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DUNGEONS & DRAGONS

As a Drupal project

Hacking and slashing our way through real-world content management problems

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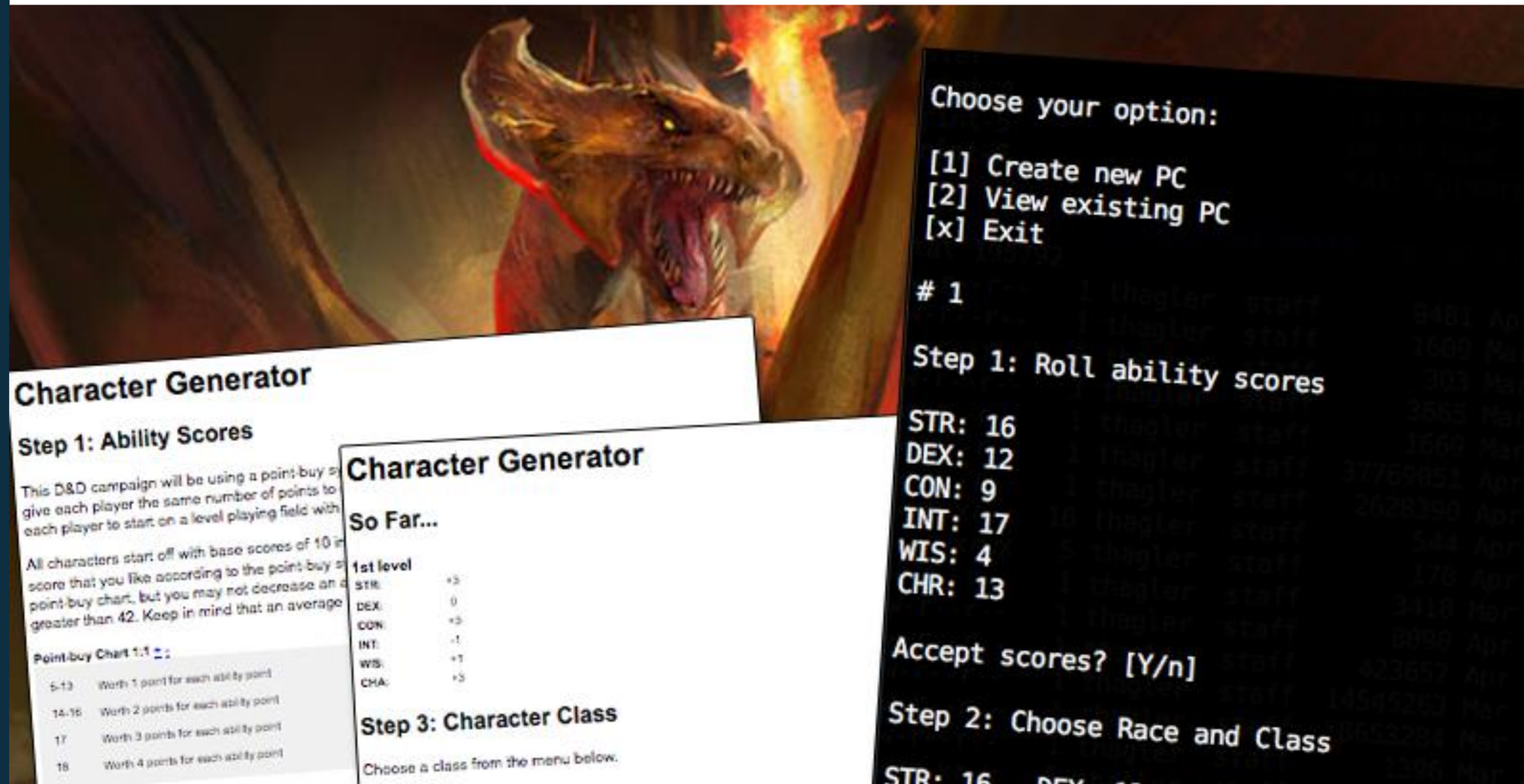
LEARNING

Exploring New Technology With Familiar Problems

- C/C++
- Perl
- PHP
- JavaScript and jQuery
- Drupal 6, 7, 8, Field API, etc.



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BEFORE WE BEGIN

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Determine What To Build

- Determine the scope
- Character sheet as a wireframe
- Scores and Data Values
  - Content and computational models
  - Content entry
  - Access control for data modification
- Player Characters belong to players (users)
- Content entry order

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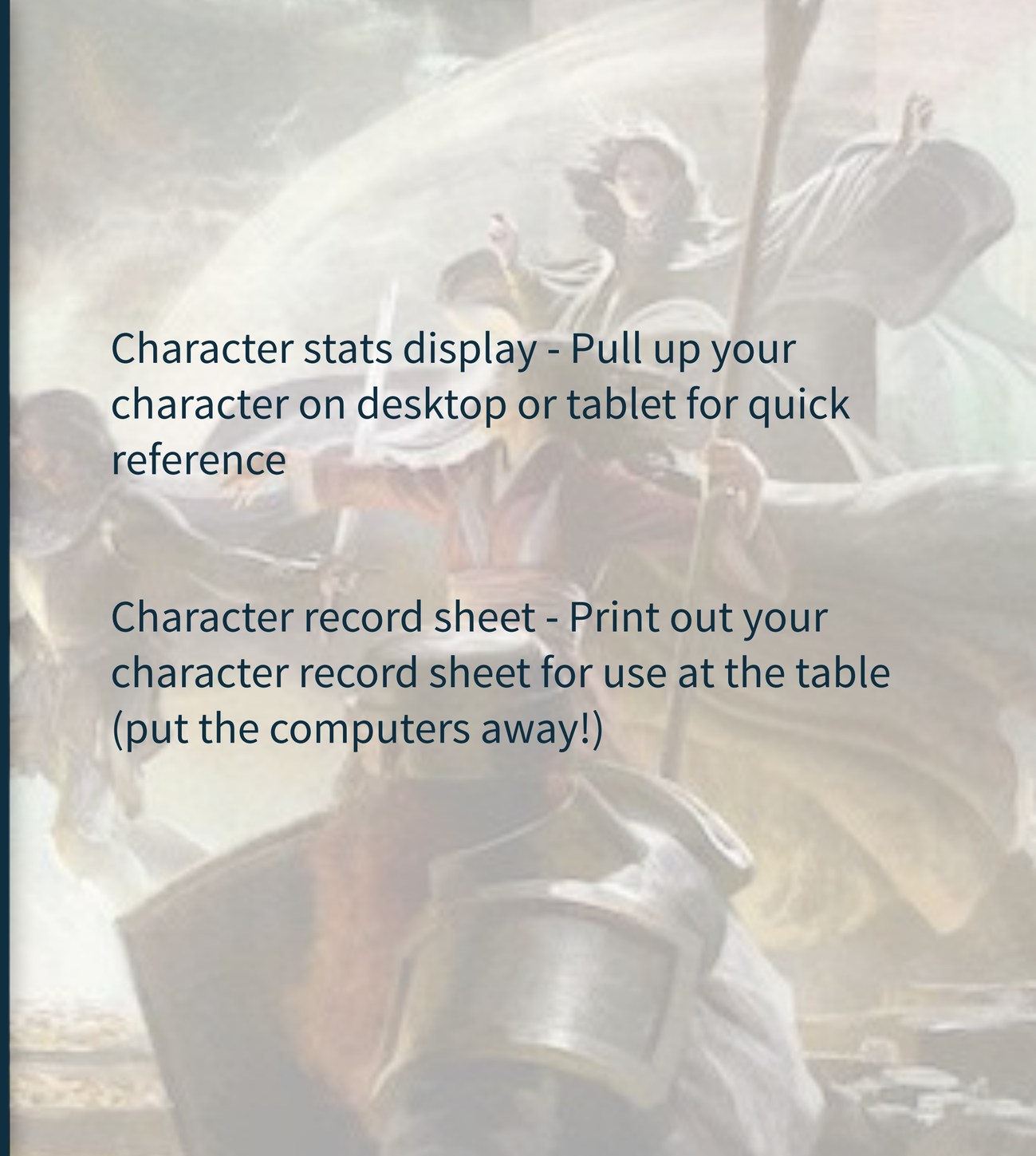
D&D CHARACTER IN A NUTSHELL

Output



Character stats display - Pull up your character on desktop or tablet for quick reference

Character record sheet - Print out your character record sheet for use at the table (put the computers away!)

