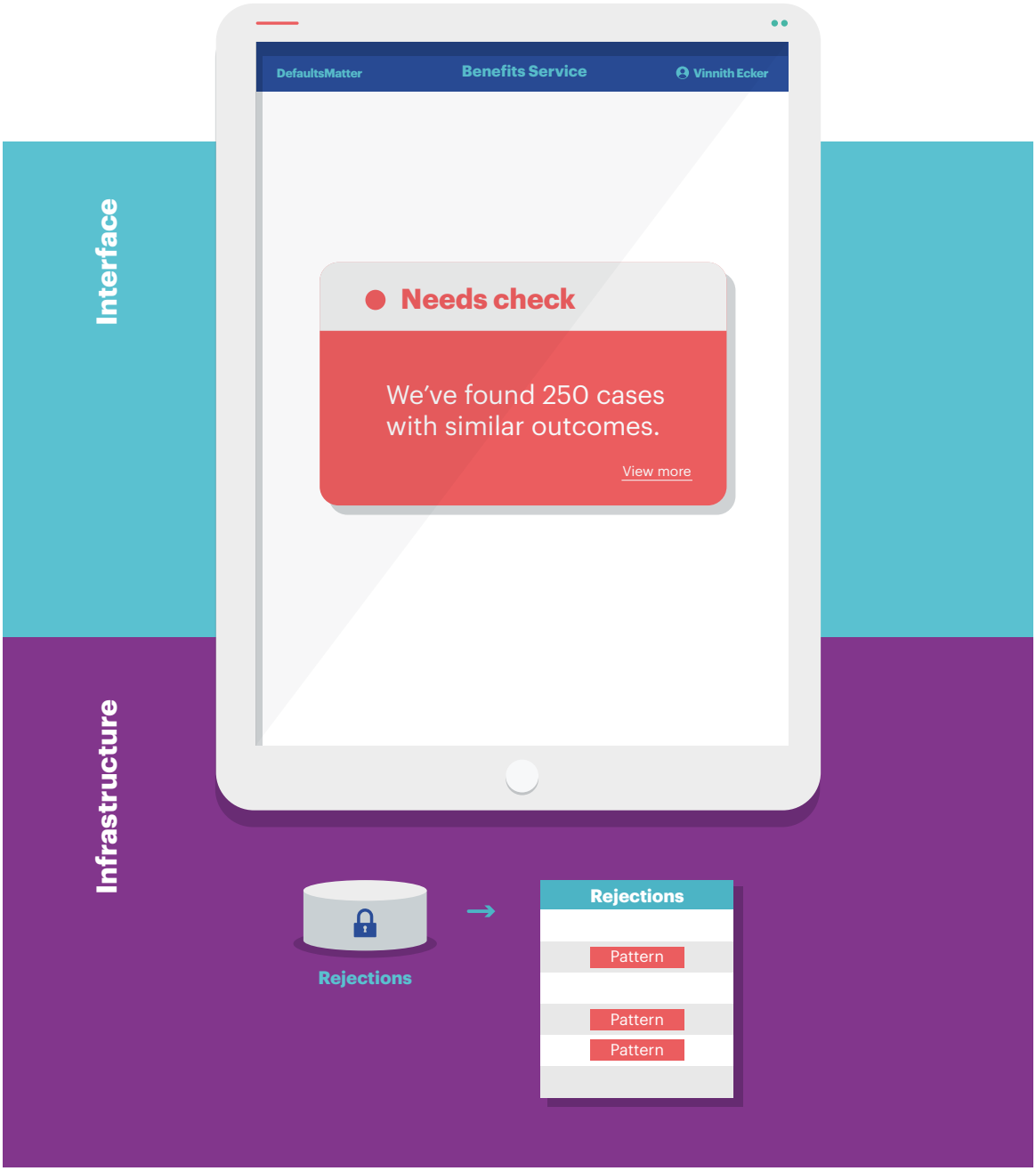

Figure 7: DefaultsMatter aggregates cases that are not initially eligible for benefits to inform caseworkers of trends that may go undetected. Image source: Digital Futre Society

What is next:

The DefaultsMatter team ideated this concept on the premise that within government agencies, specifically those in charge of deploying welfare services, there is a need for better collection, analysis and reuse of data and, additionally, skilled professionals with the know-how to do so. They designed this prototype with a public agency in mind that has a standardised way of sharing data between third parties and that works with an ADMS (can be a rules-based system) that runs behind an online platform in which the claimant may apply for benefits.

To pilot this prototype, the proof of concept should:

- Understand the needs of women and civil servants to create a better definition of the problem.
- Identify applicant cases that have been rejected by a partial or total ADMS.
- Enrich an existing ADMS by identifying false positive rejections through human collaboration.
- Test robustness of the designed data governance model.

The following phases of the proof of concept include further discovery, co-creation and validation with public servants and beneficiaries, the implementation of a workflow tested with the government agency and various iterations (a more detailed explanation is available in Annex II).

Concept 2: Who are we missing?

Design team: Ana Freire, Isabel Izquierdo, Marco Righetto

(Please see Annex I for more information about the design team)

Problem definition

When addressing ADMS, the lack of diversity within the AI industry, if not addressed, will continue to exacerbate demographic differences between those who benefit from the opportunities of applications and those at risk of exploitation.[115] The teams behind the design of AI applications, and in this case, those automating welfare services, are, as Philip Alston highlights, "overwhelmingly white, male, well-off and from the global North."[116] Although there may be values and design principles to ensure inclusion, they are rendered meaningless, as "those choices made in shaping the digital welfare state will reflect certain perspectives and life experiences."[117] A problem also highlighted in the AI now Institute's 2019 Report, which states how attempts to ameliorate the lack of diversity in teams, through fixing algorithms or diversifying datasets, are inadequate and can be ethically unsound. This problem is not new, we have seen how automated tools like the recruiting algorithm discontinued by Amazon favoured men for technical jobs, and that is just one example that illustrates the impact of this "diversity crisis" in reproducing the status quo.[118]

Design concept: Who are we missing?

Who are we missing? is a design process available to public agencies in charge of deploying digital welfare services. The process facilitates a less biased decision-making process using a combination of inclusive and diverse teams and gender-responsive algorithms. The design explores the challenge of how to create a more humane, diverse, and collaborative approach to the design of ADMS in the public sector.

The exploration spans before, during and after the building of an ADMS:

- Before: Could collaboration between key stakeholders inside and outside of public institutions improve upon the lack of diversity in teams?
- During: What if we could include in the workstream and datasets those groups usually excluded?
- After: What if we could ensure a higher standard of fairness regarding groups who may need social protection?

