

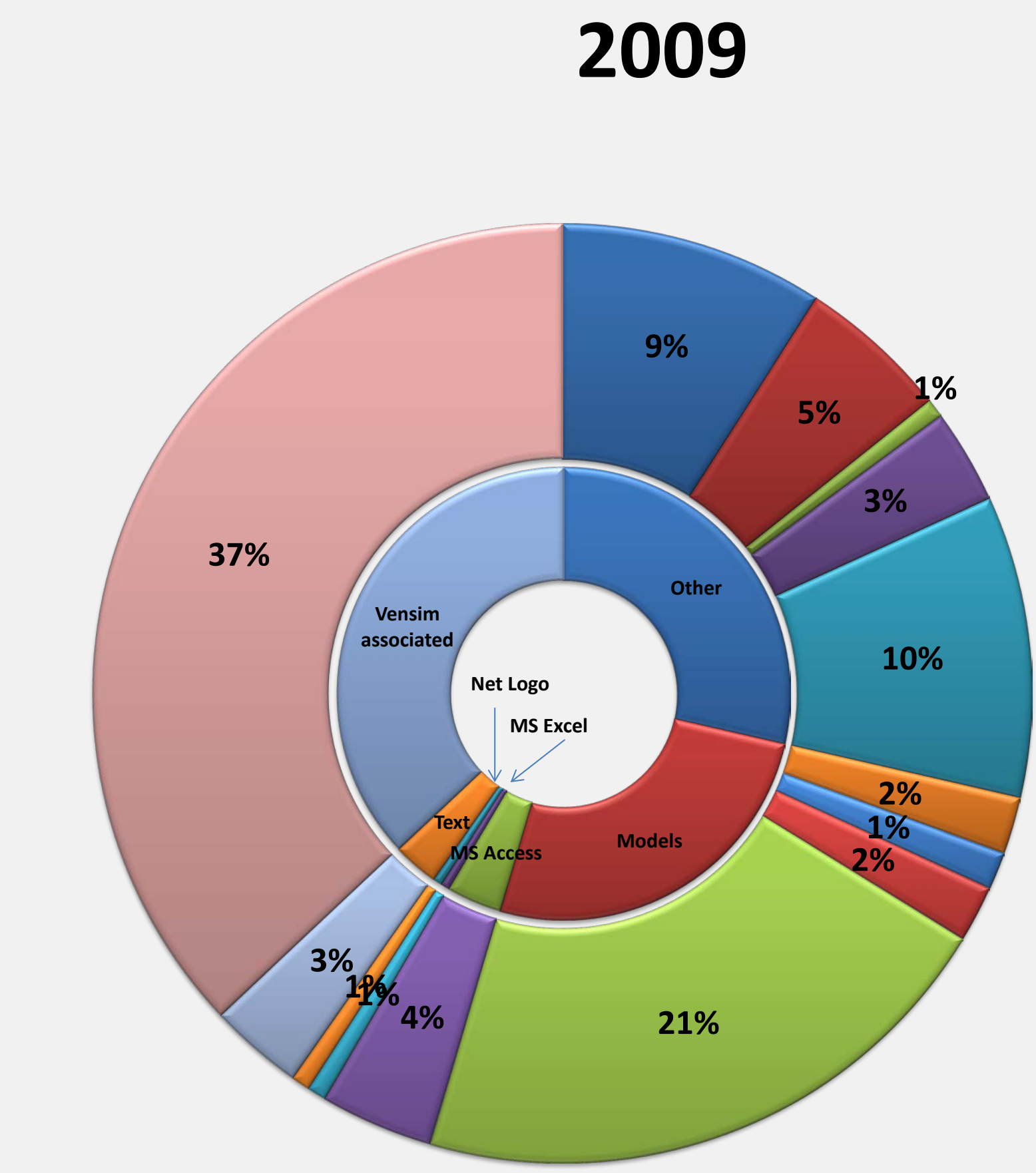
The seventh stage*: system dynamics *model construction*

HYPOTHESIS

The International Conference of the System Dynamics Society provides an opportunity to report on system dynamics models.

