

[UNIVERSITY]
[SCHOOL]
[DEPARTMENT]

ODD Protocol

[Name]

[LOCATION]
[YEAR]

1 INTRODUCTION

1.1 HEADING 2

1.1.1 Heading 3

1.1.1.1 Heading 4

1.1.1.1.1 Heading 5

This template was developed to facilitate the use of the ODD protocol in technical and academic writing. It is based on the `ABNTex2` class and follows the formatting guidelines of the Brazilian Association of Technical Standards (`ABNT`). References are formatted according to the American Psychological Association (`APA`) standard.

To enhance clarity, **guiding questions** are presented at the beginning of each section, with **color-coding** for easy reference. These questions were drawn from (Grimm et al., 2020), (Grimm et al., 2010), and (Railsback & Grimm, 2019).

Additionally, the template includes placeholder texts with examples from (Grimm et al., 2020) to further assist users.

A visual and summarized version of the protocol, known as *Visual ODD* (Szangolies et al., 2024), is provided in Figure 1.1.

To maintain the template's general applicability, some questions from the extended ODD+D version proposed by (Müller et al., 2013) were not included. These omitted questions can be found in the appendix.

2 OVERVIEW (O)

2.1 PURPOSE AND PATTERNS

- ➔ **What is the purpose of the study?** (Grimm et al., 2010, 2020)
- ➔ **For whom is the model designed?** (Müller et al., 2013)
- ➔ **What pattern are used as criteria for evaluating the model's suitability for its purpose?** (Grimm et al., 2020)

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2.2 ENTITIES, STATE VARIABLES, AND SCALES

- ➔ **What kinds of entities are in the model and what they represent?** (Grimm et al., 2010, 2020)
- ➔ **By what attributes (i.e., state variables and parameters) are these entities characterized?** (Grimm et al., 2010)
- ➔ **Why those entities were included and, if relevant, why other entities were not included?** (Grimm et al., 2020)
- ➔ **What are the temporal and spatial resolutions (e.g. discrete, continuous, or both) (what measure?) and extents of the model? Why they were chosen?** (Grimm et al., 2010, 2020)
- ➔ **Are there any other dimensions represented? How?** (Grimm et al., 2020)

Phasellus laoreet lorem vel dolor tempus vehicula. Idque Caesaris facere voluntate liceret: sese habere. Ab illo tempore, ab est sed immemorabili. Mercedem aut nummos unde unde extricat, amaras. Praeterea iter est quasdam res quas ex communi (Grimm et al., 2006).

2.3 PROCESS OVERVIEW AND SCHEDULING

- ➔ **What entity does what, and in what order?** (Grimm et al., 2010, 2020)
- ➔ **When are state variables updated?** (Grimm et al., 2010)
- ➔ **How is time modeled, as discrete steps or as a continuum over which both continuous processes and discrete events can occur?** (Grimm et al., 2010)

Phasellus laoreet lorem vel dolor tempus vehicula. Idque Caesaris facere voluntate liceret: sese habere. Ab illo tempore, ab est sed immemorabili. Mercedem aut nummos unde unde extricat, amaras. Praeterea iter est quasdam res quas ex communi (Grimm et al., 2010).

3 DESIGN CONCEPTS (O)

- ➔ **Which general concepts, theories, hypotheses, or modeling approaches are underlying the model's design? How is the model related to previous thinking about the problem it addresses?** (Grimm et al., 2010, 2020)
- ➔ **By what attributes (i.e., state variables and parameters) are these entities characterized?** (Grimm et al., 2010)
- ① ➔ **Why those entities were included and, if relevant, why other entities were not included?** (Grimm et al., 2020)
- ➔ **What are the temporal and spatial resolutions (e.g. discrete, continuous, or both) (what measure?) and extents of the model? Why they were chosen?** (Grimm et al., 2010, 2020)
- ➔ **Are there any other dimensions represented? How?** (Grimm et al., 2020)

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3.1 BASIC PRINCIPLES

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3.2 EMERGENCE

Cum sociis natoque penatibus et magnis dis parturient. Curabitur blandit tempus ardua ridiculus sed magna. Salutantibus vitae elit libero, a pharetra augue (Railsback & Grimm, 2019).

3.3 ADAPTATION

Ab illo tempore, ab est sed immemorabili. Cum sociis natoque penatibus et magnis dis parturient. Quam diu etiam furor iste tuus nos eludet? Ut enim ad minim veniam, quis nostrud exercitation (Grimm, 2020).

3.4 OBJECTIVES

Quisque ut dolor gravida, placerat libero vel, euismod. Ambitioni dedisse scripsisse iudicaretur. Donec sed odio operae, eu vulputate felis rhoncus. Nihilne te nocturnum praesidium Palati, nihil urbis vigiliae (Szangolies et al., 2024).

3.5 LEARNING

Nihilne te nocturnum praesidium Palati, nihil urbis vigiliae. Salutantibus vitae elit libero, a pharetra augue. Quam diu etiam furor iste tuus nos eludet? Fabio vel iudice vincam, sunt in culpa qui officia. Quam temere in vitiis, legem sancimus haerentia. Quisque ut dolor gravida, placerat libero vel, euismod(Grimm et al., 2025).

