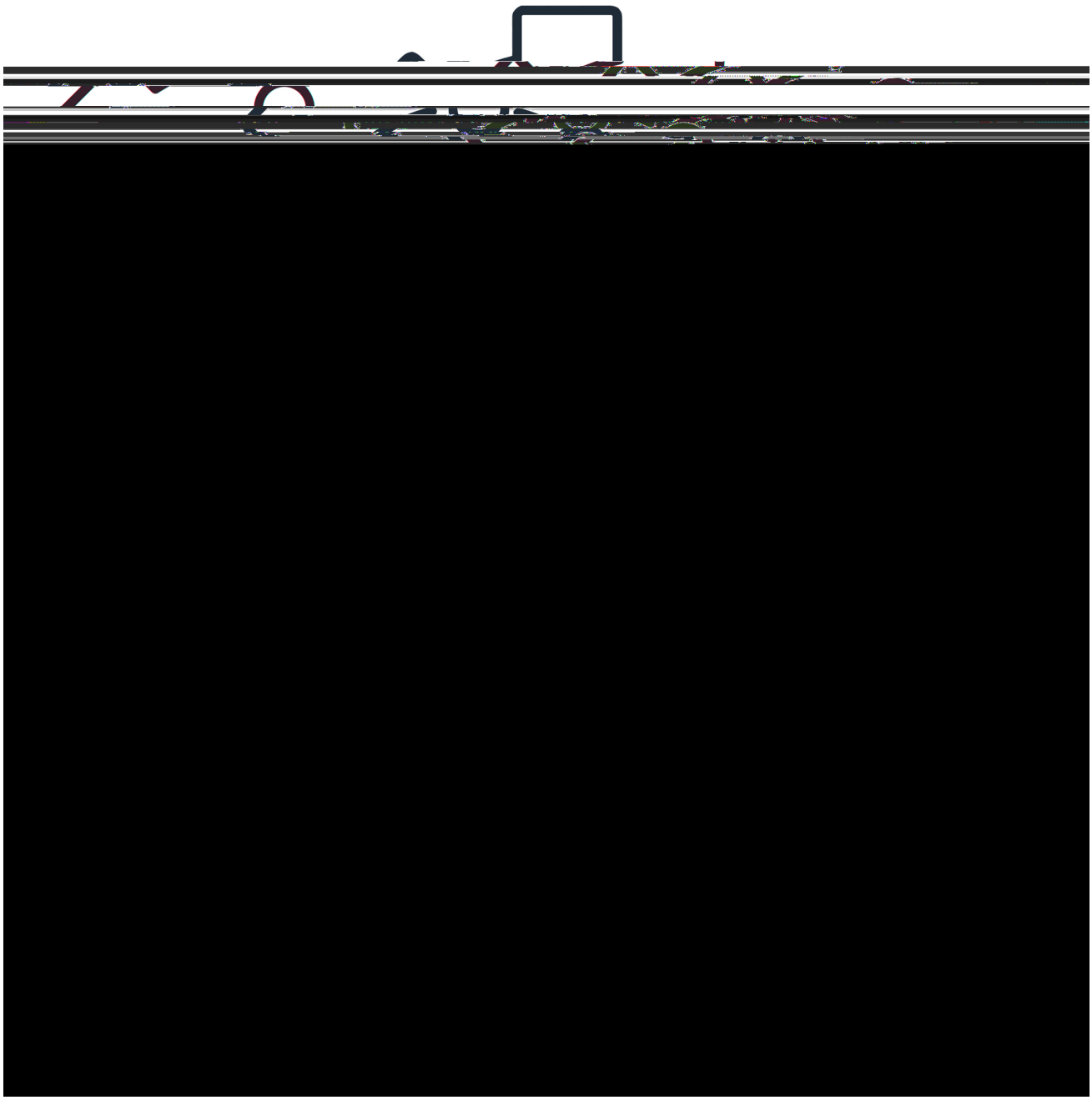

Re f ma i e ai al k h

Ad ia Smi h, Ma ia F e li, Meli a Gald F i a ch a d A h M ei a

Ma ch 2020

Post-automation: report from an international workshop

Ad ia Smi h[(a)], Ma ia F e li[(b)], Meli a Gald F i a ch [(a)] a d A h M ei a[(a)]

a. Scie ce P lic Re ea ch U i , U i e i f S e , B igh
b. F daci Ce i , U i e idad Naci al de Sa Ma i , B e Ai e

