



2017

annual **INCOSE**
international workshop

Los Angeles, CA, USA

January 28 - 31, 2017

MBSE Workshop '17

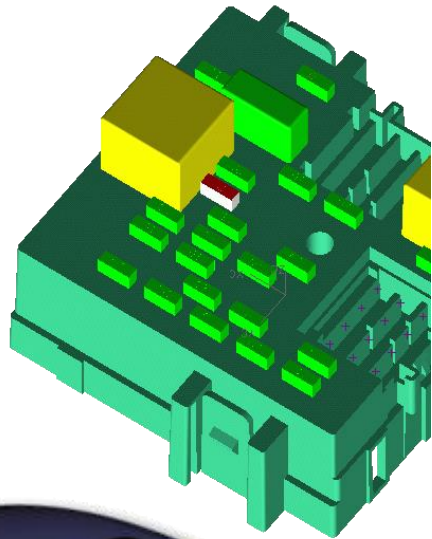
Mark Sampson: Chair MBSE Initiative

Troy Peterson: Asst-Director SE Transformation

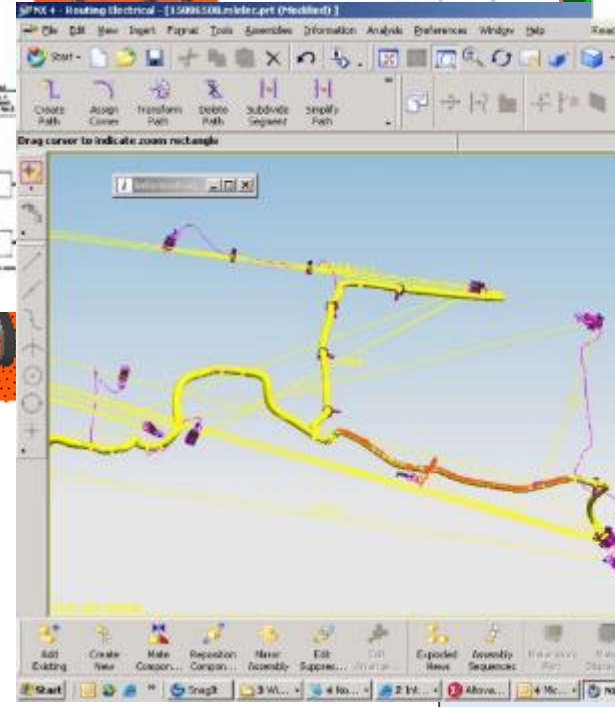
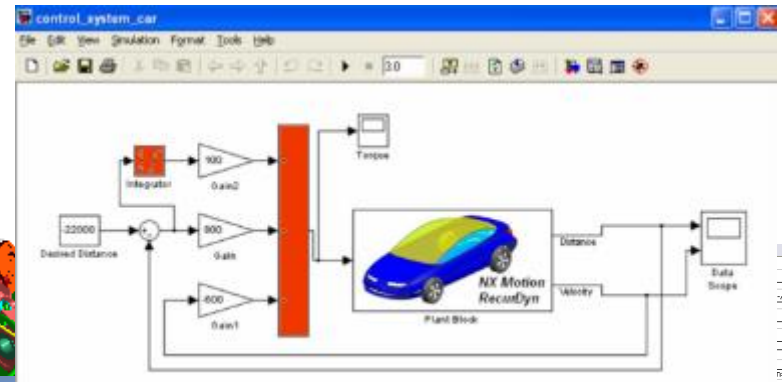
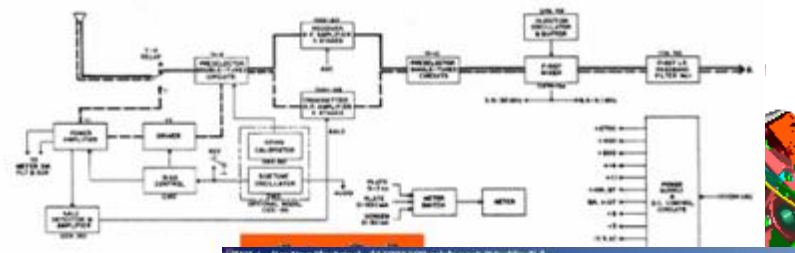
10 Year Anniversary

Accelerate Transformation...Faster

Vision: Integrated MBSE...



