

Delegates' Summit: Best Practice and Definitions of Data Value

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Delegates' Summit: Best Practice & Definitions of Data Value . . .

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The Eighth Symp. on Advanced Computation and Information in Natural and Applied Sciences,
The International Conference on Numerical Analysis and Applied Mathematics (ICNAAM 2018),
CfP: <https://research.cs.wisc.edu/dbworld/messages/2017-11/1510594041.html>

Program: http://icnaam.org/sites/default/files/Preliminary%20Program%20of%20ICNAAM%202018_Web_version_70.pdf

Recall: Last Years' Post-Summit Results

In 80 Words Around The World.

Knowledge and Computing (Delegates and other contributors)

- “Knowledge is created from a subjective combination of different attainments as there are intuition, experience, information, education, decision, power of persuasion and so on, which are selected, compared and balanced against each other, which are transformed, interpreted, and used in reasoning, also to infer further knowledge. Therefore, not all the knowledge can be explicitly formalised. Knowledge and content are multi- and inter-disciplinary long-term targets and values. In practice, powerful and secure information technology can support knowledge-based works and values.”
- “Computing means methodologies, technological means, and devices applicable for universal automatic manipulation and processing of data and information. Computing is a practical tool and has well defined purposes and goals.”

Citation: Rückemann, C.-P., Skurowski, P., Staniszewski, M., Hülsmann, F., and Gersbeck-Schierholz, B. (2015): *Post-Summit Results, Delegates' Summit: Best Practice and Definitions of Knowledge and Computing*; Sept. 23, 2015, *The Fifth Symposium on Advanced Computation and Information in Natural and Applied Sciences (SACINAS)*, The 13th Internat. Conf. of Numerical Analysis and Applied Mathematics (ICNAAM), Sept. 23–29, 2015, Rhodes, Greece. URL: http://www.user.uni-hannover.de/cpr/x/publ/2015/delegatessummit2015/rueckemann_icnaam2015_summit_summary.pdf

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Recall: Last Years' Post-Summit Results

In 80 Words Around The World.

Data-centric and Big Data (Delegates and other contributors)

- “The term data-centric refers to a focus, in which data is most relevant in context with a purpose. Data structuring, data shaping, and long-term aspects are important concerns. Data-centricity concentrates on data-based content and is beneficial for information and knowledge and for emphasizing their value. Technical implementations need to consider distributed data, non-distributed data, and data locality and enable advanced data handling and analysis. Implementations should support separating data from technical implementations as far as possible.”
- “The term Big Data refers to data of size and/or complexity at the upper limit of what is currently feasible to be handled with storage and computing installations. Big Data can be structured and unstructured. Data use with associated application scenarios can be categorised by volume, velocity, variability, vitality, veracity, value, etc. Driving forces in context with Big Data are advanced data analysis and insight. Disciplines have to define their ‘currency’ when advancing from Big Data to Value Data.”

Citation: Rückemann, C.-P., Kovacheva, Z., Schubert, L., Lishchuk, I., Gersbeck-Schierholz, B., and Hülsmann, F. (2016): *Post-Summit Results, Delegates' Summit: Best Practice and Definitions of Data-centric and Big Data – Science, Society, Law, Industry, and Engineering*; Sept. 19, 2016, The Sixth Symposium on Advanced Computation and Information in Natural and Applied Sciences (SACINAS), The 14th Internat. Conf. of Numerical Analysis and Applied Mathematics (ICNAAM), Sept. 19–25, 2016, Rhodes, Greece.
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Recall: Last Years' Post-Summit Results

In 80 Words Around The World.

Data Science Definition (Delegates and other contributors)

- “Qualified Data, especially for an enterprise, represents frozen knowledge or in other words frozen value. The abilities to understand and manage these data is what we call data science.**

Data results from action, hence, data science can be defined secondary to data. The essence of Data Science is to give qualified access to relevant data to owners and users.

Hardware and software and their implementation represent the tertiary level of qualified and high level data.”

Citation: Rückemann, C.-P., Iakushkin, O. O., Gersbeck-Schierholz, B., Hülsmann, F., Schubert, L., and Lau, O. (2017): *Post-Summit Results, Delegates' Summit: Best Practice and Definitions of Data Sciences – Beyond Statistics*; Sept. 25, 2017, The Seventh Symposium on Advanced Computation and Information in Natural and Applied Sciences (SACINAS), The 15th Internat. Conf. of Numerical Analysis and Applied Mathematics (ICNAAM), Sept. 25–30, 2017, Thessaloniki, Greece. URL: http://www.user.uni-hannover.de/cpr/x/publ/2017/delegatessummit2017/rueckemann_icnaam2017_summit_summary.pdf

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Best Practice and Definitions: Data Value (1/5)

In 80 Words Around The World.

