

Od biznesu on-premise do Cloud Native Enterprise

Artur Dyro
CEO Learnetic S.A.
artur.dyro@learnetic.com



Nasze produkty

1. Content Authoring Tools

for Publishers, Content developers and Teachers

2. eLearning Platform

eBook/digital content Distribution System

3. eContent

Multi-platform Math & Science Courses for Middle & High School

4. eContent development services

5. Custom content development

Nasi klienci

1. Wydawcy edukacyjni
2. Firmy szkoleniowe i edukacyjne
3. Ministerstwa edukacji
4. Twórcy treści interaktywnych
5. Cyfrowi “disruptor’zy”



Globalny zasięg



www.learnetic.com

Nasi użytkownicy





CHILDREN AGES 2-5



58%

know how to play a
basic computer game



52%

know how to ride a bike



19%

can play with a
smartphone application



11%

can tie their shoes

Source: <http://www.avgdigitaldiaries.com/post/5452843104/digital-diaries-kids-are-learning-computer-skills>



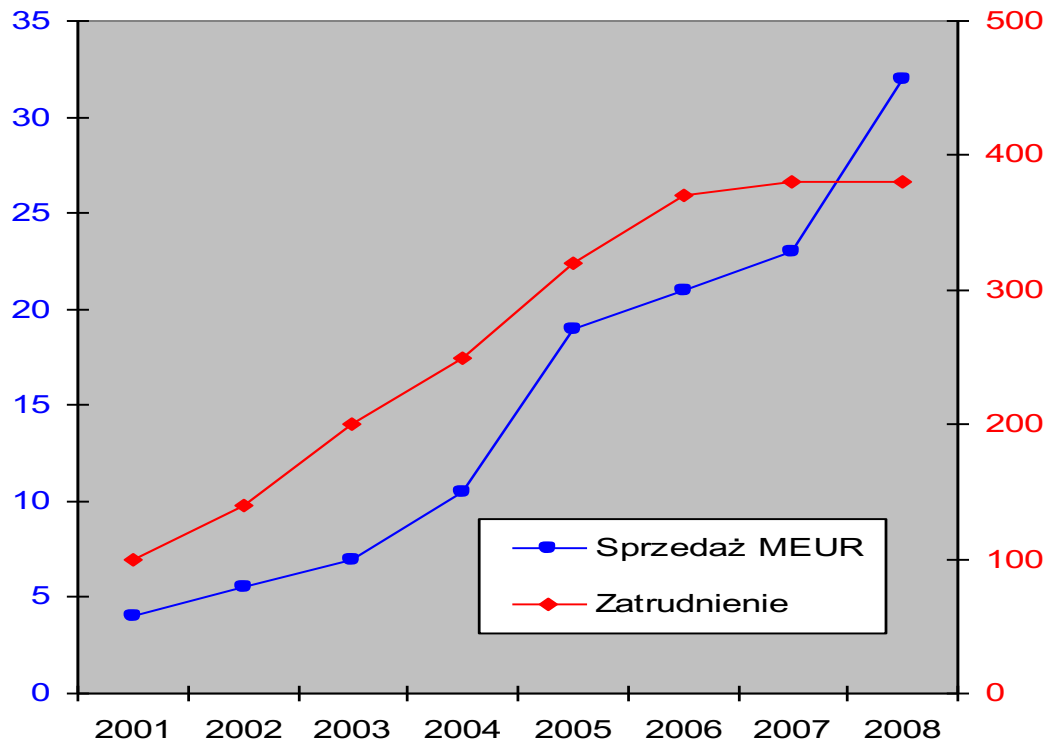
Learnetic
Everyone learns differently



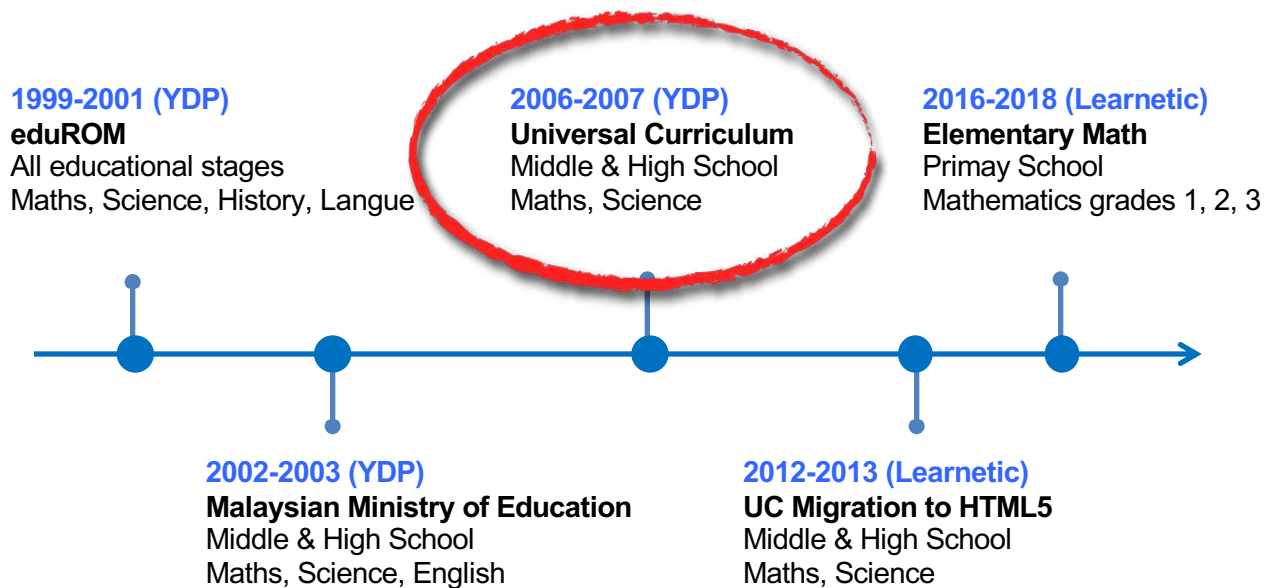
Wczoraj ...

