

# Public SSB Fact Sheet: Interface Standard for Integrated Virtual Material Modelling in Manufacturing Industry (VMAP)

Projects

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Additional Resources

<b>Short description/ Transmitted information</b>	<ul style="list-style-type: none"> <li>• VMAP is a vendor neutral standard for CAE data-storage to enhance interoperability in virtual engineering workflows</li> <li>• VMAP specification is freely (open &amp; cost-free) available,</li> <li>• VMAP development kit will be available under a Creative Commons Attribution-Share-Alike license (details currently under preparation, release planned early May 2020)</li> <li>• VMAP Standardization Community will be organized by NAFEMS association, details to be defined</li> </ul>
<b>Normative document</b>	<ul style="list-style-type: none"> <li>• -</li> </ul>
<b>Version / Release state</b>	<ul style="list-style-type: none"> <li>• -</li> </ul>
<b>Release date</b>	<ul style="list-style-type: none"> <li>• -</li> </ul>
<b>Application scope</b>	<ul style="list-style-type: none"> <li>• Describe models and results from 3D simulation tools (FEA, FVM, mesh-less models, etc.)</li> <li>• Initial use for detailed manufacturing and product/component simulations</li> </ul>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Flexibilization of integrated simulation tool-chains, by:</li> <li>• Standardized exchange format for models and result properties</li> <li>• Geometry and discretization</li> <li>• Coordinate and unit systems</li> <li>• Result and state variables</li> <li>• Parameters for (material) models</li> <li>• Meta and user data</li> <li>• Supplied IO routines for easy implementation</li> </ul>
<b>Promoting bodies</b>	<ul style="list-style-type: none"> <li>• NAFEMS, ITEA, VMAP Community (&gt; 50 partner, member fee planned, similar to FMI)</li> </ul>
<b>Type</b>	<ul style="list-style-type: none"> <li>• Own VMAP Standard rules, based on Modelica (FMI)</li> </ul>
<b>IT Standard classification</b>	<ul style="list-style-type: none"> <li>• Interoperability Standard</li> <li>• Integration Standard</li> </ul>
<b>Data format</b>	<ul style="list-style-type: none"> <li>• HDF5 (<a href="https://www.hdfgroup.org/solutions/hdf5/">https://www.hdfgroup.org/solutions/hdf5/</a>) Binary Format</li> </ul>

<b>Additional available resources</b>	<ul style="list-style-type: none"><li>• <a href="https://www.vmap.eu.com/">https://www.vmap.eu.com/</a></li><li>• Software vendors will prepare own documentation</li><li>• Under preparation<ul style="list-style-type: none"><li>• Few test Cases,</li><li>• Guidelines</li></ul></li><li>• “Modelling &amp; Simulation A vision of the state of play” <a href="https://itea3.org/magazine/35/march-2020/modelling-simulation.html">https://itea3.org/magazine/35/march-2020/modelling-simulation.html</a></li></ul>
<b>Relevant prostep ivip project groups</b>	<ul style="list-style-type: none"><li>• -</li></ul>

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Additional Resources

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- The only standard for exchange data in 3D CAE workflows

## 1 Remark:

- VMAP is based on the ITEA VMAP project –
- See also
  - “Modelling & Simulation A vision of the state of play”
  - <https://itea3.org/magazine/35/march-2020/modelling-simulation.html>

