# The Al Playbook Mastering the Rare Art of Machine Learning Deployment

## By Eric Siegel

## **Notes for CHAPTER 6**

These notes include references, plus resources for further learning. For all the chapters' notes as well as information about the book in general, access the book's website at <a href="https://www.bizML.com">www.bizML.com</a>.

UPS Invests \$30M in IT to Speed Package Delivery September 26, 2003

https://web.archive.org/web/20031011045427/https://www.computerworld.com/databasetopics/data/story/0,10801,85426,00.html

UPS Leverages Real-Time Data with Package-Flow Application Says "March 14, 2005" but was probably 2003

https://www.computerworld.com/article/2568958/ups-leverages-real-time-data-with-package-flow-application.html

New Package Flow Technology Not Delivering at UPS February 24, 2005

https://www.computerworld.com/article/2568868/new-package-flow-technology-not-delivering-at-ups.html

Planning System Isn't Fully Delivering at UPS February 28, 2005

https://www.computerworld.com/article/2568759/planning-system-isn-t-fully-delivering-at-ups.ht ml

The Road to Optimization - UPS's Analytics Success Story (webinar) <a href="https://www.brighttalk.com/webcast/14379/306419">https://www.brighttalk.com/webcast/14379/306419</a>

The Road to Optimization - Analytics Leadership Consortium Webinar Summary, Februrary 2018

https://iianalytics.com/uploads/portal-documents/IIA-ALC\_Feb-2018-BSummary.pdf?v=1642712 713

Organizational Transformation Is an Emotional Journey <a href="https://hbr.org/2022/07/organizational-transformation-is-an-emotional-journey">https://hbr.org/2022/07/organizational-transformation-is-an-emotional-journey</a>

Keynote: Machine Learning Makes UPS's Smart Logistics Network Smarter Yentai Wan at Machine Learning Week 2022 https://www.predictiveanalyticsworld.com/business/2022/agenda/#session98711

Wise Practitioner – Predictive Analytics Interview Series: Jack Levis of UPS 2015

https://www.predictiveanalyticsworld.com/machinelearningtimes/wise-practitioner-predictive-analytics-interview-series-jack-levis-of-ups-04272015/5173/

Wise Practitioner – Predictive Analytics Interview Series: Jack Levis at UPS 2017

https://www.predictiveanalyticsworld.com/machinelearningtimes/wise-practitioner-predictive-analytics-interview-series-jack-levi-ups/8699/

How UPS uses analytics to drive down costs (and no, it doesn't call it big data) <a href="https://www.networkworld.com/article/2850874/how-ups-uses-analytics-to-drive-down-costs-and-no-it-doesn-t-call-it-big-data.html">https://www.networkworld.com/article/2850874/how-ups-uses-analytics-to-drive-down-costs-and-no-it-doesn-t-call-it-big-data.html</a>

On the value of human-in-the-loop decisioning:

https://sloanreview.mit.edu/projects/expanding-ais-impact-with-organizational-learning/

Regarding how to manage decision support (aka human in the loop) systems: <a href="https://hbr.org/2021/11/managing-ai-decision-making-tools">https://hbr.org/2021/11/managing-ai-decision-making-tools</a>

Leo Cherne quote:

https://medium.com/ben-shoemate/einstein-never-said-that-9e72c7bbe658

Prescriptive versus Predictive Analytics – A Distinction without a Difference?" by Bill Vorhies, November 14, 2014, The Machine Learning Times.

https://www.predictiveanalyticsworld.com/machinelearningtimes/prescriptive-versus-predictive-a nalytics-distinction-without-difference/

Regarding phones with deployed models:
How AI is reinventing what computers are
<a href="https://www.technologyreview.com/2021/10/22/1037179/ai-reinventing-computers/">https://www.technologyreview.com/2021/10/22/1037179/ai-reinventing-computers/</a>

"ML presents a problem for continuous integration and continuous deployment for several reasons. The data that powers ML applications is as important as code, making version control difficult; outputs are probabilistic rather than deterministic, making testing difficult; training a model is processor intensive and time consuming, making rapid build/deploy cycles difficult.

None of these problems are unsolvable, but developing solutions will require substantial effort over the coming years."

-O'Reilly Data & Al Newsletter

5 things on our data and AI radar for 2021

https://www.oreillv.com/radar/5-things-on-our-data-and-ai-radar-for-2021/

Battle for Data Pros Heats Up as Burnout Builds

www.datanami.com/2021/11/02/battle-for-data-pros-heats-up-as-burnout-builds/

2021 Data Engineering Survey: Burned-Out Data Engineers Call for DataOps <a href="https://f.hubspotusercontent10.net/hubfs/2866765/Whitepapers/White%20Paper%20-%202021">https://f.hubspotusercontent10.net/hubfs/2866765/Whitepapers/White%20Paper%20-%202021</a> %20Data%20Engineering%20Survey.pdf

### Data pipelines

https://jkropko.github.io/surfing-the-data-pipeline/intro.html

On Elder Research's improvement to deployment rate:

Leveraging Data Analytics to Increase ROI, by John Elder <a href="https://www.elderresearch.com/blog/leveraging-data-analytics-to-increase-roi">https://www.elderresearch.com/blog/leveraging-data-analytics-to-increase-roi</a>