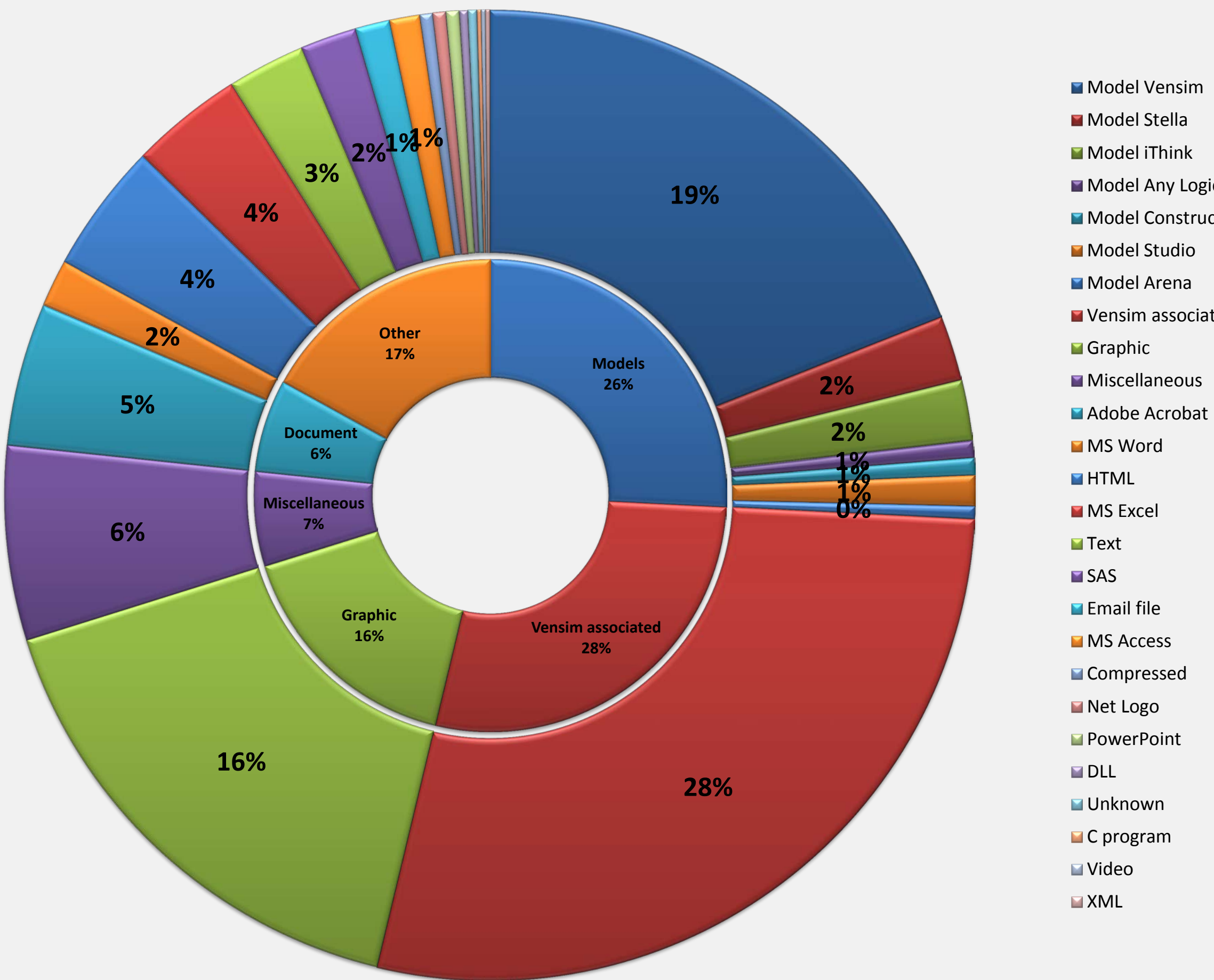
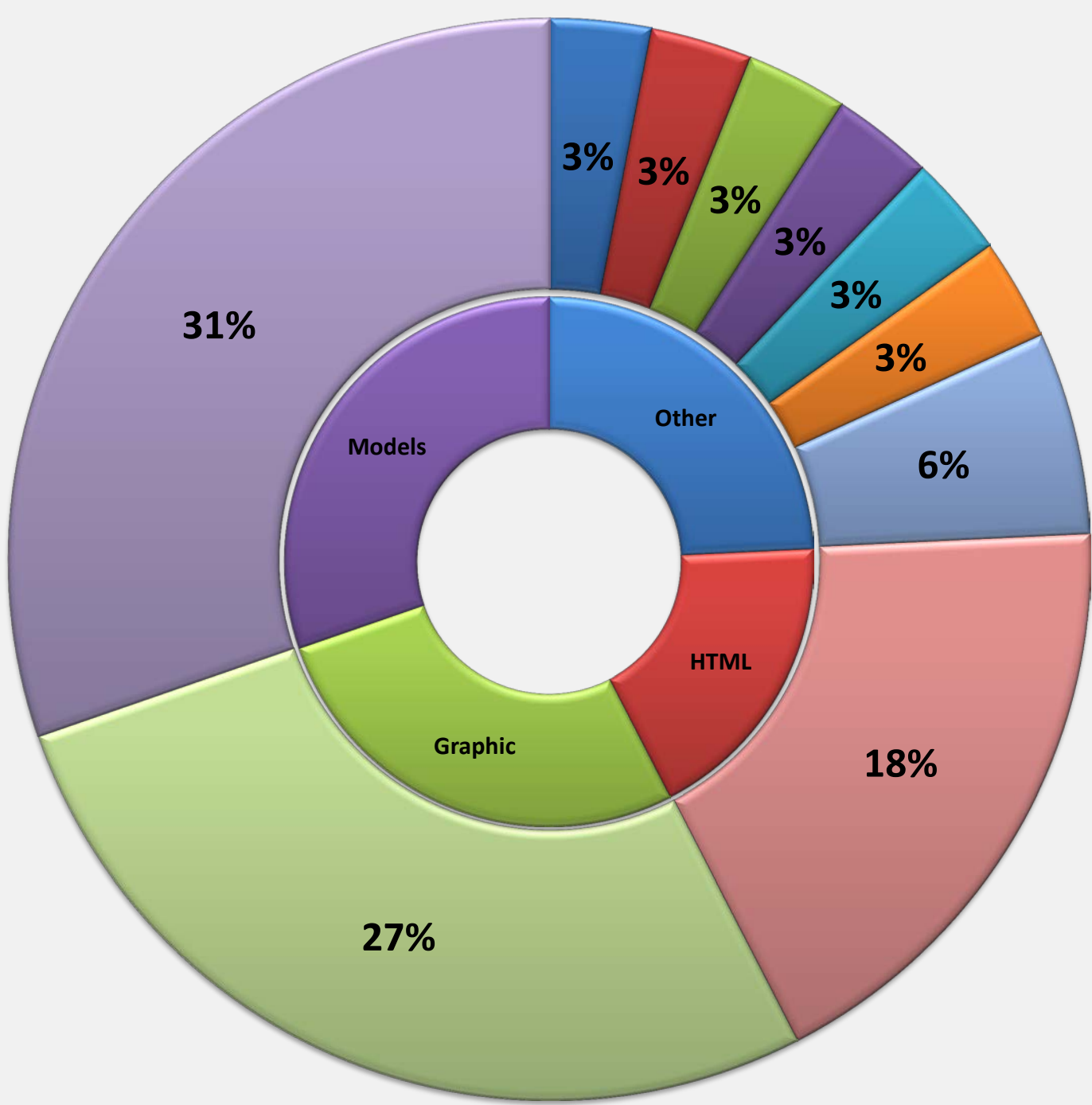
1. System dynamics models represent the application of the system dynamics methodology
2. The subjective and objective quality of those models reflects on the Society
3. The quality of system dynamics models presented at the ISDC is inconsistent.
4. Applications of ‘checklists’ and tools during model construction may improve model quality

