



Multimedia- Programmierung

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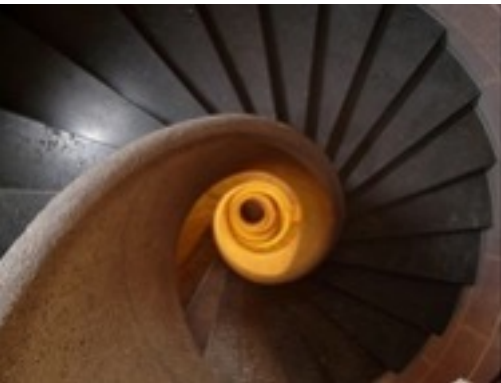
Sommersemester 2016

Deutsch und Englisch

- Viele aktuelle Materialien nur in englischer Sprache verfügbar
- Programmiersprachen basieren auf englischem Vokabular.
- Austausch von Materialien zwischen Lehre und Forschung
- Konsequenz:
 - Die wichtigsten Lehrmaterialien zu dieser Vorlesung (v.a. Folien) sind in englischer Sprache gehalten!
 - Der Unterricht findet (noch?) in deutscher Sprache statt.

Multimedia Programs

Programs using “Rich Media”



Images



Sound



Animation



Video

Images: pixabay.com (public domain)

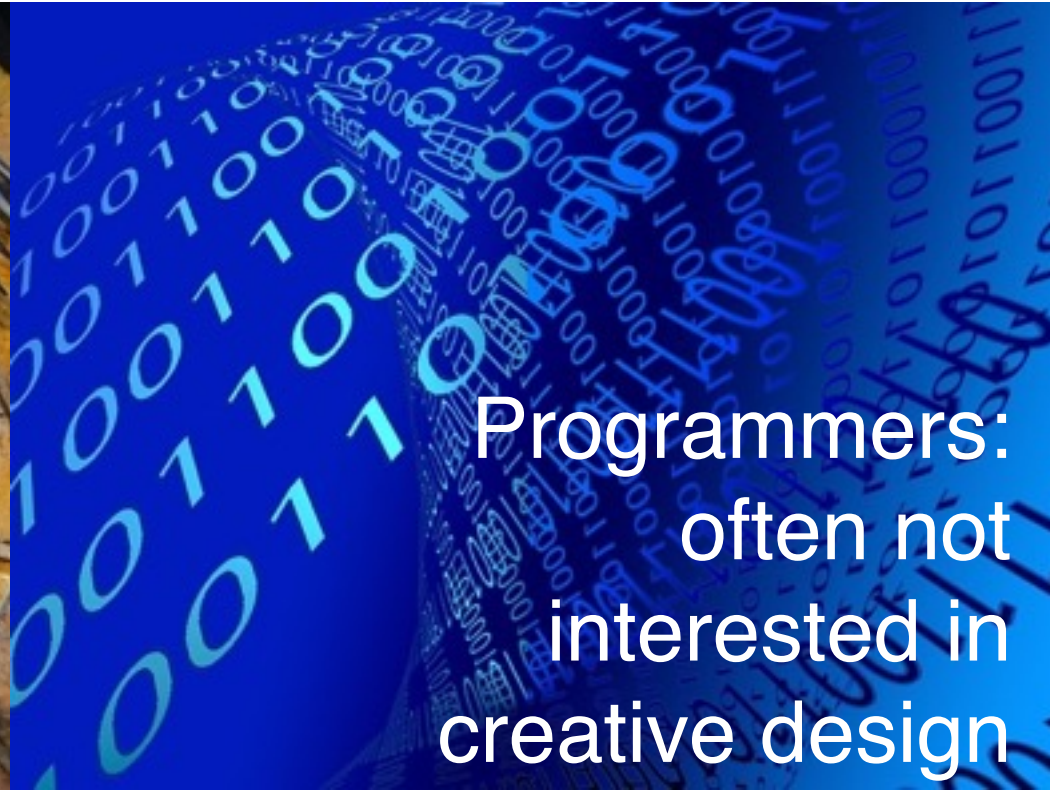
Animation: www.artie.com

Movie: xstockvideo.com

Creative Design vs. Programming



Designers: often
intimidated by
programming



