
Knowledge & Data driven decision making to improve Sort Center Operations

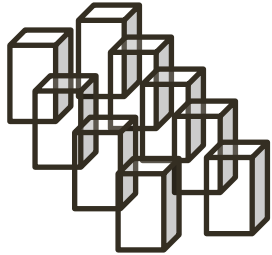
— Shreyansh Bhatt —
Amazon.com

Knowledge driven learning

- E-learning: Combine domain experts (instructors) perceived learning measurement with student performance data to assist learners in skill development.
- Supply Chain: Combine domain expert knowledge with historical performance data to assist sort center site leaders' decision making.

Who are we and what we do?

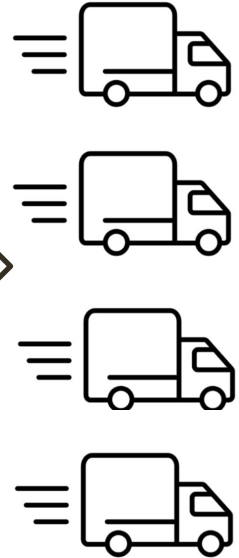
Fulfilment center



Sort center



Delivery services



amazon

Sort Center



Operations

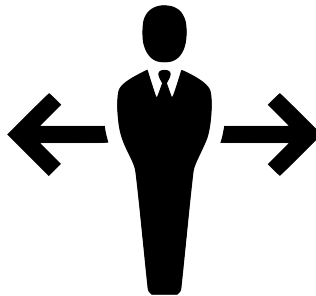


Associates make diverse intelligent choices

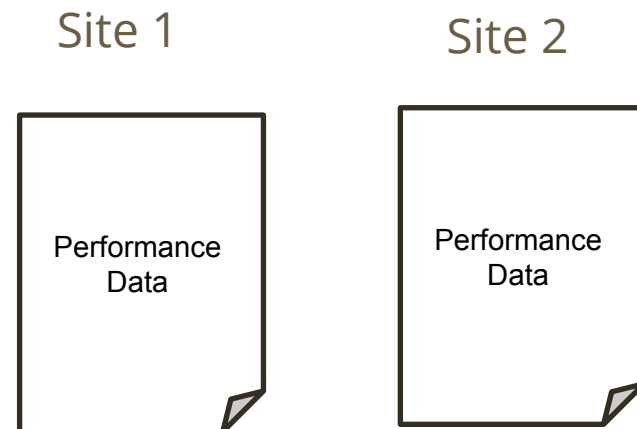
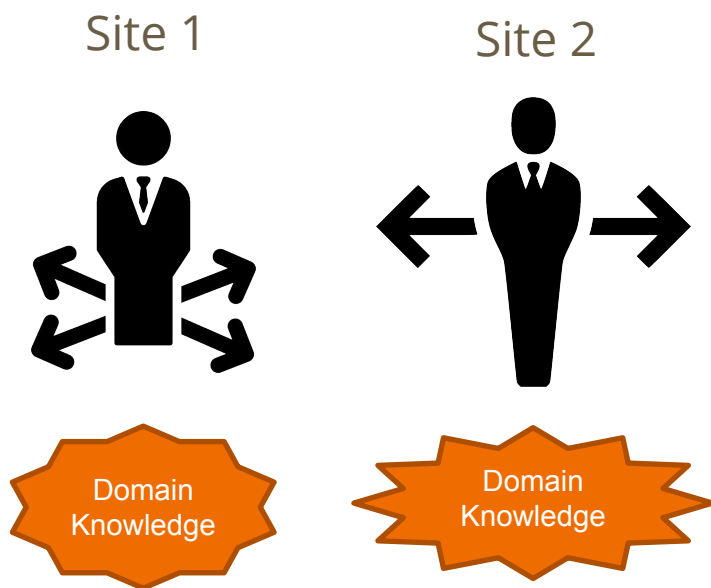
Site 1