(od chmury on-premise do chmury hybrydowej)

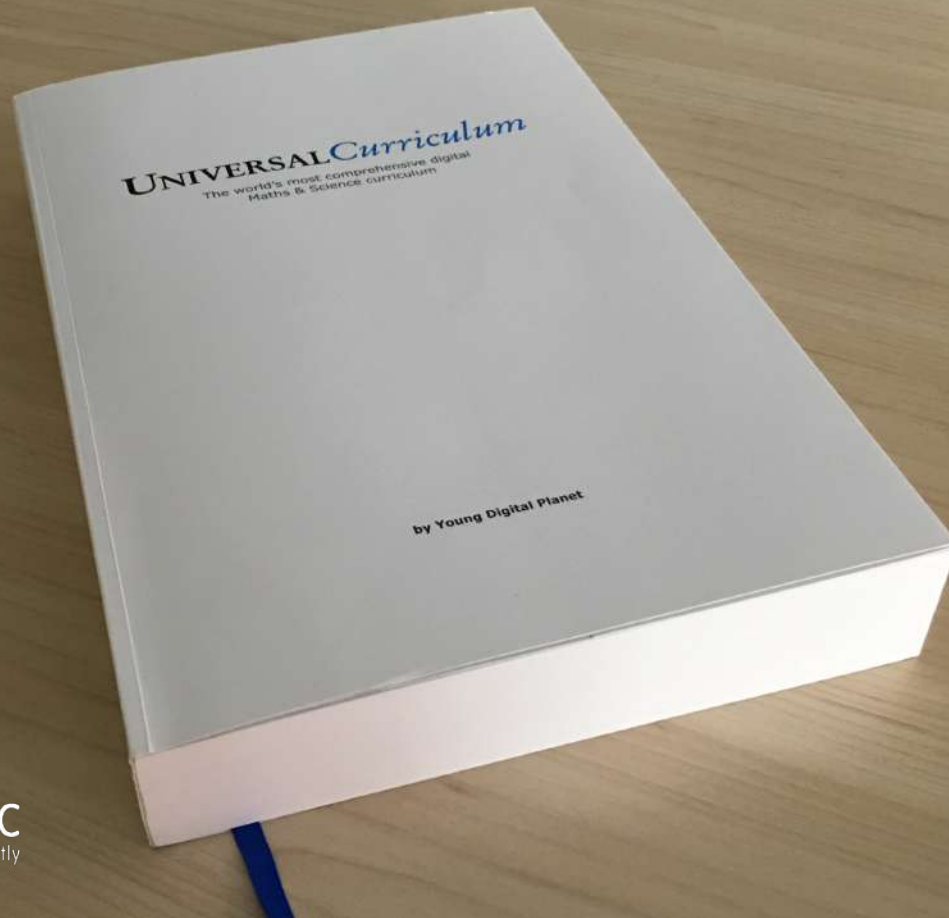
Dynamika rozwoju



Duže projekty



Co znaczy „duży projekt”



Physics Lower Secondary
Chapter: Electrostatics
Lesson: Conductors and insulators

Learning Objectives



Teaching Objects



Physics Lower Secondary
Chapter: Electrostatics
Lesson: Conductors

Learning Objectives



Solids

Chapter: States of Matter

Lesson Contents:

- What Is the Structure of Solids?
- Shape of a Solid Body
- Hardness of Solids
- Volume of Solids
- Density of Solids
- What Are the Differences Between the Three Physical States of the Same Type of Matter?

Hardness of Solids

Hardness is the ability of a material to resist being scratched or deformed. It is a property of the material and is not affected by the size or shape of the object.

The Mohs Scale of Hardness

The Mohs scale is a qualitative measure of hardness. It is based on the ability of one mineral to scratch another. The scale ranges from 1 to 10, with 1 being the softest and 10 being the hardest.

