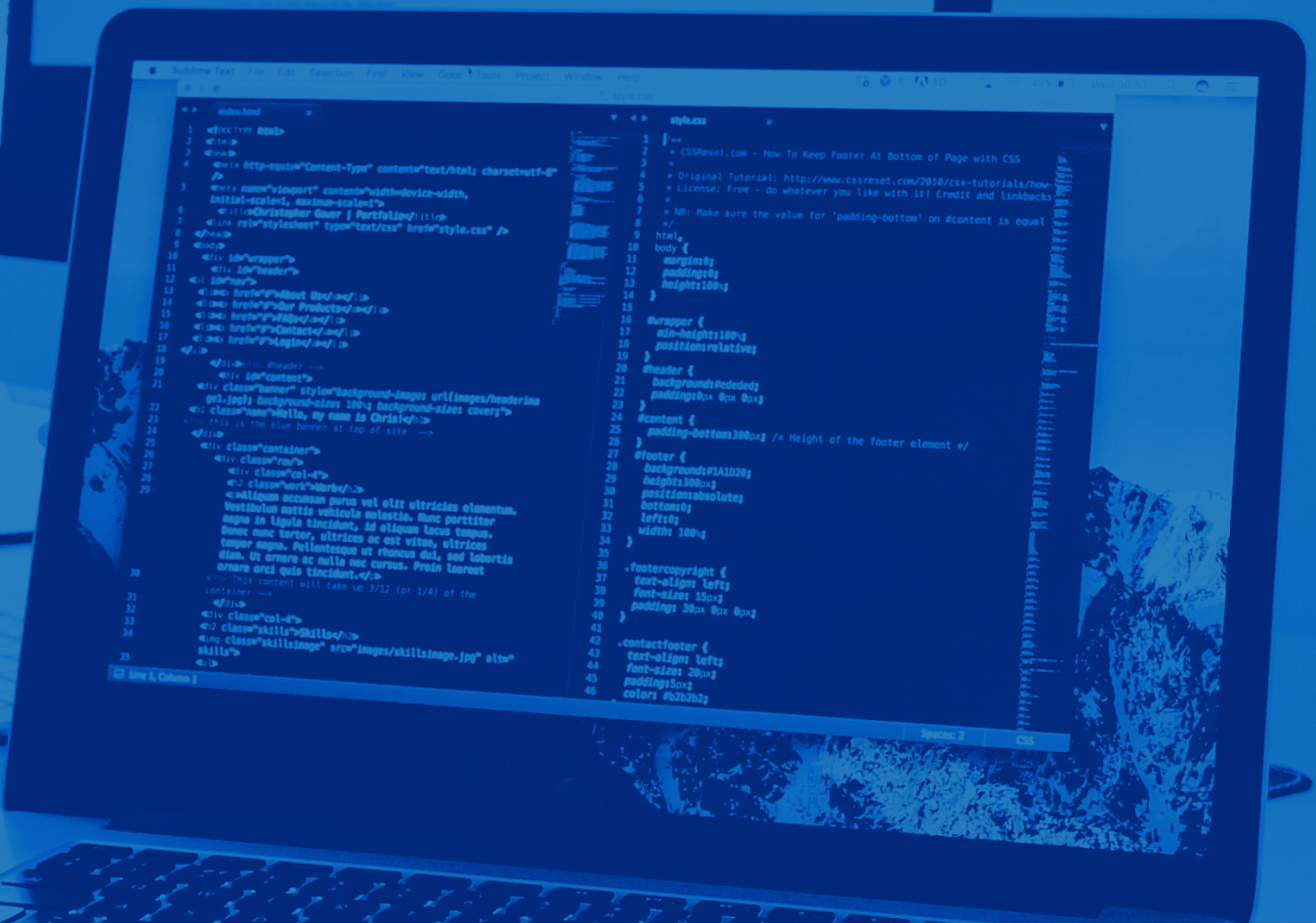# Policy As Code

ENABLING IMPROVEMENTS FOR MORE TIMELY DELIVERY OF UNEMPLOYMENT INSURANCE

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ABOUT THE TECH EXECUTIVE LEADERSHIP INITIATIVE

The Tech Executive Leadership Initiative (TELI) is a skills-building initiative to prepare experienced technology leaders to engage effectively with public sector challenges.