Contents

Ack ledgeme 3
1: I d c i 4
2: The k h 4
3: The cial ada a i challe ge i a ma i he 5
4: P -a ma i : a ciall c c i e a ach ech l g ? 8
5: W k h e l a i i -a ma i 9
6: Eme gi g heme 11
6.1 O e e 11
6.2 Dem c ac 11
6.3 H ma ca abili ie 12
6.4 Ne imagi a ie f ech l g i cie 12
6.5 E abli g i i i a d i i i al cha ge 12
6.6 C mm i g 12
6.7 M l i- cala , c - ec al a d l ali ic e ki g 13
7: C cl i 13
Refe e ce 14
A e 1: Pa e e e a i a d di c i 15
A e 2: P -a ma i g ac i i 23
A e 3: Fi al e ec i 25

Acknowledgements

The k h a made ible i h f di g f m a a ie f jec a d ga i a i . We ha k he Ec - mic a d S cial Re ea ch C cil KNOWING jec , he U i e i f S e B i e Sch l, The N E al e k f he E gi ee i g a d Ph ical Scie ce Re ea ch C cil, he Dee T a i i jec , F daci Ce i , a d he TIK Ce e f Tech l g , I a i a d C l e a O l U i e i .

We e eciall ha k Eli abe h Kelli gle a d A i ea Ma ka i f hei a ie a d i al able hel i h k h l gi ic a d c mm ica i .

1: Introduction

The e f hi e i ha e le f m a i e a i al e ea ch k h dedica ed -
a ma i . T e - e e e ea che f m ele e diffe e c ie i Af ica, A ia, La i Ame ica a d E e,
me a he Scie ce P lic Re ea ch U i a S e U i e i 11-13 Se embe 2019, he e e di c ed
em i ical e ea ch a e a d e l ed -a ma i i g ac i ie . We i e hi e ima il f
e ea che , b al f ac i i a d lic ad i l ki g f m e imagi a i e a ache g e i g
ech l g , k a d ai abili i cie , c m a ed h e d mi a age da ada i g a ma icall he
i e e behi d a ma i .

The e i c ed a f ll . Sec i i d ce he k h ic a d a e e ed, a d hich
lead i ela ed a ea ha became a f c f di c i . Fi , me challe ge i he f da i , a d hich

Wednesday 11th September 2019	
Activity:	
Wha d e -a ma i mea f igh ?	Ad ia Smi h (U i e i f S e) a d Ma ia F e li (F daci Ce i)
Papers:	
E a di g l d 4.0: S cial cie ce a ache die f ech l g cha ge	Ch i he F e a d Clai e H l ha (U i e i f Ma che e)
A ma i a d he : A ma i fe e , a ie ie a d ia	Be R be (U i e i f S e) a d Ca li e Ba e (U i e i f Camb idge)
Mee Y e al c b : Will i cha ge ? Ca e i i ?	T d B. l e c (Vie a Tech ical U i e i)

Thursday 12th September 2019	
Papers:	
Faci g he a i i : Vi i a d l d 4.0 f m make a d ma fac e	Ra l Taba e G ie e (F daci Tec alia Re ea ch & I a i)
Fai k a d he gig ec m : Seeki g dece k a da d f S h Af ica la f m ke	Richa d Heek (U i e i f Ma che e), Ma k G aham (U i e i f O f d), Pa l M gai (Fai k)), Jea -Pa l Va Belle (U i e i f Ca e T) & Jamie W dc ck (U i e i f O f d)
Activity:	
P a ma i ibili ie	Facili a ed b A Ligh (U i e i f S e a d U i e i f Malm)
Papers:	
P -A ma i : a al e a i e -c ic i C l mbia	Bele Alb (FLACSO-Q i), M ica B ame e a d Ja ie Jime e (U i e idad de L A de)
The eme ge ce f digi ali ed mall- cale d c i e k i he gl bal S h: a ca e d f Vie am	R Ze -Si d (U i e i f Ma che e)
A e make he e ‘al e a i e’? E ide ce f m	

I deed, if e ecall me f he dif c l ie i b i gi g ab he ke le , e ible fac ie e i aged i ea lie

he e ech l gie a d ada i g hem cial i i f h ma c ea i i , dig i ed k, a d ai able de el me .