[115] AI Now Institute 2019

[116] Alston 2019

[117] Ibid.

[118] AI Now Institute 2019

The result focuses on organisation-wide practices to create a culture that organically encourages teams to seek diversity.

The concept consists of 4 steps that span before, during and after building an ADMS.

1. Guidelines to create a decision-making advisory board whose purpose is to validate key milestones in the design of the software.

2. Guidelines to set up and run gender-responsive workshops involving the advisory board.

3. An inclusive process for data collection and labelling.

4. Building a gender-responsive ranking algorithm.

How does it work?

1. **Select the right advisory board members.**

   The primary purpose of the advisory board is to aid both public agency actors and the technical team to validate milestones in the design of the software. To ensure that the automated component of the system does not discriminate against women or other intersectional aspects of their identity, the advisory board should include members from diverse backgrounds, including:

   - Women with experience as welfare claimants.
   - Civil liberties organisations involved in the support of welfare claimants.
   - Caseworkers as frontline staff.

   (Please see Annex III for more information.)

2 **Set up and run gender-responsive workshops involving the advisory board.**

The advisory board will be involved in workshops that address the co-creation, prototyping and validation of the automated decision-making system. The workshops will be held between the tech team, board members, and the public administration, bridging gaps between the domains of expertise to understand the effects the implementation of the services have on women. The guidelines (please see Annex IV for more information) focus on the context in which these workshops will take place, rather than content, to help public agencies foster gender-responsiveness.

3 **Foster an inclusive process for data collection and labelling.**

Using quality data is key when training the algorithm. The concept solution proposes a process to ensure that the right information is available, accessible and actionable, and includes the board members to increase the diversity in the process of collecting, organising and labelling.

4 **Build a gender-responsive ranking algorithm.**

The final part of the design addresses how to use the labelled dataset to build a fair ranking algorithm that promotes the protected groups previously identified by the advisory board (please see Annex V for more information).

Use Case: Kendra, advisory board member

Kendra is a member of the advisory board. She works for a charity that supports women who are at risk of social exclusion when applying for jobs or funding opportunities. Her participation as an advisory board member helps the tech team identify ways to improve the automation of the welfare service. She helps by, for example, highlighting that data points should account for gender, as well as ethnicity and income so that the creators can detect any potential bias in the system. She also empowers claimants to better understand the system including why decisions are made and helps with the data collection, assessment and labelling process.

Guaranteeing full and meaningful participation of members from the advisory board group is a priority. Coordinators should consider potential barriers that could affect the participation of all group members and facilitate certain provisions such as compensation, digital equipment, and flexible processes that allow for remote participation.

In one example of a workshop, the board could define evaluation criteria for all applicants or identify those applicants most in need of protection against potential risk.

Kendra uses a tool that allows her and the other gender experts and caseworkers to label the data in terms of risk for social and economic exclusion. Given the provided data, they will be able to label the information used in the decision-making system and assess how at risk the candidate is of being excluded.

The output of this tool is a labelled dataset that can:

- Train a model to underpin the selection process to make people's eligibility fairer.
- Re-rank the candidates so the "protected groups" are represented in the people who will be selected.

Scenario: An inclusive process for data collection and labelling

During the data labelling process Kendra helps the technical team specify what data the model needs, assess the quality of the data collected, and also how to collect information previously overlooked by government agencies.

As part of the process, she provides essential information that will help the technical team decide, such as which variables to include and what weight the variable should have in the decision system itself.

Kendra provides her input to the technical team. The technical team then aggregates feedback from the other board members. Input from all board members is then collectively evaluated. The technical team then seeks to understand:

1. Whether there is enough data coverage of the claimant and whether there are additional factors they consider the ADMS will need in order to make a fair decision about a candidate.

2. Is there enough historical data already labelled, or does the model need a new labelling system?

3. Will reframing the problem improve the service?

Figure 10: Image source: Digital Future Society.

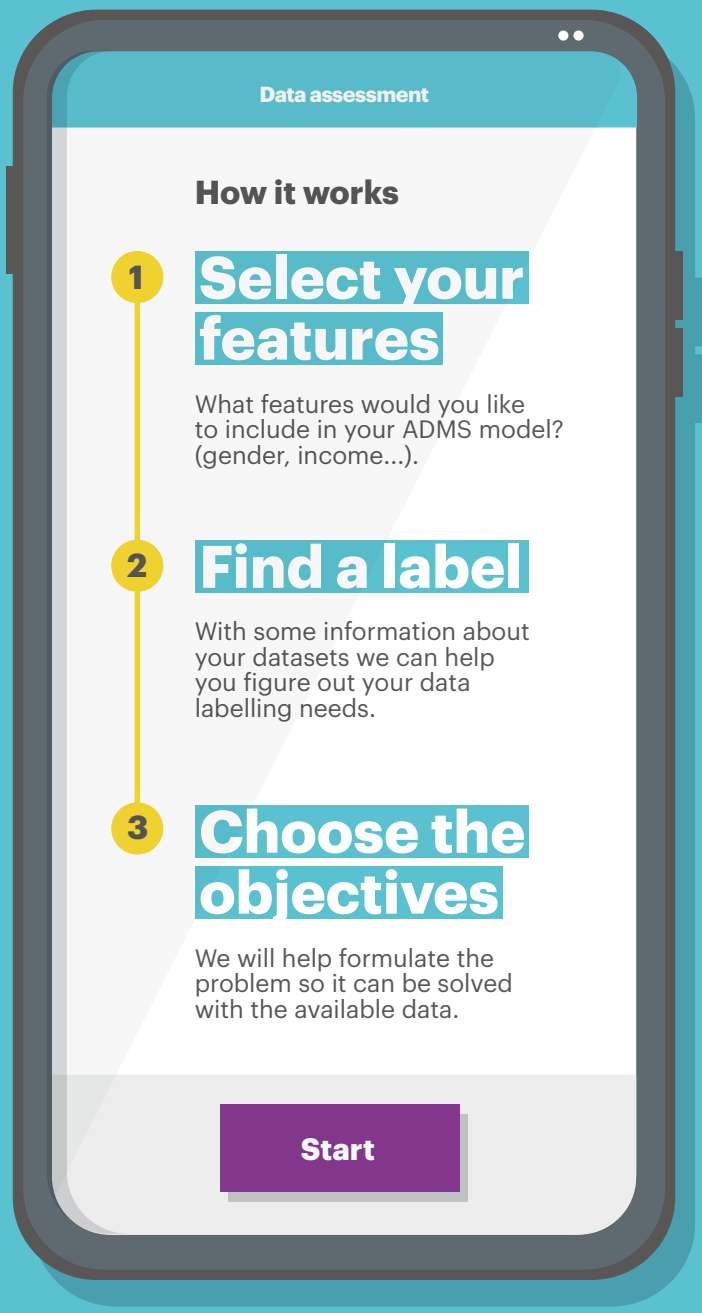

Figure 8: Concept of how Who are we missing? can share and summarise everybody's input in one place. Image source: Digital Future Society.