Case: Natural sciences & research Source: Hülsmann, Rückemann, Gersbeck-Schierholz (KiM, DIMF)

- **Data value:** Computing in general is aimed at processing data, big or small. Therefore, data are primary and machinery, including computing, is providing means of secondary ranked value. In consequence to this, data have to be ranked first on the scale of values, whereas the means for processing data have to be considered of secondary value only. In addition to this, further values can be associated with consecutive deployment and use of data and machinery.
 - Data value is defined by scientific requirements.
 - Data / knowledge quality and characteristics are focussed on research insight.
 - The knowledge concept and expertise are of primary significance.
 - From this perspective, the amount of investments does not necessarily have to correlate with a certain value.
 - Business objectives govern the embodiment of instruments.
- *Data is essential (suitable and “qualified”) for / used with:*
 - Insight (creation, preservation, . . .), scientific proof and evidence, empowering arbitrary complex solutions, working with application scenarios.
 - Long-term knowledge management, context-focussed research data management, fostering knowledge-focussed education required, multi-disciplinary and classical philosophical background increasingly important, technical aspects can contribute to applied scenarios, . . .

Best Practice and Definitions: Data Value (2/5)

In 80 Words Around The World.

Case: Mathematics and algorithms Source: Raffaella Pavani

• Data value:

Here I take under consideration the meaning of data value referring to the numerical solution of a problem. The numerical input data are obviously required to start the solution process, but they are not the only data values which affect the final solution.

Indeed, many other data values have to be considered:

- the idea for solution,
- the insight,
- the approach (how to get it?) which makes something feasible,
- the algorithm itself,
- the implementation,
- the realisation (on a certain computer architecture),
- the final current use,
- the future potential.

More, the 'overall performance' of an algorithm is never the application performance.

Therefore the numerical solution process depends on many data values, many of which are hidden.

Best Practice and Definitions: Data Value (3/5)

In 80 Words Around The World.

Case: Humanities and natural sciences Source: Lutz Schubert

- **Data value:**

The value of data vs. the value of information:

“data is the new oil” is a frequent statement these days, in particular from many players building their business on re-using or selling user data.

However, that holds an implicit assumption, namely that it is practicable and may sometimes lead to misunderstandings and in the worst case, this can result in conflicts with privacy and confidentiality.

Do we still have a right to the /information/ behind the data, once we gave / sold our data, which carries “real value”? ...

Best Practice and Definitions: Data Value (4/5)

In 80 Words Around The World.

Case: Insurance and business Source: Olaf Lau, Insurance Expert, (KiM, DIMF)

- **Data value:**

Data value is defined by significance for business objectives.

Data is the primary value for business objectives.

Tools are subordinate to data value and have to fully support business objectives.

- *Data is essential for:*

- Strategic analysis and planning,
- Cases and case related payments,
- Expenses, Investments, Visualisation,
- Analysis of future requirement,
- Staff/personnel planning, . . .

- *Further requirements:*

- Distributed access,
- Data Warehousing,
- Standard business software.

Best Practice and Definitions: Data Value (5/5)

In 80 Words Around The World.

Case: Statics / construction in civil engineering Source: Martin Hofmeister (KiM, DIMF)

- **Data value:** Data value is defined by quality of factual data. **“Data is materialised knowledge.”** One of the most valuable contribution is experience of analysing and evaluating data context. **Primary focus is on input data.**
- *Significant contributions/processes and purpose:*
 - Value of expert on-topic/paper-work, quality and plausibility checks,
 - Data, frameworks, and publications on projects and context,
 - Implementation-parallel check (separate software implementations),
 - Process output in range of tolerance (e.g., 10 percent), . . .
 - Framing data and context, third party data and frameworks importance of changes over time for data context frameworks, data, . . . (standards, DIN, ISO, BSI, . . .)
 - Essential chains of complete and continuous sequences of standards / reference data over time (e.g., EN 1992 etc. Eurocode 2, reinforced concrete constructions; EN 1993 etc. Eurocode 3, steel constructions), comprehensible, documented.
 - Most important: Object-related knowledge/data about historical buildings (calculation, construction plans) and historic construction and context.
 - Value for infrastructure / safety / economy / society; cost-performance calculation values,
 - Arbitrary complex scenarios require human expertise,
 - Algorithms, methodologies, and tables in focus,
 - Data is merged (at building inspection office / public construction authority / Bauamt).

Best Practice and Definitions

In 80 Words Around The World.

Statements on Data Value (Delegates and other contributors)

- **How should Data Value be defined?**
- **Which Best Practice for Data Value can be summarised?**
- **Next Delegates' Summit: How is structure involved?**

⇒ [See the Post-Summit Results: Data Value Definition](#) ⇐
[\(last page added to this slide set\)](#)

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Networking and Outlook

Thank you for your attention!

**Wish you an inspiring conference
and a pleasant stay on Rhodos!**

**Looking forward to seeing you again next year for the
Symposium on Advanced Computation and Information!**

Post-Summit Results

In 80 Words Around The World.

Data Value Definition (Delegates and other contributors)

“Data value is the primary ranked value in scenarios comprised of data and computing context. In general, processing of data, is the cause for computing. In consequence, data, including algorithms and other factual, procedural, and further knowledge, have to be ranked primary on the scale of values whereas machinery for processing data, including computing, are providing means of secondary ranked value. In addition, further values, including economic values, can be associated with consecutive deployment of data and machinery.”

This is unaffected by varying views and attributions, including quality. Nevertheless, different views can scale values.

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