I h ld be clea b ha -a ma i i ed a cce i e ha e af e a ma i ha bec me all- e a i e (Smi h, 2014b). Ra he , -a ma i i ab he b e i f ech l gie ha a ea f da i al a ma i he , a d a ia i g hem f diffe e cial e , le f c i ali e m . P -a ma i l k a m e e h i ba ed i dem c a ic a d ai able ela i i h ech l g , a d ha he eb de el ciall ef l e i h ma -ce ed h ma -e cl di g a . The 'bla d ambi i ' behi d a ma i ech l gie i e led b m e imagi a i e e l a i (Ba e , Kembe a d O'Ri da , 2020).

Th , -a ma i e g i g be d a ma i he i he f ll i g e e :

- P -beca e a ma i he i challe ged b g i g cial e e f dig i ed k, ai abili , dem c ac , a d l cal al e a d adi i .
- P -beca e me g a e al ead a ia i g ech l gie i -i d ial a d e -i d ial ace be d c e i al ci c i a d l gic f d c i a d c m i .
- P -beca e he e g eek ec g e he e ech l gie acc di g cial ela i a ia e l al hi ie , a i a i , a d ge g a hie .
- P -beca e he ech l gie a ia ed ha e ge eal gie i cl di g a ma i , a d h e b e i da ech e h ma -ce ed al e a i e ed b ke i ea lie ggle .
- P -beca e e c ce a d he a e e i ed ha e gage c i icall a d c c i el i h he e de el me a d hei f e ibili ie .

5: Workshop explorations in post-automation

The k h i e ga ed me f he ech l gical a d i -a ma i : f m ela i i h ma - di laci g a d h ma -di ci li i g a ma i , h gh he c ea i e e e ime a d e f - a ma i da . We ha ed a d di c ed em i ical e ea ch a e , a d e a ici a ed i g ac i i ie . The ecedi g ec i e e i f med b he e c ib i , a d ill a e he b ead h f i e a i i g. The i e i i hi ec i i gi e eade a li le m e f a a f a ic la di c i (ee he A e e f m e de ail).

S me a e i e ga ed he challe ge i ada i g a ma i (ec i h ee). We deba ed he di c e f i d 4.0, a d h gh ab he h ma ela i be ea h he a ma i e med i ha di c e. The ab e ce f e i f cial j ice a d e i me al ai abili i he l d 4.0 di c e e e ed a d deba ed, ch i ela i e a i e ed i b , i highl -c lled a d di ci li i g k e i me . We c ide ed he he cial j ice a d ai abili migh be i c a ed i a ef med di c e f , a , i d 4.2 (!), i h claim f ec l gical m de i a i , a d a ici a /libe a i g c be - h ical em (e.g. FALC ad cac). O he a g ed ha he f da i f l d 4.0 e e i edeemabl blema ic, ch ha a f ma i a d ai abili e e likel i hi ie

digi al ech l gie eamli i g ba ma ageme , he c g a i f e a d la f m b ci i e i hi ca e d heigh e ed dema d f ld-fa hi ed c mm i de el me .

The a da a c llec i i i a ed a d ha i i e d m bili e became a a e i he ec d e a e al . He e mall- cale fa me e e ided i h digi al ech l gie f m i i g il ali ie . The i e a im l a e l i e ela e hi e-g ai ed da a i h a elli e da a, hil al i g mall- cale, ai able ag ic l al ac ice . H e e , add e i g each e i ed a diffe e a ach da a c llec i a d c mm ica i ech l g . The f me em ha i ed he alidi f fa me -ge e a ed da a f i i ide - cale m i i g em . The la e a m e i e e ed i h da a ge e a i a a l call -c llab a i e ac ice facili a ed he m bili a i f he ege e a i e fa mi g ac ice , b b ildi g c mm i ie a d lea i g e k . S ch diffe e ce em ha i e he im a ce f bei g e a d e e i e a d he cial ela i bei g gh a d i i i ed h gh ech l gical e e ime a i , hich i ce al -a ma i .