Figure 9: Based on collective input, this dashboard shows suggestions on next steps, and provides feedback about the quality of the data and possible risks to help the team make decisions. Image source: Digital Future Society 2020.

The board members then individually decide the quality of the data they currently have and determine what the next steps should be. After each member shares their expertise, the technical team can see everybody's input about the current state of the datasets, and which actions will reduce bias. The technical team will also have a very rough estimate of how useful these are to start training the model.

When the team reads the report generated from their assessment, they realise there is room for improvement. Given the data available, for example, there is a possibility that new mums who have had temp jobs could be a sensitive group.

In light of this new information, the team agrees that it is important to account for the participants' risk of socio-economic exclusion. They decide to label the dataset so another algorithm can run in parallel to take this into account when considering who is eligible for aid.

Kendra, along with her fellow board members, labels the data in terms of risk for social and economic exclusion. They flag the information they use to assess risk and then judge the risk of exclusion for the participant belonging to the sensitive group.

The output of this co-creative process is a labelled dataset that can:

- Train a model to underpin the selection process to make eligibility fairer.
- Re-rank the candidates so the "protected groups" are represented as selectable.

How Kendra's insight is used to build a gender-responsive algorithm

The technical team uses the previous contributions from the advisory board to build the fair ranking, leading to the integration of the know-how of non-technical people in the development of the learning to rank algorithm. Annex V provides more information on the use of FA*IR algorithm as detailed in this prototype.

What is next:

The design team conceived this prototype under the supposition that a public agency is using a ranking algorithm to determine eligibility for aid (support). However, the components regarding the creation of a diverse advisory board and their involvement in data collection and assessment could also apply to other data-driven applications. For example, such a solution could work with profiling algorithms that categorise the unemployed according to their employability, like the tool used by the Austrian Employment Agency.[119]

To move forward with the different steps in the prototype, it is vital for those involved to:

- Understand the ecosystem where the ADMS will function in order to contact the right actors to form part of the advisory board.
- Undertake an initial data assessment to identify the technical constraints, risks and opportunities for the prototyping phase.
- Explore the appropriate fair ranking algorithm to suit the agency's needs.

[119] Allhutter et al. 2020

Concept 3: Human says yes!

Design team: Itziar Pobes Gamarra, Sonia Turcotte, Shu Yang Lin

(Please see Annex I for more information about the design team)

Problem definition

A challenge in the digitisation of welfare systems is designing a system in which automation compliments human resources.

The need for efficiency and cost-saving measures in government has profoundly shaped the way government operates and the services it designs. One risk that is difficult to assess is the way frontline workers are affected, and whether the type of knowledge that gets lost during the automation process compensates for the elimination of human bias. Research has shown that frontline workers tend to default to the system's decisions because they feel confident that the automated decision is more accurate, they have no incentives to contest the automated decision, or they have internal objectives to meet.

In the case of Trelleborg model, the system design should help alleviate the pressure faced by frontline staff. There is still a lot to evaluate, however, regarding whether automation provides a benefit for caseworkers. With regards to claimants, the optimistic numbers of a decrease in welfare claimants leads to questioning whether the service has been effective, or claimants have fallen through the cracks.

In addition to this loss of empowerment from staff, systems have yet to maximise the value of qualitative data that caseworkers rely on to understand how the system might be improved to mitigate potential bias or discrimination of the policy or systems in place.

Design concept: Human says yes!

The third design concept is a digital service that proposes an improvement to the interactions between humans and machines, incentivising 'human oversight' for automated decisions by giving caseworkers a more holistic understanding of benefit claimants. The approach suggests a better collaborative process, using the unique skills and experience of humans alongside the analytical and statistical analysis of machines.

Human says yes! leverages two key elements:

- Artificial & collective intelligence for better decisions: pairing artificial intelligence of the ADMS with the collective intelligence and experiences of caseworkers, so decisions are built and improved with both inputs.
- Immediate & long-term feedback loops: by recording the decisions of caseworkers and considering those as collective intelligence, the solution helps build a fairer feedback loop in the current case. It also creates the basis for reviewing the ADMS design or the application of rules and policies in the long term.

The following two scenarios illustrate the design concept:

- The first scenario illustrates a new interface for caseworkers that can help them understand and consider the real-life situations of the person they are facing. When the ADMS recommends a course of action, caseworkers can visualise the overlapping conditions that may be barriers for claimants to meet eligibility requirements. Caseworkers can consult the disconfirming opinions of other caseworkers in similar cases and, if necessary, they can contest the decision and introduce new qualitative data to the system.
- The second scenario proposes a new interface for benefit claimants themselves. Its purpose is to provide a visualisation of their overlapping conditions in the context of other users, as well as anonymised qualitative data from the caseworkers. Beyond transparency, this provides users with a better basis for understanding and potentially contesting an ADMS decision.

Use Case 1: Empowering Rose, the caseworker

Jo is a single mum. She works part-time at the local school as a lunch lady and is a full-time carer of her young disabled child. Jo tends to miss some appointments because it is not easy to get to the welfare office from her home or work by public transportation. Because she has missed some appointments, the social service ADMS flagged her, and she will soon have her carer's allowance stopped.

Figure 11: Image Source: Digital Future Society.

Rose, the caseworker, looks at Jo's case. Besides her personal and family information, she can consult a visualisation of similar and divergent cases. Rose can see that lots of women from the same area often miss appointments or are late, especially if they have caring responsibilities.

Clicking through, Rose can read the arguments that other caseworkers have used to contest the ADMS recommendation of stopping Jo's allowance. This gives her confidence to take another look at Jo's case and provide arguments for her own decision.

Figure 12: Image source: Digital Future Society.

Rose contests the ADMS suggestion so that Jo is still eligible to receive her benefit. Her decision is more objective and transparent because she can easily base it on Jo's situation, as shown by the system, and on the collective intelligence of many other caseworkers.

In the next review period, policymakers and system designers review the results of the ADMS and the caseworkers' decisions. They see Jo's and Rose's case, along with many others in the same direction, and decide on changing how a few rules in the ADMS are applied.