Hydraulic Fluid:



Item No.	Description	Requirement	Test Case No.	Test Case Description	Test Case Category	Test Case Status	Test Case Date	Test Case Author	Test Case Reviewer	Test Case Version				
17	Door LH	door panels	appearance due to rust	was application specified insufficient room between panels for spray head	4	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24
18				was application specified insufficient room between panels for spray head	4	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24
19				was application specified insufficient room between panels for spray head	4	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24
20				was application specified insufficient room between panels for spray head	4	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24
21				was application specified insufficient room between panels for spray head	4	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24
22	Front Door RH	Corroded interior lower door panels	Undesirable appearance due to rust	4	None	None	Upper Edge of protective wax application specified	Vehicle general durability test T-118 T-109 T-301	accelerated	Eng 6/6/04	Combine test results upper	4	2	24

Table II—Ordinary Joint Life and Last Survivor Annuitants—Two Lives—Expected Return Multiples

Ages		35	36	37	38	39	40	41	42	43	44	45	46	47	
Male	Female														
35	40	46.2	45.7	45.3	44.8	44.4	44.0	43.6	43.3	43.0	42.6	42.3	42.0	41.8	
36	41	45.7	45.2	44.8	44.3	43.9	43.5	43.1	42.7	42.3	42.0	41.7	41.4	41.1	
37	42	45.3	44.8	44.3	43.8	43.4	42.9	42.5	42.1	41.8	41.4	41.1	40.7	40.4	
38	43	44.8	44.3	43.8	43.3	42.9	42.4	42.0	41.6	41.2	40.8	40.5	40.1	39.8	
39	44	44.4	43.9	43.4	42.9	42.4	41.9	41.5	41.0	40.6	40.2	39.9	39.5	39.2	
40	45	44.0	43.5	42.9	42.4	41.9	41.4	41.0	40.5	40.1	39.7	39.3	38.9	38.6	
41	46	43.6	43.1	42.5	42.0	41.5	41.0	40.5	40.0	39.6	39.2	38.8	38.4	38.0	
42	47	43.3	42.7	42.1	41.6	41.0	40.5	40.0	39.6	39.1	38.7	38.2	37.8	37.5	
43	48	43.0	42.3	41.8	41.2	40.6	40.1	39.6	39.1	38.6	38.2	37.7	37.3	36.9	
44	49	42.6	42.0	41.4	40.8	40.2	39.7	39.2	38.7	38.2	37.7	37.2	36.8	36.4	
45	50	42.3	41.7	41.1	40.5	39.9	39.3	38.8	38.2	37.7	37.2	36.8	36.3	35.9	
46	51	42.0	41.4	40.7	40.1	39.5	38.9	38.4	37.8	37.3	36.8	36.3	35.9	35.4	
47	52	41.8	41.1	40.4	39.8	39.2	38.6	38.0	37.5	36.9	36.4	35.9	35.4	35.0	