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I. Executive Summary

During the COVID-19 pandemic, state unemployment agencies faced enormous challenges in efficiently implementing federal government legislation on unemployment insurance. Guidance provided by the U.S. Department of Labor was lengthy and confusing, and did not take into account the intricacies of state unemployment systems. As such, states were unable to make updates to their unemployment systems in a timely manner, leading to delays in processing unemployment assistance checks for thousands of recipients.

In order to more quickly and nimbly respond to unemployment crises, this paper proposes the adoption of "Policy as Code." We recommend that the Department of Labor begin issuing certain guidance to states as "code," or directly implementable logic, that would allow states to more easily interpret and deploy new legislation. This would allow states to process unemployment claims more efficiently, and would reduce misinterpretation of Department of Labor guidance.

II. Introduction

In the aftermath of the Great Depression, the first nationwide provisions for unemployment assistance were passed as part of the 1935 Social Security Act ("SSA").[1] Since that time, unemployment insurance (UI) assistance has been a longstanding partnership between the U.S. Department of Labor (DOL) and the state agencies who are charged with implementing these programs.[2]

Eighty-five years later, in 2020, Congress looked to the SSA — and UI in particular — to establish an economic social safety net for millions of citizens who had lost their jobs almost overnight due to the COVID-19 pandemic. On March 27, 2020, Congress passed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), authorizing individual states to implement three new federally funded UI programs: the Federal Pandemic Unemployment Compensation (FPUC), Pandemic Unemployment Assistance (PUA), and Pandemic Emergency Unemployment Compensation (PEUC).[3] These programs temporarily expanded existing UI eligibility and benefits. The intent of the new programs was to provide emergency assistance for individuals affected by the pandemic as quickly as possible, given the sudden spike in unemployment claims.

The COVID-19 pandemic crisis is unique, but the failure of state UI systems has been a longstanding issue.[4] The implementation of the CARES Act strained states' ability to seamlessly execute their UI programs. States were processing an unprecedented number of claims, while simultaneously seeking to modify their existing legacy systems to implement the new provisions. The Department of Labor's Employment Training Administration (ETA) provided guidance to help states implement the new provisions, but it was far from straightforward. Between March 2020 and September 2020, the DOL issued nearly 30 Unemployment Insurance Program Letters (UIPLs). In comparison, the DOL only issued 19 UIPLs in all of 2019.[5] In the media, state governors noted the ambiguity and confusion in the guidance they received.[6]

This paper explores the question of how the U.S. Department of Labor can work with state UI agencies in a more effective and collaborative way, with a goal to help ensure more rapid and efficient implementation of UI programs during times of crisis and non-crisis, and in the midst of a changing workforce.

One means of closing this communication and collaboration gap is for the DOL to issue UI guidance as "code." That is, the DOL can issue guidance as directly implementable logic, rather than through natural language that is open to divergent interpretations by the reader.

This approach, called "Policy as Code," takes the rules and policies established by federal law and issues code, or machine-readable logic, that can be tested for consistency and correctness. Importantly, we do not recommend encoding the entirety of legislative language. Rather, we propose that Policy as Code be used for specific sections of legislation that lay out the complex UI eligibility rules and interplay between them. Examples include policies that can be automatically coded to enforce rules such as "if....then" statements, as well as others. This code should be accompanied by a reference implementation to further ease the burden on the states trying to navigate legislation and guidance.[7] Enabling states to process unemployment assistance faster would be invaluable to those depending on this assistance.

III. Key Issues and Challenges

When the COVID-19 pandemic hit, a large swath of the US economy closed down overnight. The number of unemployed people surged, placing an untenable strain on a system that was already bending out of shape. The challenges created substantial delays in unemployment assistance that, in some cases, lasted months.

The pandemic highlighted a variety of challenges that UI programs were already facing:

- Old legacy computer systems that had been working slowly even in the best of times could not be quickly programmed to include new eligible claimants, such as gig and independent contractors;
- Complex guidance from the DOL was presented in a non-user-friendly manner;
- Limited resources were available at the federal and state levels;
- UI claimants and state UI programs were plagued by customer service challenges that had lingered since the 2008 recession;[8]
- The goals of the DOL and state agencies were misaligned, as the DOL was more focused on identifying fraud and improper overpayments, while states were more focused on processing claims; and
- State agencies were hesitant to ask questions they "should already know the answer to," lest they be scrutinized by the federal government.