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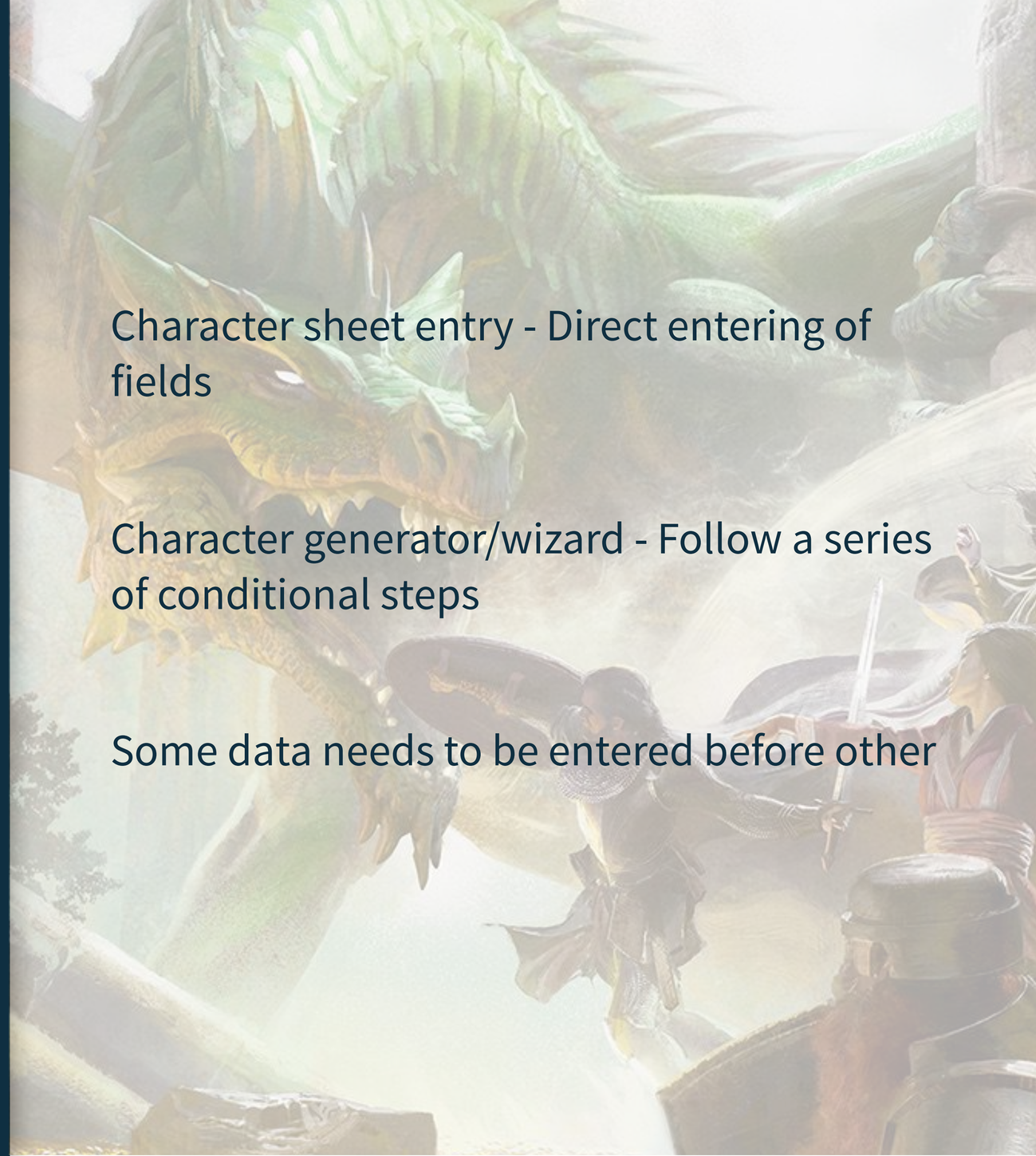
D&D CHARACTER IN A NUTSHELL

Input



Character sheet entry - Direct entering of fields

Character generator/wizard - Follow a series of conditional steps

Some data needs to be entered before other

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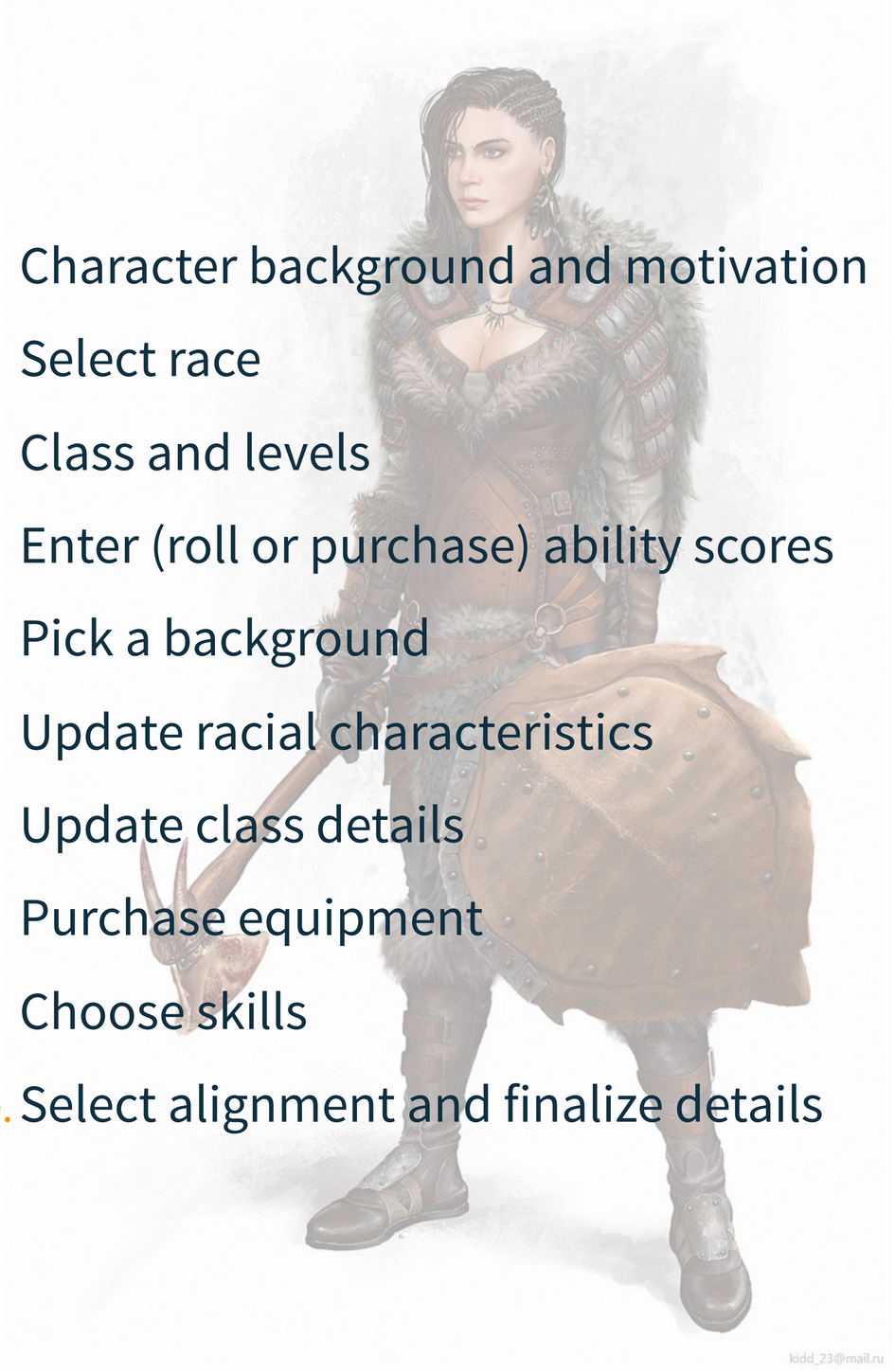
ORDER OF DATA ENTRY