Mineral	Hardness
Talc	1
Gypsum	2
Calcite	3
Flint	4
Orthoclase	5
Quartz	6
Topaz	7
Corundum	8
Diamond	10

Diamond

Diamond is the hardest natural material known. It is made of carbon atoms arranged in a crystal structure. It is used in jewelry and as a cutting tool.

Graphite

Graphite is a form of carbon that is soft and slippery. It is used in pencils and as a lubricant.

Coal

Coal is a fossil fuel made from the remains of plants and animals. It is used for energy.

The Hardest of the Elements

Diamond is the hardest of the elements. It is made of carbon atoms arranged in a crystal structure.

Activity: The Hardness of Solids

Use the Mohs scale to test the hardness of various minerals. You can find a list of minerals and their hardness values on the internet.

Shape of a Solid Body

Solids have a fixed shape. They do not change shape when they are moved. This is because the particles in a solid are packed closely together and are held in fixed positions.

Changing the Shape of Solids

The shape of a solid can be changed by applying a force. For example, a lump of clay can be shaped into a ball or a flat disc.

Is it Possible to Reduce the Volume of Solids?

The volume of a solid can be reduced by compressing it. For example, a lump of clay can be pressed into a ball, which has a smaller volume than the original lump.

Activity: The Shape of Solids

Take a lump of clay and shape it into different forms. Measure the volume of each form and see how it changes.

Volume of Solids

The volume of a solid is the amount of space it takes up. It is measured in cubic centimeters (cm³) or cubic meters (m³).

Changing the Volume of Solids

The volume of a solid can be changed by changing its shape. For example, a lump of clay can be shaped into a ball or a flat disc, which has a different volume.

Solid Compression

Solids can be compressed, which means their volume can be reduced. This is done by applying a force to the solid.

Activity: Solid Compression

Take a lump of clay and compress it into a ball. Measure the volume of the ball and see how it compares to the original lump.

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The Structure of the Earth

Chapter: Chemistry and the Earth

Lesson Contents:

- The Earth in the Universe
- Journey to the Centre of the Earth
- The Diverse Abundance of the Elements
- The Conditions Inside Our Globe
- How the Structure of Our Planet is Investigated
- The Magnetic Field of the Earth

The Diverse Abundance of the Elements

The Earth is made of many different elements. Some are more abundant than others. The most abundant elements are oxygen, silicon, aluminum, and iron.

Abundance of the Elements in the Earth's Crust

Element	Abundance (%)
Oxygen	46.6
Silicon	27.7
Aluminum	8.1
Iron	5.0
Calcium	4.1
Sodium	3.9
Potassium	2.6
Magnesium	2.1
Hydrogen	1.4
Carbon	0.2

Activity: The Diverse Abundance of the Elements

Use the periodic table to find the abundance of different elements in the Earth's crust.

The Structure of the Earth

The Earth is made of different layers. The outermost layer is the crust. Below the crust is the mantle. The innermost layer is the core.

Abundance of the Elements in the Earth's Crust

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Hydrogen	1.4
Carbon	0.2

Activity: The Structure of the Earth

Use the diagram to see the different layers of the Earth.

The Layers of the Atmosphere

The atmosphere is made of different layers. The layers are the troposphere, stratosphere, mesosphere, and thermosphere.

Activity: The Layers of the Atmosphere

Use the diagram to see the different layers of the atmosphere.

The Conditions Inside Our Globe

The conditions inside the Earth are very different from the conditions on the surface. The temperature and pressure increase as you go deeper into the Earth.

Activity: The Conditions Inside Our Globe

Use the diagram to see the conditions inside the Earth.

The Magnetic Field of the Earth

The Earth has a magnetic field. The magnetic field is created by the movement of molten iron in the outer core.

Activity: The Magnetic Field of the Earth

Use the diagram to see the magnetic field of the Earth.

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Use the diagram to see the magnetic field of the Earth.

Physical Changes Accompanying

Chapter: States of Matter

Lesson Contents:

- The Heating Curve and the Cooling Curve
- Thermal Expansion of Bodies
- The Effect of Cooling on the Volume of Bodies
- The Effect of Temperature on the Density of Bodies
- The Uniquely Behavior of Water

The Heating Curve and the Cooling Curve

The heating curve shows the temperature of a substance as it is heated. The cooling curve shows the temperature of a substance as it is cooled.

Activity: The Heating Curve and the Cooling Curve

Use the graphs to see the heating and cooling curves of different substances.

Thermal Expansion of Bodies

Most substances expand when they are heated. This is because the particles in the substance move further apart as the temperature increases.

Activity: Thermal Expansion of Bodies

Use the diagram to see thermal expansion of different substances.

The Effect of Cooling on the Volume of Bodies

Most substances contract when they are cooled. This is because the particles in the substance move closer together as the temperature decreases.

Activity: The Effect of Cooling on the Volume of Bodies

Use the diagram to see the effect of cooling on the volume of different substances.

The Effect of Temperature on the Density of Bodies

The density of a substance changes with temperature. For most substances, the density decreases as the temperature increases.

Activity: The Effect of Temperature on the Density of Bodies

Use the diagram to see the effect of temperature on the density of different substances.