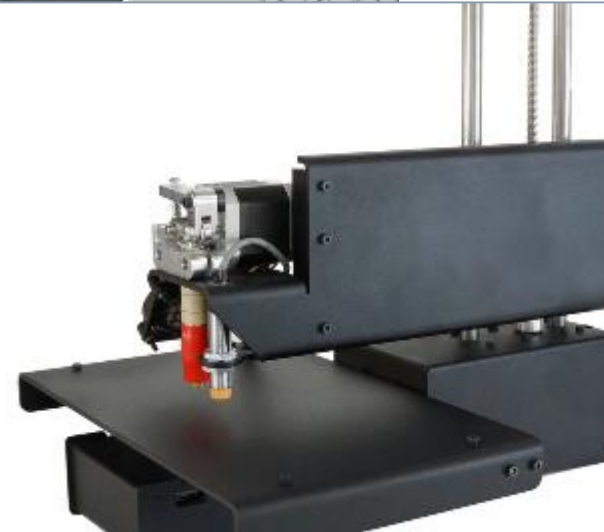
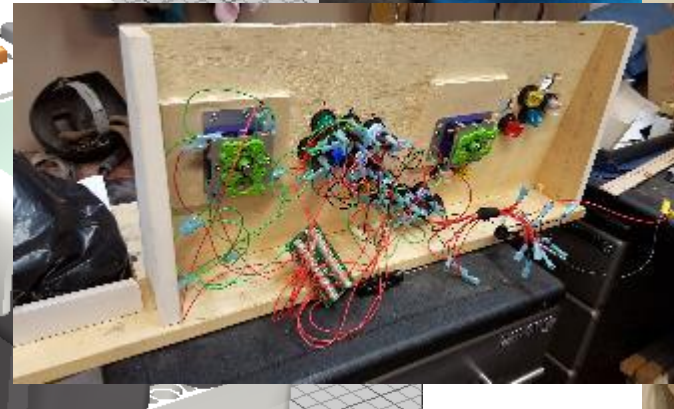
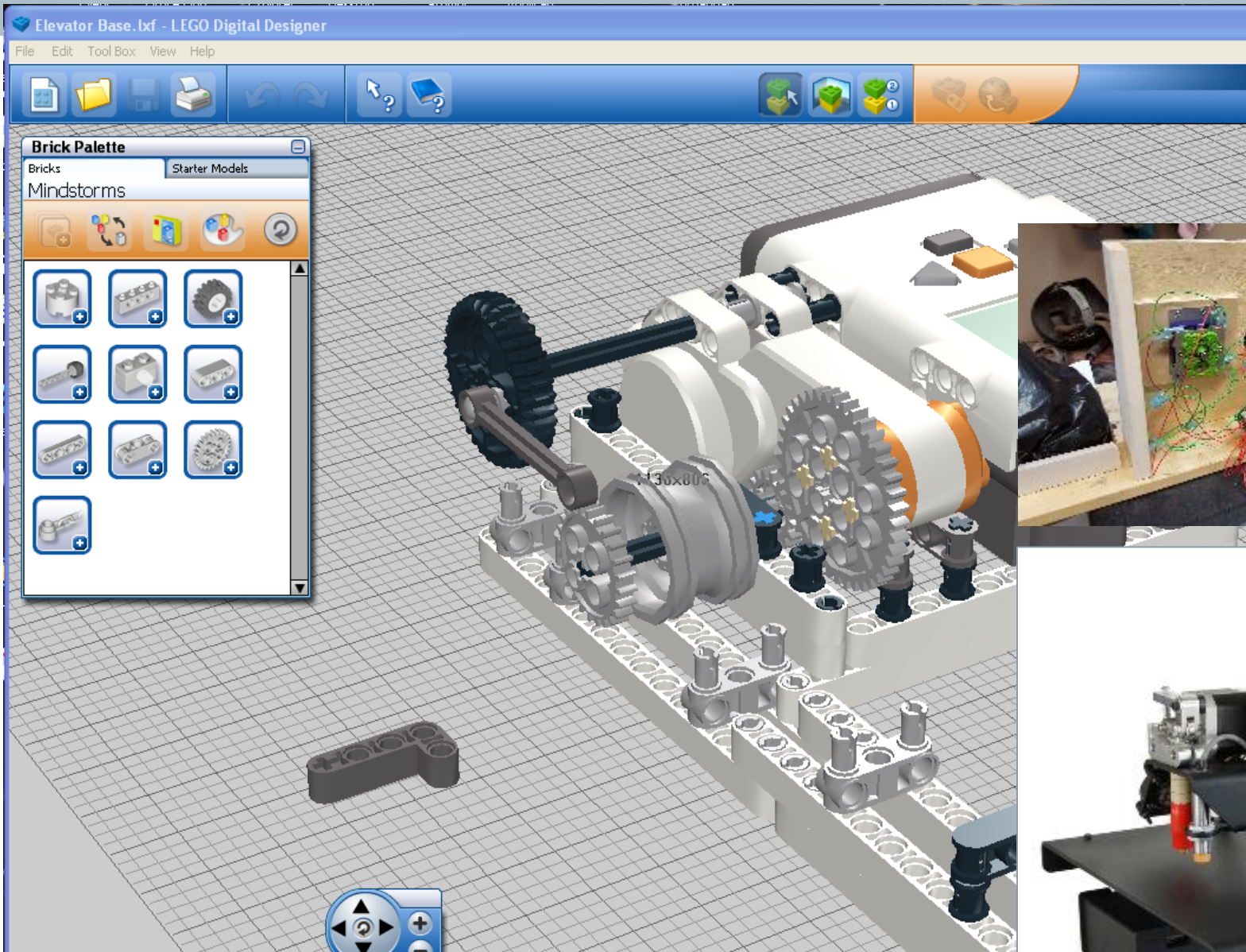
Minimum Turn Radius: 24 ft.
 Dry Pavement Braking Distance at 60 MPH : 110 ft. 90 ft