Option 1: Node Edit Form



1. Character background and motivation
2. Select race
3. Class and levels
4. Enter (roll or purchase) ability scores
5. Pick a background
6. Update racial characteristics
7. Update class details
8. Purchase equipment
9. Choose skills
10. Select alignment and finalize details

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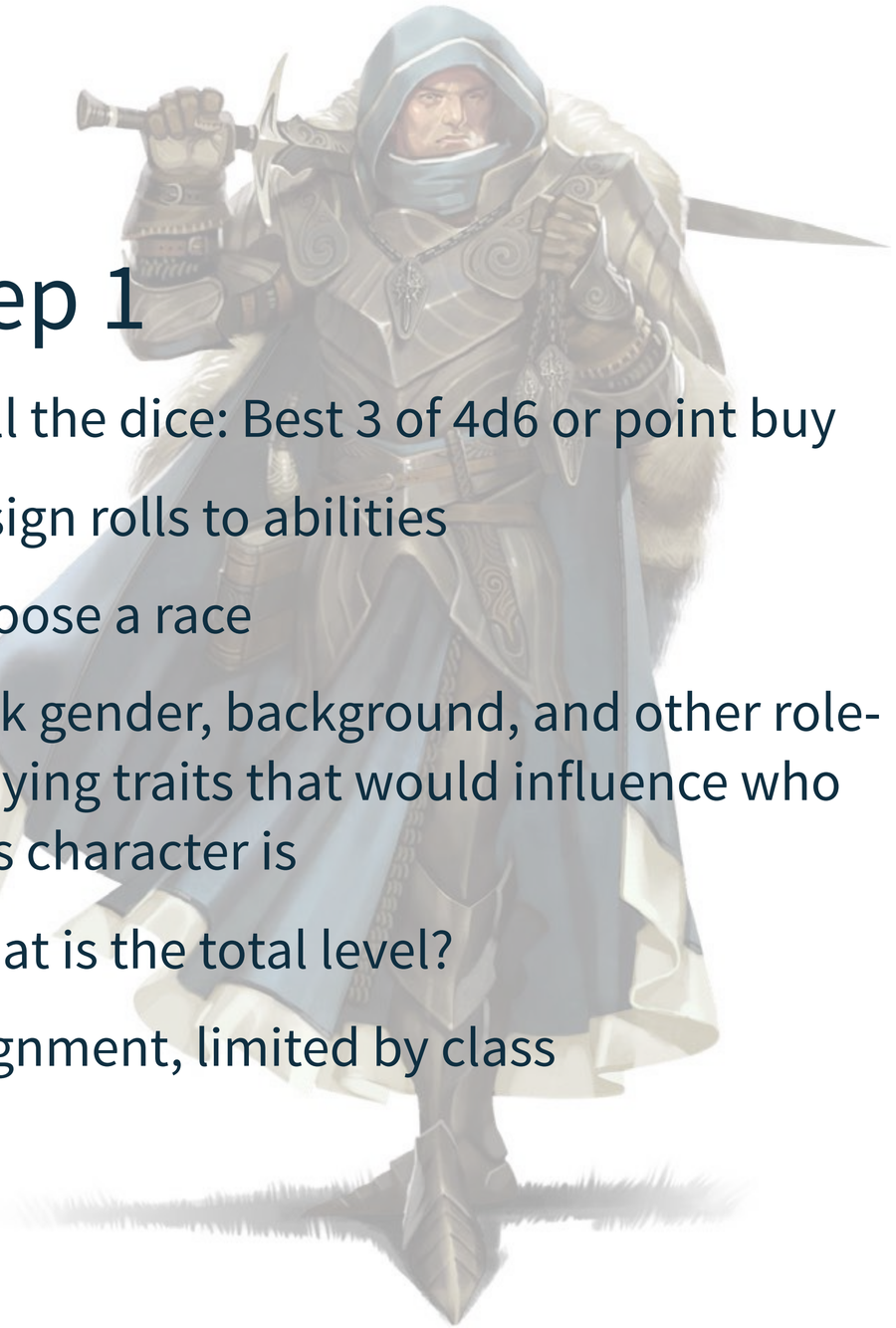
kidd_23@mail.ru

ORDER OF DATA ENTRY

Option 2: Webform



Step 1

- Roll the dice: Best 3 of 4d6 or point buy
- Assign rolls to abilities
- Choose a race
- Pick gender, background, and other role-playing traits that would influence who this character is
- What is the total level?
- Alignment, limited by class

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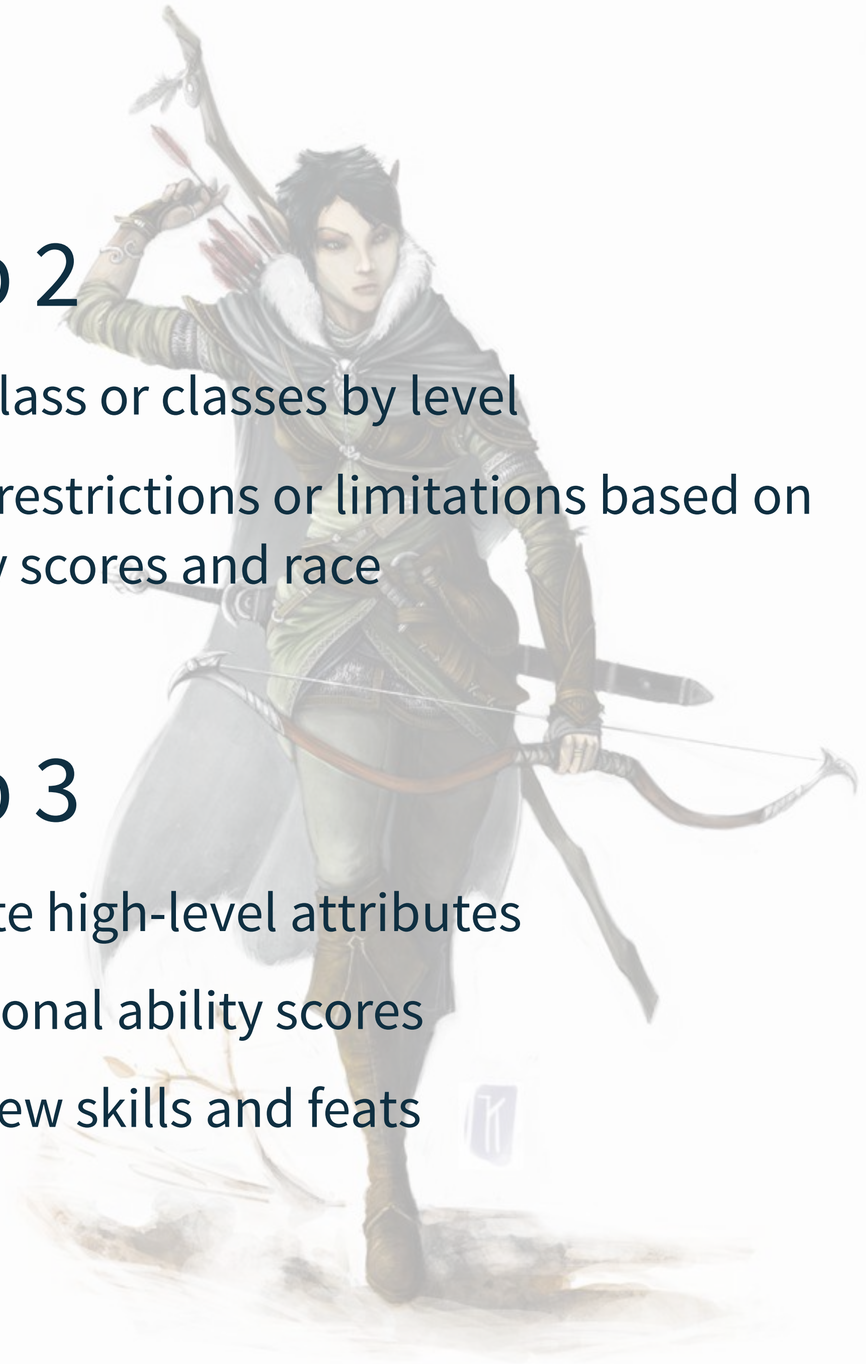
ORDER OF DATA ENTRY

