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2021

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#### Suggested citation:

Chen, Ricky, Chun, Jiyeon, Lin, Shannon and Liu, Emily (2021) Automation and the Value of Work: The effects of digital automation on job displacement in western Pennsylvania. In: Proceedings of Relating Systems Thinking and Design (RSD10) 2021 Symposium, 2-6 Nov 2021, Delft, The Netherlands. Available at http://openresearch.ocadu.ca/id/eprint/3889/

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# Automation and the Value of Work

The Effects of Digital Automation on Job Displacement in Western Pennsylvania

## Ricky Chen, Jiyeon Chun, Shannon Lin, Emily Liu

In the late 19th century, with relative world peace, greater availability of money, access to coal and iron ore, and the invention of the steam engine, the construction of factories and growth of mass production started the first industrial revolution. This also introduced the public education system, which largely represented the ideals and culture of the industrial revolution. Sometimes referred to as "factory model schools", the education system was structured to create students who would then become fit workers in the factories. It was a direct reflection of America's capitalist values and priorities and created the industrial complex so deeply embedded in all systems of the working and middle class.

With the impacts of World War II and the Great Depression, president Franklin D. Roosevelt instituted the New Deal which pushed for an evolution of the value of work and labor. Unemployment benefits were created with the intention of financially supporting Americans to invest in furthering their skill training rather than finding the next available unsustainable job. However, by mid-century, these values shifted alongside the introduction of Reaganomics as a result of the excitement of the excelling American economy. This propelled the economic inequality and declining middle class that we see today, furthered by the start of the modern technological industry and the economy's dependence on it. In the present, as the few tech giants have the reins over the American economy, many of the jobs that public education traditionally prepares people for are no longer financially viable.

From **classic automation** (that of muscle power) to **digital automation** (that of brain power), persistent throughout history are the parallels between economic revolutions and the displacement of human workers. It is the combination of the nature of industrial complexes and the free market economy that creates and reveals the wicked problem: when we exist in a society where human value is so deeply tied to our work and economic value, the dehumanization of people as their skills are able to be replaced by technologies becomes justified.

While the effects of automation are inevitable in that it lead to disruptions such as the displacement of working-class occupations, the technologies introduced by the process also continues to keep our society healthy and productive. First, the automation of activities can help enable businesses to improve performance by reducing errors and improving quality and speed. The process of automation also contributes to economic growth and prosperity, which it has done historically. While the benefits of automation are obvious for businesses and society, it becomes a wicked problem when considering how the changes will also further the process of displacement in the workforce.

# Three Horizons

## The Current State of Automation

- Disconnect between policy-makers' knowledge about the reality of digital automation More than a third of Pittsburgh's metro area workers are at high risk of job automation
- Automation displaces workers without creating more jobs for them
- The type of automation we are facing today has shifted from classical to digital where there is a greater focus on the brain than the muscle
- Technological innovation is being introduced to areas in the Midwest such as Pittsburgh

