

# PhUSE Emerging Trends & Technology WG

## Educating for the Future

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# Disclaimers and Reminders

- **The opinions in this presentation are my own**
- **I mean no one any offense**
- **There may be some exceptions to some of the generalizations I make here**
- **At the end of the day, our goal is to improve human health**



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# Co-Leads



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# Emerging Trends & Technologies

- **WG Mission**

To stay appraised on trends or technologies in the broader technology community and explore how they can be applied in the clinical development process

- **Co-leads mission**

To guide the projects and WG group direction to best serve the needs of the community towards fulfillment of the WG mission



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# Current Projects

- **Lowering Barriers to Cloud Adoption**
- **Data Visualizations**
- **Alternative Transport Formats**
- **Statistical Computing Environments**
- **Investigating use of FHIR (new)**



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# Current Trends

- **Data Science**
- **Data Representation**
- **Machine Learning / Artificial Intelligence**
- **Design Thinking**
- **User focused application development**
- **Hyper Agile Software Development and Deployment**

(this is only a sample)



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# Data Science

- **Trends**

- Massive innovation related to all things having to do with data
- Languages: Python, R, Java, javascript, Scala,
- "Best job in America"

- **Where we are as an industry**

- Things are done more or less the same way they were 20 years ago
- Languages: SAS (with a little bit of R)
- Resources are limited



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# Data Representation

- **Trends**
  - Unstructured data
    - NoSQL, Documents, Directed Graph
  - Semantics
    - RDF/OWL
- **Where we are as an industry**
  - SAS datasets (or XPT)
  - Relational databases
  - CDISC



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# Machine Learning and Artificial Intelligence

- **Trends**

- \$14B+ in investment in 2016
- Primary goal is to solve “foundational problems”
  - Language, knowledge, creative thinking
- Just Read the News
  - OpenAI, Autonomous vehicles, AlphaGo, Google Translate

- **Where we are as an industry**

- No noticeable activity or direction



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# Design Thinking

- **Trends**

- Research
  - Understanding innovation and human systems
  - Circular design, risk, and failure to drive better outcomes
- Broad adoption at major corporations
  - IBM, Capital One, Marriott, Intuit, Philips
- Emphasizing openness and minimizing ego

- **Where we are as an industry**

- Minimal relative innovation
  - Highly linear systems
  - Relational databases
  - Extremely low tolerance for risk and failure
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# User Focused Application Development

- Trends

- User Experience
  - Hiring UX designers with expertise in human factors
  - Design first application development
- User Research and Testing
  - Understanding **what** works and **what** doesn't and **why**

- Where we are as an industry

- “Technology first”
  - No human factors expertise
  - Excessive emphasis on **how**, but little time on **what** or **why**
  - Limited user engagement
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# Hyper Agile SDLC and Deployment

- **Trends**

- DevOps
- Micro-architectures
- Continuous Integration and Deployment
- Containers (e.g. Docker)
- Community Management

- **Where we are as an industry**

- Big projects with large teams (and budgets)
- Outdated architectures (often non-negotiable)
- Extended release timelines
- “Call me if it breaks”



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# How did we get here?

- The ET&T WG is the forum to start tackling many of these gaps
- **So why aren't you?**
  - CSS Guiding Philosophy
  - Volunteer Driven
- The community doesn't appear to have the awareness/desire/expertise to start and execute working groups on these topics



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# What to do?

- How do we foster awareness/desire/expertise on trending topics within the community?
- We need to start with education
  - Frameworks
    - This is not something that PhUSE has formally tackled before
  - Topics
    - Which topics (if any) should we focus on?
  - Methods
    - What is the best way to do this?



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# Educating for the Future

- A new working group
  - Focus on education to build community knowledge
- What are we going to do?
  - Inevitable philosophical discussions around PhUSEs role in educating the community
  - Identification of topics where it is felt that education is needed
    - Prioritize high risk, comprehensionally achievable topics
    - Identify topic leads
  - Develop education plans for each topic



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# Emerging Trends & Technologies

- This is a first step
- Informal discussions with other PhUSE leads indicate a desire that this be more broadly applied
- WE NEED VOLUNTEERS!



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# Emerging Trends & Technologies

THANKS!

[ian.fleming@d-wise.com](mailto:ian.fleming@d-wise.com)

[geoff.low@phuse.eu](mailto:geoff.low@phuse.eu)



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