The current state of model construction

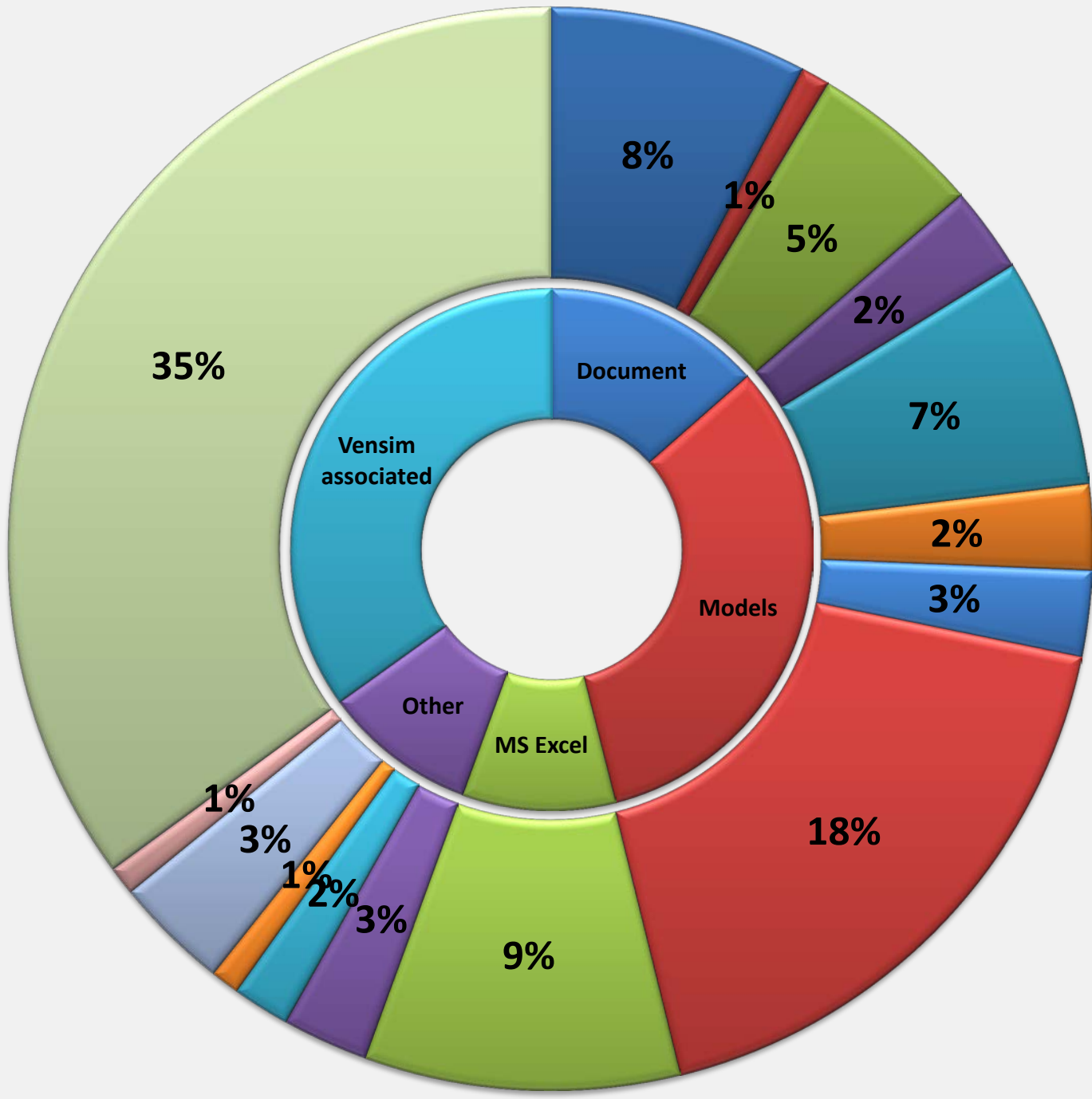


Distribution of Supporting Documents
International Conference of the System Dynamics
Society
2009 - 2013