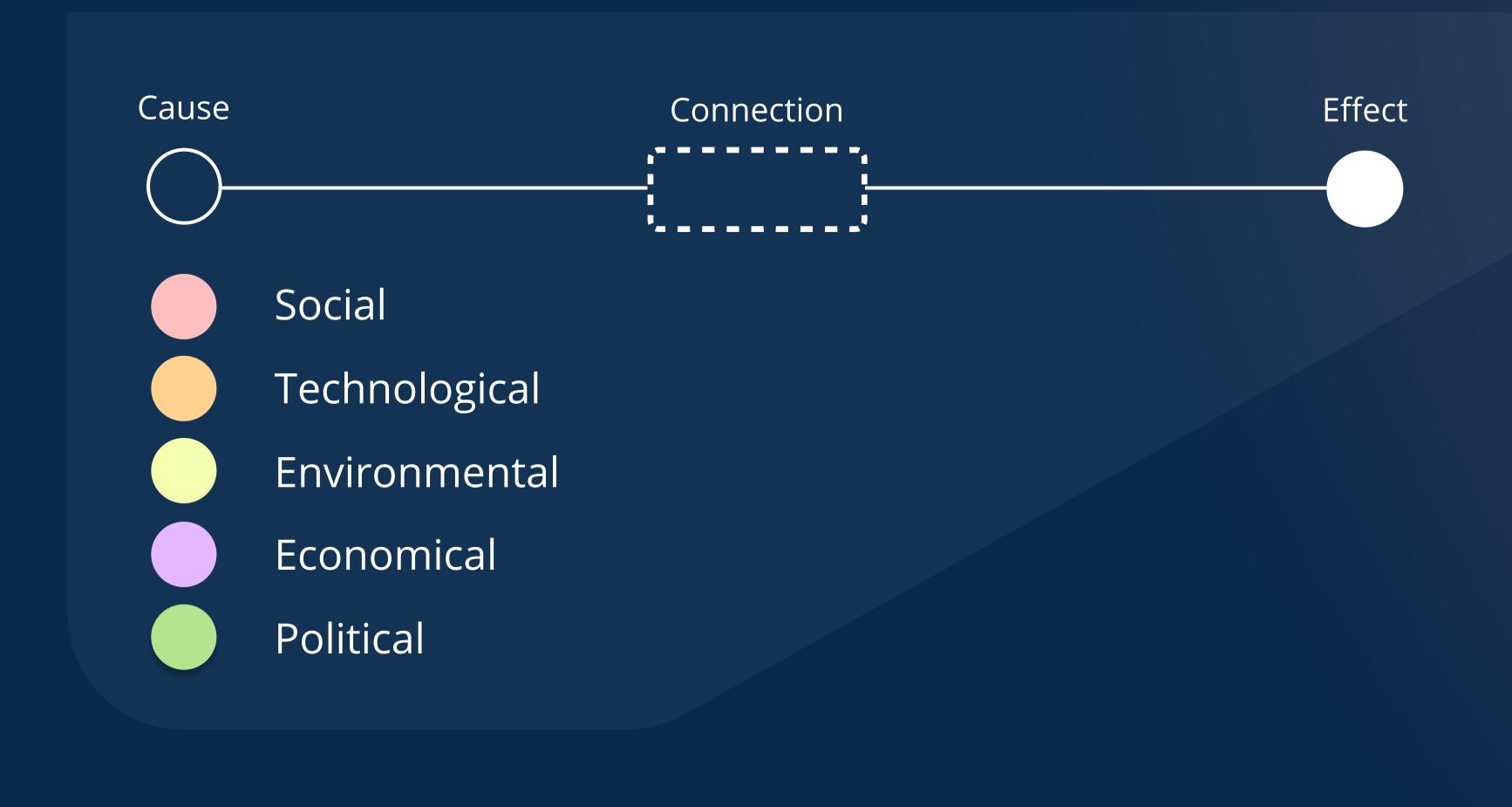
## The Transition to the Future State of Automation

- Policy-makers should be educated about automation so they are well-informed to make
- appropriate government decisions Better education and opportunities for all allows for more people to pursue more
- skill-specific livelihoods Automation helps create and cultivate jobs, rather than take them away

## The Future State of Automation

- Policy-makers are knowledgable about automation and are well-informed to make
- appropriate government decisions
- Automation for "menial" jobs, but with better education and opportunities for all, more people can pursue more skill-specific livelihoods: automation helps create and cultivate jobs rather than take them away