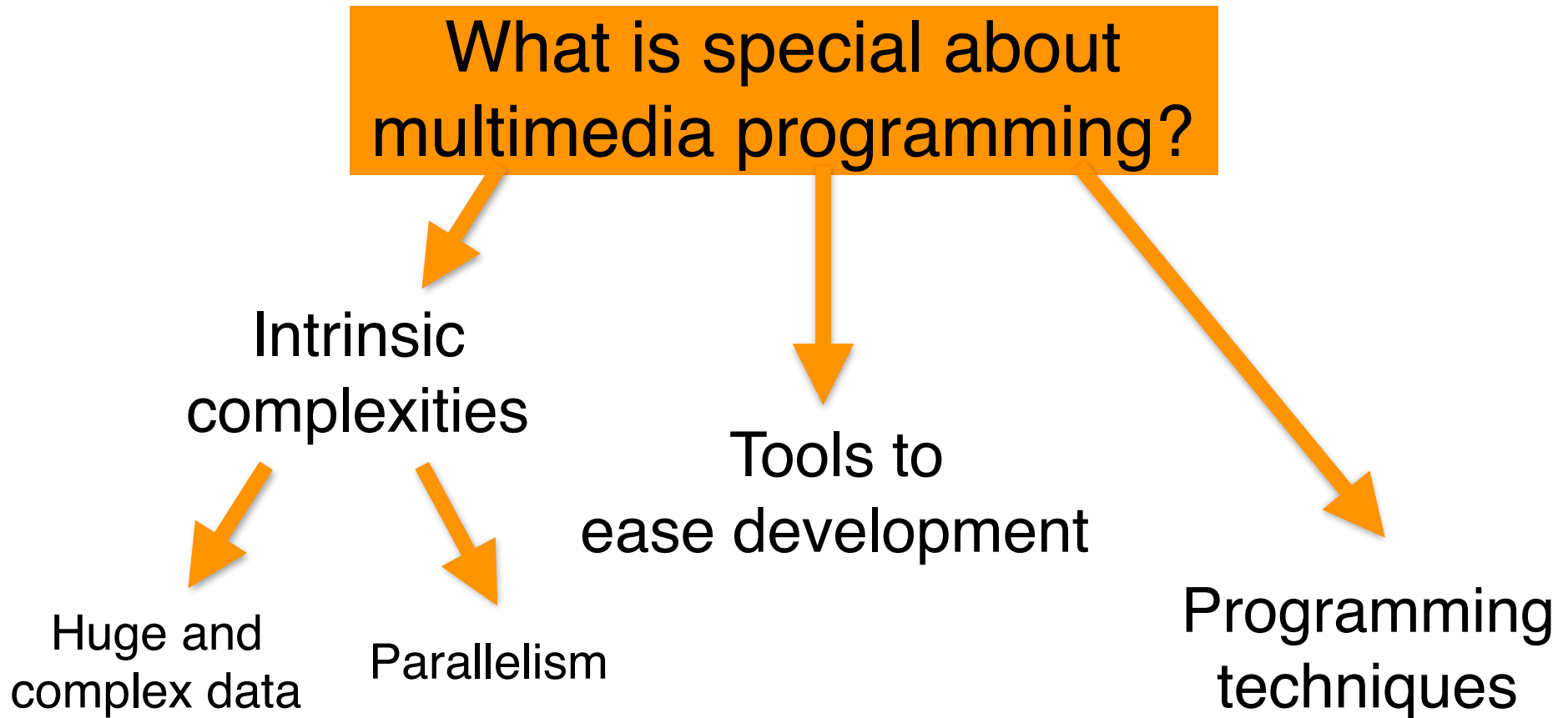
Programmers:
often not
interested in
creative design

How to bridge between the two worlds?

Platforms, tools, methods

Images: pixabay.com (public domain)

Multimedia Programming



Topics NOT Covered



Production of Linear,
Non-Interactive (Multi-)Media

Treatment of multimedia
data on low system levels
(operating system, networks)



Images: pixabay.com (public domain)

Development Platforms within Focus



Organisatorisches

Ausnahmsweise auf Deutsch:

- Die Lehrveranstaltung (2V+3Ü) ist eine Mischung aus:
 - Vorlesung (10 Doppelstunden)
 - Klassische Übungen (incl. Hausaufgaben)
 - Eigene Freiarbeit

Bewertung:

- Klausur
- **Keine** Klausurvoraussetzungen, **keine Bonuspunkte** für Übungsblätter
- **Bonuspunkte** für Klausur durch **Abschlussprojekt** gegen Ende der Übungen:
 - max. 10% Bonus für Klausur

