FUTURE of WORK Commission

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#CAFutureofWork

TECHNOLOGICAL CHANGE and the IMPACT ON WORK

PERSPECTIVES on TECHNOLOGICAL CHANGE and the FUTURE of WORK

Hal Varian, Google
Susan Athey, Stanford
Ken Goldberg, UC Berkeley
moderated by James Manyika, McKinsey

HOW WILL TECHNOLOGY CHANGE WORK?

WHAT OPPORTUNITIES WILL ARISE through TECHNOLOGY?

BESIDES AUTOMATION, WHAT WILL BE TRANSFORMATIVE?

KEN GOLDBERG
COMPLEMENTARITY

AUTOMATION ANXIETY!

DEEP LEARNING...

GO: A DYNAMIC GAME OF COMPLEXITY
... and an ANALOGY for COMPLEMENTARITY?

TAKE THE ROBOT OUT OF THE HUMAN!

"WE DON'T ALL NEED TO CODE!"

EMPATHY
COMMUNICATION
COLLABORATION

INVEST IN PEOPLE SKILLS

"I'M STILL HERE!" ... and still RELEVANT.

"CO-ROBOTICS"?

MORE INVESTMENT in HUMAN CAPITAL ... and WIDE LEARNING!

HAL VARIAN
BOTS AND TOTS

"THE CONVENTIONAL WISDOM HAS CHANGED! THE SAME RULES DON'T APPLY."
— SCENARIO PLANNING
— LEARN from DIFFERENT GEOGRAPHIES (e.g. Netherlands)

DO WE TALK TO PEOPLE ABOUT DESIGN AND PARTICIPATION around TECHNOLOGY?

ILLUSTRATION by ANTHONY WEEKS
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INCLUSIVE INTELLIGENCE!

DIVERSITY SPECTRUM of INTELLIGENCES

INTELLIGENCE AUGMENTATION, not "A.I."?

CREATIVITY
SOCIAL SKILLS

THE WORKER SHORTAGE IS NOT EVENLY DISTRIBUTED!

- SUPPLY OF WORKERS is DECREASING
- CAPABILITIES OF ROBOTS ARE INCREASING

ARE YOU AUTOMATING JOBS or TASKS?

WHAT DOES THIS MEAN FOR THE LABOR SHORTAGE?

Does it MAKE ECONOMIC SENSE to AUTOMATE?

YOU NEED TO SIMPLIFY ENVIRONMENTS FOR AUTOMATION.

AUTOMATION DOESN'T TYPICALLY ELIMINATE JOBS. IT ELIMINATES TASKS.

- A VIETNAM VETERAN I KNEW HAD BEEN HOMELESS... ONCE HE HAD HOUSING AND EMPLOYMENT, HE WENT HOME TO SEE HIS FAMILY FOR THE FIRST TIME IN 25 YEARS.
- ANYTHING WORTH DOING IS WORTH DOING RIGHT.
- FREDERICK DOUGLASS: FIGHT AGAINST INJUSTICE.
- MY GRANDMOTHER HAD BEEN A LIVE-IN DOMESTIC WORKER. THE FAMILY CHANGED HER NAME. WE ALL DESERVE DIGNITY, CARE, AND BEING RECOGNIZED FOR OUR WORK.

WE WERE DOING THE SAME JOB, UNDER DIFFERENT CIRCUMSTANCES.

- I LEARNED SO MUCH FROM MY CO-WORKER AT WINDOWS ON THE WORLD. THEY COMMUNICATED IN A DIFFERENT WAY... AND CAME TOGETHER.
- GUSTAVO TAUGHT ME HOW TO SPEAK SPANISH... AND HOW TO BUS TABLES.
- WHEN YOU'RE FIGHTING FOR PEOPLE WHO NEED YOU, KEEP CHARGING AHEAD.
- THE FIRST AMERICAN I BEFRIENDED... MY HS MATH TEACHER
"GENEROUS, INCLUSIVE, HUMAN-CENTERED."
- DICK RAYMOND: ONE OF THE FOUNDERS OF THE WHOLE EARTH CATALOG. "ANYTHING WORTH DOING TAKES 50 YEARS."

WHO had a FORMATIVE IMPACT on your work/career?