Option 2: Webform



Step 2

- Pick class or classes by level
- Class restrictions or limitations based on ability scores and race

Step 3

- Update high-level attributes
- Additional ability scores
- Add new skills and feats

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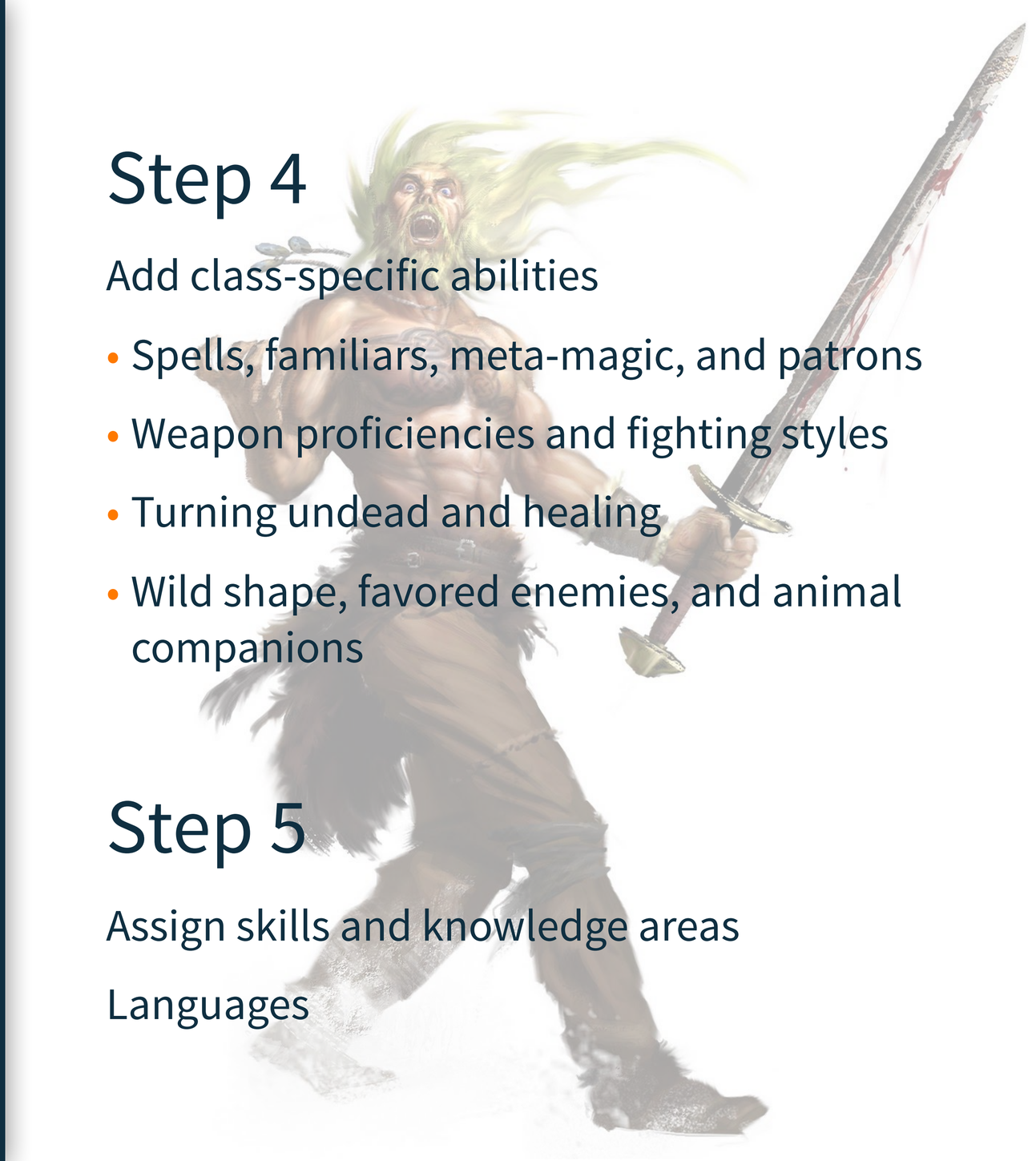
ORDER OF DATA ENTRY

Option 2: Webform



Step 4

Add class-specific abilities

- Spells, familiars, meta-magic, and patrons
- Weapon proficiencies and fighting styles
- Turning undead and healing
- Wild shape, favored enemies, and animal companions

Step 5

Assign skills and knowledge areas

Languages

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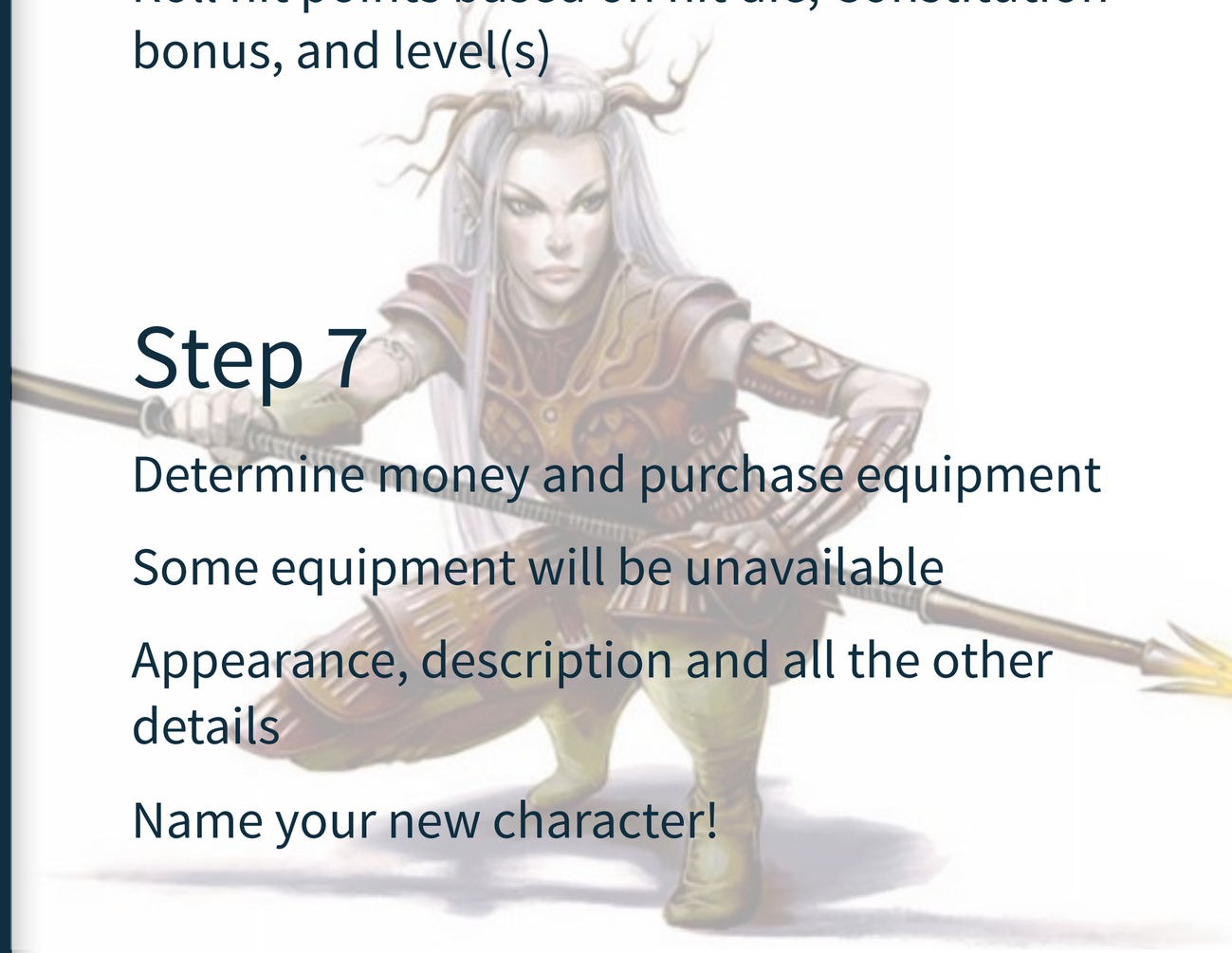
ORDER OF DATA ENTRY