## 2 Reached goals:

- Standard released and in use within a growing user and implementor community

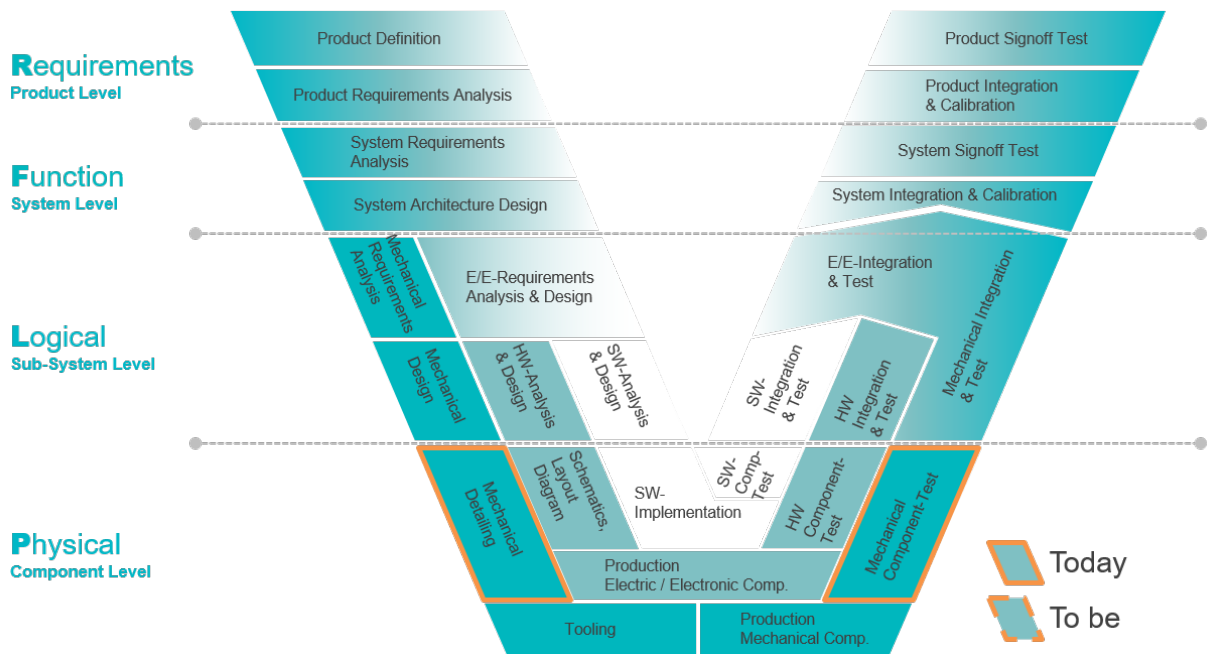
### 3 Further goals

- Addressing new use-cases within Multi-Scale Material simulation and Manufacturing Modelling
  - A follow-up project called “VMAP analytics - Smart Analytics for Multi-Scale Material and Manufacturing Modelling” has received ITEA label and will probably start in November 2020 (<https://itea3.org/project/vmap-analytics.html>)
- Setting a global de-facto standard

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Additional Resources

#### Positioning of VMAP in V-Model



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- The standard allows the community to utilize multi-disciplinary simulation processes based on standard data exchange between the dedicated simulation domains;
- This capability simplifies the usage and by this widens the availability of multi-disciplinary simulation to the MBSE.

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- Extend the usage within more simulation tools;
- Expand the usage over more simulation disciplines;
- Simplify the usage by providing libraries for a more simple migration from specific and individual interfaces to VMAP.

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Additional Resources

Datei	Geändert
Fact Sheet_ Interface Standard for Integrated Virtual Material Modelling in Manufacturing Industry (VMAP).pdf <sup>1</sup>	Apr. 06, 2023 by Peter Tabbert <sup>2</sup>
Positioning of VMAP in V-Model.png <sup>3</sup>	Apr. 06, 2023 by Peter Tabbert <sup>4</sup>
image2020-7-6_16-40-10.png <sup>5</sup>	Apr. 06, 2023 by Peter Tabbert <sup>6</sup>

1 [https://intranet.prostep.org/download/attachments/110329903/Fact%20Sheet\\_%20Interface%20Standard%20for%20Integrated%20Virtual%20Material%20Modelling%20in%20Manufacturing%20Industry%20%28VMAP%29.pdf?api=v2](https://intranet.prostep.org/download/attachments/110329903/Fact%20Sheet_%20Interface%20Standard%20for%20Integrated%20Virtual%20Material%20Modelling%20in%20Manufacturing%20Industry%20%28VMAP%29.pdf?api=v2)

2 <https://intranet.prostep.org/display/~petertabbert>

3 <https://intranet.prostep.org/download/attachments/110329903/Positioning%20of%20VMAP%20in%20V-Model.png?api=v2>

4 <https://intranet.prostep.org/display/~petertabbert>

5 [https://intranet.prostep.org/download/attachments/110329903/image2020-7-6\\_16-40-10.png?api=v2](https://intranet.prostep.org/download/attachments/110329903/image2020-7-6_16-40-10.png?api=v2)

6 <https://intranet.prostep.org/display/~petertabbert>