The caseworking system

The caseworking system comes from existing caseworking system interfaces already in use. Pol.is is an artificial intelligence conversation platform normally used during deliberation, that is also able to uncover patterns. This design concept uses pol.is for visualising correlations between cases, surfacing areas of similarity and difference, and displaying the caseworkers' reasons for contesting an ADMS decision.

As discussed in the use case above, Rose was able to see details of the interdependencies by selecting the nodes in the interactive visualisation. Caseworkers are empowered to explore and understand the root cause of each case and consult the details in case notes.

A simple interface, aligned with the caseworker's tasks, is key to enable them to focus on reviewing cases or decide on an appropriate action plan. In the meantime, the machine takes care of scanning attributes, pulling several cases side by side for easier comparison, etc.

If a caseworker decides to review the ADMS decision, they can leave detailed notes, which will then be visible to other caseworkers.

The data in the system is up-to-date all the time, and data points can be contributed to by other colleagues. This empowers caseworkers to build arguments for overriding ADMS decisions when appropriate.

What is Pol.is?

Pol.is is an open-source AI-powered tool that has been used widely in the civic technology field to moderate online conversations for large groups (1000+). Pol.is allows users to vote in response to statements from other users. They can “agree”, “disagree”, or “pass” and Pol.is uses a machine-learning algorithm to cluster users who voted similarly. One key advantage is that Pol.is helps visualise divergent opinion groups.

As a tool that visualises diversity, Pol.is is repurposed in this case to help caseworkers visualise diversity in casework, allowing them to understand the whole picture while reviewing each case.

Figure 13: Digital Future Society.

In practice, the caseworker can highlight Jo (b), to understand what similarities she has in common with other claimants (c), and what other caseworkers deliberated. By focusing on one characteristic, caseworkers can compare and see whether this is a single occurrence or a pattern (d). By using pol.is, the caseworker can identify a set of similarities among cases, which in turn can help the creators of the system understand if there are any automated discriminations.

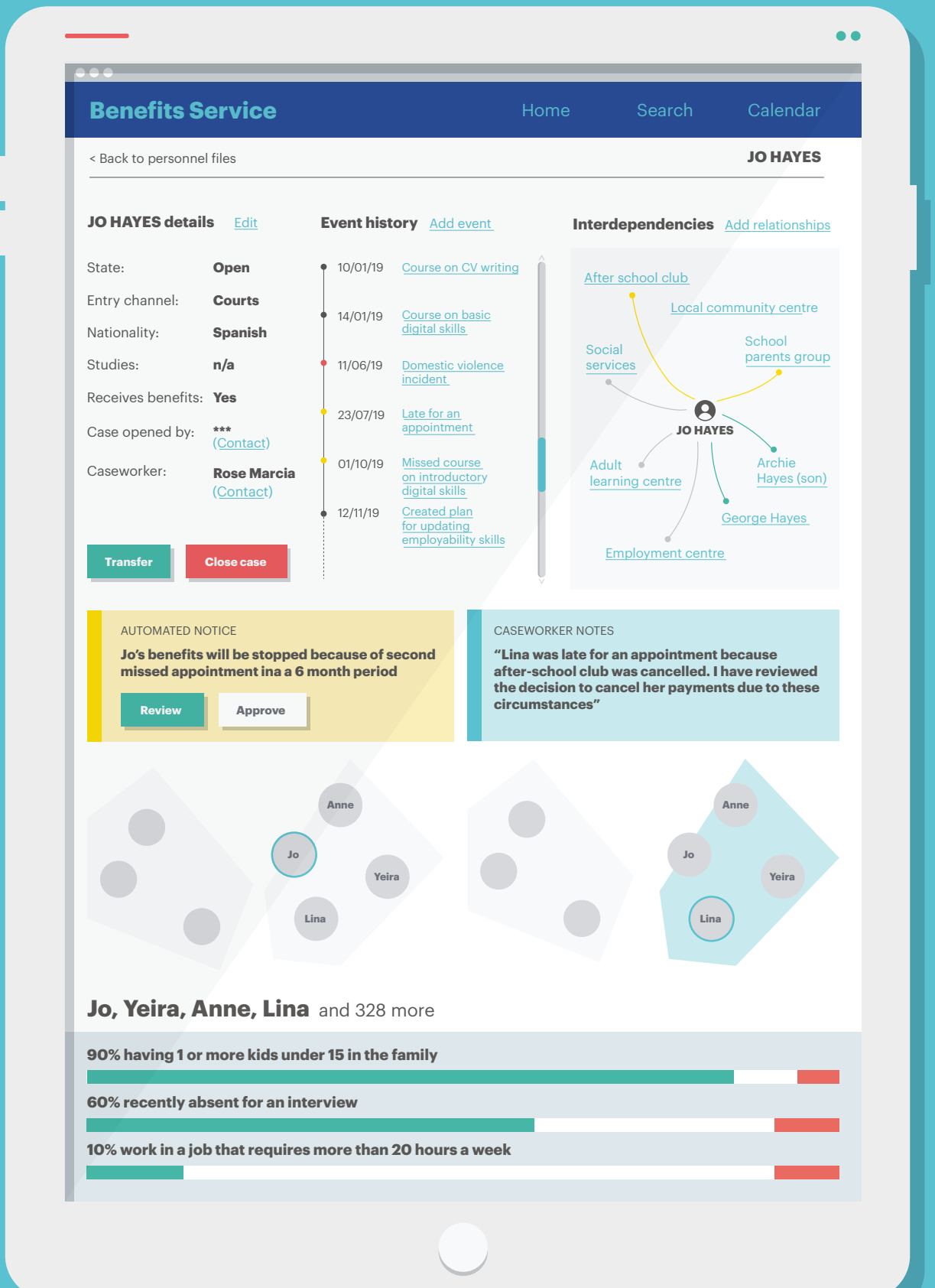

Figure 14: Image source: Digital Future Society.

Use case 2: Empowering Jo

What if it is not Rose's decision to override the ADMS recommendation to stop Jo's allowance? Jo finds out that users can also consult the public version of the collective intelligence system on their own.

Jo accesses an anonymised and aggregated view of cases similar to hers. She does not have access to her, or others, personal information, but she can consult the decisions in cases similar to hers and read an anonymised version of the caseworkers' arguments that were previously used to contest similar ADMS decisions.

The interface is especially light, and Jo can check it on her mobile with limited bandwidth. When she finds cases similar to hers, she can assess which arguments are useful for her and save and download them in PDF form to consult them offline.

She can later present her argument confidently to the caseworker who will re-examine her case, or she can write her own claim through a straightforward online form, where she only needs to include the codes of the cases she wants to use as an equivalent and why. But she can also look for help if she is afraid to write it by herself.