MMP im Nebenfach (v.a. “Kunst und Multimedia”)

- Angepasste Bewertung bei der Klausur
- Angepasste Projektaufgabe (für Bonuspunkt)

Outline

1. Development Platforms for Multimedia Programming
2. Multimedia Programming with Python and Pygame
3. Multimedia Programming with C++ and Multimedia Frameworks
4. Time and Interactivity
5. History of Multimedia Programming
6. Images, Vector Graphics, and Scenes
7. Animations
8. Physics Simulations
9. Interactive Video
10. Programmed Sound Mixing
11. Design Patterns for Multimedia Programs
12. Development Process for Multimedia Projects

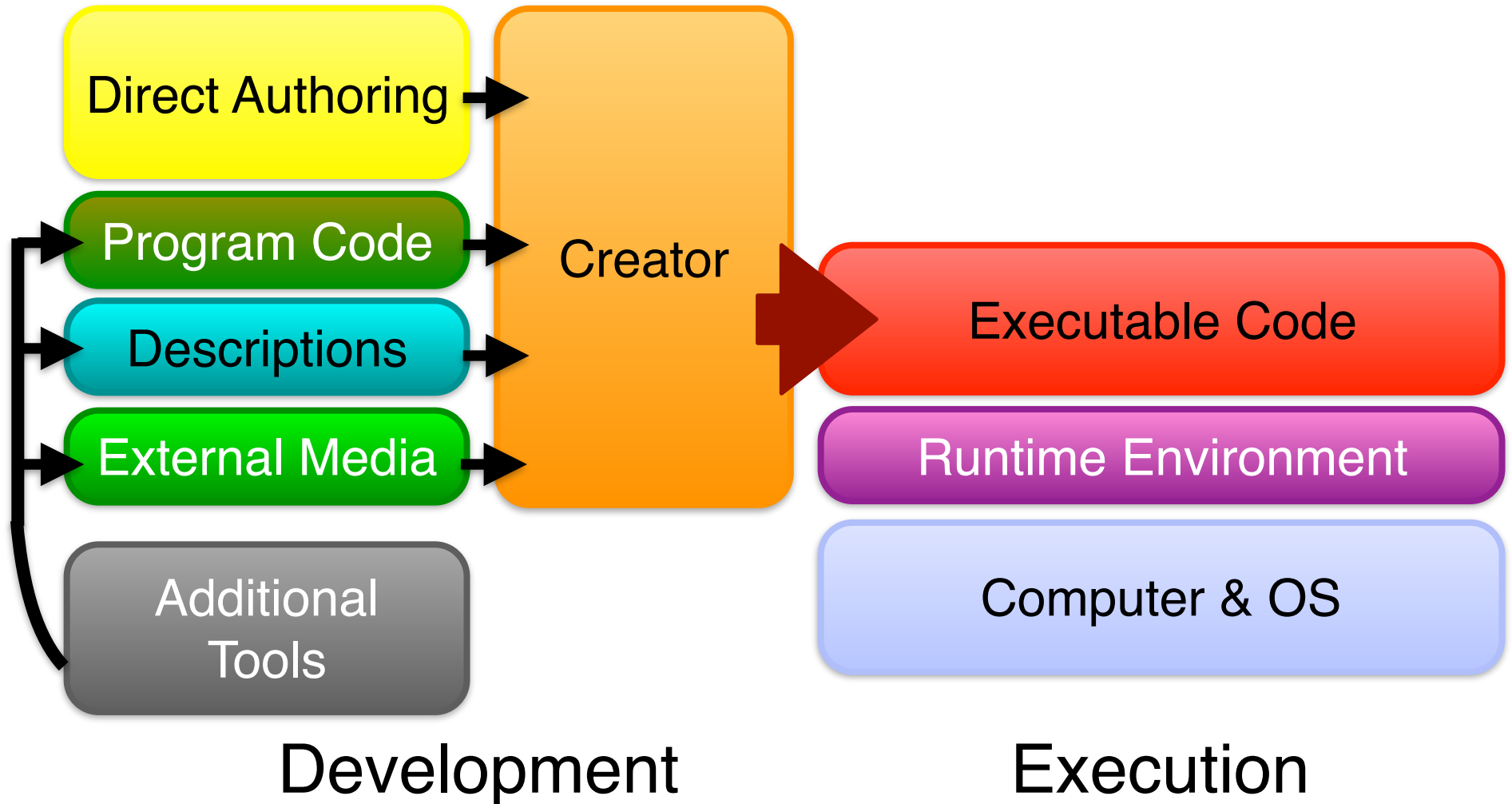
1 Development Platforms for Multimedia Programming