# Mapping Key



# Root Causes

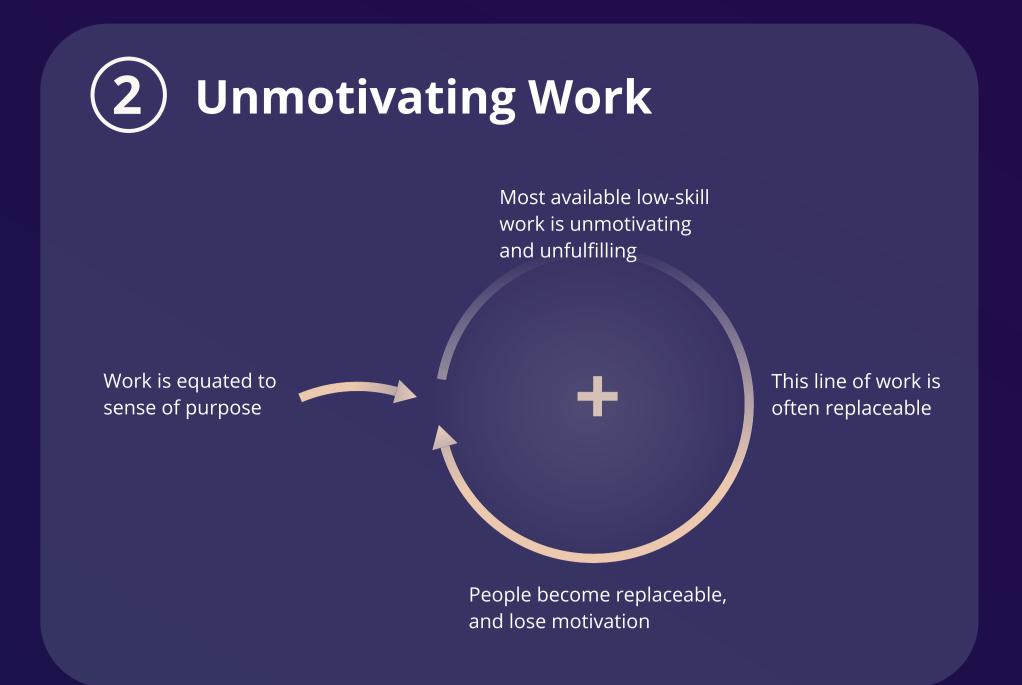
From capitalism to the industrial complex, there is a distinct, hierarchal direction of influence. Conversely, there is an inverted relationship between the direction of influence and population from a macro to micro scale.

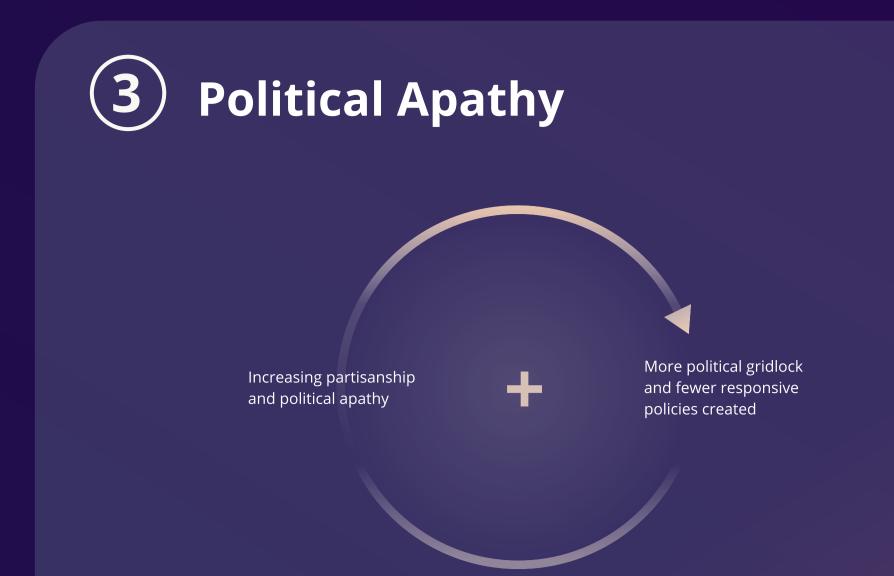
Each infastructural sector (industrial complex, working class, policy, capitalism) is the product of a positive feedback loop that continuously builds upon itself and eventually creates irreversible problems. Our goal, the designer's role, is to create interventions that break these feedback loops.