2010

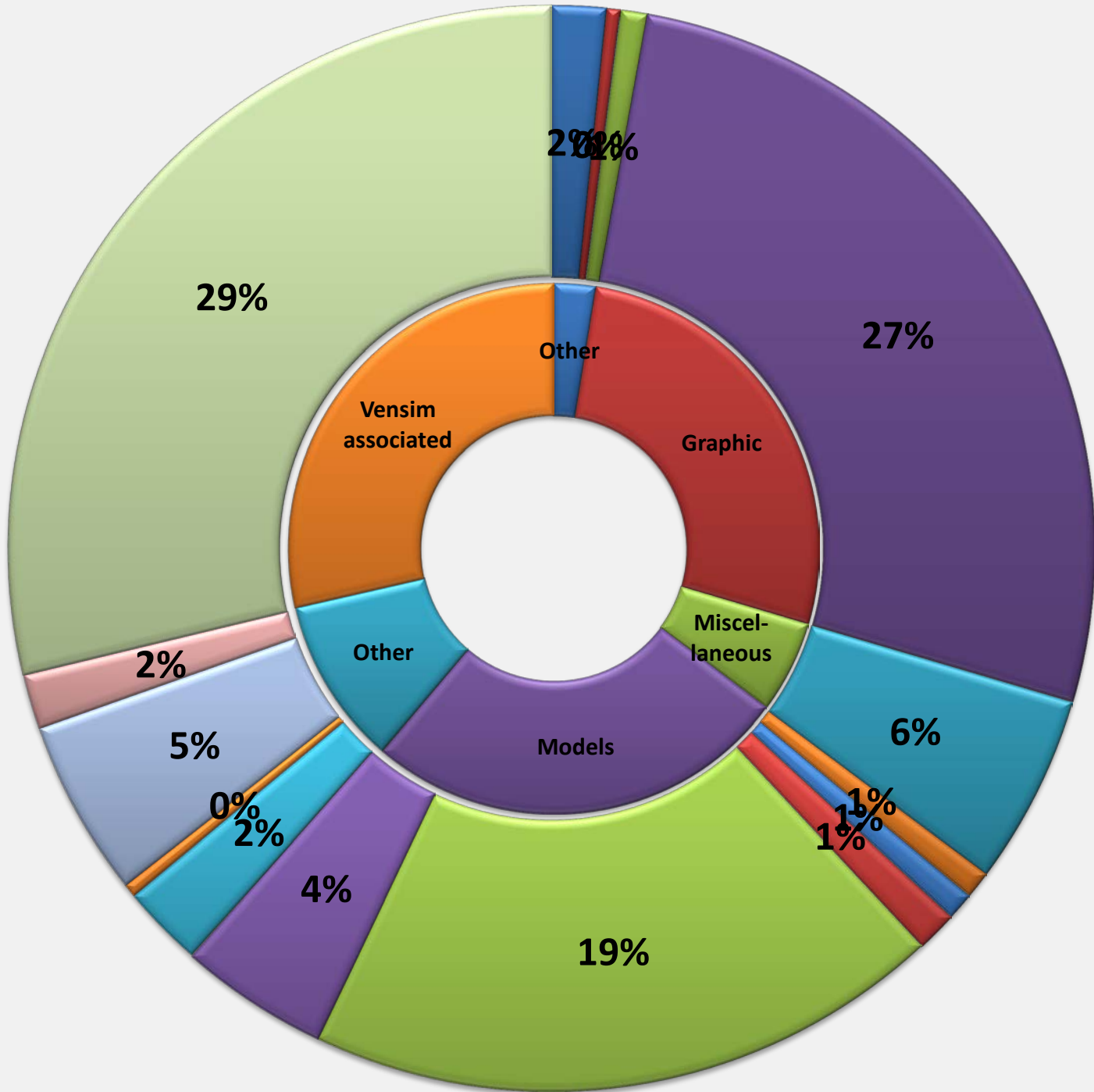


2011

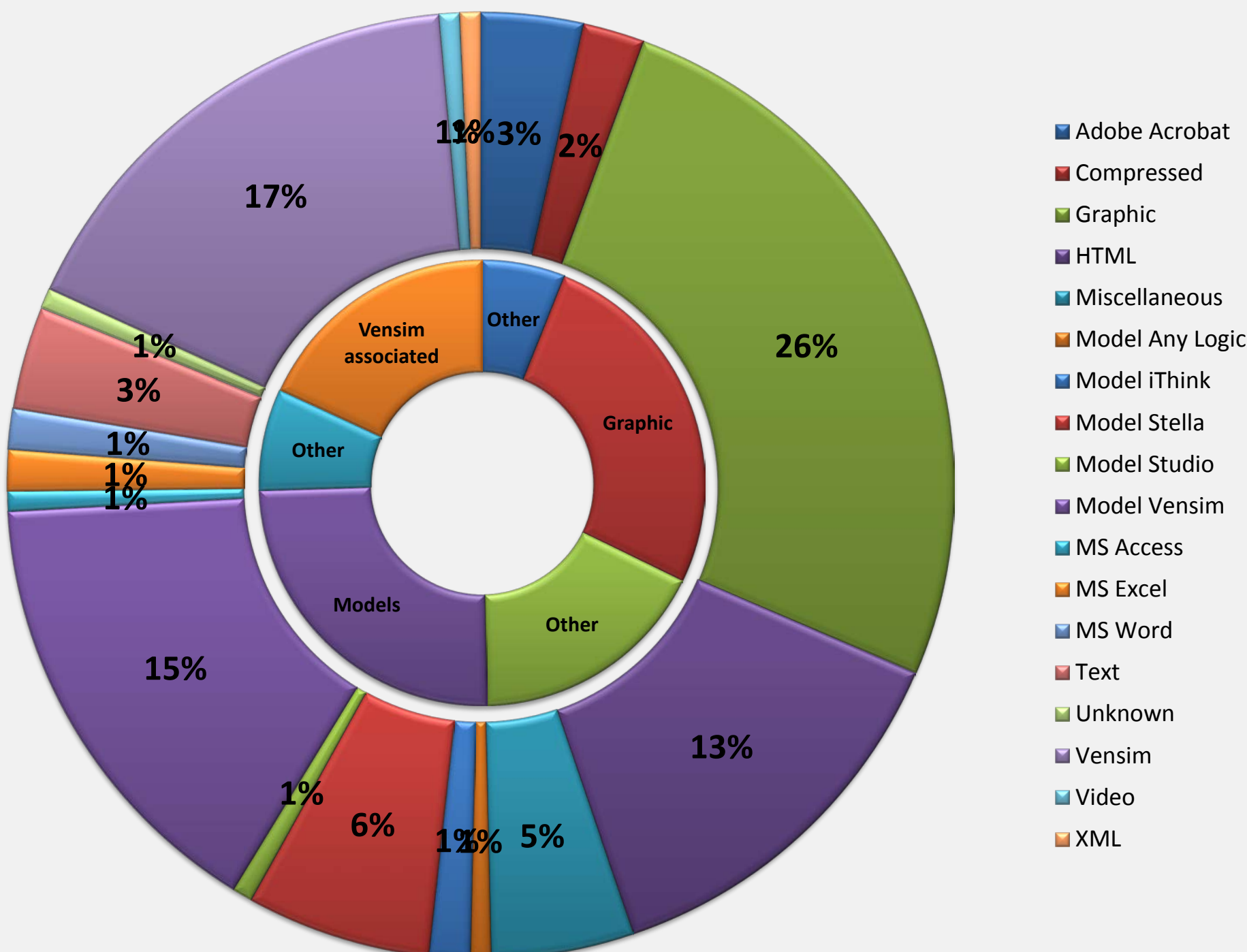


Category	2009	2010	2011	2012	2013	Sum
Model Versim	32	10	21	47	22	132
Model Stella	3	0	3	0	9	15
Model iThink	2	0	8	2	2	14
Model Any Logic	0	1	0	2	1	4
Model Constructor	0	1	3	0	0	4
Model Studio	0	0	3	3	1	7
Model Arena	3	0	0	0	0	3
Versim associated	40	12	38	54	35	179
Graphic	57	1	41	71	24	194
Miscellaneous	1	9	1	66	37	114
Adobe Acrobat	16	2	6	14	7	45
MS Word	14	1	9	4	5	33
MS Excel	0	0	3	6	2	11
HTML	5	6	0	0	19	30
Text	1	1	11	11	2	26
SAS	5	0	4	4	5	18
Email file	0	0	0	13	0	13
MS Access	8	0	0	0	0	8
Compressed	6	0	0	0	1	7
Net Logo	0	0	0	0	3	3
PowerPoint	1	0	2	0	0	3
DLL	0	1	1	1	0	3
Unknown	0	0	0	2	0	2
C program	0	0	1	0	1	2
Video	0	0	0	1	0	1
XML	0	0	0	0	1	1

