

Data Science @ Winona State

Speaker: Chris Malone (cmalone@winona.edu)

Winona State University

LinkedIn 



- 8,500 students
- 7000 Winona
 - 1000 Rochester
 - 500 graduate

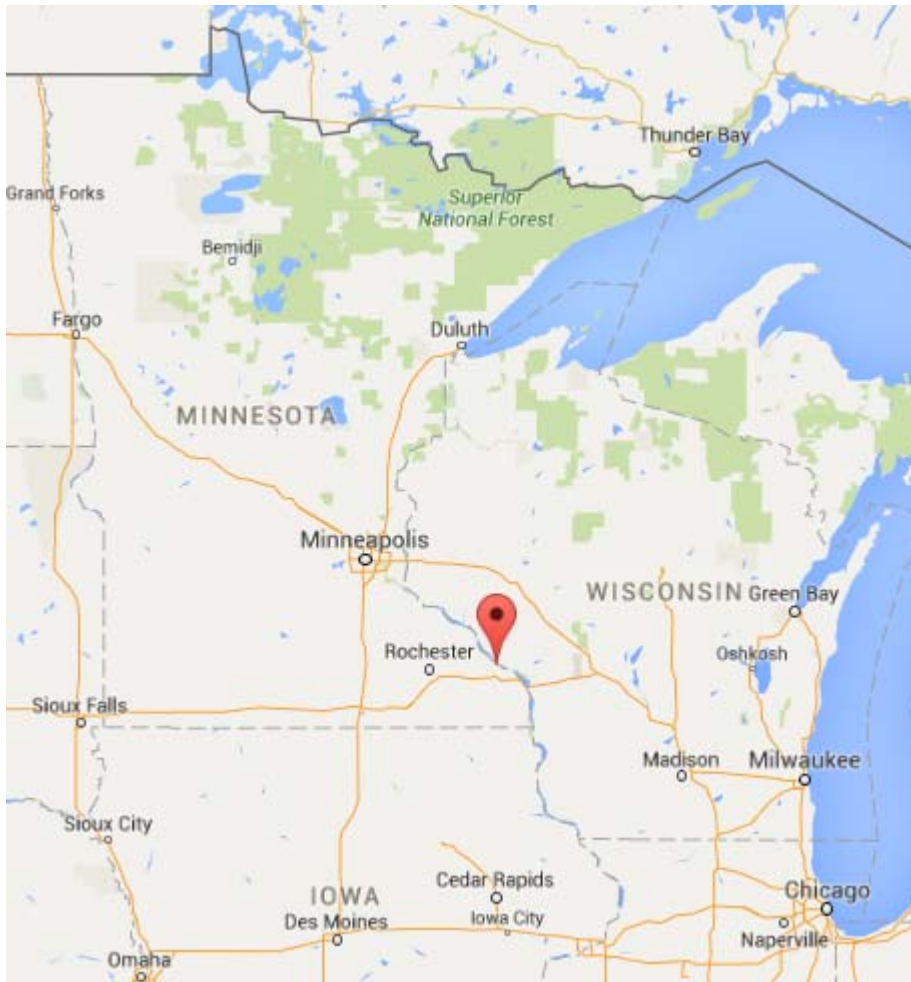


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Department

- Data Science: 1 | 25
- Statistics: 7 | 50



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Scale to 30000

35 faculty / 325 majors

We are not
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Current Undergraduate Statistics Program

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 - ~~Introductory Course~~
 - Introductory Year

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- | | |
|--|---|
| <ul style="list-style-type: none">• Introductory Course• Survey Sampling• Multivariate• Nonparametric | <ul style="list-style-type: none">• Introductory Year• Study Design• Un/Supervised Learning• Professional Skills |
|--|---|