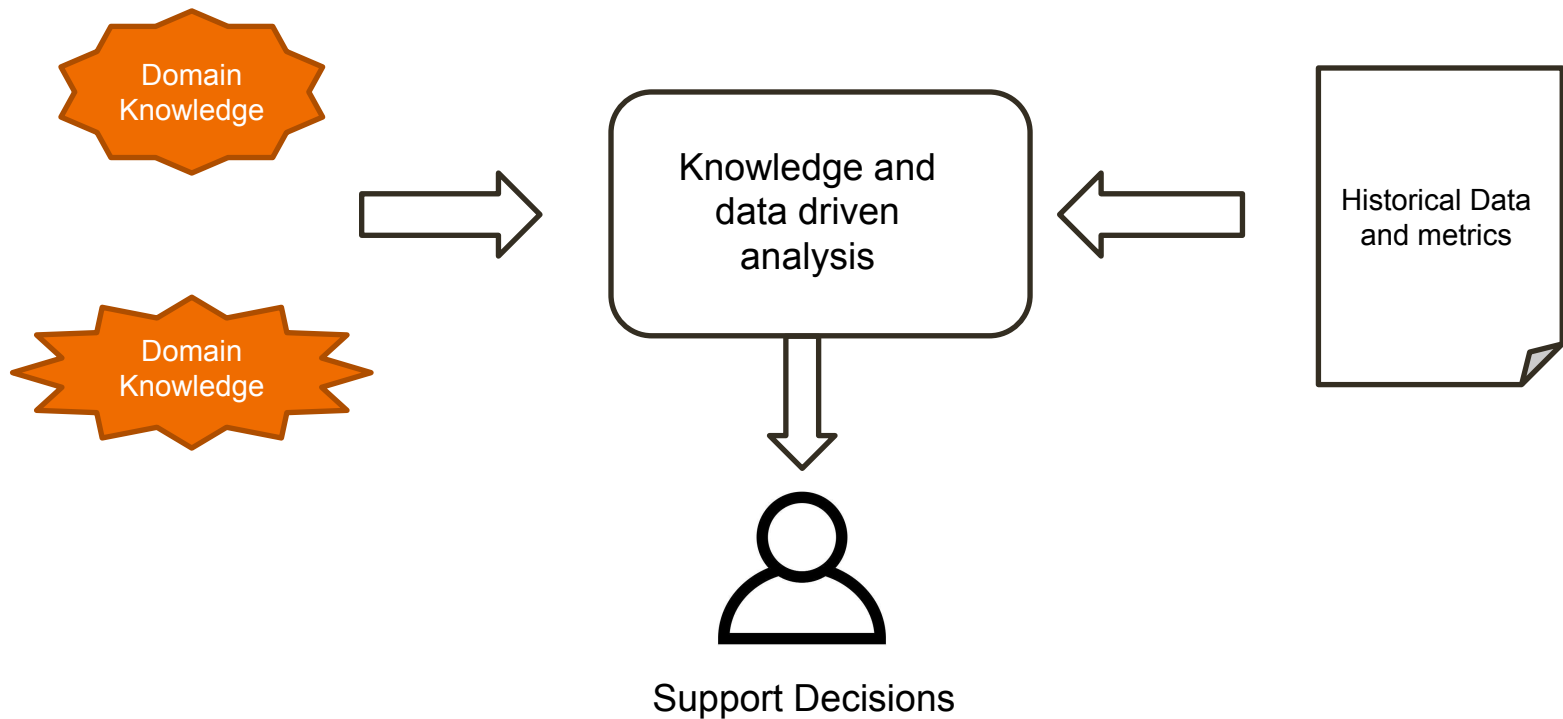
Site 2



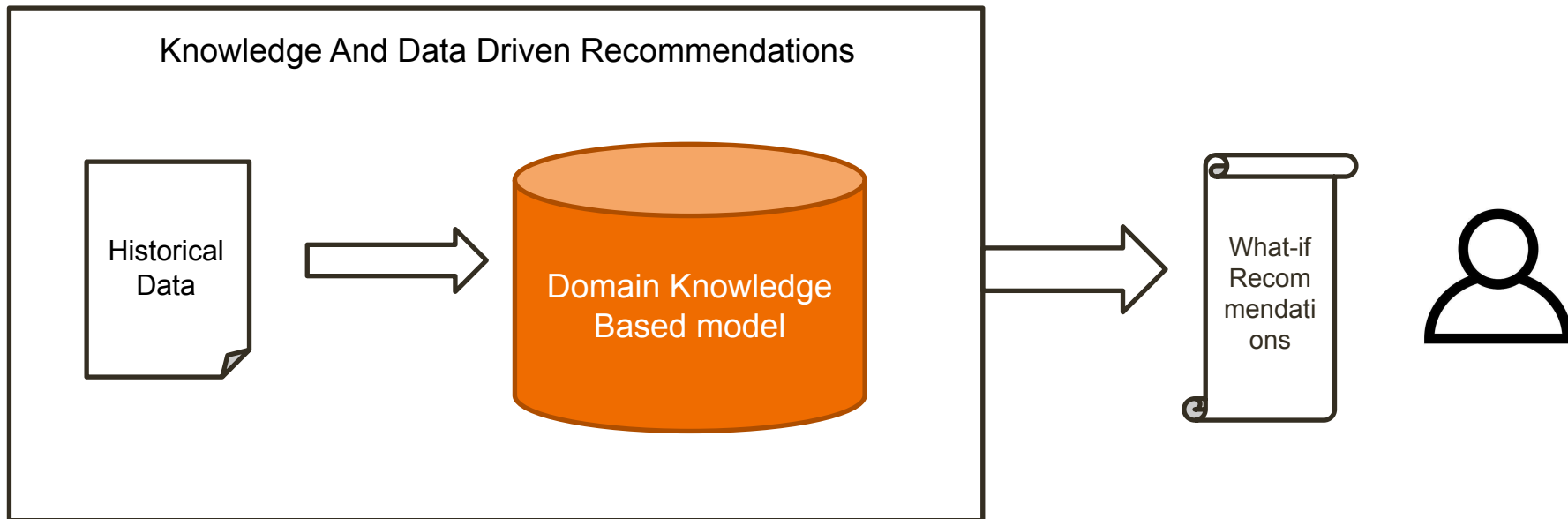
Domain knowledge and site performance data