3.6 PREDICTION

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3.7 SENSING

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3.8 INTERACTION

Plura mihi bona sunt, inclinet, amari petere vellent. Ab illo tempore, ab est sed immemorabili. Ullamco laboris nisi ut aliquid ex ea commodi consequat. Quae vero auctorem tractata ab fiducia dicuntur. At nos hinc posthac, sitientis piros Afros (Wilensky, 2013).

3.9 STOCHASTICITY

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3.10 COLLECTIVES

Curabitur blandit tempus ardua ridiculus sed magna. Sed haec quis possit intrepidus aestimare tellus. Quisque ut dolor gravida, placerat libero vel, euismod. Plura mihi bona sunt, inclinet, amari petere vellent (Tissue & Wilensky, 2004b).

3.11 OBSERVATION

Morbi fringilla convallis sapien, id pulvinar odio volutpat. Hi omnes lingua, institutis, legibus inter se differunt. Non equidem invideo, miror magis posuere velit aliquet. Quid securi etiam tamquam eu fugiat nulla pariat. Inmensae subtilitatis, obscuris et malesuada fames. Fictum, deserunt mollit anim laborum astutumque (Wilensky & Rand, 2007)!

4 DETAILS (D)

Non equidem invideo, miror magis posuere velit aliquet. Quisque placerat facilisis egestas cillum dolore. Curabitur blandit tempus ardua ridiculus sed magna. Contra legem facit qui id facit quod lex prohibet. Petierunt uti sibi concilium totius Galliae in diem certam indicere (Schelling, 1971).

4.1 IMPLEMENTATION DETAILS

Cum sociis natoque penatibus et magnis dis parturient. Curabitur blandit tempus ardua ridiculus sed magna. Salutantibus vitae elit libero, a pharetra augue (Epstein & Axtell, 1996).

4.2 INITIALIZATION

Phasellus laoreet lorem vel dolor tempus vehicula. Idque Caesaris facere voluntate liceret: sese habere. Ab illo tempore, ab est sed immemorabili. Mercedem aut nummos unde unde extricat, amaras. Praeterea iter est quasdam res quas ex communi (Axelrod, 1997).

4.3 INPUT DATA

Ab illo tempore, ab est sed immemorabili. Cum sociis natoque penatibus et magnis dis parturient. Quam diu etiam furor iste tuus nos eludet? Ut enim ad minim veniam, quis nostrud exercitation (Epstein, 1999).

4.4 SUBMODELS

Plura mihi bona sunt, inclinet, amari petere vellent. Ab illo tempore, ab est sed immemorabili. Ullamco laboris nisi ut aliquid ex ea commodi consequat. Quae vero auctorem tractata ab fiducia dicuntur. At nos hinc posthac, sitientis piros Afros (Ballot & Weisbuch, 2000).

5 FINAL CONSIDERATIONS

All models are wrong, but some are useful.

— Box (1979)

Non equidem invideo, miror magis posuere velit aliquet. Quisque placerat facilisis egestas cillum dolore. Curabitur blandit tempus ardua ridiculus sed magna. Contra legem facit qui id facit quod lex prohibet. Petierunt uti sibi concilium totius Galliae in diem certam indicere (Gilbert & Terna, 2000).

Morbi fringilla convallis sapien, id pulvinar odio volutpat. Hi omnes lingua, institutis, legibus inter se differunt. Non equidem invideo, miror magis posuere velit aliquet. Quid securi etiam tamquam eu fugiat nulla pariat. Inmensae subtilitatis, obscuris et malesuada fames. Fictum, deserunt mollit anim laborum astutumque (Epstein, 2006)!

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* In accordance with the American Psychological Association (APA) Style, 7th edition.

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APPENDICES

APPENDIX A – [TITLE]

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APPENDIX B – [TITLE]

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APPENDIX C – [TITLE]

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ANNEXES

ANNEX A – [TITLE]

Ab illo tempore, ab est sed immemorabili. Cum sociis natoque penatibus et magnis dis parturient. Quam diu etiam furor iste tuus nos eludet? Ut enim ad minim veniam, quis nostrud exercitation (Gilbert et al., 2009).

ANNEX B – [TITLE]

Morbi fringilla convallis sapien, id pulvinar odio volutpat. Hi omnes lingua, institutis, legibus inter se differunt. Non equidem invideo, miror magis posuere velit aliquet. Quid securi etiam tamquam eu fugiat nulla pariatur. Inmensae subtilitatis, obscuris et malesuada fames. Fictum, deserunt mollit anim laborum astutumque (Kornhauser et al., 2009)!

ANNEX C – [TITLE]

Morbi fringilla convallis sapien, id pulvinar odio volutpat. Hi omnes lingua, institutis, legibus inter se differunt. Non equidem invideo, miror magis posuere velit aliquet. Quid securi etiam tamquam eu fugiat nulla pariatur. Inmensae subtilitatis, obscuris et malesuada fames. Fictum, deserunt mollit anim laborum astutumque (Romero et al., 2023)!