Option 2: Webform



Step 6

Roll hit points based on hit die, Constitution bonus, and level(s)

Step 7

Determine money and purchase equipment

Some equipment will be unavailable

Appearance, description and all the other details

Name your new character!

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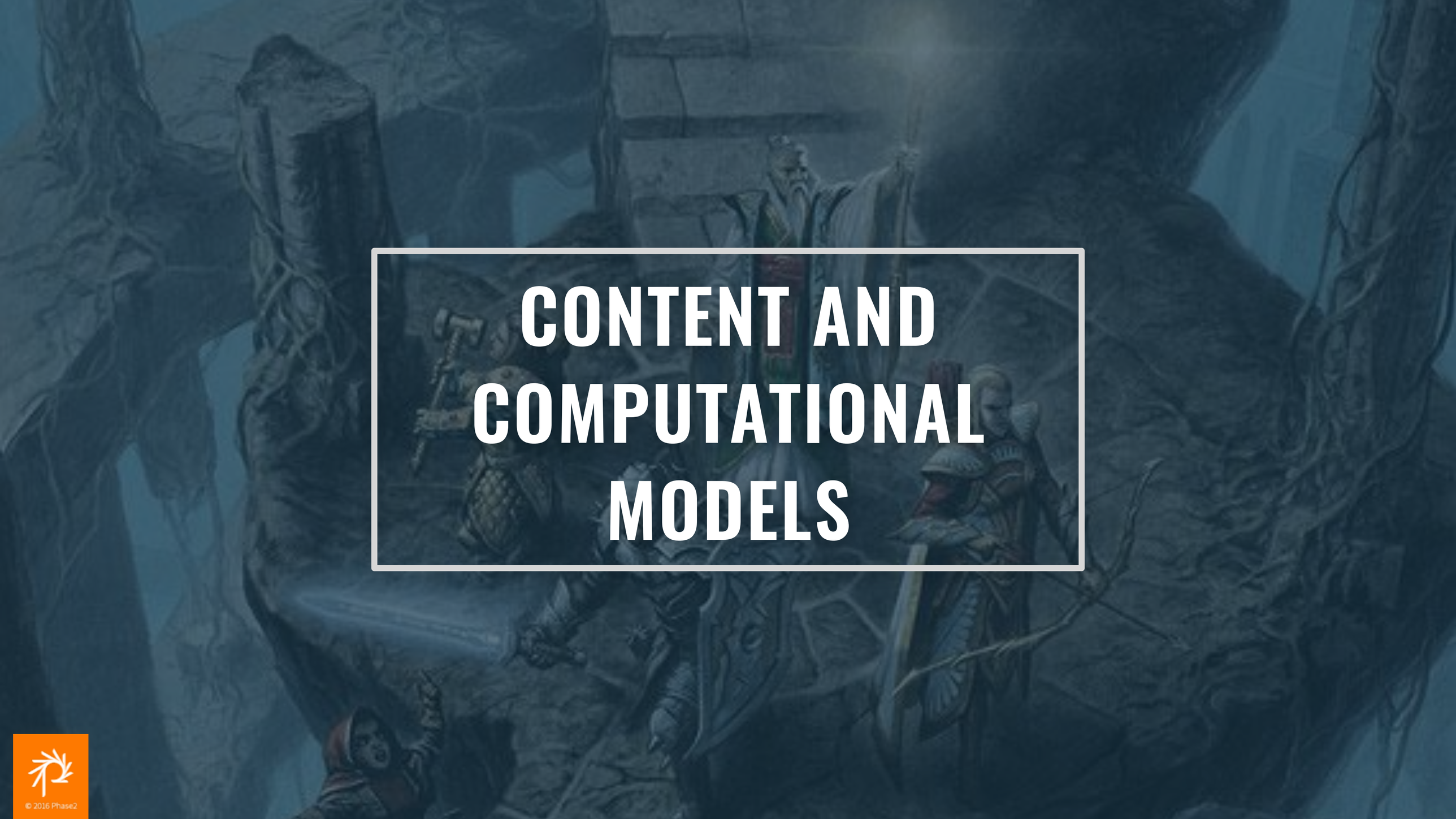

CONTENT AND COMPUTATIONAL MODELS

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Character Stats

- Race
- Class and Level
- Ability Scores
- Alignment
- Equipment, Weapons, and Armor
- Description and Backstory

The basics of a character's statistics are, at the heart, just a collection of raw data and field values.

Users select what they want from a finite list, but **the combination of these values** creates a fundamentally unique character that should be memorable and fun to play.

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Character Stats

- Racial Modifiers and Traits
- Class Skills and Hit Die
- Ability Modifiers, Skills, and Saving Throws
- Limits Class
- AC, THAC0, Damage, and other effects
- Affects how the DM creates story hooks, adventure ideas, and how NPCs react to your character

Content is more than just fields, and a Character is more than just data points.

Determine your relational model and **you will see how values affect each other**. Race affects abilities. Class determines skills and other attributes.

Even background and character description ultimately affect choices surrounding equipment, which impacts AC, etc…

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Analyzing The D&D Character Content Model

AT FIRST GLANCE

- A D&D Character is a standard node
  - A custom content type, “D&D Character”
- Ability Scores are an array of small integers
  - Range limited to 3-18
- Hit Points, Hit Die, and Armor Class are just integers
- Class, Race, and Alignment are text values from a select list

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Analyzing The D&D Character Content Model

A DEEPER DIVE INTO THE UNDERDARK

- Abilities provide bonuses and are computed.
- Class and Level changes Hit Die, Potions and curses alter Hit Points, and spells and armor enhance Armor Class.
- Each Race or Class can affect other PC attributes in a variety of ways, such as Ability score bonus/penalty and additional skills or spells.
- A node seems fine, but we need a way to handle overrides; Node plugin?