Control <FAULT>

Ages		48	49	50	51	52	53	54	55	56	57	58	59	60	
Male	Female														
35	40	41.5	41.3	41.0	40.8	40.6	40.4	40.3	40.1	40.0	39.8	39.7	39.6	39.5	
36	41	40.8	40.6	40.3	40.1	39.9	39.7	39.5	39.3	39.2	39.0	38.9	38.8	38.6	
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38	43	39.5	39.2	39.0	38.7	38.5	38.3	38.1	37.9	37.7	37.5	37.3	37.2	37.1	
39	44	38.9	38.6	38.3	38.0	37.8	37.6	37.4	37.2	37.0	36.8	36.6	36.4	36.3	
40	45	38.3	38.0	37.7	37.4	37.1	36.9	36.6	36.4	36.2	36.0	35.9	35.7	35.5	
41	46	37.7	37.3	37.0	36.7	36.5	36.2	36.0	35.7	35.5	35.3	35.1	35.0	34.8	
42	47	37.1	36.8	36.4	36.1	35.8	35.6	35.3	35.1	34.8	34.6	34.4	34.2	34.1	
43	48	36.5	36.2	35.8	35.5	35.2	34.9	34.7	34.4	34.2	33.9	33.7	33.5	33.3	
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48	53	34.0	33.6	33.2	32.8	32.4	32.0	31.7	31.4	31.1	30.8	30.5	30.2	30.0	
49	54	33.6	33.1	32.7	32.3	31.9	31.5	31.2	30.8	30.5	30.2	29.9	29.6	29.4	
50	55	33.2	32.7	32.3	31.9	31.4	31.0	30.6	30.3	29.9	29.6	29.3	29.0	28.8	
51	56	32.8	32.3	31.8	31.4	30.9	30.5	30.1	29.8	29.4	29.1	28.8	28.5	28.2	
52	57	32.4	31.9	31.4	30.9	30.5	30.1	29.7	29.3	28.9	28.6	28.2	27.9	27.6	
53	58	32.0	31.5	31.0	30.5	30.1	29.6	29.2	28.8	28.4	28.1	27.7	27.4	27.1	
54	59	31.7	31.2	30.6	30.1	29.7	29.2	28.8	28.3	27.9	27.6	27.2	26.9	26.5	
55	60	31.4	30.9	30.3	29.8	29.3	28.9	28.5	28.0	27.6	27.2	26.9	26.5	26.1	
56	61	31.1	30.5	29.9	29.4	28.9	28.4	27.9	27.5	27.1	26.7	26.3	25.9	25.5	
57	62	30.8	30.2	29.6	29.1	28.6	28.1	27.6	27.1	26.7	26.2	25.8	25.4	25.1	
58	63	30.5	29.9	29.3	28.8	28.2	27.7	27.2	26.7	26.3	25.8	25.4	25.0	24.6	
59	64	30.2	29.6	29.0	28.5	27.9	27.4	26.9	26.4	25.9	25.4	25.0	24.6	24.2	
60	65	30.0	29.4	28.8	28.2	27.6	27.1	26.5	26.0	25.5	25.1	24.6	24.2	23.8	

MBSE 2007 to present...

How models have effected his life

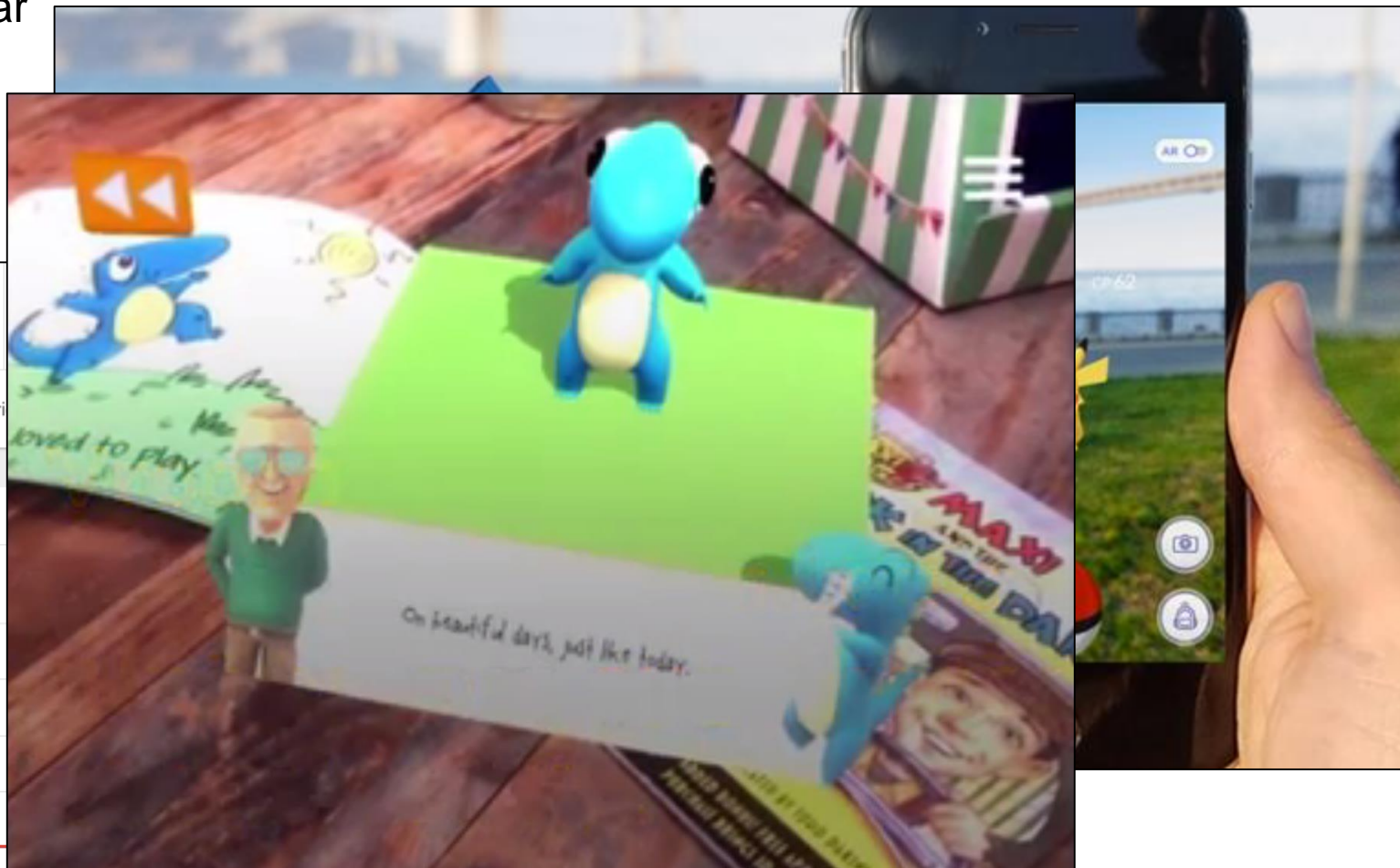
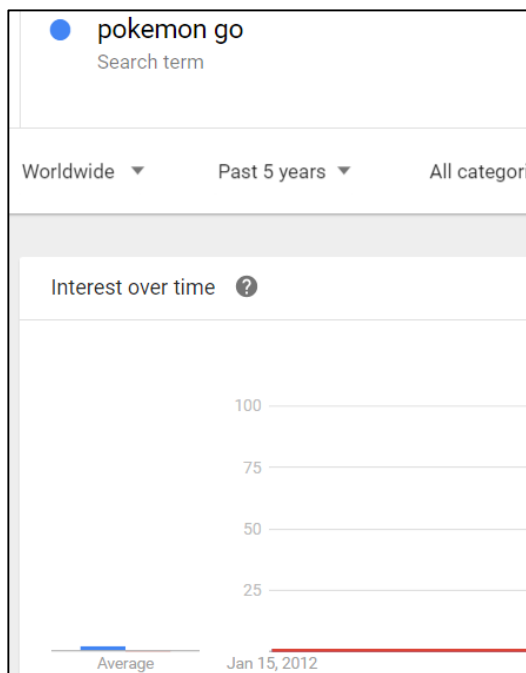