Whil k h c ib i dem a ed me me h d ef l f aci g -a ma i a diffe e cale , f m e h g a hic die di c e a al i a ici a -ac i e ea ch, am g he , addi i al me h d a e eeded f ma i g a d cha ac e i i g -a ma i ac cale , e k a d ace . Ab e i he k h a a e i diffe e ce i -a ma i i diffe e ec , a d h ec di i c i migh a f m. S , f e am le, b i gi g la f m c e a i e i la i he e e g ec c m a ed he m bili f d ec , a d e i e ec i be ee hem.

A maj heme i g ac i i ie a he ela i hi be ee he -a ma i i i a d he e 7 Tm a e

a he c l i a i f age c am g ma gi ali ed g challe ge ch e, he ha a e he diffe e dime i dem c a ic ggle i -a ma i ? H a e e ela i e led be d a ici a i , i m e c e i al ech l g a ai al a d i e me i i i ? Wha f m f cial m bili a i e m deci i el -a ma i ?

6.3 Human capabilities

P -a ma i ha im lica i f h e ega d kill , k a d lea i g. P -a ma i i i e e ed i e a di g h ma ca abili ie (O'D a a d Smi h, 2020). W k h e am le ill a ed h hi k h gh ce e ha c l i a e c mm i ie f ac ice i b h digi al a d h ical e i me . P - a ma i eca i a e ligh he im a ce f aci k ledge a d i a ed k ledge i ela i he c di ed k ledge em ha i ed i digi al ech l g . De el i g e a f lea i g a d facili a i g c llec i e ga i a i al ca aci ie i -a ma i ill c e e l be i di e able. Wha ki d f ca e ac ice ill be e i ed i -a ma i ce a i ba ed, f e am le, i ela i f e ai a d l ge i i digi al i f a c e ? A d ha ab h ma ca abili ie i digi al ci ech ical c g a i e ec i g mi imal e ce e a d c ami a i ? Whe e a e ch ca abili ie bei g c l i a ed, a d h a e he ec g i ed a d al ed?

6.4 New imaginaries for technology in society

I d ial cie ie all a cia e ech l g i h ec mic de el me , a d h ma ellbei g i h em l me . H e e, i h a ma i e li g he e idea a d e e i g a f e he e he a f em l me a d d c i f al e i e cha ge, -a ma i ide a ace e-imagi e al e a i e ha ech l gicall -media ed h ma ac i i mea i e m f c ea i i , cial e ibili , ellbei g, a d he c ea i f al e. H d e le ela e he hi g he d ce i -a ma i cie ie , a d h d e le ela e e a he ? H ca -a ma i be f he de el ed a a ci ech ical imagi a ha i able m bili e i f ha ed ellbei g a d ai able de el me ? Wha d e k feel like i he e f e ? H ca e ea abl b ild imagi a i el f m eci c i i a i e , ch a h e e e ed a he k h , a d he eb i f m m e ge e al i i f -a ma i ?

6.5 Enabling institutions and institutional change

While i i ible f g e e ime i ma gi al ace c d ci e d i g digi al diffe e l , l ima el , if

References

Ba e , C., Kembe , S. a d O'Ri da , K. (2020) F i : ech l gical femi i m a d digi al f e . L d : Pl P e .

Ba e , C. a d R be , B. (2019) 'A ma i N a d The : A ma i Fe e , A ie ie a d U ia ', Ne F ma i , (98), . 9 28. d i: 10.3898/NEWF:98.02.2019.

Bi ha e, A. a d a Dijk, J. (2020) 'R b Righ ? Le ' Talk ab H ma Welfa e I ead', i Thi d AAAI/ACM C fe e ce A i cial I ellige ce, E hic , a d S cie . Ne Y k.

Hickel, J. a d Kalli , G. (2019) 'I G ee G h P ible ? I G ee G h P ible ?', Ne P li ical Ec m .

Ta l & F a ci , 0(0), . 1 18. d i: 10.1080/13563467.2019.1598964.

Illich, I. (1973) T l f c i iali . L d : Ha e & R .

Jack , B. T. a d Vic , P. A. (2019) 'U a eli g he claim f (a d agai) g ee g h', Scie ce, 366(6468), . 950 951.