- MY MOM APPROACHED HER WORK WITH CALM AND INTENSITY.
- I WORKED FOR PRESIDENT CLINTON IN MY LATE 20s. I LEARNED ABOUT WHAT IS CHANGEABLE.
- AN ETHNOGRAPHER WHO RESEARCHED MEAT PACKING WORKERS AND GAVE ME INSIGHT INTO THE LIVES OF MEAT PACKING WORKERS

I HAD A SUPERVISOR in DETROIT...
- PEOPLE LEARN IN DIFFERENT WAYS!
- WE SHARED STRUGGLES OVER RACE... AND IN HER, I SAW SOMEONE WHO COULD BUILD MULTI-RACIAL COALITIONS... AND GET ME TO LOOK AT MY WHITENESS.
- "THERE'S A DIFFERENCE BETWEEN CHARITY AND JUSTICE."
- PEOPLE WHO TOLD ME I COULDN'T DO WHAT I WANTED TO DO!
- IN 1995, SOMEONE INFLUENTIAL ONCE TOLD ME "THE INTERNET IS DOOMED!" ... SO I WENT TO SILICON VALLEY.

MAKE ROOM FOR OTHERS.
- "YOU WILL RARELY BE ASKED TO SIT AT THE TABLE OF OPPORTUNITY... SO YOU HAVE TO BRING YOUR CHAIR UP TO THE TABLE."
- MY DAD TAUGHT ME ABOUT THE LABOR-MANAGEMENT COMPACT... ... AND ABOUT BEING A UNION MAN.
- MY IMMIGRANT PARENTS TAUGHT ME: "THERE IS DIGNITY IN ALL WORK!"

LIVESTREAMED on YOUTUBE on the GO-BIZ channel!

FRICTION!

HOW DOES TECHNOLOGY ADDRESS POINTS of FRICTION?

DO WE TAKE PEOPLE WITH TECHNOLOGY — or DO IT TO THEM?

...while addressing HOUSING, TRANSPORTATION, and HEALTH CARE...

USE TECHNOLOGY to AUGMENT HUMAN CAPABILITIES! ...not to REPLACE THEM.

SUSAN ATHEY

- MEET PEOPLE WHERE THEY ARE.
- HOW DOES TECHNOLOGY/AUGMENTATION SCALE?
- HELP PEOPLE WITH ENTREPRENURIAL SKILLS.
- RESOURCES for OLDER WORKERS ...including MEMORY ASSISTANCE.

"THEY ARE THE FUTURE, too!"

CAN WE MITIGATE BARRIERS TO ENTRY?

...ENHANCE the BENEFITS OF FLEXIBILITY?

FLEXIBILITY LOOKS DIFFERENT!

...based on the PERSON and CONTEXT

TRAINING
RE-SKILLING
WAGE NEEDS

...AS DOES ACCESS!

"IT'S NOT AUTOMATION ANXIETY. IT'S INEQUALITY ANXIETY!"

POWER is a VARIABLE!

How-to VIDEOS have transformed LEARNING!

EDUCATION + TRAINING will STILL be NECESSARY! It may be DELIVERED DIFFERENTLY.

DO WAGE INCREASES MAKE SERVICES INACCESSIBLE TO OTHERS?

Are WAGES a SOLUTION?
— WHAT WILL BE THE DEMAND?
— WHAT ARE THE UNINTENDED CONSEQUENCES?

CALIFORNIA ALL

SOME OF US WHO ARE WORKING IN POVERTY-WAGE JOBS ARE WORKING HARDER than EVER!

How do we OPTIMIZE TECHNOLOGY FOR GOOD? ...NOT JUST EFFICIENCY

FUTURE of WORK COMMISSION

THE UNEVEN SOCIAL IMPACT OF TECHNOLOGICAL CHANGE

with Ted Kolko and Anmol Chaddha

"THERE ARE LOTS OF UNCERTAINTIES about the IMPACT of TECHNOLOGY... ...BUT THERE IS LITTLE DISAGREEMENT THAT THE PAIN WILL BE DISPROPORTIONATELY BORNE BY:

- PEOPLE WITH LESS EDUCATION
- PEOPLE WITH LESS WEALTH and FAMILY SUPPORT
- PEOPLE IN "ROUTINE" JOB SECTORS
  - Sales
  - Office/Clerical
  - Production
  - transportation
  - Construction
  - Maintenance
- PEOPLE IN GEOGRAPHIES with a HIGHER SHARE of ROUTINE JOBS

CALIFORNIA IS DIVIDED BY SHARE OF "ROUTINE" JOBS... THE BAY AREA and CENTRAL VALLEY are WORLDS APART.