1.1 Classification of Development Platforms

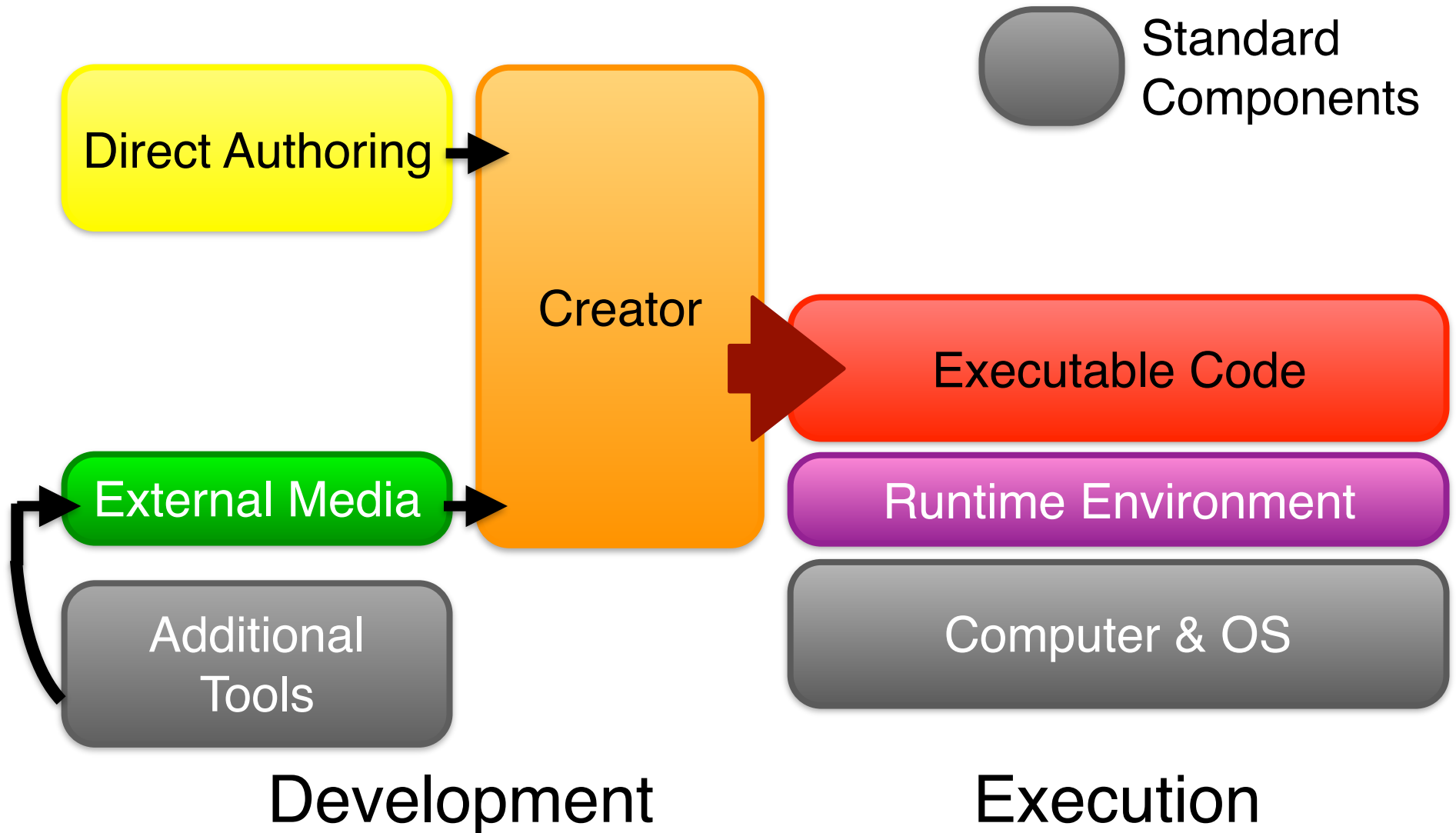
1.2 A Quick Tour of Development Platforms



