

**Recommendations
from the
NormSys/ISBE Workshop
‘Standards for Data and Model
Exchange in Systems Biology’
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NormSys/ISBE-Workshop ‘Standards for Data and Model Exchange in Systems Biology’ (Melbourne)

- Model construction needs to be **transparent**, allowing validation: Construction & validation data should be stored in the context of models
- **Reproducibility** of models (standardized simulation and documentation)
- **Multiscale** modelling and data integration is the emerging big challenge
- Healthcare informatics: Multifold of different national **regulations**
- **Data citation**: It is needed to provide credit for data providers/contributors. How to allow citation of datasets/databases?
- Data deposition: How to structure data? Which information is important? (Publishers complaint)
 - ‘Smart figures’ and ‘source data’ directly connected to publications
 - Minimal reporting guidelines are needed for common technologies
- Possible collaboration between data/model curators and publishers during publication cycle: **Pre-publication curation** of submitted data and models

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- **Research communities** determine and implement standards, they are the driving force for the development of the (grass-roots) standards
 - However: Different research communities act separately
Problem: competing or overlapping standards that are not interoperable
 - **Industry** engagement (technical & financial): Which standard to support?
 - **Publishers** can help enforce implementation of the standards, but only after a certain standard has become dominant in a community
 - **Missing career paths** for standard developers and data managers
Problem of gaining credits/recognition
 - **Sustainability** of standards (long-term maintenance) is crucial for industry
 - **Research funders** are most potent drivers of implementation of standards
- Need to bring together all stakeholders and initiate concerted actions and synchronization (‘Society of biomedical standard developers’?)

Discussion

- Shouldn't we establish COMBINE as a **legal entity**?
- How to **publish** the standards and specifications?
- How to **convince** the communities to apply standards?
- How to **certify** support of standards provided by tools?

COMBINE as a legal entity?

- **How?**
Consortium?
Registered Society?
Under the umbrella of another organization?
- **Where?**
Which country provides which conditions?
- **Structure?**

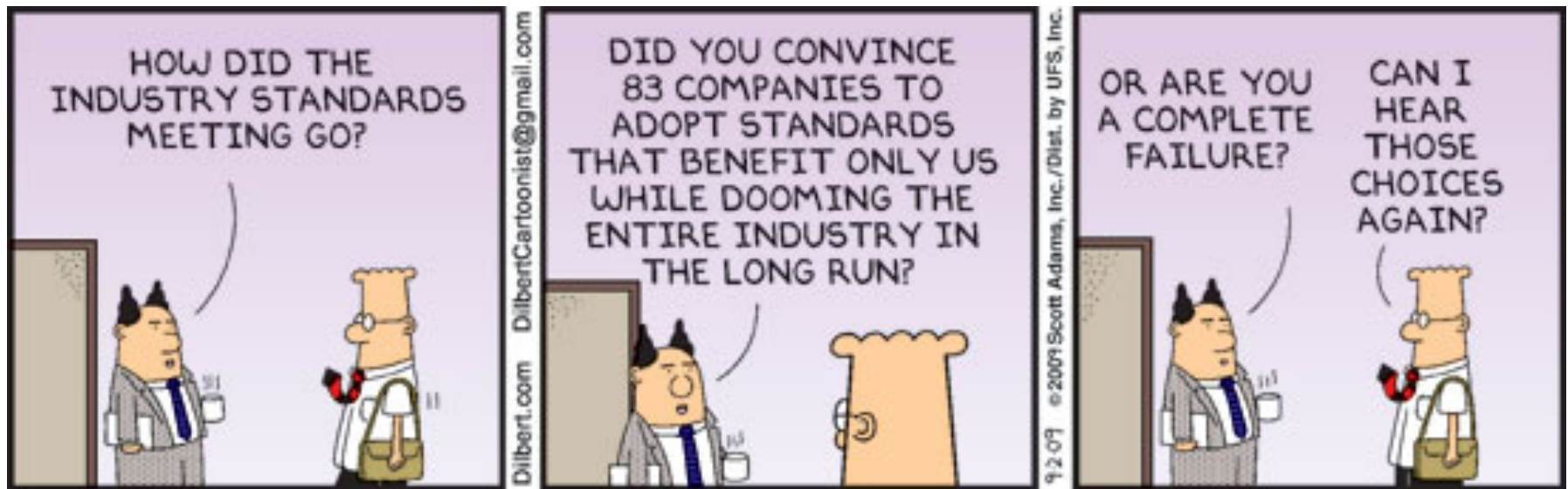
How to publish the standards?

- **Journals:**

Special issue of Journal of Integrative Bioinformatics (JIB) for standards in systems and synthetic biology just has been published (with 14 standard / packages articles):
JIB (2015), Vol. 12, No. 2 (<http://journal.imbio.de>)

- **Standardization bodies** (e.g. ISO)
- **Independently** organized by each standard?
- **Concerted** actions?

How to convince the communities to apply standards?



Outreach events

How to certify support of standards provided by tools?