Anyone see a Bulbasaur in the room?



Did you see that coming?

- Nintendo value increases \$3.65 billion with the launch of Pokemon Go. Nintendo value bigger than Sony
- Revenue tops \$342 million (as of Aug.2016) \$2.3 million/day in-app purchases
- Estimated revenue at \$1.1 billion/year (advertising, Gyms/Pokestops,...)
- Expanding to books,...



He expects things to happen now... Amazon

- 5 billion items sold in 2014 (per *FastCompany* 40% 3rd party) 16 million items sold on CyberMonday
- 608 million packages/year, 1.6 million/day 1k/min.*
Rumors of them buying cargo planes/trucks to make your Amazon experience even 'now-er'
- <60 sec of human labor to ship package, longer to open package than to package/ship it to you
- Looking forward to first drone delivered package

How?

'Chaotic Storage'—find an empty slot and use it

- Flexibility—free space is filled immediately
- Simplicity—no learning curve
- Optimization—optimized random route is more efficient than any organization scheme (SE application here?)

64 million releases/yr

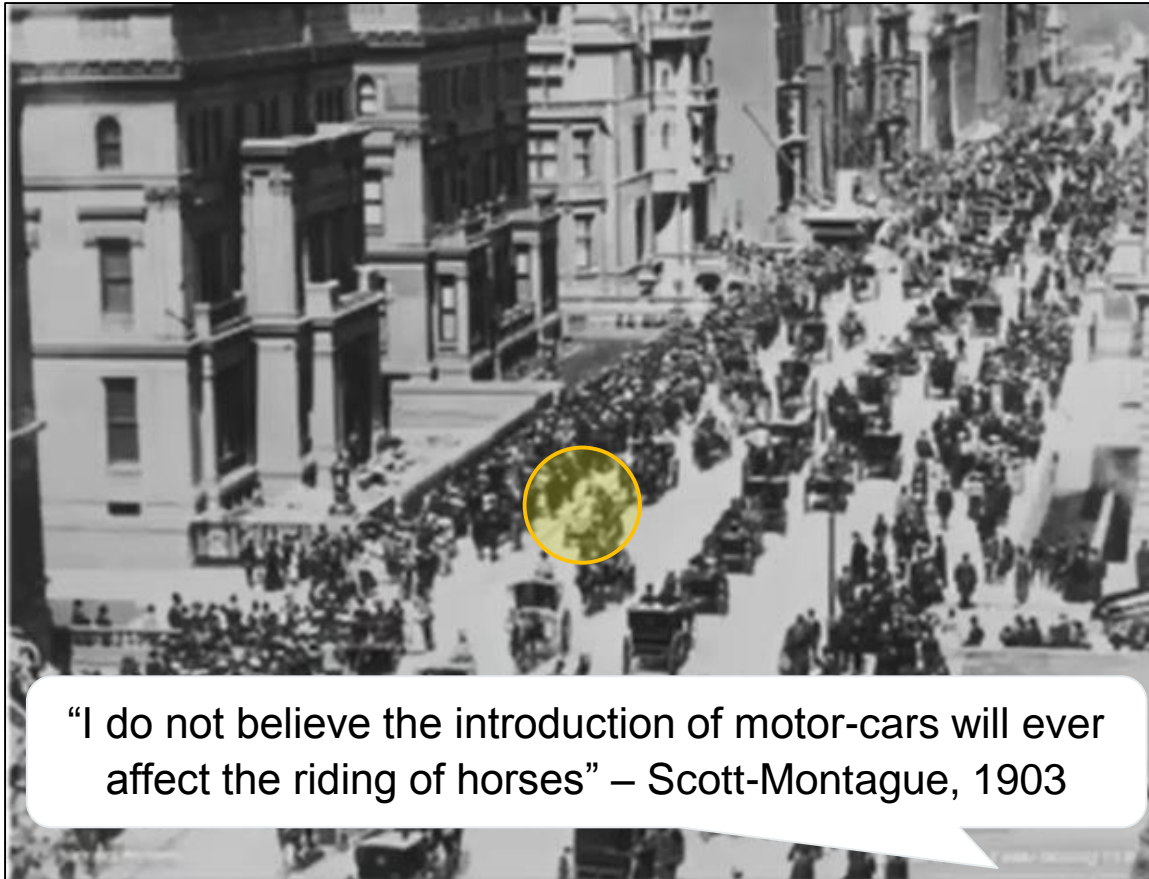
'Chaos Monkeys'