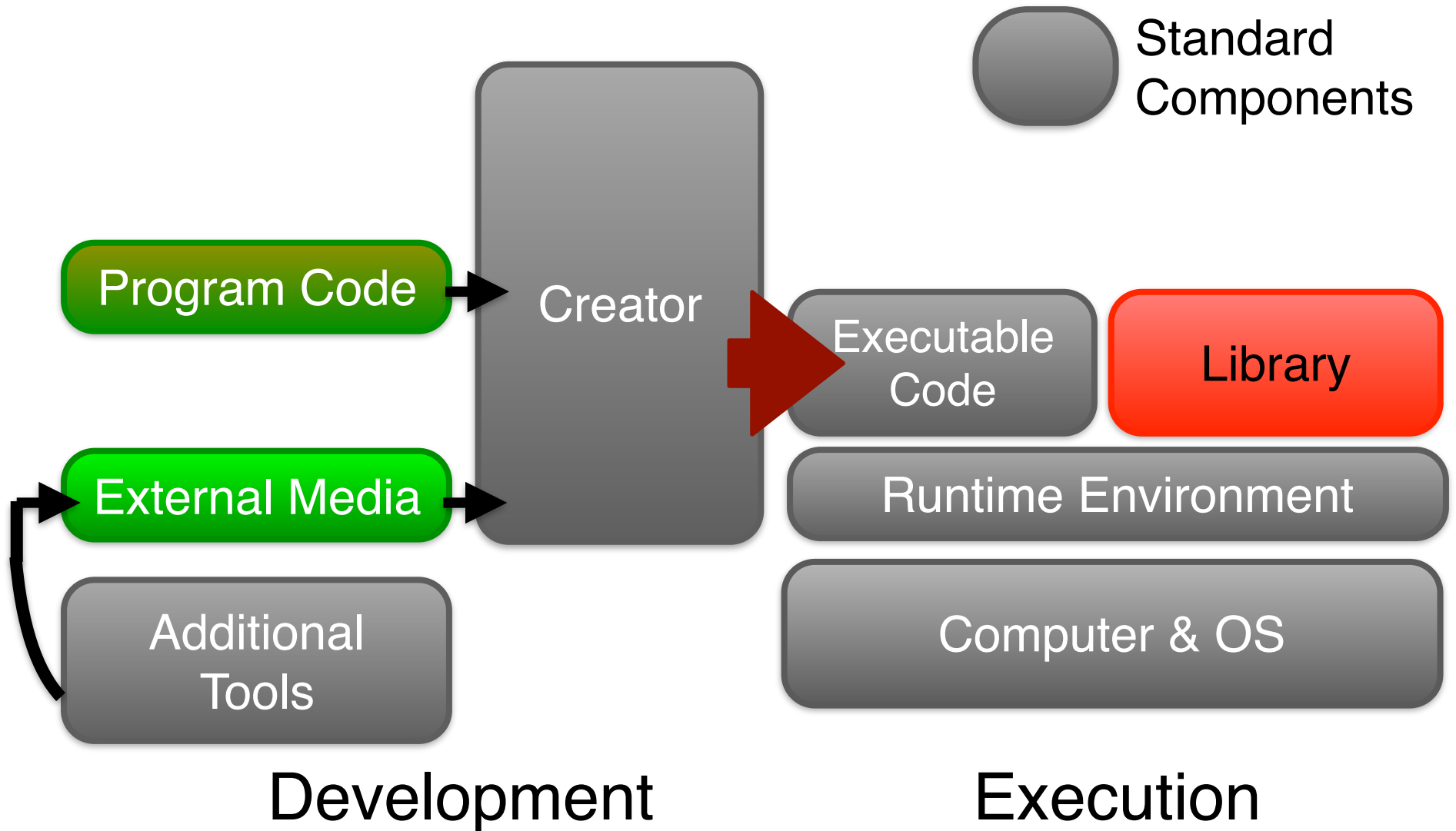
Components of a Development Platform



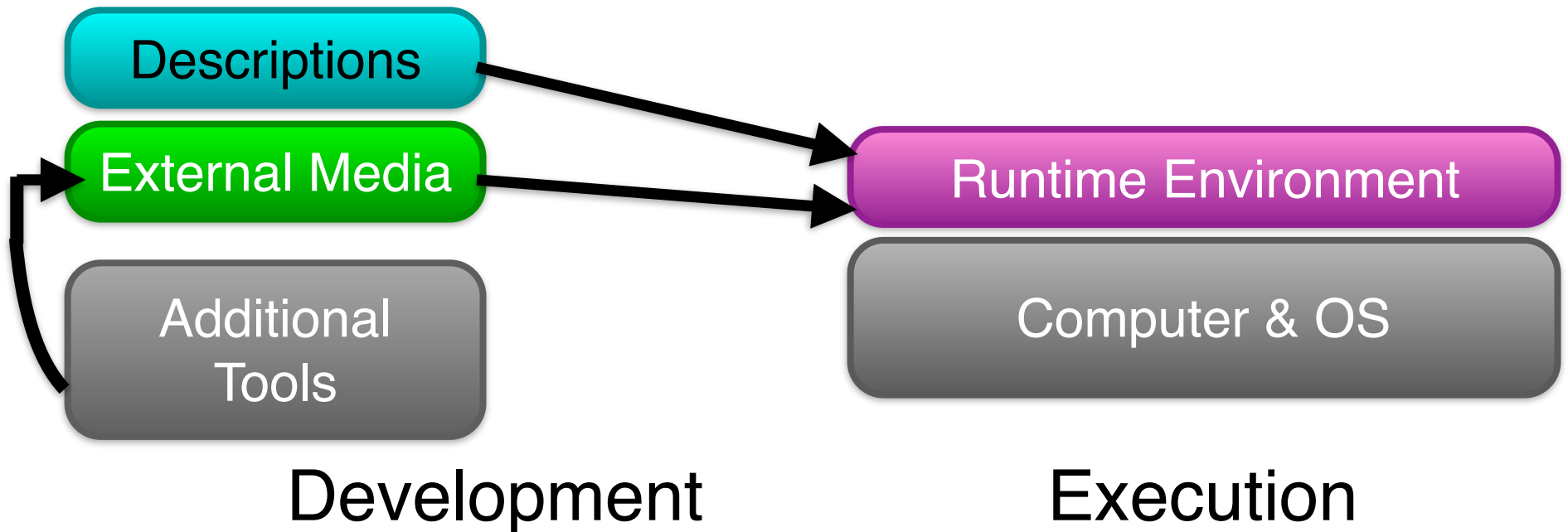
Platform of Type “Pure Authoring Tool”



Platform of Type “Framework/API”



Platform of Type “Declarative Language”



1 Development Platforms for Multimedia Programming

1.1 Classification of Development Platforms

1.2 A Quick Tour of Development Platforms



One Example – Variety of Platforms

- Example application:
 - Simple slide show, showing a sequence of bitmap pictures (photos)
- Same application behavior and appearance
 - Background and picture area
 - Presentation steps take place at fixed points in time
- Different development environments



SMIL - Idea and History

- Synchronized Multimedia Integration Language (pronounced: "Smile")
- Standard language for co-ordinated combination of time-dependent media elements into a multimedia presentation
 - Temporal dependencies are described explicitly (declarative language)
 - Integrates time-independent media (text, still image)
 - Suitable for "Streaming"
- Standardization by W3C (WWW Consortium)
 - SMIL 1.0 Standard June 1998
 - since 1998: Implementations by CWI/Oratrix, REAL and others
 - SMIL 3.0 Recommendation Dec. 2008