2012



2013



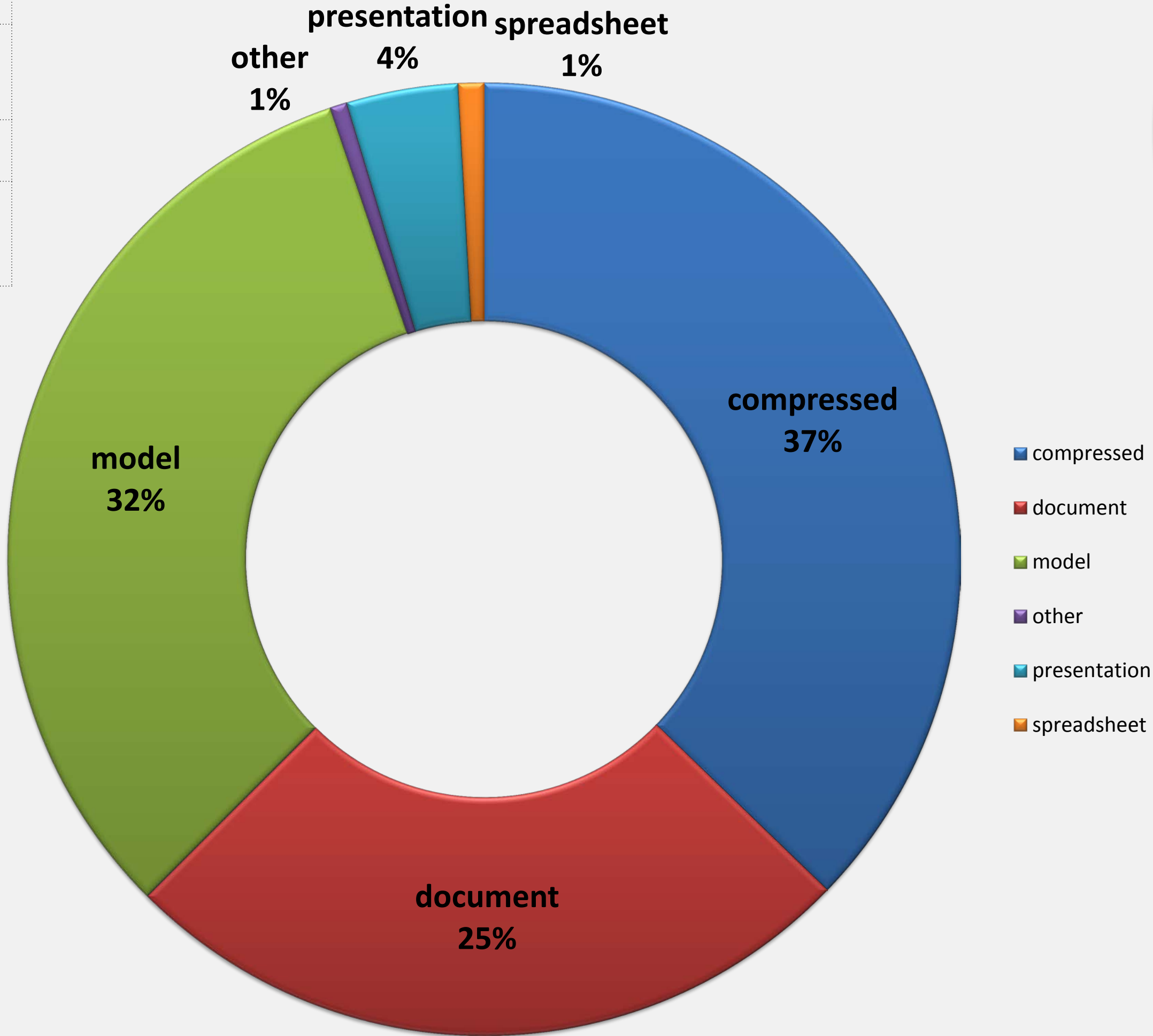
Objective criteria

Model size	Variables
	Elements
	Element/Variable ratio
	Relative model size
	Ranges
	Defined units
	Adequate units
	Stocks
	Auxiliaries/Flows
	Constants
Modularity: Constructor diagram / View / Sector frame	Model modules
	Interface modules
	Other modules
	Adequate documentation
Modeling conventions	Naming
	Embedded constants
	Variable names well defined

Subjective criteria

Organization score *
Sufficient documentation exists: to undertake improvement by original author(s)
Sufficient documentation exists: to reproduce results by non-authors
Percent of constants documented
Constants documented in the wrong place
Sufficient documentation of constants
* Subjective score with values Awful, Poor, Good, Very Good and Excellent.

All files 2009-2013



Join the ad-hoc model construction quality SIG!

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Sandia National Laboratories
Systems Analysis Group



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*Martinez-Moyano and Richardson list six stages: Problem identification and Definition, System Conceptualization, Model Formulation, Model Testing and Evaluation, Model Use, Implementation, and Documentation, Design of Learning Strategy/Infrastructure, "Best practices in system dynamics modeling", System Dynamics Review vol. 29, No 2 (April-June 2013): 102-123