We provide more information on these issues in the sections below, and categorize them as either communication and collaboration or business process obstacles.

A. Communication and Collaboration Obstacles

1. Top-Down, One-Size-Fits-All Approach

In 2020, the federal government was faced with historic unemployment numbers due to the COVID-19 pandemic. In response, Congress passed the CARES Act, which contained three new UI programs designed to provide much-needed, expanded support for the ever-growing unemployed population. Passed quickly, this crisis legislation included language that required substantial clarification. Our research suggests that there was limited if any input by the individual states regarding how the new UI requirements would be implemented. As a result, states had to play catch-up, and the DOL had to publish multiple Unemployment Insurance Program Letters (UIPLs) to further clarify ambiguous and confusing legislative language.

The challenges identified in this report were identified in part through discussions with individuals with federal government experience and knowledge of the workings of government (see Appendix B). From these discussions, we conclude that there needs to be better collaboration and communication between the federal and state governments on the implementation of federal programs, including during non-crisis periods.

The DOL understands that there needs to be better collaboration with state agencies responsible for deploying UI insurance and has made initial steps to improve communication. In June 2020, DOL Secretary Eugene Scalia testified before the U.S. Senate Finance Committee and highlighted efforts the DOL had undertaken to improve communication with state agencies during the pandemic.[9] For example:

- Over nine weeks between March and May 2020, the Department of Labor issued 19 separate UIPL guidance documents directly related to COVID-19. By comparison, in 2019 the Department issued a total of 19 UIPLs for the entire year.
- As of October 2020, the DOL's Office of Unemployment Insurance hosted 14 webinars to provide direct implementation support to state unemployment insurance directors. On these calls, Department staff provided guidance on making adjustments to state laws, best practices for implementing unemployment legislation, and measures to protect program integrity.
- Assistant Secretary for Employment and Training John Pallasch has convened state workforce agency leadership and UI directors multiple times to discuss program integrity, present innovations in identifying and stopping fraud, and respond to questions raised by state officials. Secretary Scalia himself has joined two of these calls.

Despite these communications, our research has found that there is still insufficient two-way collaboration between the federal government and states.[10] The current methods of communication and collaboration need to be reviewed for effectiveness.

2. Complex Advisory Letters

The Employment and Training Administration (ETA) is the division of the U.S. Department of Labor tasked with issuing guidance and advisory letters to states. A review of the numerous guidance letters issued between March 2020 and September 2020 reveals the complexity that state agencies had to wade through in trying to translate the new legislation and associated legal requirements.

State departments responsible for UI innovation had to go through a complex set of steps to understand and implement this new legislation. After receiving the new legislative guidance, a typical state agency had to:

- Analyze and assess the new legal requirements;
- Determine what aspects of their business and process flows were impacted by the new legal requirements;
- Determine how their current practices needed to change;
- Develop a roadmap to make those changes;
- Communicate and train personnel on those changes;
- Identify external stakeholders impacted by the changes;
- Assess how best to encourage the adoption and understanding of the changes;
- Implement those changes that impact external stakeholders;
- Monitor to determine whether the changes appropriately address the issues; and
- Iterate and pivot, as necessary.

The CARES Act set expectations that were untenable, as state agencies were asked to make requisite changes almost overnight.[11] UIPL 16-20, one of nearly 30 UIPLs that were published, shows that additional DOL and ETA guidance was not immediately translatable into implementation. Indeed, it was just as complex and confusing as the underlying legislation.

For example, the first version of UIPL 16-20, issued on April 7, 2020, contained 43 pages, including six attachments and eight linked references.[12] This UIPL was revised three additional times, on April 27, July 21, and August 27.[13] The last revision, from August 27, came more than four months after the initial guidance was issued. In the forward, the DOL ETA explained the purpose of 16-20 Change 3 as follows:

> *"States have gained experience administering the PUA program under the CARES Act, Public Law (Pub. L. 116-136), and have identified additional questions about the PUA eligibility of individuals who are caregivers and affected by school systems reopening. The purpose of this Unemployment Insurance Program Letter (UIPL) is to address those questions concerning the PUA program."*[14]

This is but one example of the nearly 30 UIPLs issued between March 2020 and September 2020. Understanding, implementing, training, and communicating the content of guidance can be a difficult undertaking. Managing this process with an unprecedented number of guidance letters is, by most objective standards, unmanageable. This is especially true considering that the guidance was changed regularly to provide the most up-to-date information or to clarify past communications. Just like the legislation, the guidance letters themselves must be thoroughly analyzed by states for implementation purposes.