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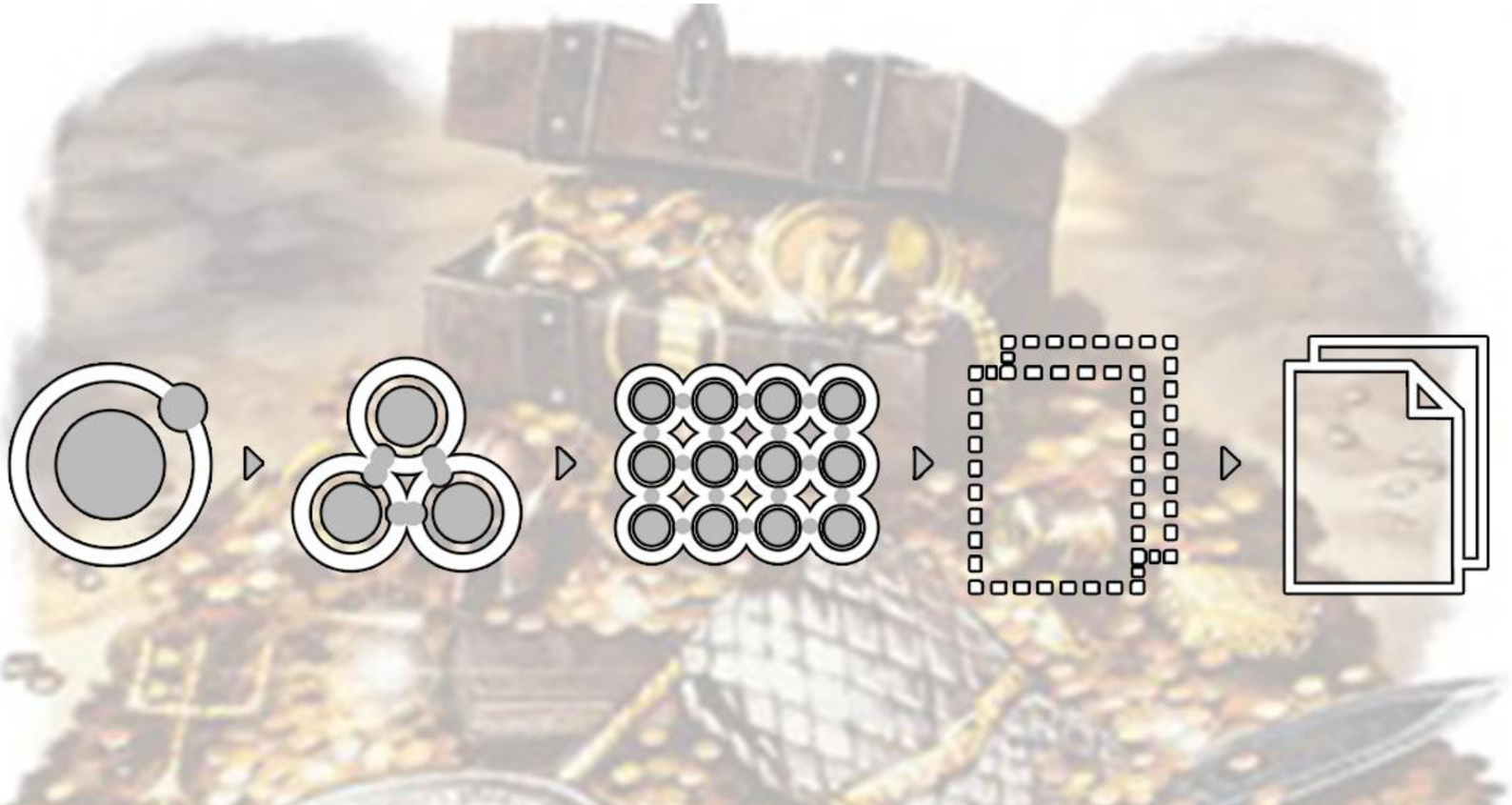
DATA DESIGN

Atomic Design and Data Models

1. Atoms
2. Molecules
3. Organism
4. Templates
5. Pages



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FIELDS, ENTITIES, AND RELATIONSHIPS

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Polymorphing Fields

- Many fields on a PC node would have compound values
- Race is a string from a list
- Ability is 6 values, each with modifiers and bonuses
- Feats and Skills have names, descriptions, game details…
- For your project, Drupal core fields won't cut it, and there's no contrib project…

Compound Fields

Like a recipe has ingredients, and each ingredient has sub-values: name, quantity, description, metric or imperial measurements.

Addresses have a number, street, secondary street, city, state or province, ZIP or postal code, and country; **which determines if other sub-values may be present or changed**.

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Ability Scores

Ability Scores

- Strength
- Dexterity
- Constitution
- Intelligence
- Wisdom
- Charisma

Base score modified by race, higher level, and temporary effects.

Include an ability bonus for exceptionally high or low scores.

Ability bonuses are easy to calculate, no need to have a lookup table:

Bonus = floor((BaseScore / 2) - 5))

- 3 (-4)
- 4-5 (-3)
- 6-7 (-2)
- 8-9 (-1)
- 10-11 (no bonus)
- 12-13 (+1)
- 14-15 (+2)
- 16-17 (+3)
- 18 (+4)

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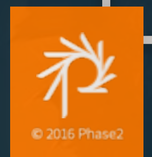
More Compound Fields

Class

- Level (of each class)
- Leveling up is based on effective level

Skills

- Name
- Ranks
- Class skill
- Ability modifier
- Description



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More Compound Fields

Feat

- Name
- Description
- Effects

Feat Effects include:

- Ability score bonus
- Initiative
- Advantages to a variety of rolls
- Proficiencies with equipment (think: permissions)
- Other in-game modifiers that don’t affect the content here

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Compound Fields

DIFFERENT SOLUTIONS TO THE SAME PROBLEM

Paragraphs
A contrib module that lets us combine mixed field types into a single field. We can place a paragraph as a single field on a content type.

Webform
Create a complex form in a UI. The form can be single-page or a multi-step form. We can create custom submit methods to handle the user form submission. Exports to YAML.

Field API
Create custom fields and field widgets.

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INPUT OPTIONS

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PARAGRAPHS

Compound Ability Scores

- Choose a race
- Base score
- Race bonus/penalty
- Feats and other skills
- Level bonus
- Total score and modifier

Show row weights

ABILITY SCORES *

	Base Score *	Race Bonus	Subrace Bonus	Feats	Level Bonus	Total Score	
Strength	15				1	16	Remove
Dexterity	14	1		1		16	Remove
Constitution	12					12	Remove
Intelligence	12					12	Remove
Wisdom	12	1				13	Remove
Charisma	13	2				15	Remove