Li , D. e al. (2018) 'Ec l gical F i Acc i g f C ie : U da e a d Re l f he Na i al F i ', Re ce , 7(3), . 58. d i: 10.3390/ e ce 7030058.

Ma he ma , S. (2011) Tech l g a d cial he . Ba i g ke: Palg a e Macmilla .

O'D a , C. a d Smi h, A. (2020) 'Tech l g a d H ma Ca abili ie i UK Make ace ', J al f H ma De el me a d Ca abili ie . R ledge, 21(1), . 63 83. d i: 10.1080/19452829.2019.1704706.

Pa ale, F. (2019) The Sec d Wa e f Alg i hmic Acc abili , La a d P li ical Ec m . A ailable a : h ://l ebl g. g/2019/11/25/ he- ec d- a e- f-alg i hmic-acc abili / (Acce ed: 3 Ma ch 2020).

Sad ki, J. (2020) 'The l e e f La dl d : Digi al Pla f m a d Ne Mecha i m f Re ie Ca i ali m', A i de, 0(0), . 1 19. d i: 10.1111/a i.12595.

Sa e , A. (1989) 'P f di m i e i ', I e a i al J al f U ba a d Regi al Re ea ch, 13(4), . 666 695. A ailable a : h ://li elib a . ile .c m/d i/ df/10.1111/j.1468-2427.1989. b00141. .

Sch ab, K. (2017) The f h i d ial e l i . Ge e a: W ld Ec mic F m.

Smi h, A. (2014a) S ciall ef l d c i . 58. B igh . A ailable a : h :// e -ce e. g/ blica i / ciall - ef l- d c i /.

Smi h, A. (2014b) 'Tech l g Ne k f S ciall U ef l P d c i ', J al f Pee P d c i , (5). A ailable a : h :// ee d c i . e /i e /i e-5- ha ed-machi e- h / ee - e ie ed-a icle / ech l g - e k - f - ciall - ef l- d c i /.

T e , G. (2008) A c m a i f he Limi G h i h hi ea f eali . Ca be a.

Annex 1: Paper presentations and discussion

DAY 1

1. Christopher Foster & Claire Hoolohan - ***Expanding Industry 4.0: Social science approaches to studies of technology change***

The a e e l e he f da i f c ce 'I d 4.0', he me h d ed e l e hi he me a d i e ial c me b i g cial cie ce a ache m e a d m e c i ical e ec i e ab ech l gical cha ge. The a e ai e a e f i e e i g e i ha challe ge c e i al deba e

The f ll i g i e e e ai ed af e he e e a i :

Reactivation of cultural phenomenon

A ma i ca be ee im l a a he me ha bec me m e e fec l c m le ed a each ime, e ec i g i elf i he e l i f ech l g . B ha eem ha e i a e e i i i diffe e m del f h cie ee machi e e embli g h ma : c be e ic he machi e lea i g.

Real anxieties regarding job displacement

S me f he a ie ie , al h gh c clical, ha e ed ake lace a d ha e eal c e e ce a each ime. Wha diffe e i a ie ie f m c e e i ha he i a e clea ha e f cha ge ld cc , hile he e i a m e ed ie ha he a f ma i a e ece a il a i a i e, b ali a i e.

Con icting views on the impact of automation

DAY 2

1. Raúl Tabarés Gutiérrez - *Facing the transition: Visions around Industry 4.0 from makers and manufacturers*

The e e f ded c llab a i e a e hi be ee make a d ma fac e aimed a accele a i g he de el me f e ce e . F m i e ie i g he ac i l ed i hi c llab a i he a h c llec ed i igh ab m i a i , i i a d h he e cei e he fac f he f e a d he ad l d 4.0. Clea diffe e ce e e ed d e he em e e i cie . While make e e led b d ci g i i e cial im ac a d de ec ed he a i i a d i d digi i a i a a i i d ce c ea i i , e e , ha i g a d ai abili i he d c i , ma fac e ecei ed i a i a a l c m e ea d e e ce ical ab he fea ibili f digi i a i . Ne e hele , he a h a g e ha i d digi i a i c ld be ed a fe g a ' al e he ma fac i g ec , e bef e a ig i ca lic age da.