The information conveyed by these letters is both important and necessary. However, much can be improved in how this information is communicated.

B. Business Process Obstacles

1. Requisite Coding and Ambiguity

Especially in times of crisis, communication gaps arise that require future course corrections. These communication gaps can be exacerbated when questions about how new legislation should be implemented from a technical perspective are not considered ahead of time.

In total, the ETA published 30 UIPLs from March to October 2020, consisting of 460 pages of guidance, 364 references, and 63 attachments.[15] This avalanche of advisory letters and the ongoing changes to the letters indicate that the federal government did not realize the implementation challenges state agencies would face.

The legislation and guidance letters referenced "regular," i.e. existing, UI claims and benefits. These FPUC, PUA, and PEUC eligibility requirements then needed to be incorporated into current eligibility requirements. Once the states analyzed and assessed the new legislation, they needed to code these new requirements into their current systems. As additional guidance was issued, further changes needed to be coded.

2. Record Numbers of Claims

State agencies were receiving these new requirements while processing an unprecedented number of claims. This record number of claims filed online broke many state UI websites.[16] As a result, states ended up implementing workarounds such as (a) only allowing claims to be filed during certain days of the week; (b) only allowing applicants whose last name began with A-M to file claims on certain days and N-Z on other days; and (c) shutting down websites on the weekend to allow for updates to be made. The volume of phone calls seeking support was so high that states had to onboard entirely new call centers to handle the increased load.

Despite the unprecedented number of "regular" claims breaking the already fragile UI systems, the three programs enacted under the CARES Act forced states to institute changes to legacy systems in just weeks that would normally take months. The effort required to make such dramatic changes to legacy systems was unsustainable in the long term.

3. Communication Gaps Between States

Because states had to implement CARES Act requirements as quickly as possible, most states went about implementation individually. States did not initially benefit from best practices learned in other states. Eventually, the National Governors Association shared best practices in an attempt to close this interstate communication gap.[17] However, significant gaps in communication remained.

IV. Recommendations

A. Translating Policy to Implementation

Currently, policy is dictated through written-out laws and guidance conveyed to 53 separate "entities" (50 state agencies, the District of Columbia, Puerto Rico and the Virgin Islands). In turn, each of these 50 entities must interpret policies and create their own implementations of forms, websites, and other processes to enable the delivery of UI benefits.

This separation between policy and implementation often leads to ambiguity and misinterpretation. In some cases, policies cannot be carried out because of internal inconsistencies that are discovered during the implementation phase.

The Policy as Code approach is designed to express policy in a language that is explicitly created to minimize ambiguity. It provides iterative mechanisms for feedback through which implementation concerns from states can be shared back to the federal government. It additionally produces working artifacts such as software that can be shared between states to reduce the cost and time required to deliver value to citizens.

B. How Policy as Code Has Been Successfully Used Elsewhere

Policy as Code has been shown to benefit other problem spaces in government. The digital service agency 18F, which sits within the U.S. General Services Administration, has piloted the use of Policy as Code to improve eligibility verification in the Supplemental Nutrition Assistance Program (SNAP).[18] In New Zealand, "Legislation as Code" has also been introduced by the federal government's Service Innovation Lab to address cross-agency opportunities within the New Zealand government.[19] The success of this effort has led to further experiments with Policy as Code in other countries, including Israel, Uruguay, and Canada.

C. Suggested Rollout Processes

To be successful, Policy as Code must be a joint effort. Below, we propose a roadmap that will allow Policy as Code to be implemented at the DOL and state agencies. Our research has found that the DOL's current guidance reflects a lack of understanding of state IT systems and their constraints. Accordingly, it is necessary to have the state agencies responsible for implementing DOL guidance at the table for any discussions of Policy as Code.