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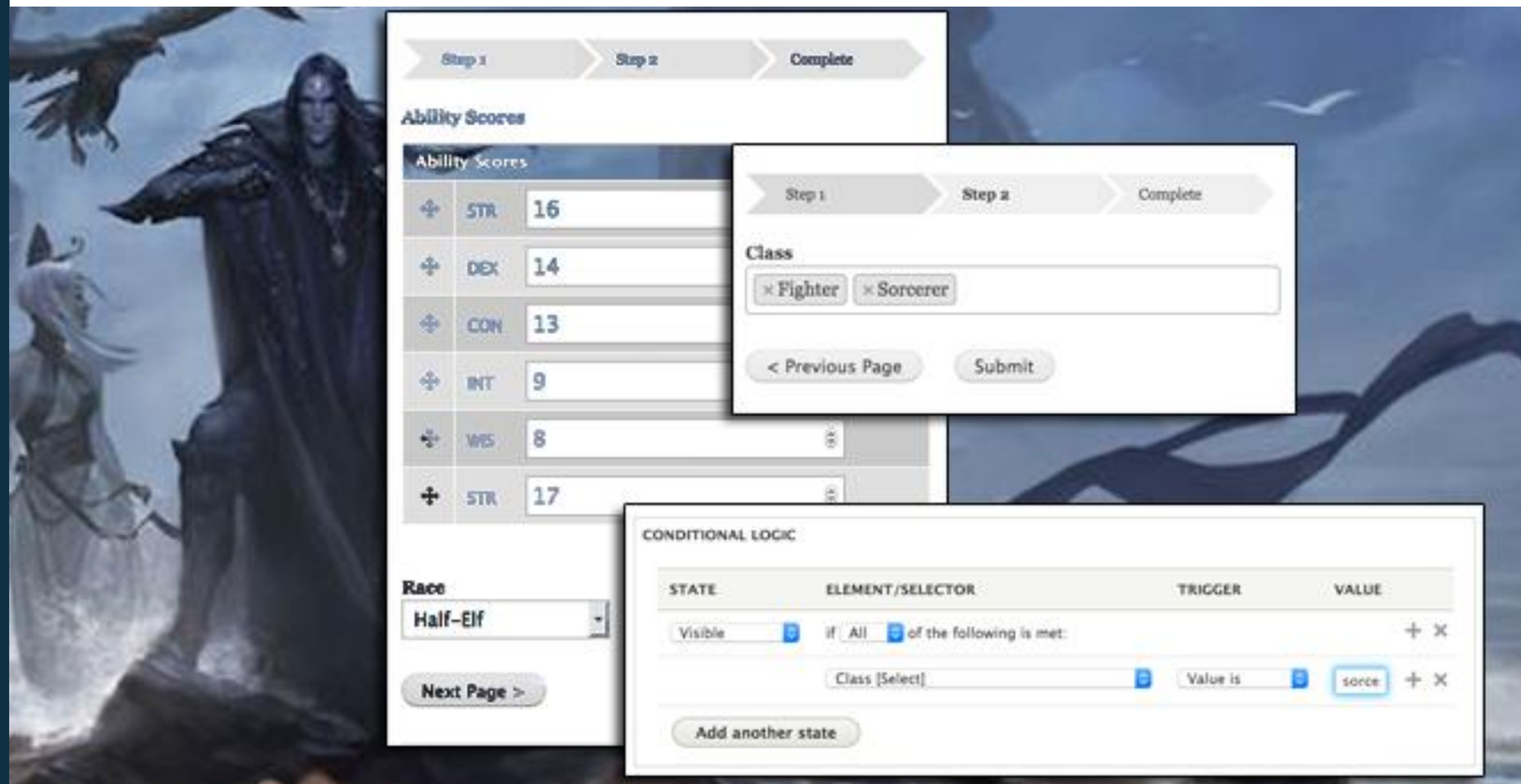
WEBFORM

Conditional Multi-Step Forms

- Create a page for each step
- Nest elements within each page
- Conditionally show/hide fields based on previous selections



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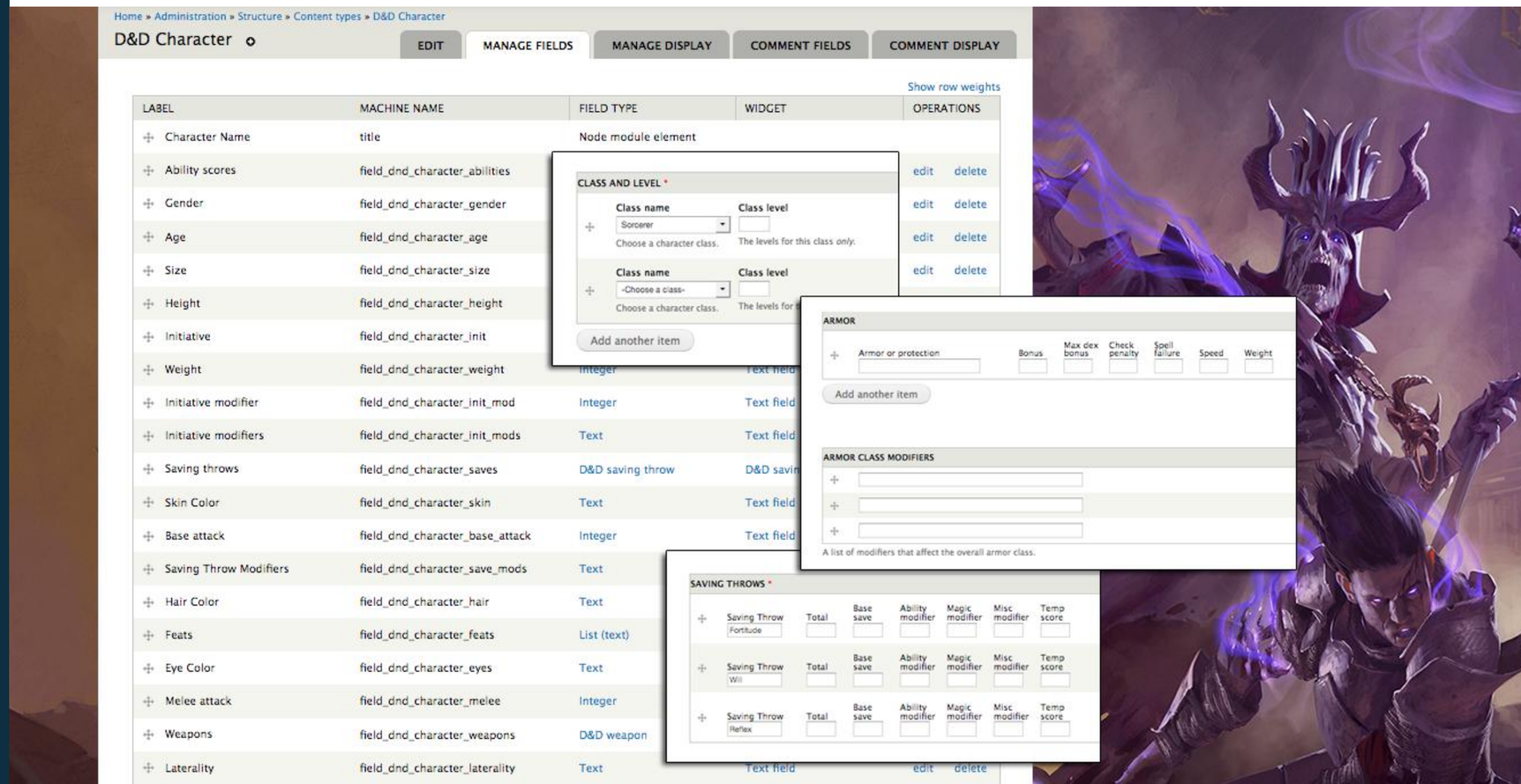
FIELD API