The f ll i g i e e e ai ed af e he e e a i :

Human agency versus automation
Ne ech l gie ca be ed b h a e h ma lab a d deal i h lab eg ia i (b di laci g j b).

Contacting and bringing together different actors
The a h ack ledge he dif c l ie i i g ge he a la g age c cilia e he i e e f b h ac . I a m e dif c l e gage ma fac e ha make i he a e hi . Ve f e he e e a a e f ha make ace e e e . Ide if i g c mm al e be ee hem c ld e e e a a c c f he c ec i .

2. Richard Heeks, Mark Graham, Paul Mungai, Jean-Paul Van Belle & Jamie Woodcock - *Fairwork and the Gig Economy: Seeking Decent Work Standards for South African Platform Workers*

The a e f c e he ela i be ee digi al la f m a d he f e f k (eci call he gig k). I e ec he fac ha a da d ab dece k eed be adj ed he i c me digi al la f m . Ba ed a d f he a i de f 70 ke ac 11 digi al la f m , he d elab a e a a i g i me ba ed e i ci le (fai la , fai c di i , fai c ac , fai ma ageme a d fai e e e a i) m e he adhe e ce f digi al la f m dece k a da d .

The f ll i g i e e e ai ed af e he e e a i :

Tensions between traditional workers and gig-workers
The gig- k migh ca e c ic be ee adi i al ke a d h e h a e e abled b digi al la f m . The e eem be a ade- ff i he i d c i f he gig-ec m : hile i e a d k i ie a d ide m e e ibili f ke , i dimi i he he abili ca e he kf ce i he m e c e i al ec .

Can we equate the gig-work with informal work?
The a e f he k ca ied h gh he e la f m migh , me e e , e a e i f mal k c di i i he Gl bal S h. I ha ega d, h ld e ec ide e ce i ab eg la i i ce he e la f m a e e able f a c a eek f i c me i a imila a a i f mal k d ? The a h a g ed i he di c i ha hile i f mal j b a e f e a ch ice (i.e. i i he c e e ce f lack f i), ki g i h he e la f m i (i e m f efe e ce ela ed i c me a d e ibili). H e e, b ki g a d h ee le e age i (c ea i g eg la i , a i g he la f m a d c me efe e ce), m e fai c di i f he e ke ca be c ea ed.

Traceability, individual trajectories and the advantages of being a local
Whe e a e he ke c mi g f m? S me f he Ube d i e e e ck d i e i he a , a d hei deci i bec me 'i de e de ke ' a made ba ed e al ea (e.g. e e di g m e ime i h hei familie). H e e, he ci c m a ce a e diffe e f h e h a e f eig e . Ge i g a j b a dece ala eem be ha d f -l cal , he e la f m ffe hem a al e a i e e e he hi mea adi g ff hei ec i (e.g. Ube d i e a e l e able c ime a d bei g killed i S h Af ica).

ech l gie all e f m fi e ac i a d a k e ace f dial g e; , ech l gie a e de i i g cial ce e . Tech l g ca a ce d he cial i e. I hi ega d, e eed ma di c ec i a d ide if h ech l gie ca hel .

What is, what could be and what should be

I i ke ide if he ‘ ha i ’ he e a e deali g i h he me a ha b i g ge he cial ela i a d ech l g . O l he he ‘ ha i ’ i ide i ed, he ‘ ha c ld be’ a d he ‘ ha h ld be’ i ega d ha ech l g ca be ma ed. P -a ma i i ab mi iga i g he ‘ ha c ld be’ a d i g , d a a d he ‘ ha h ld be’. N e hele , e eed be mi df l ha he ech l gie a ailable a e c a l i ec i g he ‘ ha i ’ e i a d, a a c e e ce, a e leadi g he ‘ ha h ld be’. Diffe e ech l gie legi imi e ce ai f m f k ledge (e.g. i e m i a d c di ed k ledge) a d e a challe ge dem c a i e ac i a d hem. Tha i h i bec me m e a d m e im a ide if ace f delibe a i d i e b he c mm i ie . F e am le, al h gh Sma Ci ie i a E ea C mmi i jec , he i i ad ed b a ci , la ded i a c mm i , i hei decide he ‘ ha h ld be’.