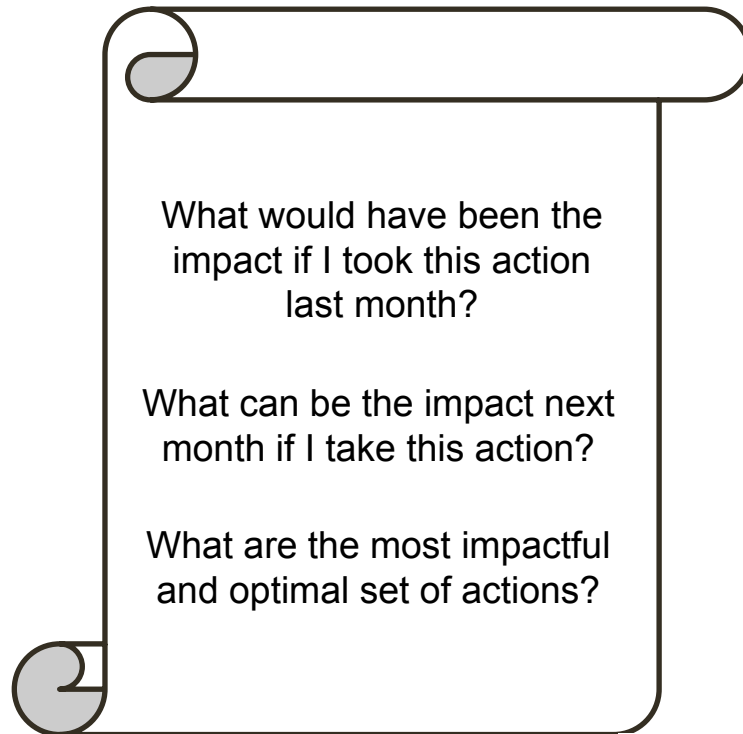
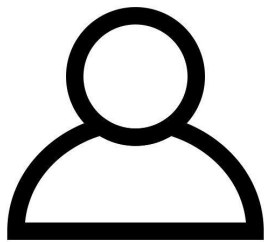
Help improve Operations



