

Data (*art* &) Science

Strata + Hadoop World 2015

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data

knowledge

algorithms & automata

competitive advantage



Different Capabilities

Expert-Human Processing

- Cognitive abilities
- Access to additional info
- Powerful distinctions

Let's call this "Art"

Machine Processing

- Executing supervised and unsupervised learning algorithms
- Execution of complex calculations
- Discern between different and significantly different
- Estimate and apply multivariate weights
- ... etc.

Let's call this "Science"



STITCH FIX

YOUR PARTNER IN PERSONAL STYLE

Your preferences, your schedule,
our expert stylists.

[LEARN MORE](#)



1



Create Your Style Profile.

2



Get Five Hand-picked Items.

3



Keep What You Like.
Send Back the Rest.

Algorithms: our differentiating asset

- 35% of Amazon sales are driven from recommendations
- 50% of LinkedIn connections are driven by recommendations
- 75% of Netflix videos watched are from recommendations
- **100% of Stitch Fix merchandise is sold by recommendations**



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          age:           31,
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          city:           'Austin',
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          hip_fit_pref:   'loose',
          color_pref:     ['blue', 'green', 'mauve'],
          dress_price_pref: '50-100',
          past_purchases: [5008, 808, 11508, 2204, 3553],
          profile_note:   'I am a teacher.  My clothes need to
be
                                appropriate for both the office as
well
                                as 3rd-graders',
          pinterest_link: 'http://pinterest.com/stitchfix/
1234',
          ...
}
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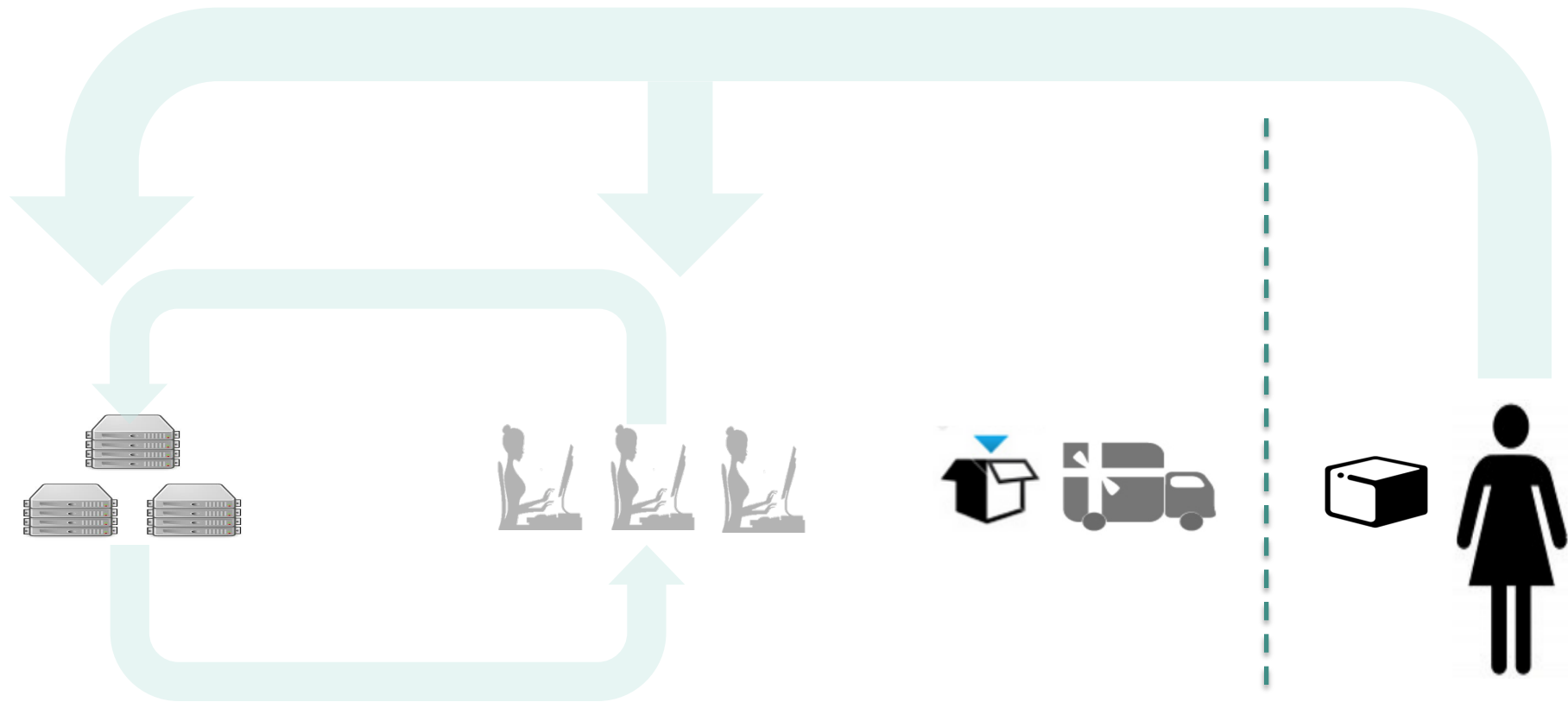