4. Cian O’Donovan - *Governing robotics through ethical standards*

S a da d a e ed each c e a f d i g hi g a d mi iga e he i k e c m a ed b e ced e ech l gie . The a h i e iga e he c ea i f e hical a da d f b ic he le eme gi g a d he ac i l ed i he deci i all i g e ec i i he g e a ce f b ic i a i . F he , -a ma i e ial f a ici a i e g e a ce ha a da d b i g a e li ed a d di c ed i e m , f e am le, f h ma age c a d ci ech ical ela i .

The f ll i g i e e e ai ed af e he e e a i :

Ethics towards robots

A b bec me e d bec me m e f e e i e e da life, he i e f e hical a da d li e i h hem a i e. Al h gh legall e abli hed, he al e ha h ld f m he e hical f ame k deal i h h ma - b i e ac i al ead e i , i de e de l f he e f ela i ha ma cc , be he b hel e , ke , c m a i c lleag e .

Ethics and standards

Al h gh a da d a e hel f l i de make hi g k, e hic a e ece a il eeded d . O ce hi g ac all a k im a i e c ide a e h i e ible m i alg i hm , h fe i al m (ch a IEEE m) a e liced he he ge de ia ed, h a da d ca be ed a id e ec i g a d c ide i g f he e hical i e , h a da d ca hel mali e ac ice i ech l gie ha a e a e m e le (e.g.: Dee eb a d e c ed ec i em).

5. Alex Pazaitis - *Capturing value in open innovation: the case of Sensorica*

The a h di c e a e f m f cial d c i amed c mm -ba ed ee d c i (CBPP) i hich al e de i e f m c ib i f m diffe e a ici a . The ca e d a al ed i Se ica, a Ca adia e e e i e ha d ce e ha d a e e ech l gie b c di ai g e ce f m m l i le ce . Se ica de el ed a acc i g em ca e c ib i a d a e di ib i f al e ha

ible idea e l e he m i i g f ha i g k ledge a d c ib i i b cial deb , i hich e le ack ledge he ac b i d e ha e i l e a cial a me f he deb .

Accounting value

The c ib i a e l gged i he em a he a e bee c m le ed. A d he ame i d e ega di g he i e ac i i h lie . B beca e me d c d make i he ma ke he e i a k he mbe f ale a d e e e a e. The m i i g f c ib i i made i a acc i g de a me , b i a a e a d dem c a ic.

Production and risk management

Rega di g he edi ib i f i k , bei g Se ica a me i c a ic e k a d a egali a ia e, he e i eci ci i he di ib i f e e eb he e i m ch lida i a ici a ega di g he e ce a lied a jec i ca e i fail . The a ici a ee hem el e a af lia ed membe a he ha f eela ce d ci g ced e ice . Ne e hele , he e i f m f cial ec i .

Anex 2: Post-automation group activity

The half f he ac i i aimed a imagi i g -a ma i , a ic la l , i ace a d d i e , all i g f a ia a ach if ece a . Ba ed he e e f he da (he e ele a heme -a ma i e e c m iled), a ici a e e a ked e ec he i e ha ma e m hem (i em ha he ca e ab a d ca cha ge he ld ac , d i e , i i , e e c.), i e hem d i a e hee a d lace hem he l , cl e i g idea he e ible.

The a ici a e e he a ked a ach cl e a d heme he ela e he m , a d g a ed f m. Af e me ea a geme f b h e le a d a e , e g e e c ea ed. The e e i i ed ick he a e a d d a able i d . The g a d me f he a e c llec ed e e:

Group 1: Ad ia , Ale , Bele , JP, Sid & T d C mm i g, P e i , G h, O e ee d c i f g d , Agai a h i a ia i m, Re ec , Di e i .

Group 2: Ma ia , Meli a, Ra el, R Sca ci , E i me al c lla e, Clima e cha ge, Z mbie a cal e, The 0.1% mega eal h, R i g he ai e he cliff.

Group 3: Ed, El i , Pa l, Ra l, Richa d Mig a i , 20h- eek, U i e al cial blem , S digi al e a i , Mea i gf l k, Dece j b f all.