Recommendations



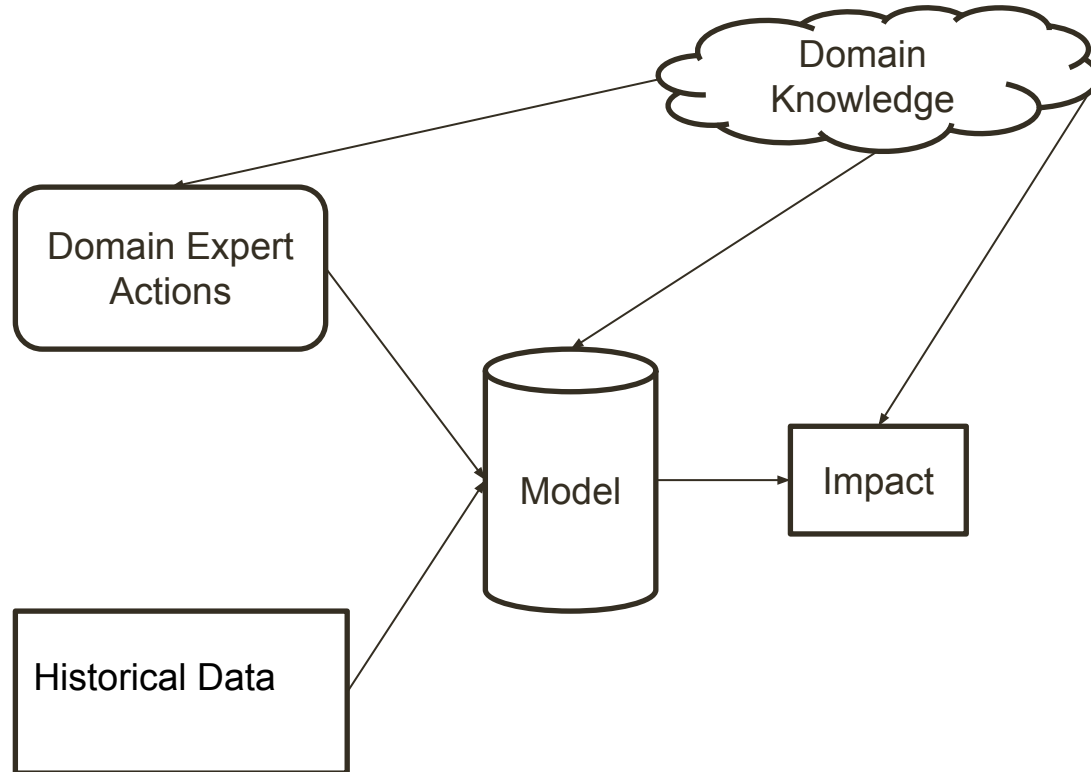
Contd.



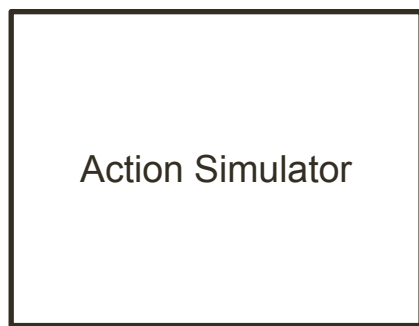
Action simulator

- Domain knowledge helps identify action to impact dependencies.
- Historical data helps learn the action simulator.
- Generative model developed based on the domain knowledge and learned with historical data.

Action simulator



Contd.

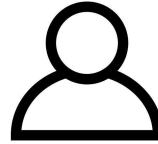


What if I made this change?

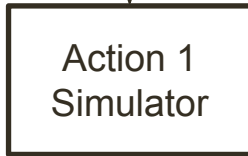


Resulting Impact

Action plan

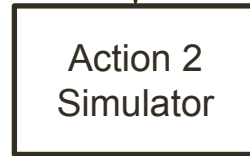


What if I made this change?



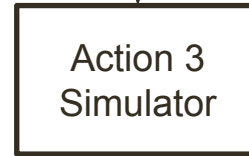
Resulting Impact

What if I made this change?



