

COMPLEXITY

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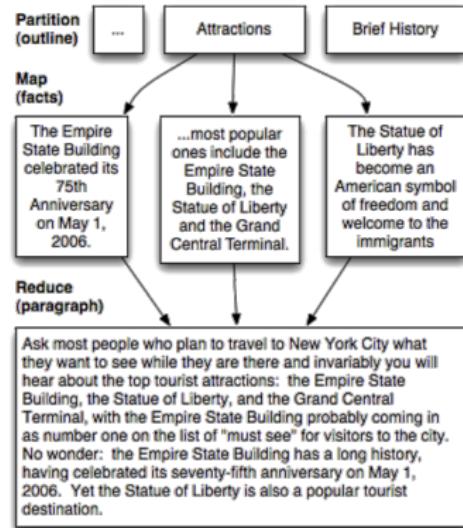
- Can crowds create things from whole cloth?

Kim and Monroy-Hernández [5], Kim et al. [6], Hahn et al. [4], and Lasecki, Kushalnagar, and Bigham [9]

WHAT DOES THE CROWDSOURCING LITERATURE SAY?

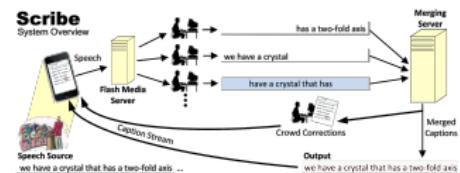
- Build complexity into the process
 - Apply CS methods to people

Kittur et al. [8]



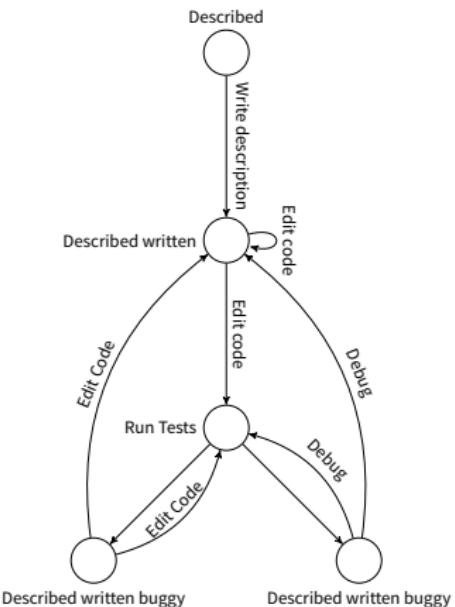
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 - **Crowdsourcing workflows as function state machines**
LaToza et al. [10]



WHAT DOES THE PIECEWORK LITERATURE SAY?

George Airy (astronomer) used a very similar approach [3]



- Employed computers
- 13–20 years old
- Overworked
- Underpaid
- Could be fired at will

GEORGE AIRY — WHIZ KID

Airy built complexity into the process, assigning *human computers* to compute, verify, and correct the right ascension and declination of stars.

No. of Swings.	Approximate Time (Astronomical Reckoning).	Number of Signals.	Mean of Times by SHELTON.	Mean of Times by EARNSHAW.	Interval by SHELTON.	Interval by EARNSHAW.	Rate EARNSHAW / SHELTON	Logarithm of EARNSHAW / SHELTON	Corrected Logarithm of EARNSHAW / SHELTON
1...	Oct. h 1. 23	22	3 19 36·505	21 23 28·764	h m s 4 0 23·100	h m s 4 0 38·722	1·0010831	0·00047012	
2...	2. 3	21	7 19 59·605	1 24 7·486	3 58 21·652	3 58 37·400	1·0011011	0·00047793	
3...	2. 7	21	11 18 21·257	5 22 44·886	4 45 27·829	4 45 46·421	1·0010855	0·00047117	0·00047387
4...	2. 11	29	16 3 49·086	10 8 31·307	4 17 6·532	4 17 23·234	1·0010827	0·00046995	
5...	2. 16	17	20 20 55·618	14 25 54·541	3 13 21·898	3 13 34·795	1·0011116	0·00048249	
6...	2. 19	25	23 34 17·516	17 39 29·336	3 49 42·503	3 49 57·654	1·0010994	0·00047720	0·00047990
7...	2. 23	31	3 24 0·019	21 29 26·990	3 55 2·071	3 55 17·433	1·0010893	0·00047282	
8...	3. 3	21	7 19 2·090	1 24 44·433	4 2 41·510	4 2 57·445	1·0010944	0·00047503	
9...	3. 7	25	11 21 43·600	5 27 41·868	4 31 5·786	4 31 23·591	1·0010947	0·00047516	0·00046316
10...	3. 11	22	15 52 49·386	9 59 5·459	3 27 49·747	3 28 3·324	1·0010888	0·00047260	
11...	3. 15	24	19 20 39·133	13 27 8·783	3 59 47·292	4 0 3·188	1·0011049	0·00047959	
12...	3. 19	24	23 20 26·425	17 27 11·971	4 3 30·416	4 3 46·020	1·0010686	0·00046384	0·00047194

COTTAGE INDUSTRY

First appearances of piecework:

COTTAGE INDUSTRY

First appearances of piecework: farms



COTTAGE INDUSTRY

First appearances of piecework: farms, textiles



COTTAGE INDUSTRY

First appearances of piecework: farms, textiles, and matchsticks.