*Sanford C. Bernstein & Co Report

Industry Transformation/Disruption...

5th Avenue – NYC in 1900



5th Avenue – NYC in 1913



Accelerating...

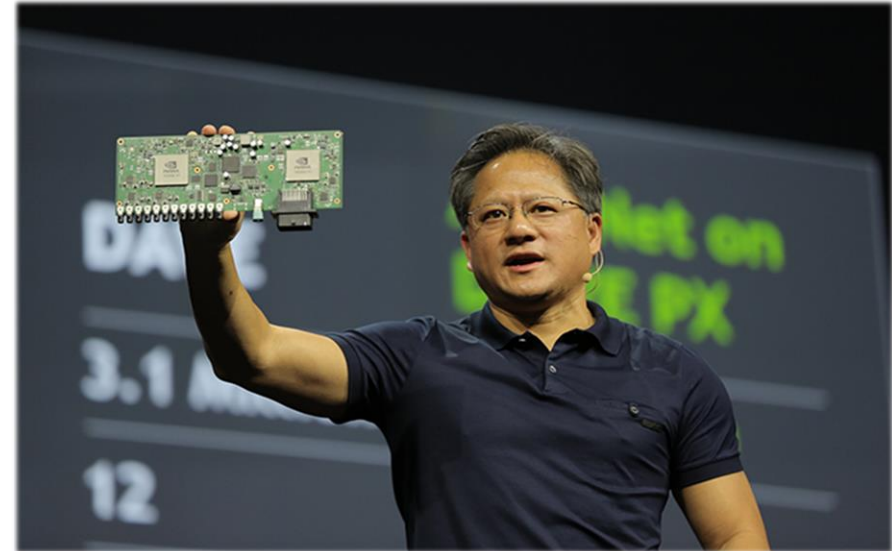
Year 2000 – ASCI RED Supercomputer



The most powerful computer on Earth...

- 1 Teraflops computer
- Surface: 150m² (1,600 sq ft)
- Power consumption: 850 KW
- **Cost: \$46 million**

Year 2016 – GPU NVIDIA Drive PX2



Built for Self-Driving Cars...

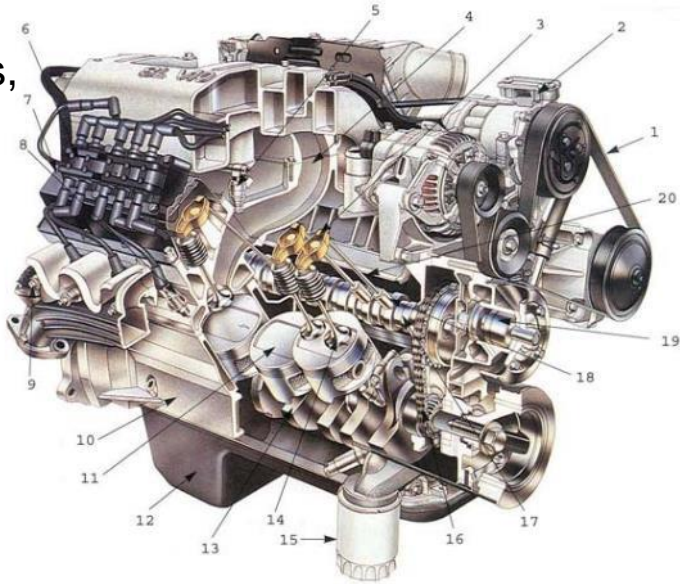
- 8 Teraflops
- Surface: few cm²
- Power consumption: 80 W
- **Cost: \$15,000...and fast going down**

Has deep learning SW, surround computer vision, over-the-air updates, etc...