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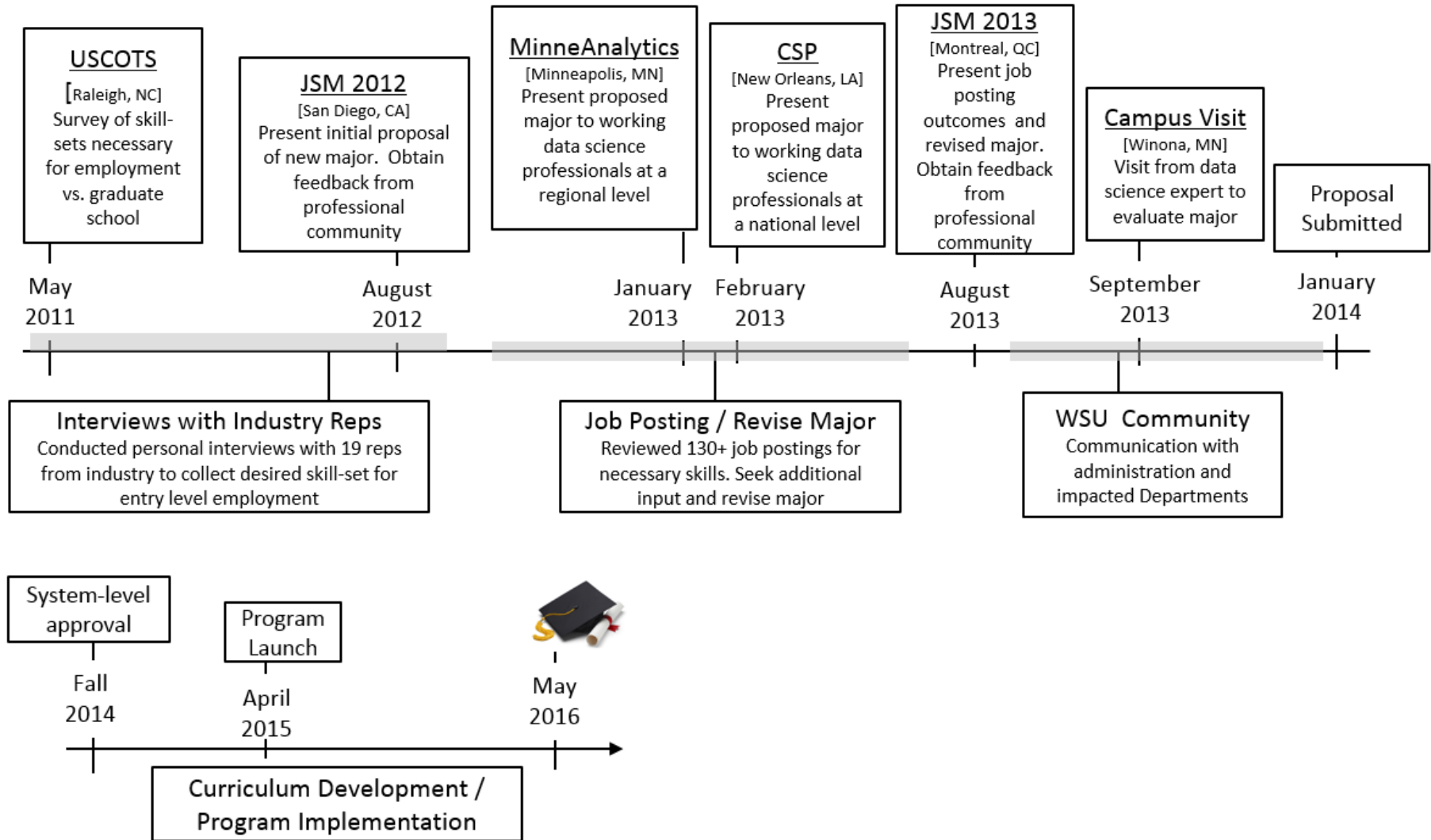
Last Program Review – 2010