Thermal Expansion of Solids

Solids expand when they are heated. This is because the particles in the solid move further apart as the temperature increases.

Activity: Thermal Expansion of Solids

Use the diagram to see thermal expansion of different solids.

The Effect of Temperature on the Density of Solids

The density of a solid changes with temperature. For most solids, the density decreases as the temperature increases.

Activity: The Effect of Temperature on the Density of Solids

Use the diagram to see the effect of temperature on the density of different solids.

Co znaczy „duży projekt”

Ponad 100 osób

Ponad 2 lata

Inwestycja rzędu 30 mln PLN



Początki – „chmura” prywatna

- Start – „chmura” prywatna – głównie do przechowywania tworzonych treści multimedialnych (teksty, obrazki, animacje, pliki wideo)
- Setki TB danych
- Duży przepływa danych (edycja zasobów multimedialnych)
- Kilkadziesiąt milionów złotych wartości odtworzeniowej (w przypadku utraty danych)

Zalety?



Wady

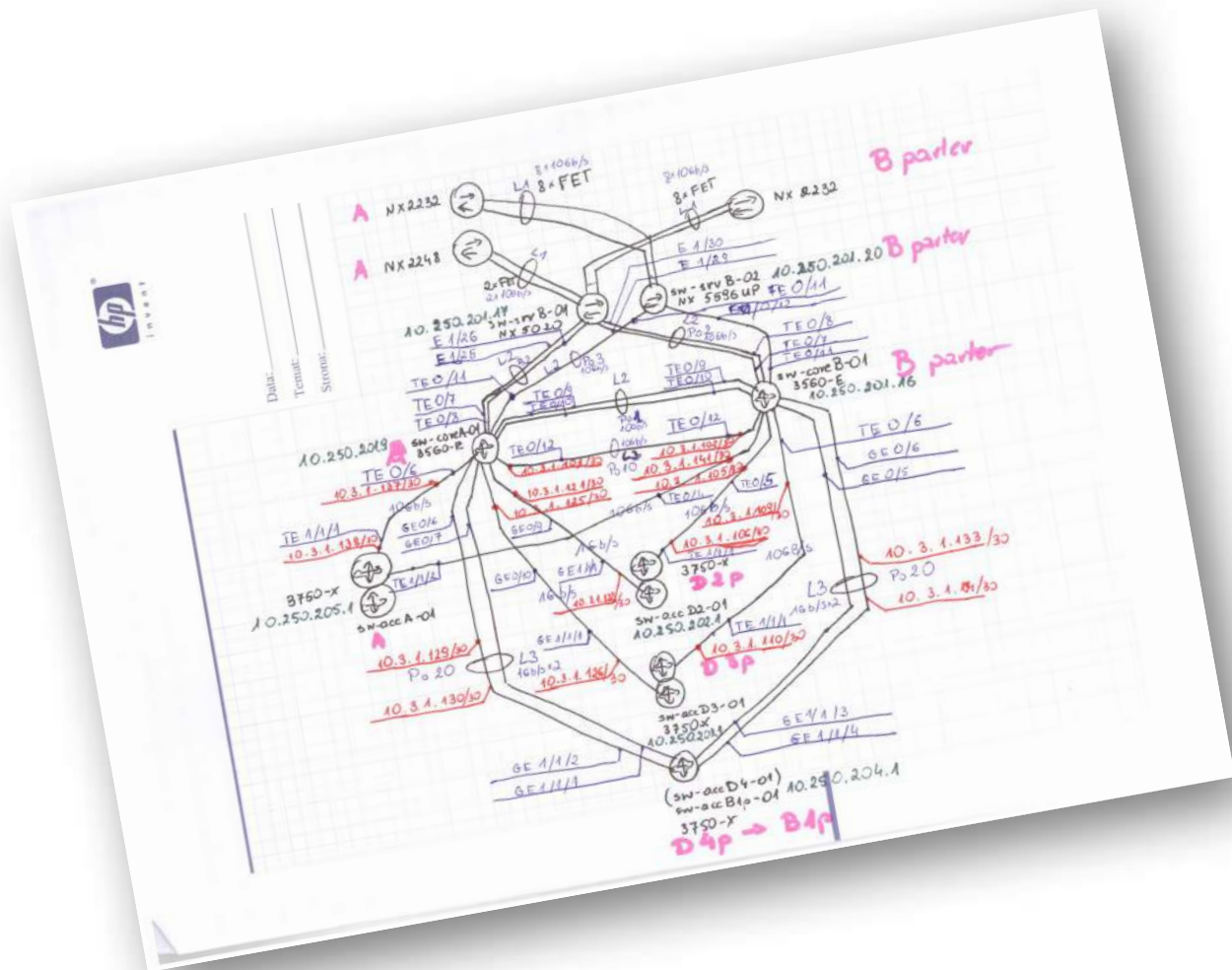
- Własny generator prądu
- Wynajem dwóch pomieszczeń w dwóch różnych budynkach (bezpieczeństwo)
- Położenie własnego światłowodu do synchronizacji danych między serwerowniami
- Instalacja systemów gaśniczych.
- Bardzo bolesne doświadczenia ze skalowalnością...
- Wieloosobowy zespół do obsługi całości
- Koszty...