ADAPTIVE TECHNOLOGIES and ASSISTIVE TECHNOLOGIES may HELP PEOPLE WORK BETTER-LONGER!

WHO can BEST MANAGE TRANSITIONS?

YOUNGER, MORE EDUCATED, MORE MOBILE WORKERS!

PEOPLE WHO ARE LESS EDUCATED, PEOPLE WHO ARE LATINO ARE MOST AT RISK!

- WHITE
- ASIAN
- AFRICAN AMERICAN
- LATINO

THERE ARE GAPS in EDUCATION, PRESENCE in "ROUTINE" JOBS based on ETHNICITY + RACE!

REFRAME BASED on LESS EDUCATION and PARTICIPATION in "ROUTINE" JOBS — "STRUCTURALLY BLOCKED"? ...but SKILL and EDUCATION are NOT the Same.

POLICY CONCERNS for CALIFORNIA

- HIGH HOUSING COSTS
  - Long commute times
  - Inaccessibility of jobs
  - High cost to employers/ pressure on wages
- TAX CREDITS
- SUPPORT for TRAINING
  - Safety net/cushion
  - Make transition manageable!

SUBSIDIZED CARE to ASSIST WORKERS who MUST CARE for PARENTS/ FAMILY? ...OR PROVIDE A LIVABLE WAGE!

WHAT IS THE ROLE OF EDUCATION in the FUTURE?

WE CAN'T IGNORE RACIAL and ETHNIC disparities. ...and GENDER!

DOES THIS FIGURE INTO OUR CONSIDERATION OF THE FUTURE?

PAY differently... HIRE differently...

BETTER EVALUATION OF SKILLS. — BEING ABLE TO "READ A ROOM".

AI EXACERABATES INEQUALITY! JUSTICE!

— HOW ABOUT — WORKER-INFORMED DEPLOYMENT of AI?

THINK ABOUT HUMAN FACTORS!

ARE THERE MODELS of worker VOICE?

TRANSIT WORKERS! ...who are ALSO CAREGIVERS, SUPPORT PROVIDERS, SOCIAL WORKERS, HEALTH AIDES, etc.

anne marie SLAUGHTER

CEO, NEW AMERICA

"A THINK and ACTION TANK."

UNFINISHED BUSINESS: MEN, WOMEN, FAMILY, AND WORK

WHY WOMEN CAN'T HAVE IT ALL UNDER THE CURRENT SYSTEM...

WHAT DO YOU REALLY MEAN?

HUMAN CENTERED design is a CORE VALUE!

LET'S THINK OF WORKER-CENTERED DESIGN!

CARE

"ALL OF THE WAYS TO INVEST IN OTHERS TO HELP THEM REACH THEIR FULL POTENTIAL..."

MINISTRY · MENTORING · COACHING · NAVIGATION · PHYSICAL CARE · ADVISING

INVESTING in CHILD CARE: "It's a MATTER of NATIONAL SECURITY!"

- Developing CHILDREN'S BRAINS and BODIES
- This WORK is often UNDERPAID and DONE by WOMEN of COLOR

HOW DO WE VALUE CARE?

- Socially?
- Monetarily?
- Allowing families to COME TOGETHER?

CARING for PARENTS:

- Do we have ENVIRONMENTS that allow us to CARE for PARENTS at HOME?

EDUCATION:

- HOW MANY PEOPLE DO YOU INCLUDE?

The Arizona State University example

- EXPAND the CATEGORY of "CARE."
- ADD TECHNOLOGY... ...and see how it can MAKE JOBS BETTER.
- LOOK at possible GOVERNMENT intervention...
  - ...and include BUSINESS...and TAXPAYERS!
  - Pilots?
  - Ask what they want!