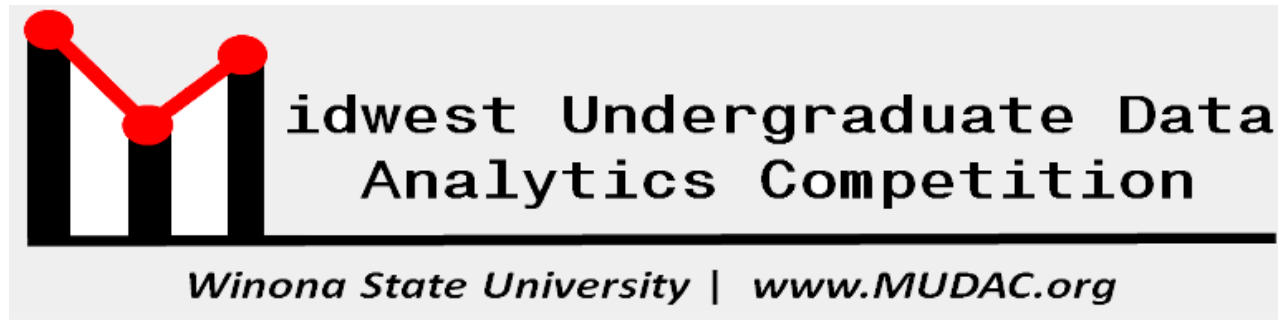


Key Questions

- Is the curriculum evolving quickly enough?
- What characteristics should drive change?
- Are we sufficiently training students for employment and/or graduate school?

Timeline





- Started in 2012
- Models
 - ASA Data Analysis Competition of mid 1990s
 - COMAP: Mathematical Contest in Modeling
 - DATAFEST: Rob Gould, UCLA



Key Features of MUDAC

- Corporate partner motivates the problem, fields questions during the competition, and participates in the judging
- Teams of students have 24 hours to provide a solution
- Teams are judged/interviewed by corporate partner representatives, data science professionals, and faculty advisors
- **Professional development for students (and advisors)**
- **On-site job fair**

MUDAC 2016

- Teams from 17 different colleges/universities (currently limited to 2 teams per school)
- 100 students, 25 advisors, 40 working data science professionals assist with judging
- Budget: \$12,500