Kolejny etap – chmura hybrydowa

- Chmura prywatna zamienia się w hybrydową (Softlayer, OVH)
- Infrastruktura rozrasta się około 850 serwerów wirtualnych, z czego połowa w OVH a połowa on-premise.
- Tworzenie własnych aplikacji do obsługi zgromadzanych danych multimedialnych.
- Tworzenie własnych platform do serwowania treści multimedialnych końcowym użytkownikom
- Bardzo poważne (i kosztowne) zasoby do utrzymania infrastruktury
- Duże problemy z zapewnieniem skalowalności rozwiązań

Projekt sieci



Przeprowadzka...

*(...) najgorsza była
przeprowadzka do Gdyni,
nawet jak teraz pomyślę... to
był rok bez żadnego weekendu
wolnego dla mnie (...)*

...i dziś

(czyli chmura publiczna)

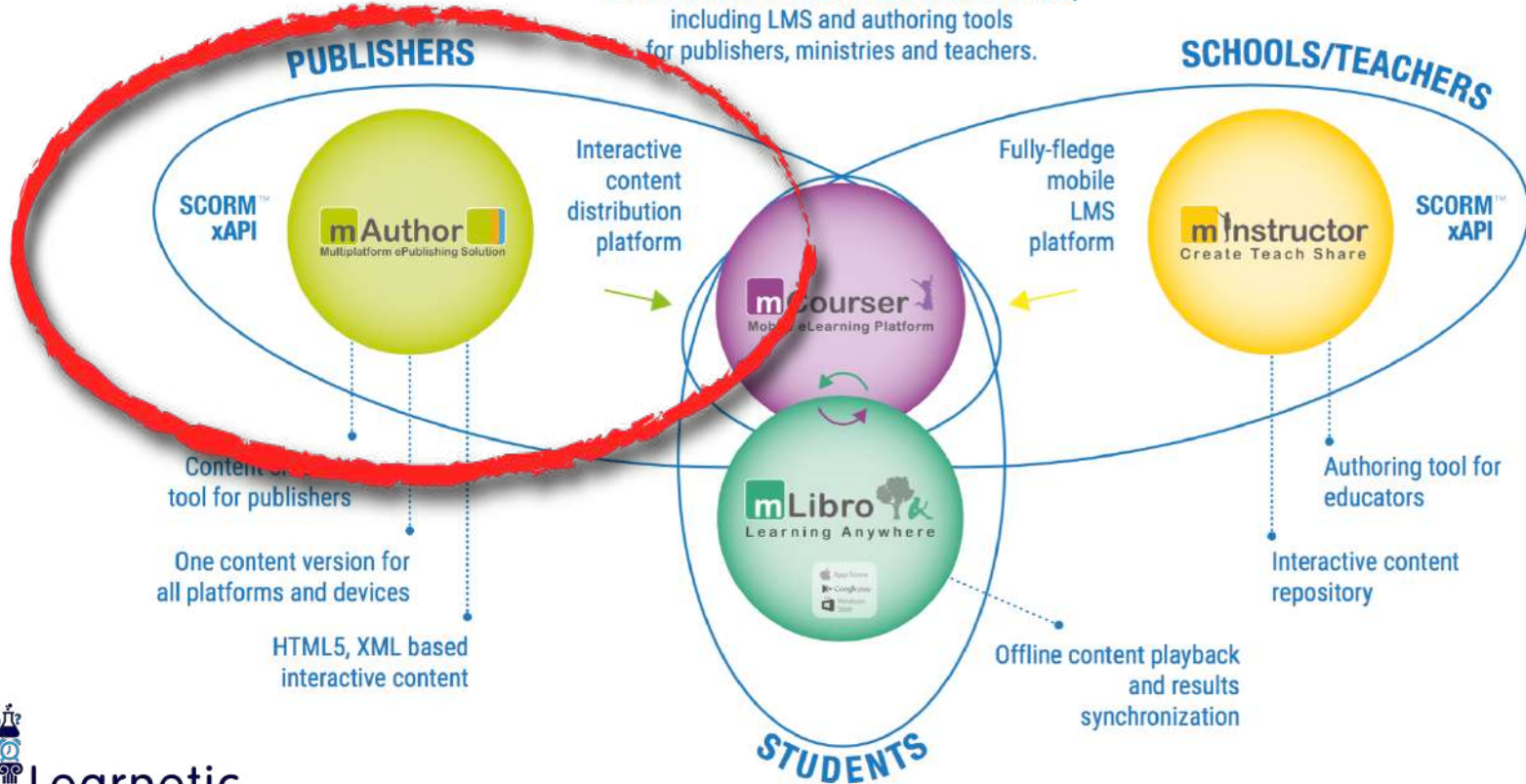


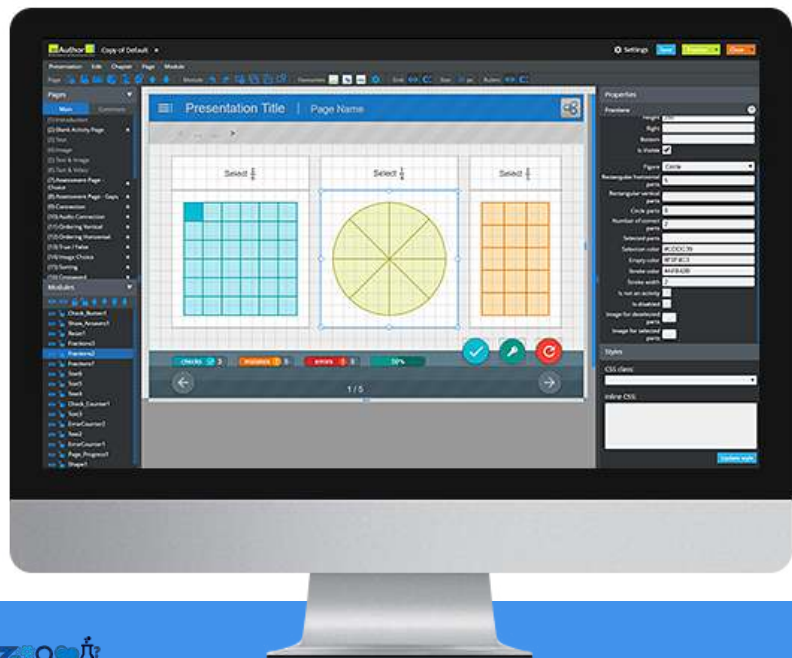
Każdy
współczesny
podręcznik musi
mieć komponent
cyfrowy



eLearning Ecosystem

Complete SaaS solution to create, sell and deliver interactive educational content, including LMS and authoring tools for publishers, ministries and teachers.