DO WE GAIN MORE TIME AND FLEXIBILITY TO CARE FOR FAMILY with our "FLEXIBILITY" in WORK?

RECOGNIZE "PAID" and "UNPAID" WORK as CRITICAL TO SOCIETY!

WORK & COMPETENCY

SKILLS...

VALUE PROFESSIONS!

IT'S TIME to RETHINK THESE IDEAS... and change THE NARRATIVE!

- RECOGNIZE HISTORICAL EXCLUSION...
- WHAT IS THE SOCIAL COMPACT?

WHAT IS THE WORKER VOICE in THE FUTURE?

REIMAGINE CARE WORK!

- REWARDS
- INCENTIVES
- DEFINITIONS of "QUALITY"
- POLICIES

ASK QUESTIONS!

DON'T ADVANCE POSITIONS...

MANUFACTURING + CONSTRUCTION · MANUFACTURING ON DEMAND · MANUFACTURING AS A SERVICE · MACHINE LEARNING

ADVANCED MANUFACTURING: INCREASED DEMAND + REDUCED SUPPLY

"GENERATIVE DESIGN"

HOW DO YOU PARTNER WITH TECHNOLOGY AS A DESIGN COLLABORATOR?

WHERE IS TALENT SOURCED?

WE CAN'T CONTINUE TO DO TRAINING and EDUCATION IN THE SAME WAYS!

MANUFACTURING IS HIGHER SKILLED WORK.

MORE GENDER DIVERSITY in the FIELD.

HOW ARE WOMEN and PEOPLE OF COLOR INCLUDED?

- ADVANCED MANUFACTURING with AUTOMATION IS ALREADY HERE!
- GOVERNMENT WILL HAVE AN IMPACTFUL ROLE!
- THERE NEED TO BE INCENTIVES FOR TRAINING.

THERE WILL BE BOTH JOB LOSS AND JOB GROWTH.

INDUSTRY CASES

MODERATED BY LANDE AJOSE

- LISA CAMPBELL, AUTODESK
- STEVE VISCELLI, U PENN
- MELISSA VALENTINE, STANFORD

NEW NETWORKS... NEW PLATFORMS... NEW TECHNOLOGIES... NEW LEARNING...

- THE TRUCKING INDUSTRY IS AN EXCELLENT EXAMPLE OF THE IMPACT OF TECHNOLOGY ON WORKERS.
- CONTEXT MATTERS!
- WORKER VOICE MATTERS!
- DON'T PREDICT IMPACT. SHAPE IT!

WHAT'S THE Narrative? HOW WILL WE SHAPE IT?

PUBLIC CORPORATIONS: MORE EXITS, FEWER ENTRANTS...

- UNDERSTAND THE IMPACT ON WHITE COLLAR WORK
  - DISAPPEARANCE OF CORPORATIONS?
  - DISINTERMEDIATION
  - SAFETY NET: WHAT WILL HAPPEN TO IT?

HOW WILL WE REPLACE THE SOCIAL BENEFITS THAT ARE LOST?

- UNDERSTAND THE TECHNOLOGY
- DEVELOP POSSIBLE SCENARIOS OF ADOPTION
- OVERLAY SCENARIOS ON POTENTIAL LABOR IMPACTS, given EXISTING INDUSTRY TRENDS
- HOW CAN WE SHAPE THE FUTURE?

MARKETED and SOLD by the WEB!

FLASH TEAMS and CROWD SOURCING · WEB ENTERPRISE · DECISION ENGINES

DRIVEN BY ALGORITHMS...

WE NEED FEWER WHITE COLLAR WORKERS!

IS THERE A ROLE FOR NON-WHITE COLLAR WORKERS AS SYSTEMS CHANGE?

GROWTH IN LOCAL JOBS? WHERE WILL THEY EMERGE/FLOURISH?

LAST-MILE DELIVERY?

OUTSIDE TRUCKING, THERE ARE LOTS OF EXAMPLES IN OTHER INDUSTRIES OF "LAST MILE".

LAST-MINUTE AUTOMATION?