Figure 15: Image source: Digital Future Society.

Feedback loop

In the case presented, we see two moments during the process at which new information/ data informs the ADMS. In the short term, caseworkers can use their colleagues' contestations to back up their own argument to counter the system. While in the long run policymakers and designers can address these contestations in order to address any blindspots in the rules of the ADMS itself.

The image below depicts how the feedback loop works for the current case and in the long-run.

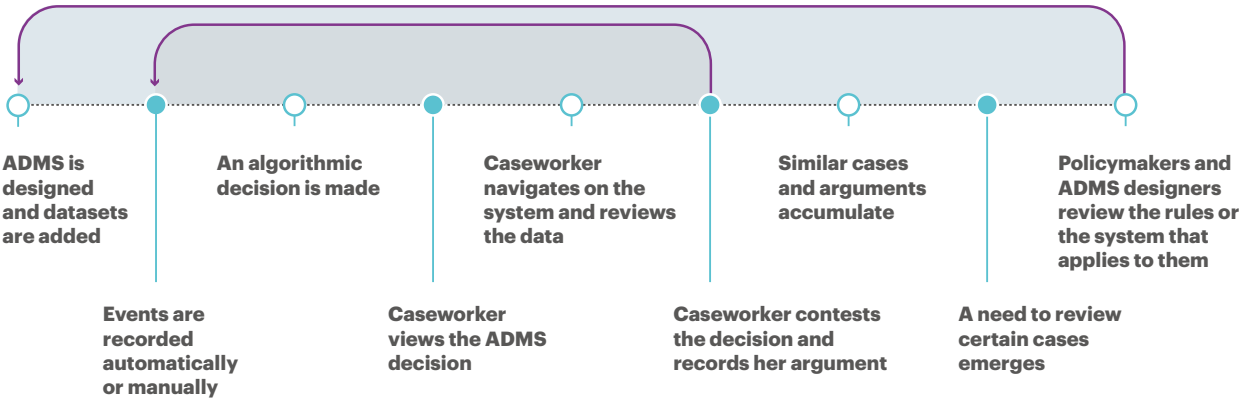

Figure 16: Image source: Digital Future Society.

What is next:

The design concept seeks to respond to the lack of transparency of ADMS systems and the need to integrate qualitative data for better decision-making. It assumes that improvements to the design could lead to a behavioural change among frontline workers and that a gender-responsive feedback loop could engage policymakers and ADMS designers to review staff input more actively.

To move forward with this design concept, the following must be considered:

- First, the concept comes from issues raised in literature regarding the general challenges of ADMS. Designing a relevant system requires in-depth research to understand the common pain points between caseworkers and staff involved in the creation and implementation of ADMS, along with suppliers and system developers to understand the technical requirements of the system and policymakers to understand the legal requirements.

- Secondly, there is a need to assess the data to evaluate the gaps with regards to gender perspectives. Once the problem and potential risks are clearly defined, the prototype can be built and tested with frontline staff, welfare beneficiaries, policymakers and system designers. Once the development of the case management system is complete, creators can assess how caseworkers are using the system and therefore evaluate impact and outcomes. Through regular reviews and iteration, data scientists and analysts will aggregate input from frontline staff for review. Policymakers and ADMS designers will also ensure that the datasets and ADMS adequately represent women and other vulnerable people.

Design concepts: Key takeaways

Design concepts & strategic intent

As alluded to in the introduction, the concept of strategic intent[120] has served as a guide for thinking about how ADMS in digital welfare can respond to the vision of gender responsiveness. The use cases and scenarios included in the design concepts help us think and see details on how automated services can behave to increase inclusion and gender-responsiveness.

We can see how each concept touches on the main pain points women face as users of digital welfare. Mentioned earlier, these are being misrepresented by data, not having their situations considered in the decision-making models or exclusion as active agents during the design processes of services that address them. In practice, this means:

1. Addressing services around ADMS to consider gendered barriers.
2. Maximising on opportunities to increase inclusion in the design of the systems.
3. Making room for new metrics that consider the lack of quality datasets on gender.
4. Guiding a holistic digital transformation within the public sector.

[120] The glue that translates the motivating force of a grand vision into principles that can be used to make choices on a more discrete level.

DefaultsMatter, Who are we missing? and Human says yes! convey features and characteristics only accessible when diving into possible scenarios of implementation. The use cases contribute to the points above in the following manner:

1

Services around a gender-responsive ADMS are able to understand the physical, cultural and socio-economic barriers that women claimants face when applying for or interacting with digital welfare services. For the public agency designing the service, this could mean:

- **Providing flexible services in terms of time and available channels to facilitate access.** Ex. DefaultsMatter consciously meets the needs of Afsa by providing her with scheduled time slots that compliment her busy work-life schedule.
- **Using plain language in digital public services.** Ex. DefaultsMatter and Who are we missing? highlight the use of plain language in communication to ensure full and conscious participation.
- **Considering support for low-end devices and non-digital profiles with text message-based interactions or off-line content.** Ex. DefaultsMatter sends claimants an SMS each time their data is accessed and Humans Says Yes! provides claimants with an offline option to visualise their case.

2

Digital welfare services have the potential to increase inclusion by seeing ADMS as more than a technological tool. The more inclusive processes are, the better they can design tools to meet the needs of those most impacted. As we have seen in the scenarios above, inclusion can be engendered by:

- **Creating People to Machine (P2M) collaboration spaces to generate value for end-users.** Ex. By repurposing Pol.is, Human says yes! facilitates knowledge sharing between frontline workers to help make a better-informed decision.
- **Using iterative and co-participated data for algorithm training.** Ex. Who are we missing? defines the processes of data collection and assessment that come from different stakeholders.
- **Building opportunities for added value services built on top of data.** Ex. DefaultsMatter provides government agencies with a service to understand possible data-based discrimination.

3 Requirements and metrics in ADMS should be flexible considering the intersectionality of the user, the lack of gendered data in public services and the over-reliance on statistical data. Gender-responsive ADMS require:

- **Creating new success indicators for ADMS beyond operational and efficiency criteria.** Ex. Who are we missing? recognising the "weakness" of algorithms and then compensating by giving the advisory board "power" to attribute more weight to those cases that are most likely at risk of exclusion in order to create a fairer algorithm.
- **Considering users' needs and interests as an input for technological requirements.** Ex. Human says yes! addresses the co-creative element, as frontline workers can feel forced to work with mechanistic logics that contradict their professional and personal experience.
- **Facilitating transparent and real-time feedback loops.** Ex. All concepts ensure ways in which the ADMS can be revised based on new data and use the collective intelligence of frontline workers to allow policymakers and ADMS technicians to adjust the workings of the system.