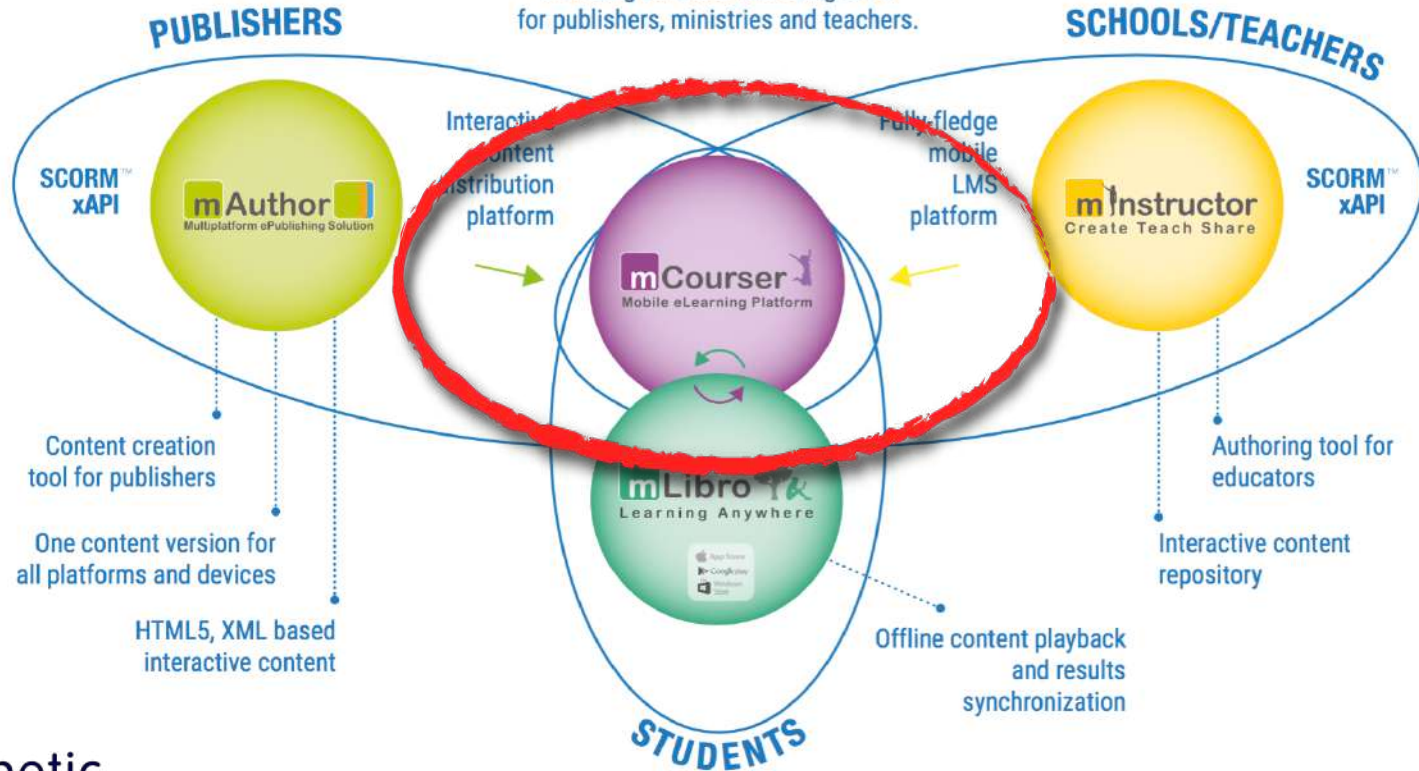


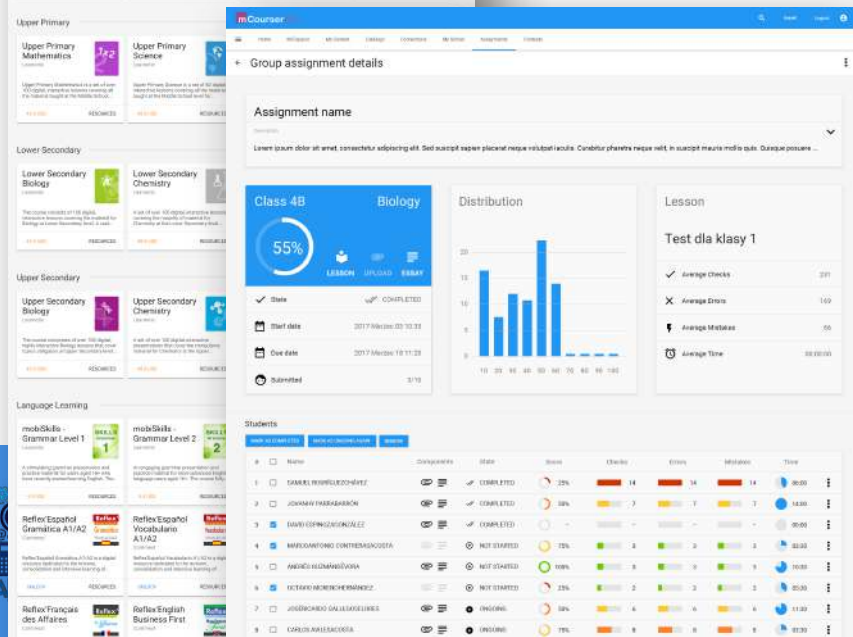
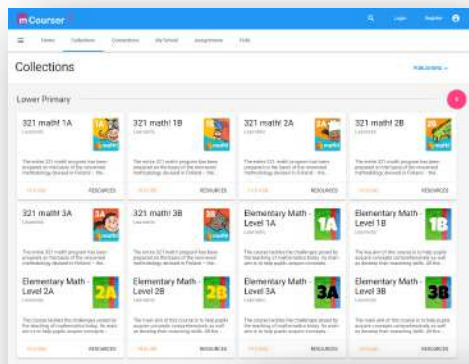


- Jedna instancja aplikacji (SaaS)
- Kilkadziesiąt dużych firmy wydawniczych
- Kilkaset osób pracujących 24/7 (strefy czasowe)
- Materiał (treści) o koszcie wytworzenia dziesiątek milionów euro (strategiczne narzędzie dużych firm wydawniczych)
- Bardzo zmienne wykorzystanie architektury (dzień publikacji!)
- Zasoby raczej nie są backupowane lokalnie...
- Tworzone treści są częścią znacznie większego biznesu

eLearning Ecosystem

Complete SaaS solution to create, sell and deliver interactive educational content, including LMS and authoring tools for publishers, ministries and teachers.





- Około 30 instancji aplikacji SaaS w różnych regionach świata
- Każda instancja zdolna potencjalnie obsłużyć kilka milionów zarejestrowanych użytkowników i kilkadziesiąt tysięcy jednoczesnych użytkowników
- Wszystkie strefy czasowe
- Niezależne rozliczanie kosztów hostingu
- Niezależna analiza danych dla każdej instancji
- Zerowe koszty "stand by"

Problem skalowalności

Zaczynamy od kilkuset użytkowników przez rok lub dłużej (wymagane minimalne koszty infrastruktury), ale system powinien być skalowalny (gotowy) do kilku milionów użytkowników

„Serwerownia”



Nasz dział IT



... i zaufany partner ☺

Solw' **IT** | Let's
Solve
It

Skalowalność

(12.11.2019, godzina 12:00, 321 szkół, 4478 jednoczesnych użytkowników)

CPU megacycles

1 min interval (mean)

50M

- O godzinie 11:59 było po 200 maszyn czekających i obsługujących
- minutę później o 12:00 było 1400 maszyn obsługujących i 100 czekających.
- Po tym wzroście o 12:01 ilość maszyn obsługujących spadła do 130 oraz 1000 czekających,
- a trzy minuty później wszystko się uspokoiło do poziomu 230 czekających i ~80 pracujących.

GAE

1 min

128GiB

64GiB

0

9 AM

10 AM

11 AM

12 PM

1 PM

Instance count

1 min interval (mean)

1,500

750

0

10 AM

11 AM

12 PM

1 PM

Network bytes sent.