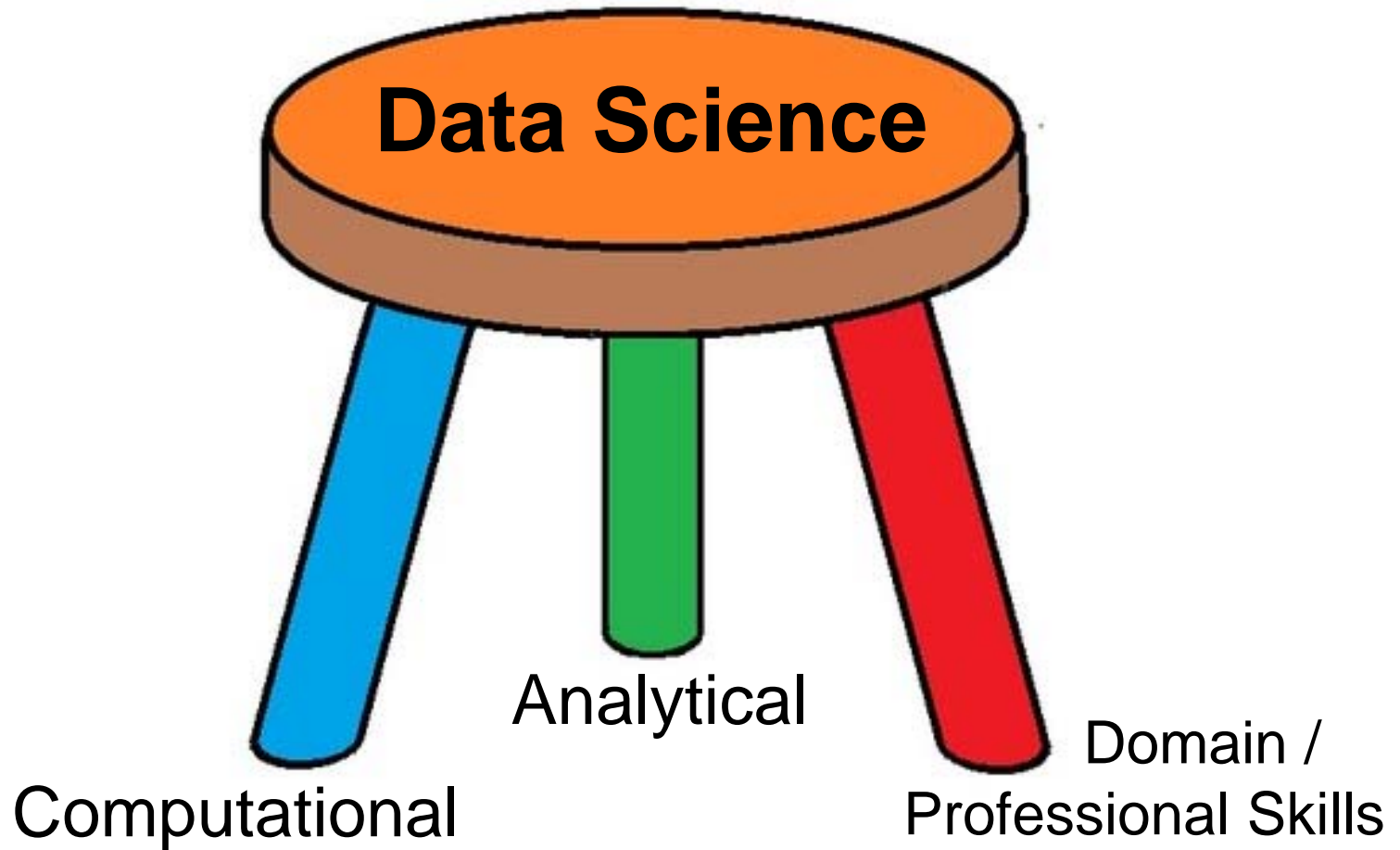


Twin Cities Big Data, Data Science and Analytics Community

MUDAC has convinced us that

- undergraduates can do data science
- strong demand exists for students who possess these skills
- developing a comprehensive undergraduate data science program should be done

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Computational (17 credits)

Computer Science

- (3) Intro to Computer Science
- (8) Year-long sequence in object-oriented, high-level programming
- (3) Database Course

Data Science

- (3) DSCI 325: Management of Structured Data

Analytical (18 credits)

Data Science

- (6) Year-long sequence in data science, e.g. software, basic programming, data management, visualization

Statistics

- (6) Year-long sequence of introductory statistics
- (3) Regression Analysis

Mathematics

- (3) Applied Calculus

Domain & Professional Skills (18 credits)