4 Guiding a holistic digital transformation within the public sector, and going beyond efficiency, means that technology can be a useful tool in making processes and services more accessible and transparent. This includes:

- **Facilitating new types of relationship between governments and service users.** Ex. Human says yes! promotes transparency through its collective visualisation of other cases to empower service users, making them participative in holding government accountable for automated decisions.
- **Considering cross-reference and interoperability between public bodies and external organisations to increase awareness and access to services.** Ex. DefaultsMatter offers two feedback mechanisms, one for the government agency involved so they can learn of denied and contested cases, and the other for civil society organisations whose interests lie in protecting the rights of women claimants.
- **Offering tips and guidelines to work in diverse and cross-functional teams.** Ex. Who are we Missing? combines a co-creation approach and conceives of a channel to facilitate experts input on the quality of data training the ADMS. By ensuring diversity in the advisory board, Who are missing? ensures that different perspectives enrich the dataset.

Conclusion

Automated Decision-Making Systems, the decision to implement them and their very purpose for being are, like everything we create, a social construct. This technology is only one part of the many cogs within the administrative machinery behind it. The actual risks and challenges posed by automating complex systems must help shape the design of those systems rather than simplified ideas of efficiency.

This two-report series looking at how digital welfare systems treat, and so often ignore, the experiences of women, aims to highlight said risks and challenges, and further still offers prospective designs for how to deal with them effectively. Report one, Towards Gender Equality in Digital Welfare, addresses the ways traditional welfare systems fail to consider the lived lives of women claimants and offers four guiding principles to help overcome this reality.

The first part of this report adds to this and shows how the evolution of what we call digital transformation in governments has been fraught with inefficient corner-cutting. Hiding behind an imagined neutrality of digital technologies overlooks the experience of women and does not even recognise that, in the case of welfare systems, women are the main claimants. Furthermore, although the private sector has provided many "lessons", it is clear that public agencies have to forge their own path as they go through a delicate balancing act, trying to optimise the cost-cutting benefits and efficiencies promised by technologies, all the while shaping norms and providing inclusive services for all.

By adopting different methodologies, public agencies will come to understand that flexible ways of implementing and designing will not only be more cost-effective in the long run but also create a more receptive approach to the collectives they seek to serve.

The second part of this report conceives of automation as part of a greater ecosystem, which relies on different stakeholders, proposes new metrics and maximises the opportunities that governments have within reach. Building on the principles defined in the first report, the design concepts presented construct a possible reality, where automation can empower women, a traditionally excluded and silenced collective.

Design plays an essential role by helping us to see and build a world that allows and enables women claimants to become more active agents in society. Agents who can traverse the traditional and patriarchal barriers that hold them back and also define, design, feed and improve the systems that support them through their own experiences.

It is important also to note, however, that as this series of reports highlights, the Covid-19 pandemic has swiftly turned back the clock on progress towards a more gender-equitable society. Here again, though, the need for a robust and inclusive design process is made abundantly clear as the current global context shows us that it is not just marginalised populations who are at risk from poorly conceived and executed ADMS.

There has been massive upheaval in the UK this summer, with children taking to the streets in protest against a shoddy algorithm's systematic allocation of their future expectations. The algorithm entrusted to decide their exam results, and therefore their university opportunities, sat at the heart of the children's grievances as they forced the UK government to make an embarrassing U-turn.[121] Governments and policymakers around the world should take note of this experience. Well designed, inclusive and transparent automated government services can empower the populations they serve while poorly designed, and target-focused automations have the power to enrage them.

[121] Weale and Stewart 2020

Annexes

Annex I: Who are the design teams behind the concepts?

Coordinator

Beatriz Belmonte – Beatriz is the Head of Service and Experience Design of the PublicTech Lab at IE University. She holds a Bachelor of Art History from Universidad Complutense (Madrid) and has extended her training with a Bachelor of Information Management from Universitat de Barcelona and further studies on design and management in Central Saint Martins (London) and IE Business School (Madrid). Beatriz's expertise is in digital service design projects where she has been working for the last 10 years. She has collaborated with private companies and public sector entities, leading digital transformation projects through design.

Design team 1 – DefaultsMatter

Chuk Ikéh – Chuk is an experienced content designer and UX writer with a demonstrated history of working in the design industry. Chuk is skilled in multiple areas of content production, including journalism, marketing, UX/content design and content strategy and has a strong media and communications background with a BA (Hons) London College of Communication, one of the constituent colleges of the University of the Arts London.

Maria Izquierdo – Maria cares about contributing to a better future, that distributes power and puts people's needs first. Her work as a service designer focuses on bringing teams and organisations together, advocating for businesses that create value for society.

Over the last 10 years, Maria has worked in the private and public sector on subjects such as data infrastructure for public services, AI in healthcare and practical ethics in emerging technologies. Her recent work includes Babylon Health and the UK government. Maria also engages with visual culture through the lenses of queer theories and current socio-political and cultural issues. She holds an MA in Design Products from the Royal College of Art in London.

Nerea Luis – Nerea has a PhD in Artificial Intelligence and is currently working as an Artificial Intelligence Engineer at Sngular. In 2016, she won the Anita Borg scholarship by Google for her technological initiatives. Among them is T3chFest, a free-to-enter technology event (+2000 attendees) that also promotes and highlights the lack of diversity in that sector. In 2018 the COTEC Foundation selected Nerea as an expert in Technology, Talent, and Gender within its network "Los 100 de Cotec". That same year she was selected as a scientific advising technician, in the Science in Parliament initiative. Business Insider has recognised Nerea as one of the 23 talents under 35 for leading the technological revolution. Recently, the Royal House awarded Nerea the Civil Merit Order award and she has also been included in the list of the Top 100 Women Leaders in Spain.

Design team 2 – Who are we missing?

Ana Freire – Ana holds a PhD in Computer Science and is a Lecturer and Researcher at Pompeu Fabra University in Barcelona. She has received multiple awards for her research combining novel, cutting-edge technologies pushing social and economic impacts. Ana's contributions include more than 40 publications in scientific journals, and some of her work has also supported the creation of several patents. Ana has also worked with prestigious, worldwide institutions such as Yahoo Labs and Glasgow University. In 2019, Business Insider listed her among the 23 under 35 tech leaders in Spain. Ana also leads STOP (Suicide deTection in sOcial Platforms), a multidisciplinary project aimed at detecting users with mental disorders through social media (https://stop-project.github.io/).