ILLUSTRATION BY ANTHONY WEEKS
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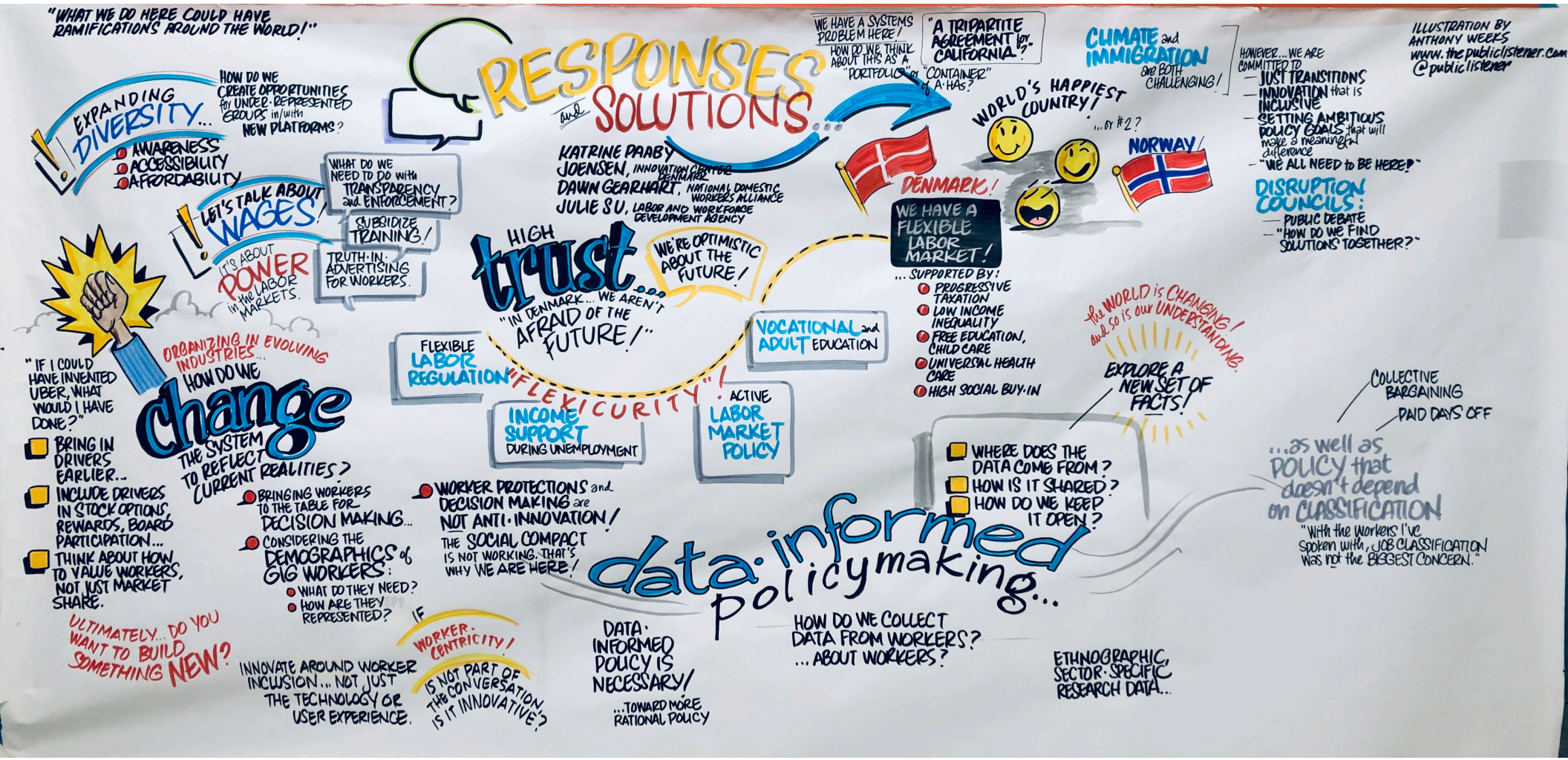
"WHAT WE DO HERE COULD HAVE RAMIFICATIONS AROUND THE WORLD!"
RESPONSES and SOLUTIONS
KATRINE PRAABY JOENSEN, INNOVATION CENTER DENMARK
DAWN GEARHART, NATIONAL DOMESTIC WORKERS ALLIANCE
JULIE SU, LABOR AND WORKFORCE DEVELOPMENT AGENCY
EXPANDING DIVERSITY...
AWARENESS
ACCESSIBILITY
AFFORDABILITY
HOW DO WE CREATE OPPORTUNITIES FOR UNDER-REPRESENTED GROUPS in/with NEW PLATFORMS?
LET'S TALK ABOUT WAGES!
IT'S ABOUT POWER in the LABOR MARKETS.
WHAT DO WE NEED TO DO with TRANSPARENCY and ENFORCEMENT?
SUBSIDIZE TRAINING!
TRUTH-IN-ADVERTISING FOR WORKERS.
HIGH trust...
"IN DENMARK... WE AREN'T AFRAID OF THE FUTURE!"
WE'RE OPTIMISTIC ABOUT THE FUTURE!
FLEXIBLE LABOR REGULATION
"FLEXICURITY"!
INCOME SUPPORT DURING UNEMPLOYMENT
ACTIVE LABOR MARKET POLICY
VOCATIONAL and ADULT EDUCATION
WE HAVE A SYSTEMS PROBLEM HERE!
HOW DO WE THINK ABOUT THIS AS A "PORTFOLIO" or "CONTAINER" of A·HAs?
"A TRIPARTITE AGREEMENT for CALIFORNIA"?
WORLD'S HAPPIEST COUNTRY!
...or #2?
DENMARK!
NORWAY!
WE HAVE A FLEXIBLE LABOR MARKET!
... SUPPORTED BY:
PROGRESSIVE TAXATION
LOW INCOME INEQUALITY
FREE EDUCATION, CHILD CARE
UNIVERSAL HEALTH CARE
HIGH SOCIAL BUY-IN
CLIMATE and IMMIGRATION are BOTH CHALLENGING!
HOWEVER... WE ARE COMMITTED TO
JUST TRANSITIONS
INNOVATION that is INCLUSIVE
SETTING AMBITIOUS POLICY GOALS that will make a meaningful difference