Interdisciplinary component

- (12) Any discipline, 300+ level courses only

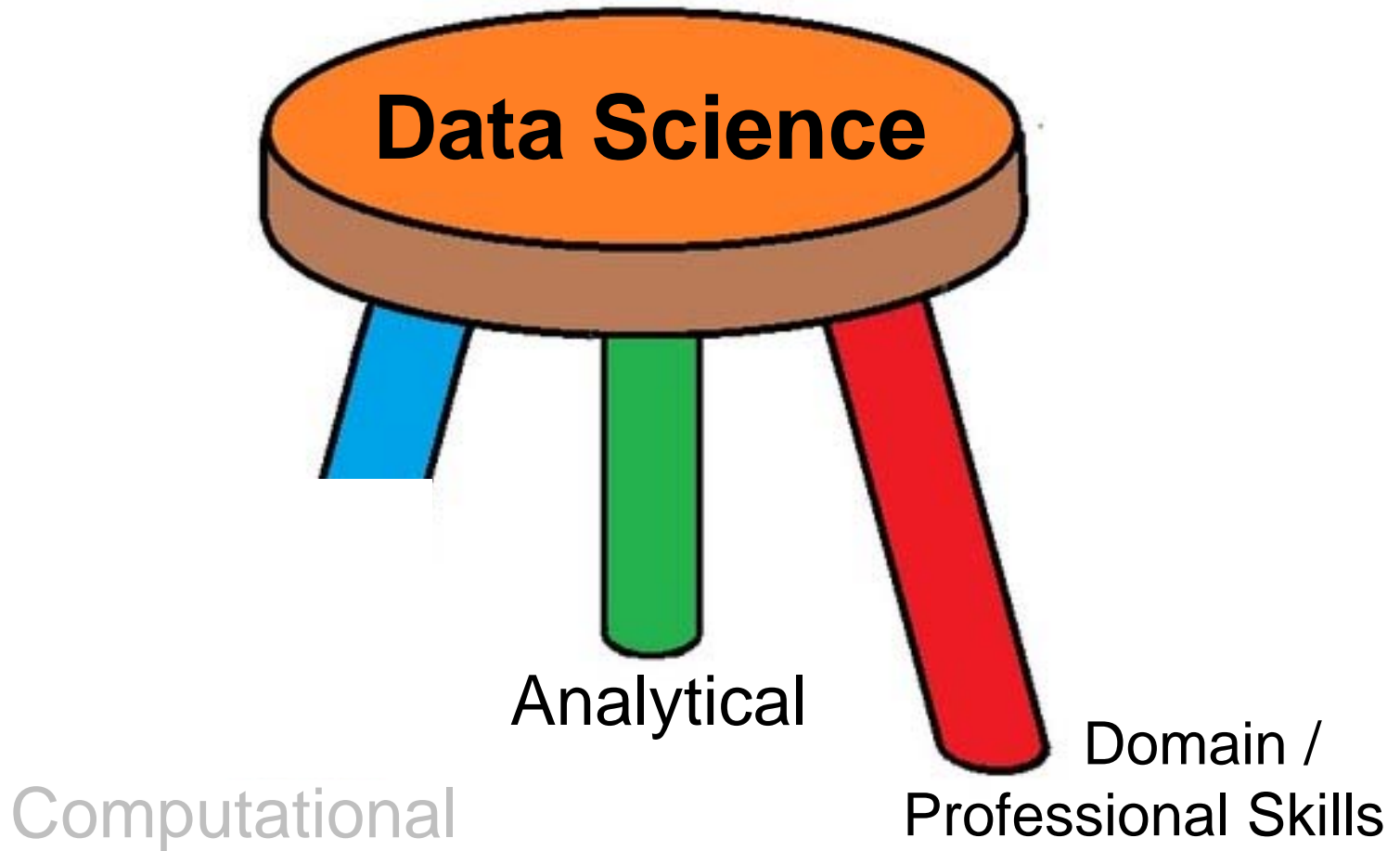
Professional Skills

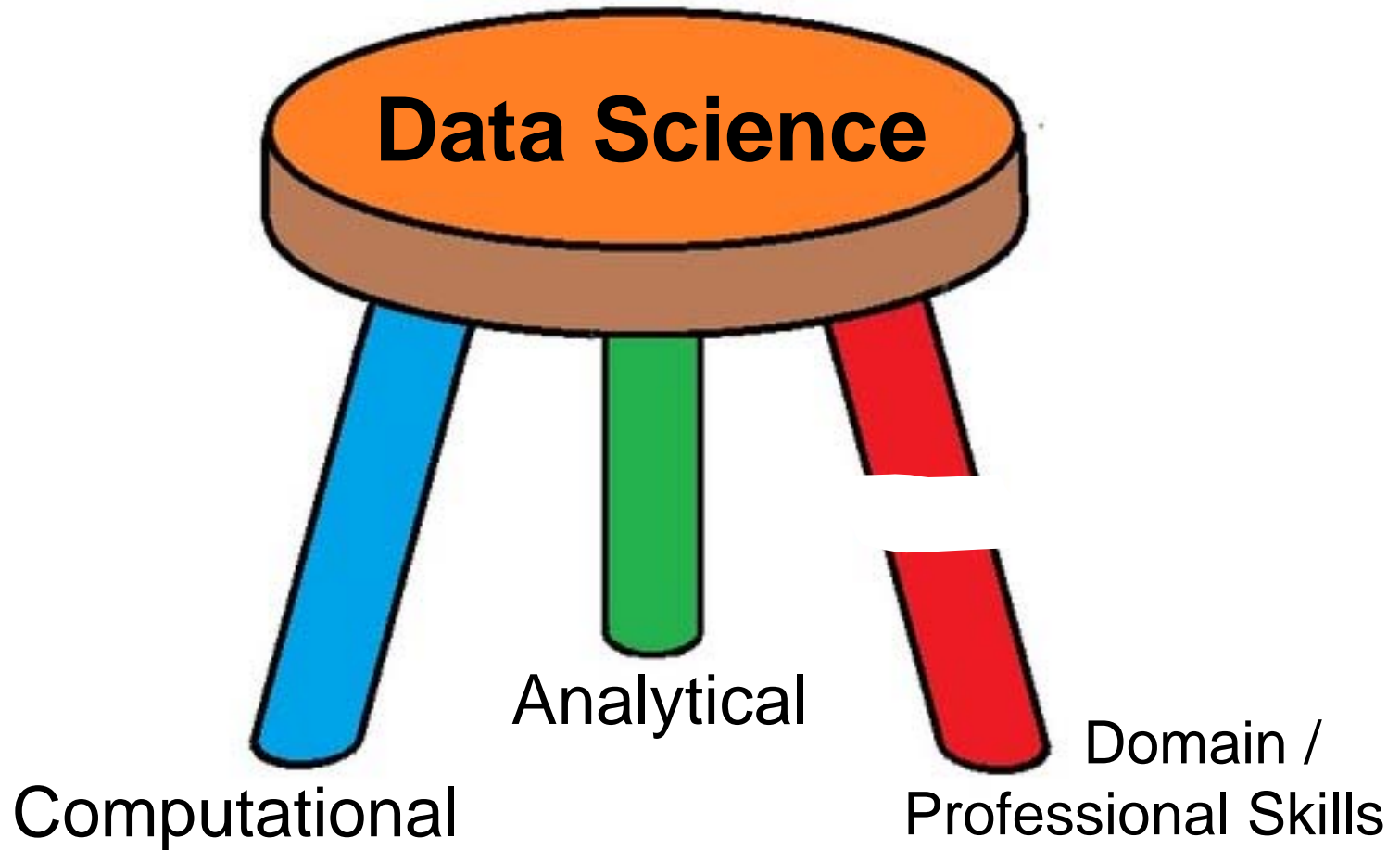
- (3) Career development, communication, etc.