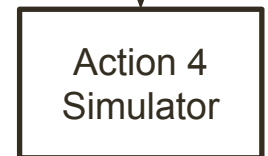
Resulting Impact

What if I made this change?



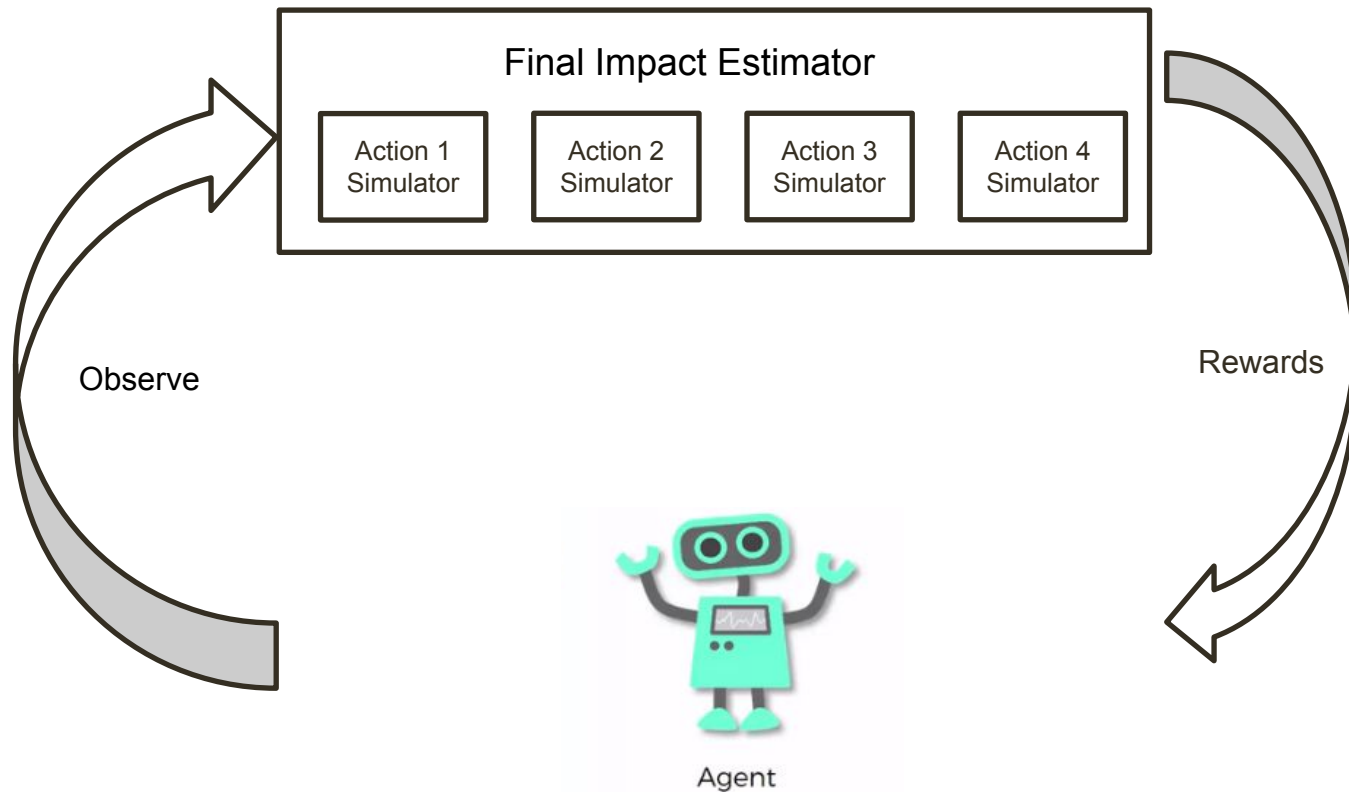
Resulting Impact

What if I made this change?



Resulting Impact

Action plan (function) estimator



Observations and Opportunities

- Showing the impact of decision helps make informed key decisions.
- Domain knowledge driven ML modeling helps avoid with model degeneracy.
- Formal representation of Knowledge driven ML.
- Knowledge representation beyond graph.

Thank You