Isabel Izquierdo – Isabel works with organisations to help people navigate the rise of conversational artificial intelligence in order to develop the practice and show how to use it for good. She translates technical jargon and "AI hype" into human stories and actionable projects, building products and services we can all understand, own and use. Isabel co-founded an award-winning AI startup to make daily tasks easier for people with visual impairment using computer vision. Isabel also worked with non-profits in the US to democratise access to conversational AI and big data for social good. She has held research positions to address violence against women at United Nations Women, Universidad Autónoma de Madrid, and Columbia University in New York.

Marco Righetto – Marco is a designer, innovation strategist and product leader, who aims to affect how people think, feel, and behave and enact positive change. He is passionate about the role of design at the intersection of digital services and the public good. Marco has extensive experience designing and building digital products and services, at international consultancy firms like Fjord and IDEO, startups, and product companies such as Spotify. He co-founded Streetlives, a mission-driven organisation that drives systemic change toward an equitable and inclusive model for social services, building digital products with, not for, the homeless and vulnerable communities in New York City.

Design team 3 – Human says yes!

Itziar Pobes Gamarra – Itziar is a service designer and the mastermind behind We Question Our Project, a service design studio based in Barcelona. She typically helps public organisations and businesses understand the citizens' or their clients' needs and craft new services around them. Itziar has been working on projects in healthcare, social services, education, economic development and tourism, urban environment and energy, among others. She is also the coordinator of the MA in Service Design at IED Barcelona.

Itziar also uses some of her time to promote service design as a field, and service design in the public sector through organising events such as the Barcelona GovJam and giving talks or workshops in conferences like Service Design in Government or Advancing Research.

Shu Yang Lin – Shu is a re:architect & international liaison of PDIS.tw who worked as an interaction designer and creative technologist with international teams before co-founding PDIS with the Digital Minister of Taiwan. She leverages her passion and skills in interaction design and HCI (Human Computer Interaction) to rethink the interaction between government and civil society. Shu's computer science background helps her assist the digital transformation in Taiwan's open government scene. Her work as a re:architect in PDIS means constantly reflecting and reshaping the culture in her team and as well as the government overall (http://info.vtaiwan.tw/).

Sonia Turcotte - Sonia is passionate about using design to reduce inequality. Her practice prioritises accessible and inclusive design and improving the lived experience of vulnerable people and groups. Sonia's work cuts across design, technology and the social sciences.

As a designer, Sonia has worked both for the UK government and in the charity sector on a range of print and digital products and services.

As a researcher, she has explored the opportunities and challenges of designing for new and emerging technologies, carefully considering their ethical and social impact. Her most recent project looks at the impact of new technology on people, particularly queer communities, who are usually under- or mis-represented in data collection and data use.

Annex II: DefaultsMatter roadmap

1 Discovery, research and exploration

Organise different sessions to validate the hypothesis, understand the context how the system will be designed. Groups of interest:

- Civil servants from customer service and technical roles.
- Workers from government agencies, and foundations.
- Women who have low-income and depend on additional support, including single-mothers and two-parent households. Especially women who have had their application for benefits denied.

2 Technical exploration: choosing the service, understanding the data

Option A: Public agency buy-in: public servants decide which welfare service better adjusts to the requirements regarding the proof of concept. We recommend that the service allows online applications and depends on an ADMS that completely or partially decides eligibility and allots payment. The public agency identifies those potential applicants that would be willing to take part in the experiment.

Option B: The public agency in charge of deploying the automated welfare service, provides pilot designers with a list of rejections and also identifies/recruits potential applicants that would be willing to be part of the experiment.

With regards to the technical infrastructure, pilot designers would need to:

- Build a private database to store rejection cases.
- Build a database to store successful cases and ensure that these cases are effectively anonymised.

- Create an open-access service (.CSV file or API) to retrieve data from successful cases.
- Design a read-only code to access the applicant's submitted information.
- Design a temporal read-only code for the applicant to trace who and when someone from the organisation accesses his/her data (in the hypothetical organisation).
- Implement the web service to see access logs and designated workers: both an applicant's view and an admin view.

3 Design the workflow to give back to government

Conduct hands-on sessions with public agency representatives and people from technical roles to verify the joint public-private workflow proposal to benefit both sides.

- Discuss data from false positives to understand which information is more useful for the administration to identify or return.
- Define how to send anonymised false positives to the government.
- Define certifications or data-sharing agreement that the future external organisation needs to sign or obtain.
- Define human collaboration experience based on the proposal.

4 Evaluation

Test the workflow from infrastructure to feedback loops with the administration. Fix errors and repeat until the process is agile and easy to handle.

5 Future Work

- Pilot proposal to integrate the testing environment in an external organisation.

Annex III:
Who are we missing? Advisory board makeup guidelines

Use the following questions to explicitly define the composition of your board and how it represents the population you are serving:

Gender Distribution:

What percentage of board members self-identify as women?

Socio Economic Represenation

Are all socio-economic strata (e.g. as defined by the national statistic agency) represented? If not, why?

Members with Lived Experience

What percentage of the board are women with lived experience relevant to the welfare benefits in question?

Minorities & Intersectionality

What percentage of the board are legally recognised minorities and/or varied intersectionality (e.g. ethinicity, race, sexual orientation, physical or mental disabilities)?

Civil Liberties Organisations

What is the percentage of members proposed by civil liberties organisations?

Caseworkers

What percentage of the board are frontline staff (e.g. caseworkers) that previously supported applicants to this (or similar) welfare benefits?

Never applied before

What groups of women have never applied to this or similar benefits? Are they represented? Why?

Previously rejected

What groups of women applied but never received the benefit? Are they represented? Why?

Annex IV:
Who are we missing? Gender-responsive workshops guidelines

Use the following guidelines to set up gender-responsive workshops:

Distributed First

Consider all workshops as if no physical space will be available for people to gather. Beyond increasing safety during the Covid-19 pandemic, this approach is more inclusive of board members for whom commuting could be expensive, hard, or impossible due to personal/caring commitments.

Plan Ahead

Provide a rough estimate (e.g. week of) of when key workshops will happen so that participants can plan accordingly.

Provide options

Rather than making assumptions on availability, ask participants when they would be available and provide options.

Anonymity

Whenever possible, collect attendance anonymously to increase openness.

Invite the right people to be in "the room"

Not all workshops will require the attendance of all board members. Formalise what the goals for the workshop are and make sure you have the right people to ask pertinent questions or provide appropriate answers that lead towards these goals.