Breakthrough...

Internal Combustion Engine (Gas) Vehicle

Clutch, pistons, gears, driveshaft, transmission, injection,...



2000+ moving parts...

Electrical Vehicle



18 moving parts...

- 100X cheaper to maintain
- Tesla > Infinite Mile Warranty
- All new cars by 2025 will be EVs

Accelerates entire downstream process...

After a Twitter complaint, Elon Musk a rapid fix

Published January 10, 2017 | Newser

Some owners of electric cars have made it a habit to use charging stations as after their charge is complete, and other electric car drivers are getting sick of

One took the problem straight to Tesla CEO Elon Musk last week when he tweeted "San Mateo supercharger is always full with idiots who leave their tesla for hours charged." Within minutes, Musk replied: "You're right, this is becoming an issue. Charging spots are meant for charging, not parking. Will take action." Six days later he and others are debating the merits of his solution, others are applauding his fast response. A Tesla consultant Richard Jhang did when he wrote on LinkedIn: "Idea to execution in 6 days." To remedy the problem, the company is "introducing a fleet-wide idle fee to increase Supercharger availability," per a Tesla blog post.

"For every additional hour of idle fee." If the car is

(An app alerts Tesla customer service, which is what that was Musk's pe



TESLA'S OVER-THE-AIR FIX: BEST EXAMPLE YET OF THE INTERNET OF THINGS?



Image: jurvetson/Flickr

THE NATIONAL HIGHWAY Traffic Safety Administration recently published two recall announcements, one from Tesla Motors and one from GM. Both are related to a software bug that could cause fires. Tesla's fix can be conducted "over the air" software update and doesn't require bringing their cars to the dealer. For that reason,

Team of hackers take remote control of Tesla Model S from 12 miles away

Chinese researchers were able to interfere with the car's brakes, door locks and other electronic features, demonstrating an attack that could cause havoc



Ludicrous Speed is now a \$10,000 hardware and software upgrade, though buyers of the P85D will get it at half price.

PHOTO BY TESLA

Here's how Tesla hits 'Ludicrous Speed' 2.8-SECOND 0-60 SPRINT TIME IS NOW A \$10,000 UPGRADE AWAY

JULY 21, 2015

SHARE



We told you last week about Tesla's upgrade from Insane Mode to Ludicrous Speed, now available on the Tesla Model S, allowing the pure-electric sedan to make the sprint from 0 to 60 mph in just 2.8 seconds. That's down from a relaxed, gentle 3.2-second launch time.

Our environment demands transformation

“Digital is the main reason just over half of the companies on the Fortune 500 have disappeared since the year 2000.”

Pierre Nanterme
CEO Accenture



Where's he going to work?

Some demographic trends* ...

- He's inclined to entrepreneurial startups (favorite title for millennials is 'owner')
- He's already experienced how youtube can generate revenue
- Into animation, has networks of other animators, including some famous ones
- Will stay 2 years in first job
- Gen Y will make up 75% of workforce by 2025 (boomers retiring 1 every 8 sec.)

Perfect storm converging on systems engineering...

- Complexity getting worse (old methods won't scale)
- Technology disruptions coming faster (Amazon vs Sears, Macy's)
- Contribute to design (Crowd sourcing: Local Motors, Tesla power hogs)
- Want it now (3D printing, Amazon)
- Expecting more options (Tesla: Ludicrous, Plaid Speed)