- Current player software:
 - RealPlayer
 - Ambulant Player

Slideshow as SMIL Document

```
<smil xmlns="http://www.w3.org/2001/SMIL20/Language">
  <head>
    <layout>
      <root-layout width="356" height="356"
        backgroundColor="black"/>
      <region id="imgReg" width="256" height="256"
        left="50" top="50"/>
    </layout>
  </head>
  <body>
    <seq>
      
      
      
    </seq>
  </body>
</smil>
```

Spatial Structure
(Layout)

Temporal Structure
(Execution)

QUIZ:
Which type of platform is this?

Slideshow as Python/Pygame Program

```
background = pygame.Color(255, 228, 95, 0)
sc_w = 712
sc_h = 712
```

```
pygame.init()
```

```
# Create program display area
screen = pygame.display.set_mode([sc_w, sc_h])
pygame.display.set_caption("Simple Slide Show")
```

```
# Set background color
screen.fill(background)
```

```
for event in pygame.event.get():
    if event.type == QUIT:
        exit()
```

```
# Load image and show it on screen
slide = pygame.image.load('pics/tiger.jpg').convert()
screen.blit(slide, (100, 100))
pygame.display.update()
pygame.time.wait(4000)
```

Code excerpt !

QUIZ:
Which type of platform is this?

Slideshow as Adobe Flash Project (CS6)