Capstone / Internship

- (3) Substantial independent project or internship

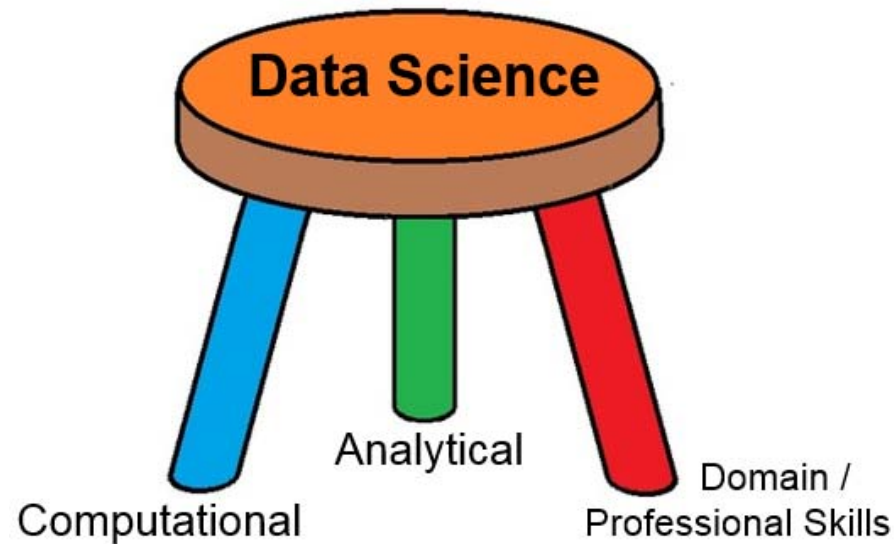
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1. Balance
2. Develop skills
3. Students do



~ Thank You ~

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(Very) Slow to Change

Years Ago	Author	Statement / Purpose
65	ASA President Wilks	"As business and industry become more complex executives will depend more and more on scientific statistical methods for collecting, analyzing, and interpreting information for decision-making."
33	Minton	Suggests training undergraduates is necessary to meet the demands of industry.
18	Higgins	Encourages the training of statisticians at the undergraduate level and proposes new curriculum
15	Moore	"our future depends on achieving a more prominent place in undergraduate education beyond the first methods course."

DSIC Example



Voice Mail Preview:

The following message is brought to you by school reach.

Hello from asphyxiation 12 taken either packing schools will be attending so I was great to go back at 10:25 every now and preschool kids clamber be okay at 8:30.

[Actual Voice Mail Message](#)

DSIC Example

Message per system

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Message per human ear

The following message is brought to you by School Reach.
Hello from Rushford Peterson schools. Due to the weather R P schools will be starting 2 hours late tomorrow. School will start at 10:25. There will be no am preschool. Kids Club will be open at 8:30.