1. Hackathon and Design Sprint

First, we propose that the DOL should host one or more hackathons or design sprints with relevant federal and state agencies. A "hackathon" is an event in which relevant stakeholders are brought together with the explicit goal of creating functional end-to-end implementations during a compressed time period.[20] While hackathons within government are a relatively recent phenomenon, they have now been embraced by many agencies as a way to address a variety of issues.[21,]

With the help of the National Association of State Workforce Agencies (NASWA), the states and DOL can be brought together for the hackathon. In advance of the event, the DOL should send proposed guidance to the state agencies, highlighting the goals of the DOL. The state UI agencies should bring together all the relevant personnel to review DOL guidance and goals, and should then designate representatives to attend the event. Attendees can be split into teams and tasked with delivering an end-to-end implementation, or teams can be tasked with focusing on a particular aspect of policy or a specific deliverable, such as user experience flows.

The success of this event will be tied to the composition of the attendees and will require buy-in and time set aside from a broad range of individuals. The ideal attendee list should include those with first-hand knowledge of UI implementation and state UI systems. Attendees could include technical roles

from each state, such as software engineers, user experience researchers, and designers, as well as policy experts from the ETA. Finally, end users, such as state employees managing the day-to-day operations of UI and UI applications, can provide valuable feedback on the end product design. By including end users in the hackathon process, outcomes can be tested quickly and alterations made based on feedback.

2. Multi-State Council

NAWSA should create a multi-state council made up of at least five states that have demonstrated objective success in implementing UI programs. The council should be made up of representatives of these states, and of the DOL, ETA, NASWA, and independent third parties that have expertise in implementing new IT systems on a budget.

The council should be responsible for judging the hackathon and making recommendations on next steps. In addition, the council should be responsible for creating a UI reference implementation, as described further below.

3. Reference Implementation

Prior to the issuance of Policy as Code, the multi-state council should create a "reference implementation." In software development, a reference implementation is a model that incorporates all requirements of a specification.[22] The reference implementation will serve as a fully operational state UI system that sets the standard upon which other state UI implementations will be based.

This reference implementation should be piloted by the states that make up the multi-state council. At the end of the pilot, the council should use the feedback obtained through the pilot period to make alterations to the reference implementation as needed.

The council should then issue the Policy as Code, along with the reference implementation that can be used by the other states at their discretion. This provides a proven system from which to draw and increases confidence that the issued code will be correct.

4. Policy as Code

a. Example: Computing Benefit Amounts

Below, we provide an example of Policy as Code, using a sample subset of UI laws from the 2020 COVID-19 unemployment crisis. Consider the following statements that have been distilled from several pages of text in section 2104 of H.R. 748 of the CARES Act:[23]

1. If a claimant is eligible under State law for regular unemployment compensation, then in addition to their regular unemployment compensation they will receive $600/week for any week the claimant maintains their regular unemployment compensation eligibility.

2. The State may pay benefits under this provision at the same time and in the same manner as regular unemployment compensation payments or the State may pay these benefits separately, but on the same weekly basis.

Currently, each state individually translates the above legal language into a business process. States could easily misinterpret this language. Rather than leaving each individual state with reams of text that attempt to explain the logic in provisions #1 and #2 above, a reference implementation could be created that is able to compute the amount of money owed in benefits to a claimant. The text above could be reduced to something as simple as:

```
if eligible_for_ui and cares_act_still_active:
weekly_benefit = weekly_benefit + 600
```

This code can then be added to the basic UI eligibility criteria. The basic UI eligibility criteria could be coded as:

```
if unemployed and not_fault_of_claimant and base_period_worked:
federal_requirements_met = true
if federal_requirements_met and state_requirements_met:
eligible_for_ui = true
```

Though this initial example is simplistic, it demonstrates that describing a policy using code leaves little room for misinterpretation. Similar efforts of using code to calculate and issue public assistance benefits are underway in other countries. For example, the French government has recently started using the "OpenFisca" platform, which allows citizens to determine their eligibility for various tax and public assistance benefits using publicly available code.[24]

b. Example: A Unified, Multi-Program Application

Pandemic Unemployment Assistance (PUA), as defined in section 2102 of the CARES Act, was intended for those now out of work who had been previously self-employed, such as independent contractors or gig economy workers, rather than for those who had regular full-time jobs (and thus were eligible for enhanced unemployment benefits under the Pandemic Emergency Unemployment Compensation (PEUC) program). The policy dictated that PUA only be paid to claimants not eligible for regular UI benefits.