"WE ALL NEED to BE HERE!"
DISRUPTION COUNCILS:
PUBLIC DEBATE
"HOW DO WE FIND SOLUTIONS TOGETHER?"
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"IF I COULD HAVE INVENTED UBER, WHAT WOULD I HAVE DONE?"
BRING IN DRIVERS EARLIER...
INCLUDE DRIVERS IN STOCK OPTIONS, REWARDS, BOARD PARTICIPATION...
THINK ABOUT HOW TO VALUE WORKERS, NOT JUST MARKET SHARE.
ORGANIZING IN EVOLVING INDUSTRIES...
HOW DO WE change THE SYSTEM TO REFLECT CURRENT REALITIES?
BRINGING WORKERS TO THE TABLE FOR DECISION MAKING...
CONSIDERING THE DEMOGRAPHICS of GIG WORKERS:
WHAT DO THEY NEED?
HOW ARE THEY REPRESENTED?
WORKER PROTECTIONS and DECISION MAKING are NOT ANTI-INNOVATION!
THE SOCIAL COMPACT IS NOT WORKING. THAT'S WHY WE ARE HERE!
ULTIMATELY... DO YOU WANT TO BUILD SOMETHING NEW?
INNOVATE AROUND WORKER INCLUSION... NOT JUST THE TECHNOLOGY OR USER EXPERIENCE.
IF WORKER-CENTRICITY! IS NOT PART OF THE CONVERSATION, IS IT INNOVATIVE?
data-informed policymaking...
DATA-INFORMED POLICY IS NECESSARY!
...TOWARD MORE RATIONAL POLICY
HOW DO WE COLLECT DATA FROM WORKERS? ... ABOUT WORKERS?
ETHNOGRAPHIC, SECTOR-SPECIFIC RESEARCH DATA...
WHERE DOES THE DATA COME FROM?
HOW IS IT SHARED?
HOW DO WE KEEP IT OPEN?
the WORLD is CHANGING! and so is our UNDERSTANDING.
EXPLORE A NEW SET OF FACTS!
COLLECTIVE BARGAINING
PAID DAYS OFF
...as well as POLICY that doesn't depend on CLASSIFICATION
"With the workers I've spoken with, JOB CLASSIFICATION was not the BIGGEST CONCERN."