Creating Custom Field Types

- Create a field type
- Create a field formatter
- Create a custom field widget



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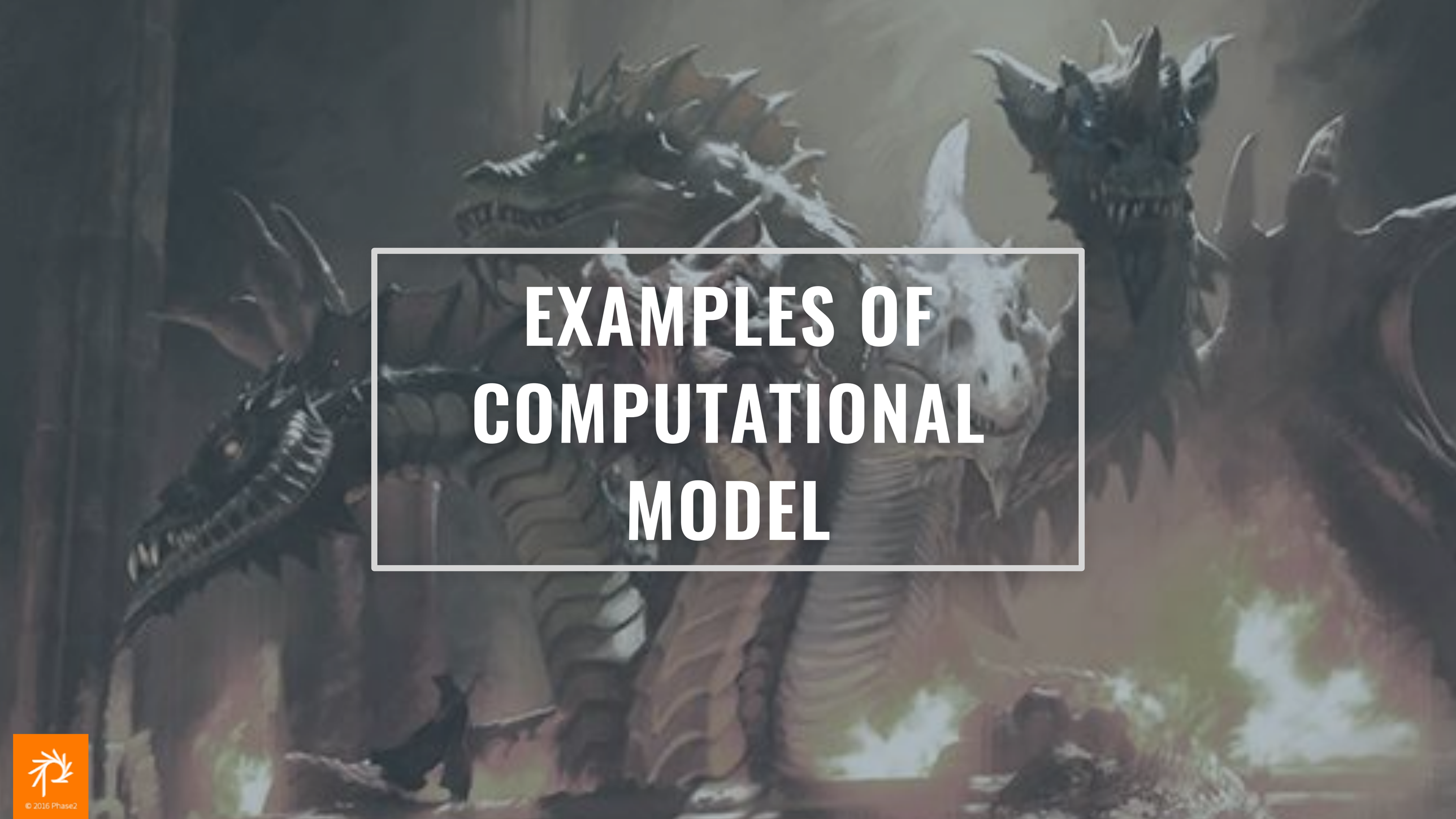

EXAMPLES OF COMPUTATIONAL MODEL

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Skills, Spells, And Equipment

Class features

- Different types of spells
- Skill ranks and class and cross-class skills

Racial bonuses

- Change ability scores
- Additional skills, language, or traits

Money and Background

- Roll wealth based on class
- Choosing backgrounds may change starting wealth and initial skills

Calculating Armor Class

- Armor and magic items
- Ability modifiers
- Spell effects

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Conditions May Apply

How much to program, how much to rely on editorial input?

Required fields for some classes but not others

Conditional content entry for each class or race

- Node edit form validation/ submission tricks
- Webform wizards and Conditional Logic

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PULLING IT ALL TOGETHER

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Node Output

VIEWING A NODE PAGE

Node template for Character

- node—dnd-character.html.twig

CSS added as a library

- D&D_character.dnd_character_fields
- dnd_character.dnd_character_node

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Printable Character Sheets

PRINTING A D&D CHARACTER RECORD SHEET

Modules (many in early development)

- Entity Print
  - Uses WKHTMLtoPDF
- FillPDF
  - Can use an existing fillable PDF
- Printable and PDF generator API

Other options

- WK HTML to PDF library and custom code

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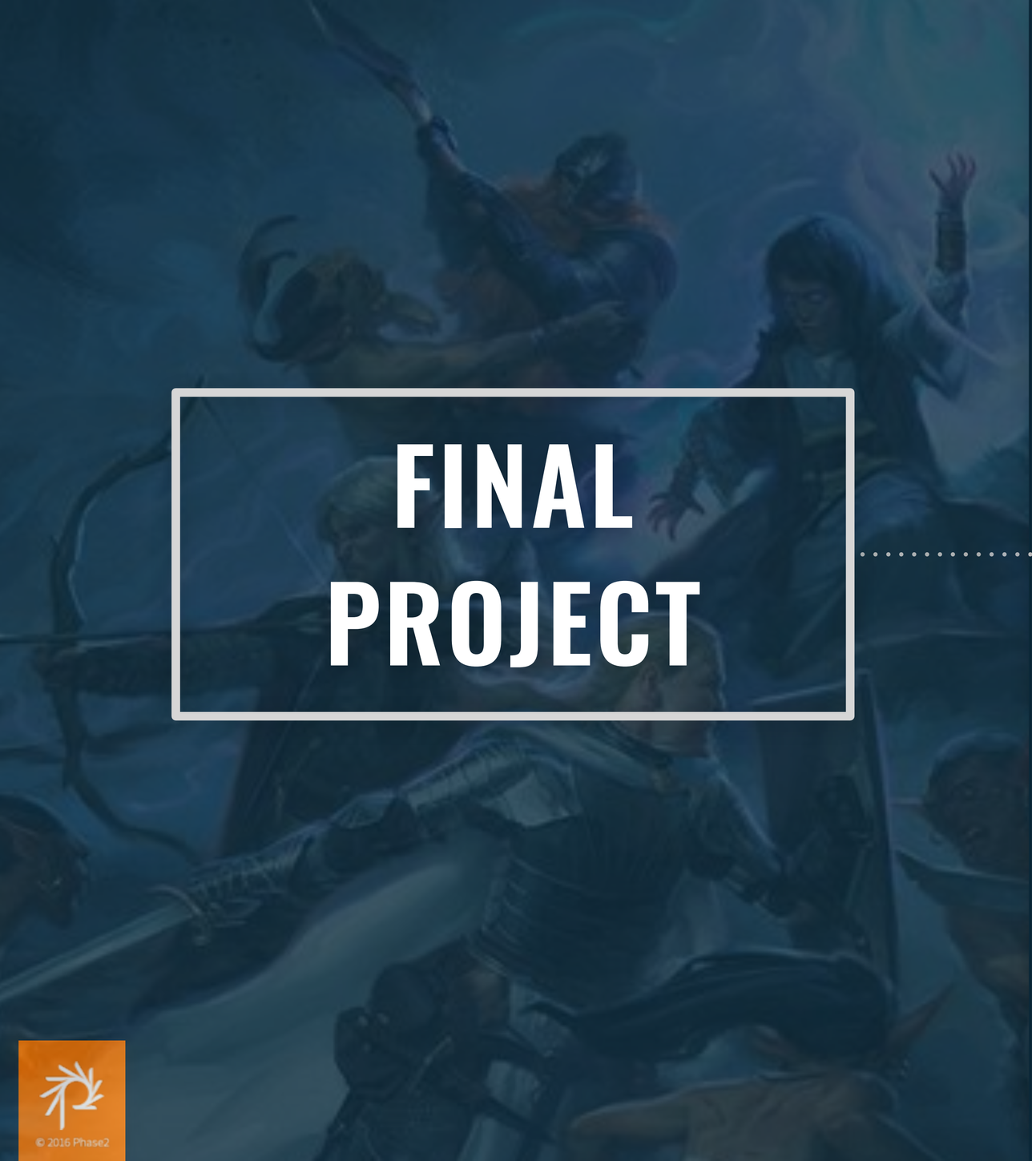

FINAL PROJECT

D&D Character content type

Collection of Paragraph fields

Some custom UI work

Printable character sheets (PDF)

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