PLANES, TRAINS, AND AUTOMOBILES

... NOT IN THAT ORDER

Trains



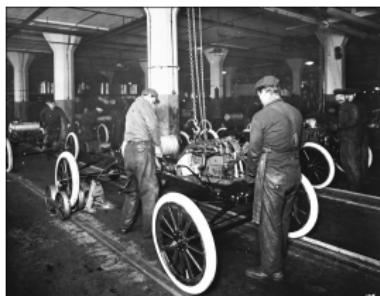
- “Efficiency experts” measured how long it would take to do various jobs
- These measurements would be used to assign values for each specific task
- Train engineers performed work more slowly when inspectors were around

PLANES, TRAINS, AND AUTOMOBILES

... NOT IN THAT ORDER

Automobiles

- Fordism,
Taylorism, and
Scientific
Management in
full force



- *Manufacturing* proved amenable to assembly line processes.

PLANES, TRAINS, AND AUTOMOBILES

... NOT IN THAT ORDER

Planes



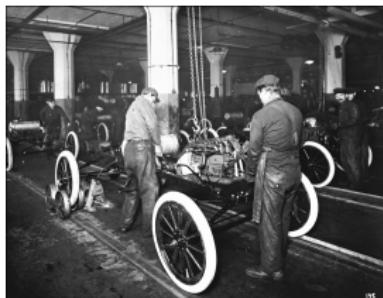
PLANES, TRAINS, AND AUTOMOBILES

... NOT IN THAT ORDER

Trains



Automobiles



Planes



COMPARISONS

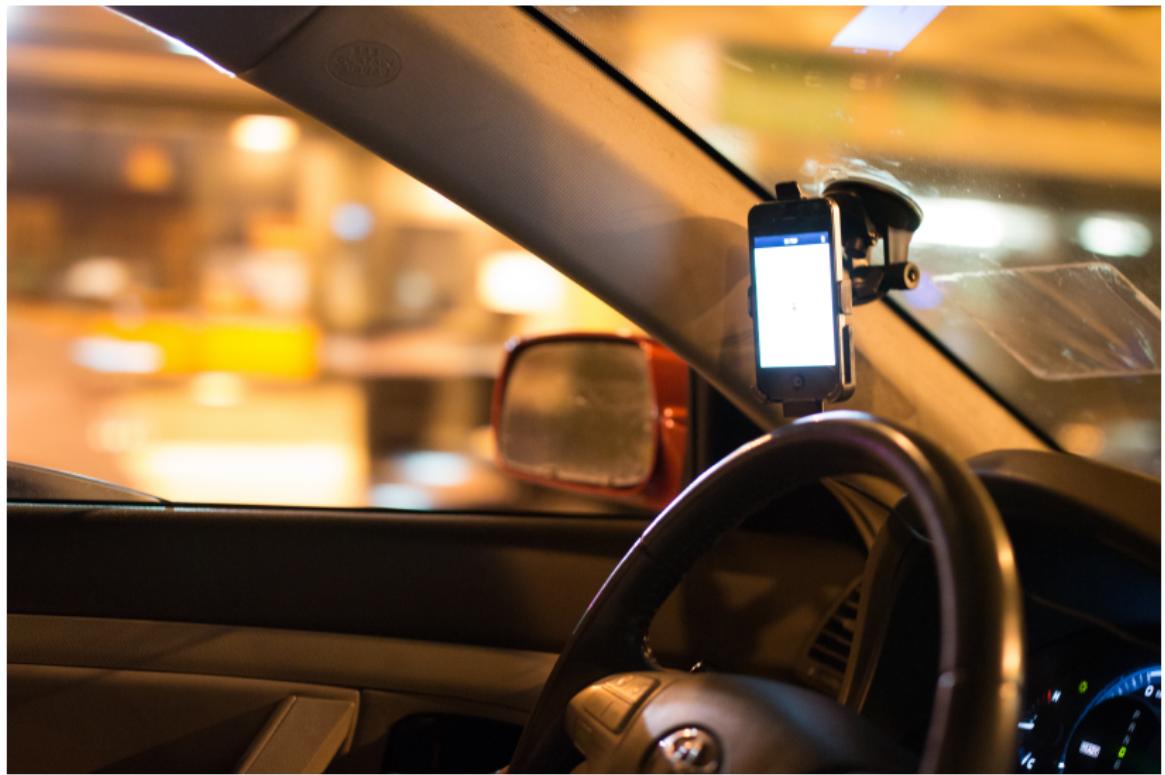
- Limited range of tasks > arbitrary changes (building planes is easier than fixing trains)
- Has technology changed this? Yes
 - Technology makes complex tasks relatively trivial
 - Measuring workers is easier than ever

COMPLEXITY

CAB DRIVERS



COMPLEXITY CAB DRIVERS



IMPLICATIONS

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