Annex V: Who are we missing? Gender-responsive ranking algorithm

The recent research literature on fair ranking algorithms already offers some implemented and tested solutions that can be easily adapted to build a gender-responsive ranking algorithm. These approaches can be classified into three different types: *pre-processing*, representing those techniques that mitigate discriminatory bias in training data; *in-processing*,[122] those that address potential issues of discrimination and unequal opportunity in rankings at training time; and *post-processing*,[123] referring to those algorithms which re-rank a previous unfair ranking. Each of these could be built using several different attributes combined through machine learning.

Let's explain in detail how a post-processing algorithm works, as the explainability is usually higher in these approaches. Authors Zehlike and Castillo,[124] propose a post-processing method, named FA*IR, that can be used to re-rank the output of a previous algorithm to make it gender-responsive. Therefore, it assumes that a ranking function has already been trained and a ranked search result is available. The figure above represents the behaviour of the algorithm.

This algorithm ensures a minimum target proportion of a protected group at every prefix of a ranking based on a statistical significance test. Therefore, the algorithm creates two lists with up to k candidates each: P_0 for the non-protected candidates and P1 for the protected candidates (both ordered). Then, it computes the minimum number of protected candidates, following the table included in Figure 7. Afterwards, for each position of the new ranking, if the previously computed table demands a protected candidate at the current position, the algorithm appends the best candidate from P_1 to the ranking; otherwise, it appends the best candidate from the union of both lists - i.e. from the original ranking.

[122] Zehlike et al. 2020

[123] Zehlike et al. 2017

[124] Ibid

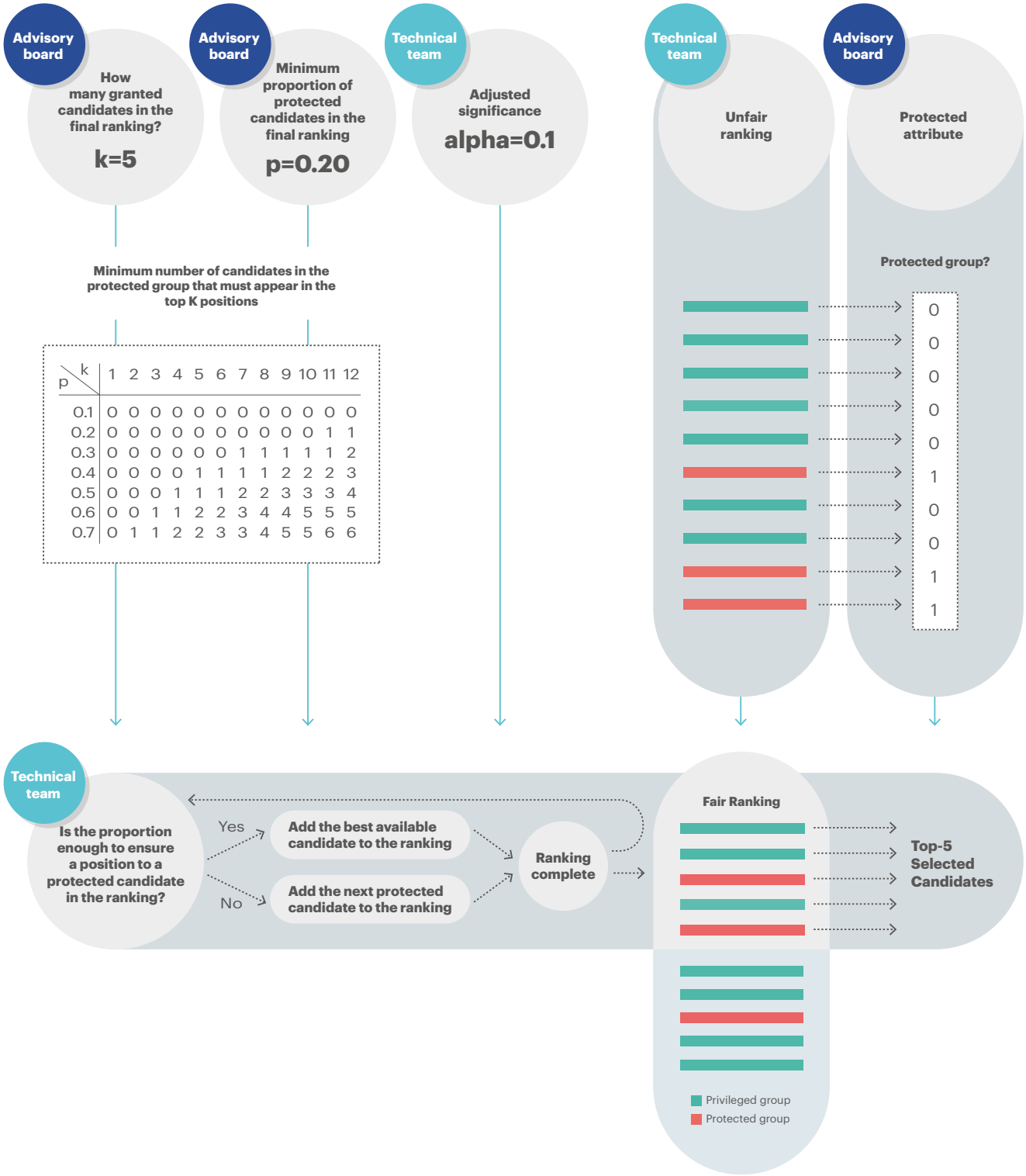

Figure 17. FA*IR Algorithm description. Image source: Digital Future Society. Data source: Zehlike, M. (2017)

In order to use this algorithm, the **Advisory Board** should define the **input** to the system, which is determined by the following variables:

- The **number of granted candidates** among all n applicants - i.e. the size of the final ranking (denoted as *k*).
- A boolean vector representing, for each candidate, if they belong to a **protected group**. If we represent this vector as $\hat{q}$, each component q_i will take the value "1" if the corresponding applicant belongs to a protected group and "0" otherwise.
- The **minimum proportion of protected candidates** in the final ranking ($p \in [0,1]$).).

The technical team should define:

- The result of a **first "unfair" ranking** - i.e. a vector of the applicants' qualifications (denoted as $\hat{p}$).
- The **adjusted significance** for each fair representation test (described in detail in [1]). Recommended value: α =0.1.

With this information correctly defined, the technical team should be able to run the FA*IR algorithm and output a fair top-k ranking.

This algorithm is available for public use at https://github.com/fair-search through a Python API, a Java API and also a plug-in for Elasticsearch[125] (a widely used, popular, well-tested search engine). This will facilitate the job of the technical team.

[125] Elastic.co 2020

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