When applying the new PUA requirements, many states required applicants to first apply for regular UI benefits and be denied prior to applying for PUA benefits. This was extremely confusing and emotionally distressing for many of the applicants, who often experienced delays in receiving their benefits. This process was also unnecessary, and the additional number of applications increased the load on legacy UI systems.[25]

There are multiple reasons why states may have approached the PUA legislation in this way. States may have interpreted the law as stating that a covered individual is one who "is not eligible for regular compensation or extended benefits under state or federal law or pandemic emergency unemployment compensation under section 2107." Alternatively, states may have thought that this was the most expeditious way to build upon legacy systems already designed for regular UI applications. In either case, the approach could have been improved through the creation of a reference implementation, a model demonstrating a simple way to accept applications for all forms of UI.

The Policy as Code example below builds upon a sample PUA application created by the U.S. Digital Response team. It walks through a reference implementation of a unified system that would allow an individual to walk their way through an unemployment benefits application without having to understand the programs in depth or go through a multi-step process. The code underlying this sample application behaves similarly to products like TurboTax, in which the software walks the user through a process to help them discover what benefits are appropriate for them, and submits a single clean application for the correct programs.

```
def ApplyForUIBenefits():
    if unemployed and not_fault_of_claimant and base_period_worked:
        federal_ui_requirements_met = true

    if federal_ui_requirements_met and state_ui_requirements_met:
        eligible_for_ui = true

    return eligible_for_ui

def ApplyForPUA():
    if unemployed and not_fault_of_claimant and (self_employed or
1099_worker):
        approved_for_pua = true
    return approved_for_pua


approved_for_ui = ApplyForUIBenefits()

if self_employed or 1099_worker or exhausted_ui_benefits:
    approved_for_pua = ApplyForPUA()

if approved_for_ui:
    benefits = ComputeStandardBenefit()
else if approved_for_pua:
    benefits = ComputePUABenefit()

if claim_week < 2020-07-25:
    benefits = benefits + 600 # Per CARES Act
```

V. Metrics for Success

Under the "old system," what is the average number of claims found in favor of the claimant by state after an eligibility appeal? Our team proposes the following metrics for measuring success:

1. **Implementation time before and after:** On average, how long does it currently take states to implement new legislation 1) from the date new legislation is passed; and 2) from the date new guidance is provided from the ETA? And how does that compare to the average time it takes states to implement these processes if a reference implementation is issued?

2. **Number of guidance letters issued by the ETA:** How does the number of guidance letters — as measured by number of pages, letters, references and appendices — change after Policy as Code is implemented?

3. **Time it takes states to make an eligibility determination:** On average, how long does it take for an applicant to go through the UI eligibility process from the initial filing of the application to the benefit determination stage? And how does that change after Policy as Code is implemented?

4. **Percentage of claims found in favor of claimant on appeal:** Under the "old system," what is the number of claims found in favor of the claimant by state after an eligibility appeal on average? And how does that compare to the average number of claims after Policy as Code is implemented? (We propose this metric because we hypothesize that the appeals found in favor of claimants will decrease because the initial decisions on UI eligibility will be more accurate.)

VI. Conclusion

Government services, and unemployment insurance in particular, are all about individuals and families. These services are critical for putting food on the table, paying rent, and surviving.[26]

We are currently confronted by a pandemic that has resulted in millions of unemployment claims, and a rate of unemployment that has not been seen since the Great Depression.[27] As UI programs evolve and the nature of work changes, there needs to be a framework that enables greater collaboration between the Department of Labor and individual state agencies. Our research and interviews uncovered critical pain points in the current UI legislative processes, and we hope our suggestions resolve some of those challenges.

Policy as Code reduces the ambiguity involved in the legislative guidance process, but still requires two-way communication between state implementers and the Department of Labor. The Policy as Code approach is intended to better enable, but not replace, communication between states and the federal government. The best solutions are informed by technology *and* humans. The recommendations provided here should not be considered a prescription for a single process, but rather should be seen as a broad framework in which processes can evolve. By working within this framework and using code as a concise, descriptive language for policy, our institutions can nimbly adapt to circumstances and deliver high-quality essential services in times of crisis and non-crisis.