Scaling



Benefits of Systematizing

1. Scale
2. Specialization
- 3. Feedback**
- 4. Controlled Variation**

Feedback for more Learning



Controlled Variation for more Exploration

random()



random()



Generalizing

Common business processes

Content Production

Merchandising

Pricing

Partner Management

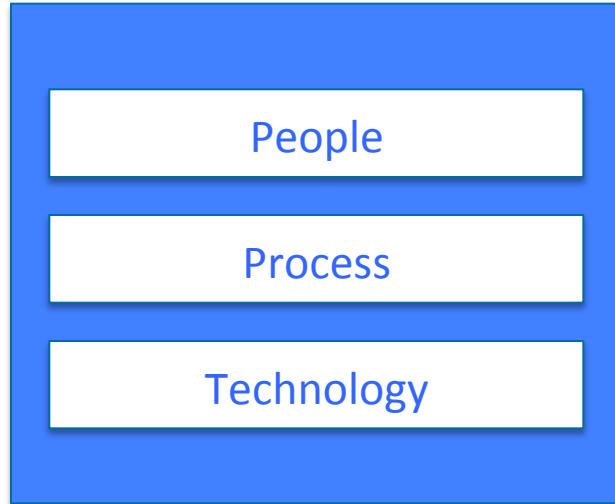
Fraud Detection

Etc.

Systematize when:

- Both Art & Science are required
- The process can benefit from
 - Scale
 - Specialization
 - Feedback
 - Controlled Variation

Building the capability



People

Data Scientists need to become Data Artists.

Skills:

- Frame the optimization problem
- Train & implement algorithms
- Design systems, processes, and workflows
- Write production code
- Communicate beautifully
- Design experiments & measurement
- Evangelize adoption
- ...etc.

Grow them with big roles that provide autonomy, mastery, purpose¹

1. From Dan Pink's book, "Drive"



They do exist. The horns are not always visible in early development.

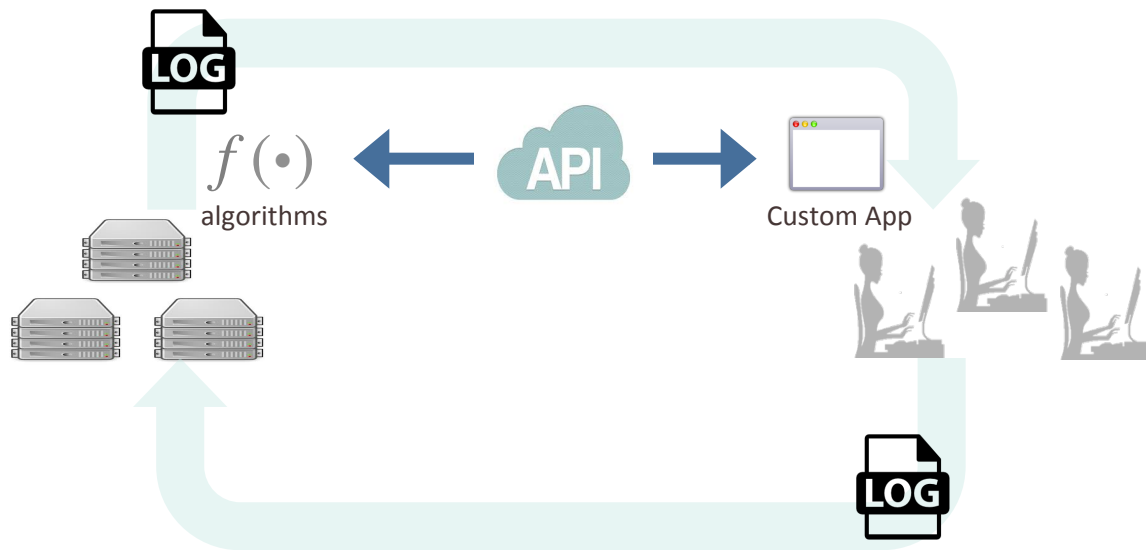
Process

1. Form a strong partnership between data science and functional team
2. Make them accountable
3. Practice proper experimental design



Technology

1. Build custom solutions
2. Build APIs
3. Invest in a logging pipeline



Enable a 'Power'¹

A capability becomes a “Power” if:

1. It enables **S**uperior returns
2. The returns are **S**ignificantly differentiating
3. The capability is **S**ustainable (hard to copy)

1. See works of Hamilton Helmer, Stanford Consulting Professor, <https://economics.stanford.edu/faculty/helmer>

Summary

- Expert human judgment (Art) and machine processing (Science) contribute differently to strategic capabilities
- Some processes call precisely for their combination
- Systematizing gets you: Scale, Specialization, Feedback, Controlled Variation
- Building the capability requires the right people, process, technology
- The capability can enable a ‘power’



Thank you.
Questions?