Smart Contact Lens
Augmented Reality
Driven by Pokemon Go



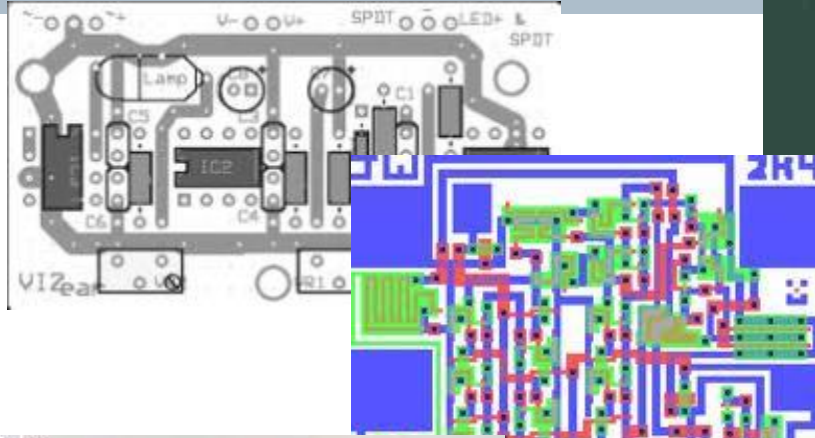
© Skyscanner/PA

"Gen Y Traits in the Workplace" Kristin Burnham

This requires change...
High-tech experience



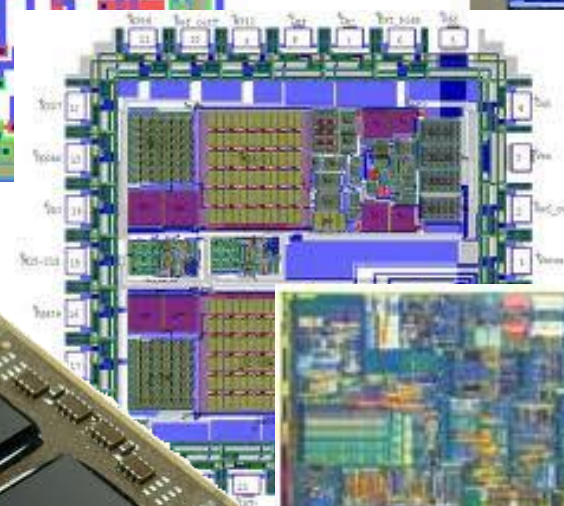
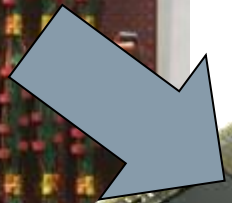
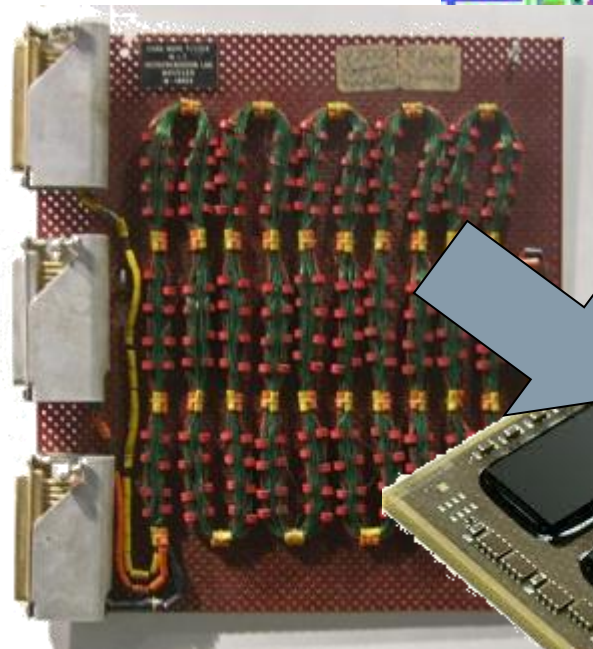
Documents



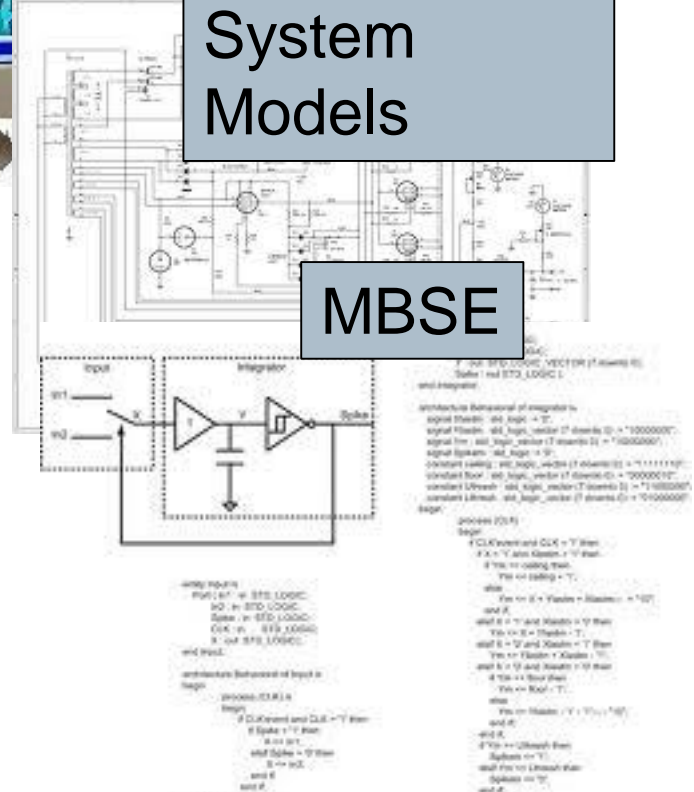
Document
Generation



Disconnected
System
Models



MBSE





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www.incose.org/IW2017

10 Year Anniversary

Materials posted at:

http://www.omgwiki.org/MBSE/doku.php?id=mbse:incose_mbse_iw_2017