Group 4

gge a m e ha m i li i g. P -a ma i c ld lead i g he idea f mbie diffe e l : i ead f h ma bli dl ma chi g a d de c i , i i i al mbie c ld be c ea ed, f i a ce, ea la ic f he cea .

Group 1: Not too far from now
A b i de ic ed bei g ed i a h i a i e a d c di a ed a b e e al h ma , c f i g a machi e ha ie ada a d ha dle all he de . A me i , he b ebel agai he h ma ma e a d e e e he di ec i f c mma d .

Group 3: A future approach
The g gge ed a ie f he f e ha deli e be e di ib i f i c me, i e al ba ic i c me, al e a i e e hi , hea il eg la ed ma ke (he c m e i i e a ec i e di g he lab fac) a d da a c mm .

Group 5: A far-future approach
The g f c ed ca e a d Ea h . The e e ed a ba ke hich i a e e e a i f he ld a me c mm i ie i S h Ame ica e cei ed i . I ide i e e laced all he hi g he ca e ab , ch a ac i h age c , m i g a a f m c l a d a d i cl i a d a h ma - ie ed a ach Al ha ca ei f ce dem c acie .

The following issues were raised after the activity:

The i i f he f e di c ed a d ambi i ed e e ed me c mm fea e . Fi , he e e c m le el ia a d, he ef e, ha e a high deg ee f fea ibili f he f e. Sec d, he i i eac i g a i d -d mi a ed f e e e ba b a al. Thi highligh ed he fac ha ac i f a ic la h ma g ca im ac c mm i ie (ece a il he h ma e) ha d ha e he mea ai e hei ice a d be hea d. Thi d, i i f c ed m e cial a ec a d al e ha ech l gie , hich highligh ha h ma a d hei ela i a e a he ce e f ha i c ide ed m e al able, a d i i e hi k h e ca be e a d f cha ge. La l , ega di g he e hical a lica i f ech l gie , cial cie ce e ea ch i f e e i ed e hical a al bef e de aki g ce ai ac i i ie ; h e e, i he di ci li e ha d di ec l i l e h ma , hi i le c mm , al h gh e i ale l ece a i ce ch ac i i ie e d ha i g a im ac h ma .

II. Second Part

The aim f he ec d a f he ac i i a c ide he al e de i i g -a ma i , a d c ide he i i i al challe ge (ma i e, c g i i e, eg la i e a d ec mic) ha limi de ec he e lme a d ake -a ma i . S , i he, 30 mi e f he ac i i , he a ici a e a ked i e d he ac ical ba ie accele a f each e f he ce a i ha he imagi ed i he e i ac i i .

c ce -a ma i i ha ha e he ech l gie de ig ed be e l i a i e a d c lli g a e
ed i a m e libe a i g a d ciall - ie ed a .

Ideology, conceptual frameworks and methodologies

cliff) he f c m e iable al e a i e .
P -a ma i e e diffe e ibili ie f i e e i g a e ld ha e i ci - ech ical m de c ld . The e i a ibili i eg a e diffe e e ec i e , ch a i d ial, ma fac e, ai abili , e hic , g e a ce e c.
The be e f he c e m de f d c i a d he a ma i cha e f i ha e al ead bee di ib ed.
I ellec al P e make e k ledge i ed a d ec ed. P -a ma i c ld be ee a a a ma age he i e ali ie ha a i e f m a ma i a d hel c ec i mi ake .
P -a ma i i a i g ha a ma i i he a add e c em a i e . I hel b ild ie f he e g be d hi a a i e f big-da a, b -d i e , ge e ic e gi ee i g e c. F he m e, i gi e he cha ce e a e i em l gical c c f c ce i hi ac ice , d ha ha a ed a d ha e a e e ha i c me.

Efficiency

A ma i mea ef cie c a d ec mic g h, hile -a ma i d e ece a il di ega d ef cie c a d g h, b a la e ef cie c a d g h i m e h ma , cial a d la e dime i .
P -a ma i , i hi ega d, h ld ha e a m e cial a d e i me al a ach ha ack ledge ha hile he h ma a ec i e e ial, i eed be ee i ega d f la e a b da ie ; ha i , ee all he e eleme a a h le.
H ca -a ma i hel igge di c i be d ma imi i g e e e ef cie c a d, f i a ce, f c hi g like ‘ ha i g’