Algorithmic Management
Consequences for Work
Organisation and Working Conditions

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What is algorithmic management?

- **Algorithm**: ‘process or set of rules to be followed in calculations or other problem-solving operations’ (OED Online, 2021)

- **Weber**: step-by-step, distributed and nominally objective procedures for selection and sorting that characterized decision-making in modern bureaucracies

- Explosion in computing power and digital data collection = business use of algorithms qualitatively different

- Use of software algorithms (computer-programmed procedures for transforming input data into a desired output) in controlling an organisation

- Lee et al. (2015) Uber ‘algorithmic management’
Algorithmic management of what?

- Automation of **direction** (what needs to be done, in what order and time period, and with different degrees of accuracy)
- **Evaluation** (the review of workers’ activities to correct mistakes, assess performance, and identify those who are not performing adequately); and discipline (the punishment and reward of workers in order to elicit cooperation and enforce compliance).
- **Discipline** (the punishment and reward of workers in order to elicit cooperation and enforce compliance) – (Kellogg et al., 2020)
- **Platform Work**
- **Warehouses** (esp. Amazon)
Algorithmic direction in platform work

- **Ride hailing** and **food delivery** platforms automatically allocate fares/orders & provide route via GPS map.
- In theory workers can **reject** gigs and route.
- But ability to choose gigs limited by **information asymmetries**.
- **Uber** found to dock pay for not following ‘efficient route’.
- **Food delivery** workers contacted by human supervisor if headed in wrong direction or taken too long.
  
  ‘You just do what you’re told by the app’ (Veen et al., 2020)

- ‘**Dispatchers**’ ‘monitor riders and orders in real-time and help solve ‘issues” (Ivanova et al., 2018)
Algorithmic direction in conventional employment

- **Warehousing**: hand-held ‘scan guns’ or wearable devices that combine barcode scanners, motion and location tracking, and a display.
- Automatically assign optimal items to workers in terms of efficiency.
- Item and route communicated via text and images displayed on hand-held device. Takes into account the location of stock and other workers in real time and gives a time to complete task.
- Installation of cameras that use machine learning to alert workers when they are breaking social distancing rules.
Algorithmic direction in conventional employment

- **Delivery**: AI-cameras: instruct workers to maintain safe distances, slow down, not make unplanned stops and take 15-min break if yawning
- **Retail**: combine workforce, customer traffic, sales and weather data to automatically schedule workers
- **Manufacturing**: (Siemens’ Congleton): software plans production in real-time and instructs workers as to what needs to be produced each day
- **Klick Health**: alerts when projects are behind schedule, notifies outstanding and urgent things to do, reduce distractions hampering productivity
- **Publics**: assign account managers, coders, graphic designers, and copywriters to new projects
Algorithmic evaluation in platform work:

• **Ride hailing platforms**: customer ratings; work acceptance rates; braking and acceleration speeds

• **Digital service platforms**: Customer ratings, jobs completed, length of worker-client relationship, keyboard presses and screenshots etc.

• **Food delivery platforms**: weekend shifts after 8pm, average weekly hours, no-shows, late log-ins, orders per hour, tenure; time to accept orders, travel time to restaurants, travel time to customers, time at the customers, orders not accepted, customer ratings
Algorithmic evaluation in conventional sectors

- **Warehousing**: device records the number of products picked per hour – automatically compared to target based upon previously achieved pick rates in workplace.
- Aggregated together to rank individual workers relative to their colleagues.
- Individual speed, productivity, accuracy and errors in real-time and retrospectively are bundled into a single, composite assessment of performance and matched to a normal distribution curve.
- Lowest 10% told to speed up by human managers.

- **Retail**: algorithmic task management – failure flagged to human manager.

- **Hotels**: TripAdvisor ratings and reviews incorporated into individual performance management and weekly team meetings.
Algorithmic discipline in platform work

- **Ride-hailing platforms** automatically deactivate workers with low ratings
- Workers do not have a right to appeal but **can ask for review** & in some cities undertake a ‘quality improvements course’ (at their own expense)
- **Uber** claims that deactivations manually reviewed by human manager
- **Food delivery sector**: low-ranked workers have access to shifts restricted
- **Digital service platforms**: filter work to highest ranked workers through search tools
Algorithmic discipline in conventional employment

- **Warehousing**: individual performance scores used to decide who should be fired: ‘*Management consists of executing decisions based on data analytics*’ (Briken and Taylor 2018)
- Text messages in the mornings confirm or cancel their shifts based on their previous day’s productivity metrics
- **Amazon**: terminations for low productivity generated automatically without input from supervisors – although human managers can intervene in the process
- **Delivery**: AI-cameras (Amazon) used for disciplinary actions including firings
- **Hotels**: online reviews result in workers being fired
What does this tell us about algorithmic management

<table>
<thead>
<tr>
<th>Level of automation</th>
<th>Narrative definition</th>
<th>Direction, Evaluation, Discipline</th>
<th>Review (in case of system failure)</th>
<th>Mode specific (human manager can ignore/overrule system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No automation</td>
<td>Full-time performance by human manager of all aspects of direction, evaluation and discipline</td>
<td>Human manager</td>
<td>Human manager</td>
<td>n/a</td>
</tr>
<tr>
<td>Management Assistance</td>
<td>Assistance in either direction, evaluation or discipline with the expectation that human managers perform other management tasks and use own judgement to review, ignore and overrule system.</td>
<td>Human manager and algorithmic system</td>
<td>Human manager</td>
<td>Yes</td>
</tr>
<tr>
<td>Partial Automation</td>
<td>Mode specific execution of either direction, evaluation or discipline with the expectation that human managers perform remaining functions.</td>
<td>Algorithmic system or human manager</td>
<td>Human manager</td>
<td>Yes</td>
</tr>
<tr>
<td>Algorithmic management</td>
<td></td>
<td>Algorithmic system</td>
<td>Human manager</td>
<td>Yes</td>
</tr>
<tr>
<td>Conditional Automation</td>
<td>Mode specific execution of direction, evaluation and discipline with the expectation that human managers will respond appropriately to a request to intervene.</td>
<td>Algorithmic system</td>
<td>Human manager</td>
<td>Yes</td>
</tr>
<tr>
<td>High Automation</td>
<td>Full-time performance by an algorithmic system of direction, evaluation and discipline without the need for human managers to intervene.</td>
<td>Algorithmic system</td>
<td>Algorithmic system</td>
<td>Yes</td>
</tr>
<tr>
<td>Full Automation</td>
<td>Full-time performance by an algorithmic system of direction, evaluation and discipline without the possibility for human managers to intervene.</td>
<td>Algorithmic system</td>
<td>Algorithmic system</td>
<td>No</td>
</tr>
</tbody>
</table>