Scaling from the Industrial Complex to Capitalism

# 1 The Half Life of Knowledge

knowledge "expires" Continues to try to find soonest available (equally potentially technology and the Job automated









# Ecology of Interventions

#### LEVERAGE POINT: Restructuring the Educational System

## PROBLEM

**Ecological Effects** 

Within communities, the current industrial-focused public education system promotes job-preparedness and productivity in the curriculum over raw thinking skills and emotional intelligence. Because of this, students graduate, which are the most prone to displacement by automation.

#### INTERVENTION METHOD

To intervene in this problem space, the more vulnerable, regional education systems can redirect focus on helping their students develop more EQ, interpersonal skills, and uniquely human qualities that are related to socio-emotional intelligence. Higher education should also be made more accessible through and affordable with more focus on STEM education through refunding of local budgets and income.

#### POSSIBLE NEGATIVE EXTERNALITIES An unintended negative externality could be the uneven

implementation of these new educational curriculums. First, education varies across the country, so it would be rather difficult certain communities will first receive these changes, which is likely to be in more affluent areas, which are usually the group of people least negatively impacted by this wicked problem. Another potential externality is the need for careful consideration and planning of these curriculums. Since great changes are needed to be made into the currently existing system, the new curricular plans will need to be thoroughly planned and tested to become

effective tools for growth and learning in today's age.

# LEVERAGE POINT: Government Policy

As digital automation continues to grow, more and more low skills jobs are being replaced by new technologies. Often, these displaced workers are not given the proper level of support to reskill and learn, leaving them unable to find new opportunities that won't be touched

#### INTERVENTION METHOD

National government policy can be implemented to alleviate the direct unemployment caused by automation in the present or near-future. Additionally, the government should improve its unemployment benefits to further encourage people to pursue training. Unemployment programs can also have more re-skilling workshops that allow people who become immediately unemployed to participate in, rather than trying to find another immediate low-skill job also at the risk of being replaced by automation.

#### POSSIBLE NEGATIVE EXTERNALITIES

Due to environmental differences and social norms, there is often a disconnect in understanding and willingness to comply with to reach a universal agreement with a shared efficiency: given the size density and population of some states, some areas will take significantly longer to transition than others. This, coupled with group polarization of shared beliefs within that area, will only further the ideological divide.

## LEVERAGE POINT: Oversight for the Fast Changing Pace of Technology

Currently, there is little government oversight on the development of big tech due to lobbying tactics and the lack of technological fluency among government leaders. As big tech continues to advance forward, the government is ill-prepared to revise policies that can effectively tackle these coming technological changes.

#### INTERVENTION METHOD

At the highest level, a root cause of unemployment by automation is the economic system entirely, and the positive feedback loops that exist between the lack of knowledge- and in turn, oversightthat the government has with the monopolistic technology industry. An intervention for this problem space can focus on increasing technological fluency among politicians. They should shift away from "power growth" mindsets, and instead embrace technology in a more equitable and transformative sense

#### POSSIBLE NEGATIVE EXTERNALITIES

**Education from Industrialization** 

Even with a greater understanding of technology in terms of the occupational field, people in power will likely use this knowledge policies will do little to empathize with the lower class and those in fear of displacement. Instead, there's a higher chance that they would cater to more powerful, high-tech corporations, leading to increased lobbying and manipulation of power.

## **Declining Value of Education**



# The Designer's Role

Throughout these three levels of intervention, designers play a role through methods of problem framing and user research to understand the pain point and needs of stakeholders. Many of the issues caused by our wicked problem are due to a mass misunderstanding and "fear" of Al and technology, so designers can play the role of simplifying the problem through communication to educate people on all scales, from individuals to corporations to governments. We can design awareness campaigns, new education systems, or redirecting/refunding policies.

Conpole,

Natural Resources

Policy Implementation Gap

form of apps, devices and software platforms are

not so much facilitating a "race against the

machines," but a race against our own social

institutions, values and practices, and that is the

"Too Big To Fail"