Appendices

Desk Research

Considerable desk research was conducted on background to help narrow in on a problem statement and solution. The research was wide-ranging, and included review of legislation, guidance letters, news reports, policy institute white papers, government reports, legislative testimony, and more. Our desk research included, but was not limited to:

‣ Analysis of statutes and regulations related to unemployment insurance at the federal and state levels, the Patriot Act, the Privacy Act, and the CARES Act;

‣ A state-by-state review of all state unemployment websites;

‣ A documented timeline from March 2020 through September 2020 of guidance documents, testimony, and several news reports;

‣ Analysis of data at oui.doleta.gov;

‣ Review and analysis of information on the NASWA website;

‣ Review and analysis of ETA guidance letters during the pandemic period;

‣ News articles from a variety of sources;

‣ Various testimony before Congress and state legislatures;

‣ Memoranda issued by the National Governors Association;

‣ White papers from various policy institutes and think tanks; and

‣ Reports from the U.S. Government Accountability Office (GAO).

While we investigated some areas where Policy as Code has already been implemented, more research likely needs to be done. This will further our understanding of Policy as Code and will inform assessment of its potential value.

Interviews

The team interviewed the following individuals for this report:

‣ Giacomo Bagarella: Formerly of the Massachusetts Digital Service

‣ Ginny Hunt: Founding Director, White House U.S. Digital Service; Vice President of Justice and Opportunity, Chan Zuckerburg Initiative

‣ Cassandra Madison: Tech Talent Project; Former Deputy Commissioner in the Department of Vermont Health Access

‣ Mina Hsiang: Health Data Lead, U.S. Digital Service

‣ Addie Strumolo: Deputy Commissioner, Department of Vermont Health Access

‣ Reshma Khilnani: U.S. Digital Response

‣ Michelle Evermore: Senior Researcher and Policy Analyst, National Employment Law Project

‣ Three people who applied for UI benefits during the pandemic.

We cold-called several representatives at the Department of Labor and at state unemployment agencies, but were unable to identify any contacts that would be available during the timespan of this project. We also would have benefitted from conducting interviews with current and/or former employees of the Department of Labor (specifically the ETA), state agencies, and NASWA, and recommend that anyone interested in this proposal do so.

Endnotes

1   *Social Security Act, U.S. Code Title* 42, §503.

2   *Social Security Act, U.S. Code Title* 42, §503(a)(1).

3   U.S. Congress, House, *Coronavirus Aid, Relief, and Economic Security (CARES) Act,* HR 748, 116th Cong., https://www.congress.gov/116/bills/hr748/BILLS-116hr748enr.pdf.

4   U.S. Government Accountability Office, *Unemployment Insurance Information Technology: States Face Challenges in Modernization Efforts*, GAO 13-859 (Washington, DC, 2013), https://www.gao.gov/assets/660/657735.pdf; U.S. Congress, Senate, Committee on Finance, *Testimony and Statement of Eugene Scalia,* 116th Cong., 2020, 2, https://www.finance.senate.gov/imo/media/doc/09JUN2020SCALIASTMNT.pdf: "One of the greatest challenges in the UI system is the information technology infrastructure used by States to administer their programs. Fifty-one different systems are used by the States; the average age of these systems is 28 years. Many States' systems are more than 40 years old. These cumbersome, outdated systems inhibit the collaboration and data-sharing associated with sophisticated program management. Although some States have made the investment needed to maintain their systems, few have been able to implement much-needed overhauls, and even fewer have installed new and more nimble systems."

5   *See Scalia Testimony, supra* note 4, at 2.

6   Megan Cassella and Rebecca Rainey, "Gig Workers Struggle To Claim Unemployment Relief," *Politico*, April 15, 2020, https://www.politico.com/news/2020/04/15/workers-struggle-to-claim-unemployment-relief-188814; "'It's Still Not Helping Everybody': Hogan Lays Part of Blame for Unemployment Issues With Government," *CBS Baltimore*, May 27, 2020, https://baltimore.cbslocal.com/2020/05/27/coronavirus-unemployment-hogan-press-conference-latest/.