Mining Your Own Business, Jeff Deal and Gerhard Pilcher (of Elder Research) <a href="http://www.miningyourownbusiness.com/wb/">http://www.miningyourownbusiness.com/wb/</a>

Real-Time Machine Learning: Why It's Vital and How to Do It <a href="https://www.predictiveanalyticsworld.com/machinelearningtimes/real-time-machine-learning-why">https://www.predictiveanalyticsworld.com/machinelearningtimes/real-time-machine-learning-why</a>-its-vital-and-how-to-do-it/12166/

Seven Reasons Why Realtime ML Is Here To Stay <a href="https://fennel.ai/blog/seven-reasons-why-realtime-ml-is/">https://fennel.ai/blog/seven-reasons-why-realtime-ml-is/</a>

Machine learning scoring on premises or in the cloud? You decide. White paper by Alex Feinberg and Jonathan Sloan <a href="https://www.ibm.com/downloads/cas/VKPE307Q">https://www.ibm.com/downloads/cas/VKPE307Q</a>

#### REGARDING THE ADVERSE EFFECTS OF LATENCY ON THE WEB:

Google VP Marissa Mayer just spoke at the Web 2.0 Conference <a href="https://glinden.blogspot.com/2006/11/marissa-mayer-at-web-20.html">https://glinden.blogspot.com/2006/11/marissa-mayer-at-web-20.html</a>

Speed Matters for Google Web Search

https://services.google.com/fh/files/blogs/google\_delayexp.pdf

150 successful machine learning models: 6 lessons learned at Booking.com <a href="https://blog.acolyer.org/2019/10/07/150-successful-machine-learning-models/">https://blog.acolyer.org/2019/10/07/150-successful-machine-learning-models/</a>

How Loading Time Affects Your Bottom Line <a href="https://neilpatel.com/blog/loading-time/">https://neilpatel.com/blog/loading-time/</a>

The Value of a Millisecond: Finding the Optimal Speed of a Trading Infrastructure <a href="https://research.tabbgroup.com/report/v06-007-value-millisecond-finding-optimal-speed-trading-infrastructure">https://research.tabbgroup.com/report/v06-007-value-millisecond-finding-optimal-speed-trading-infrastructure</a>

Mainframe 2020: A catalyst for transformation

https://wp.technologyreview.com/wp-content/uploads/2020/09/Mainframe-2020-A-catalyst-for-transformation 0920.pdf

Mainframe Matters: How Mainframes Keep the Financial Industry up and Running <a href="https://blog.share.org/Article/mainframe-matters-how-mainframes-keep-the-financial-industry-up-and-running">https://blog.share.org/Article/mainframe-matters-how-mainframes-keep-the-financial-industry-up-and-running</a>

From Shopping To Space Travel, How The Mainframe Changed Our World https://www.forbes.com/sites/ibm/2014/04/08/from-shopping-to-space-travel-how-the-mainframe -changed-our-world/?sh=116fdd2d4a5f

Mainframes: Are They a Legacy Technology? <a href="https://www.sacatech.com/2019/08/15/mainframes-are-they-a-legacy-technology/">https://www.sacatech.com/2019/08/15/mainframes-are-they-a-legacy-technology/</a>

Machine learning scoring on premises or in the cloud? You decide. https://www.ibm.com/downloads/cas/VKPE307Q

FICO Takes Its Analytics Expertise Far Beyond Credit Scores

<a href="https://www.forbes.com/sites/oracle/2019/05/01/fico-takes-its-analytics-expertise-far-beyond-credit-scores/?sh=4d36849a7c33">https://www.forbes.com/sites/oracle/2019/05/01/fico-takes-its-analytics-expertise-far-beyond-credit-scores/?sh=4d36849a7c33</a>

Gary Loveman, an economist who became CEO of Caesars Entertainment, demands that his employees operate the business by analyzing data rather than leaning on hunches. <a href="https://www.technologyreview.com/2011/02/18/197014/qa-the-experimenter/">https://www.technologyreview.com/2011/02/18/197014/qa-the-experimenter/</a>

What's the value of a better model? More than you may think
"Even a small increase in predictive ability can create millions in economic value."

<a href="https://web.archive.org/web/20210516063844/https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/digital-blog/whats-the-value-of-a-better-model-more-than-you-may-think#">https://web.archive.org/web/20210516063844/https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/digital-blog/whats-the-value-of-a-better-model-more-than-you-may-think#</a>

20 Great Ideas to Steal in 2013 August 28, 2013

https://web.archive.org/web/20211027001542/https://www.informationweek.com/government/20-great-ideas-to-steal-in-2013

 $\underline{https://drive.google.com/file/d/1I6XnAbG8dWQtQ4YOW\_6sCRvOvRr45Yun/view?usp=share\_lin\_\underline{k}$ 

Model Deployment Challenges: 6 Lessons From 6 ML Engineers <a href="https://neptune.ai/blog/model-deployment-challenges-lessons-from-ml-engineers">https://neptune.ai/blog/model-deployment-challenges-lessons-from-ml-engineers</a>

Quotation from Scott Zoldi:

"The Data Economy Podcast: Machine Learning Models for Real-Time Financial Services with FICO"

April 7, 2022

https://www.youtube.com/watch?v=oshYnZYnvkl