7   For more information on reference implementations, see "Definition of Vendor-Neutral," Gartner, accessed January 28, 2021, https://www.gartner.com/en/information-technology/glossary/vendor-neutral.

8   U.S. Government Accountability Office, *Unemployment Insurance: States' Customer Service Challenges and DOL's Related Assistance*, GAO 16-430 (Washington, DC, 2016), https://www.gao.gov/assets/680/677082.pdf.

9   *See Scalia Testimony, supra* note 4.

10 *See* Cassella and Rainey, *supra* note 6.

11 Yolanda Richardson and Jennifer Pahlka, "Employment Development Department Strike Team Detailed Assessment and Recommendations," *Report from Employment Development Department Strike Team to State of California Government Operations Agency*, September 16, 2020, https://www.govops.ca.gov/wp-content/uploads/sites/11/2020/09/Assessment.pdf.

12 U.S. Department of Labor, Employment and Training Administration. *Unemployment Insurance Program Letter No. 16-20*, 2020, https://wdr.doleta.gov/directives/attach/UIPL/UIPL_16-20.pdf.

13 U.S. Department of Labor, Employment and Training Administration. *Unemployment Insurance Program Letter No. 16-20 Change 1,* 2020, https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=5899; U.S. Department of Labor, Employment and Training Administration. *Unemployment Insurance Program Letter No. 16-20 Change 2*, 2020, https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=5479; U.S. Department of Labor, Employment and Training Administration. *Unemployment Insurance Program Letter No. 16-20 Change 3*, 2020, https://wdr.doleta.gov/directives/corr_doc.cfm?DOCN=3849.

14 *See UIPL Change 3, supra* note 13.

15 "ETA Advisories," US Department of Labor Employment and Training Administration, accessed January 31, 2020, https://wdr.doleta.gov/directives/.

16 Minyvonne Burke, "Coronavirus: State Unemployment Websites Crash As Applications Surge," *NBC News*, March 18, 2020, https://www.nbcnews.com/news/us-news/coronavirus-state-unemployment-websites-crash-applications-surge-n1162731.

17 Loren Shimanek and Rachael Stephens, "Memorandum: Unemployment Insurance During COVID-19," *National Governors Association*, August 6, 2020, https://www.nga.org/wp-content/uploads/2020/04/Summary-of-Unemployment-Insurance-under-COVID-FINAL.pdf.

18 Alex Soble and Mike Gintz, "Rapid Implementation of Policy as Code," *18F Blog*, May 12, 2020, https://18f.gsa.gov/2020/05/12/rapid-implementation-of-policy-as-code/.

19 "Better Rules and Legislation as Code," The Service Innovation Lab of the Government of New Zealand, https://serviceinnovationlab.github.io/projects/legislation-as-code/.

20 Hackathons can also sometimes be called codeathons. For example, NASA uses the term codeathon (Ali Llewellyn, "Coding for Better Government," *Open NASA Blog*, March 14, 2012, https://open.nasa.gov/blog/coding-for-better-government/).

21 The first hackathon in the executive branch was hosted by the White House in 2016, when the Department of Health and Human Services invited participants to help improve foster care. See Chris Chmielewski, "The First Ever White House Hackathon," *Foster Focus Magazine*, https://www.fosterfocusmag.com/articles/first-ever-white-house-hackathon and Aisha Chowdhry, "Hackathon, policy moves designed to apply tech to foster care programs," *FCW,* May 27, 2016, https://fcw.com/articles/2016/05/27/hackathon-foster-care.aspx.

22 Eric Dalci, Elizabeth Fong, and Alan Goldfine, "Requirements for GSC-IS Reference Implementations", *National Institute for Standards and Technology*, (June 2003), https://web.archive.org/web/20060928231404/http://xw2k.sdct.itl.nist.gov/smartcard/document/ref-imp51.pdf. As described in Dalci's article, in plans for developing a government electronic identification (or "smartcard") specification, a reference implementation is "an implementation of a specification to be used as a definitive interpretation for that specification. […] At least one relatively trusted implementation […] is necessary to (1) discover errors or ambiguities in the specification, and (2) validate the correct functioning of the test suite."

23 *See* U.S. Congress, *supra* note 3.

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