1 min interval (rate)

48KiB/s

40KiB/s

32KiB/s

24KiB/s

16KiB/s

8KiB/s

0

9 AM

10 AM

11 AM

12 PM

1 PM

Nasza polska rzeczywistość...



Sześć milionów użytkowników...

Specyfikacja istotnych warunków zamówienia
Nr sprawy: ZA.TP.164.2018

Architektura systemu powinna być skalowalna dla min 6 000 000 użytkowników. System musi zostać stworzony przy użyciu technologii zapewniających skalowalność systemu (możliwość elastycznego zwiększania wydajności systemu w miarę wzrostu liczby użytkowników).

Przetworzenie mediów zawierających 20 filmów o wielkości do 1GB, 200 nagrań o wielkości 50MB, 500 obrazków o wielkości do 1MB nie może trwać dłużej niż 1 godzinę i nie może wpływać na czas ładowania treści dla użytkowników Platformy.

Sześć milionów użytkowników...

W celu realizacji przedmiotu Umowy w zakresie o którym mowa w Załączniku nr 3 do SIWZ – Istotnych Postanowieniach Umowy § 2 ust. 3 pkt 1-2 Zamawiający udostępni Wykonawcy poniższe zasoby:

1. vCPU (ilość rdzeni fizycznych do dyspozycji bez HT) – do 96 sztuk
2. Częstotliwość taktowania vCPU/fizycznego rdzenia CPU – nie mniej niż 2.0 GHz
3. vRAM – 160 GB
4. Przestrzeń dyskowa – 9 TB
5. Load Balancer
6. system operacyjny - CentOS Linux 6.x. lub 7.x

Krok dalej

(w chmurę)

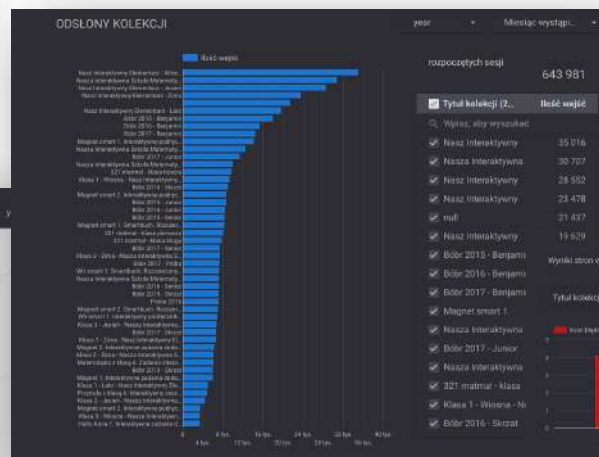
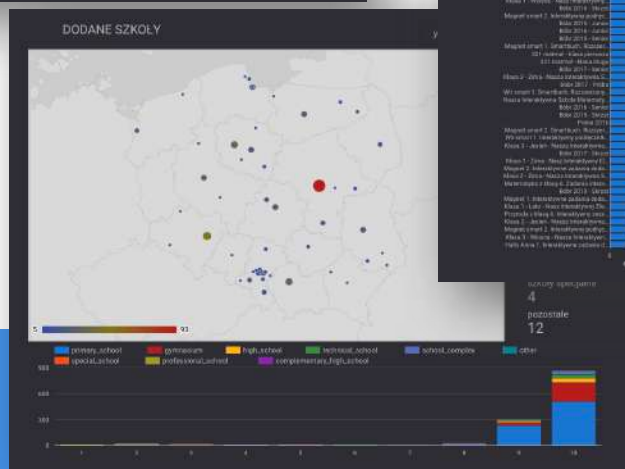
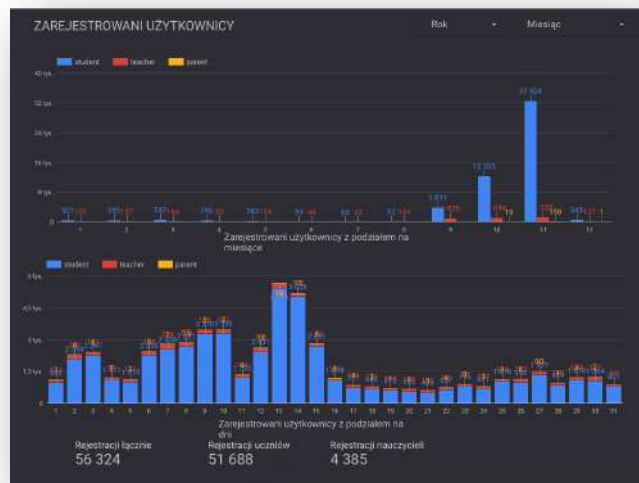
Od treści interaktywnych Do nauczania adaptacyjnego

Treści (podręczniki) są ważne ale dużo ważniejsza będzie umiejętność zaproponowania każdemu uczniowi indywidualnie właściwych materiałów zgodnych z jego potrzebami, możliwościami i preferencjami.



... w oparciu o 'Big Data'

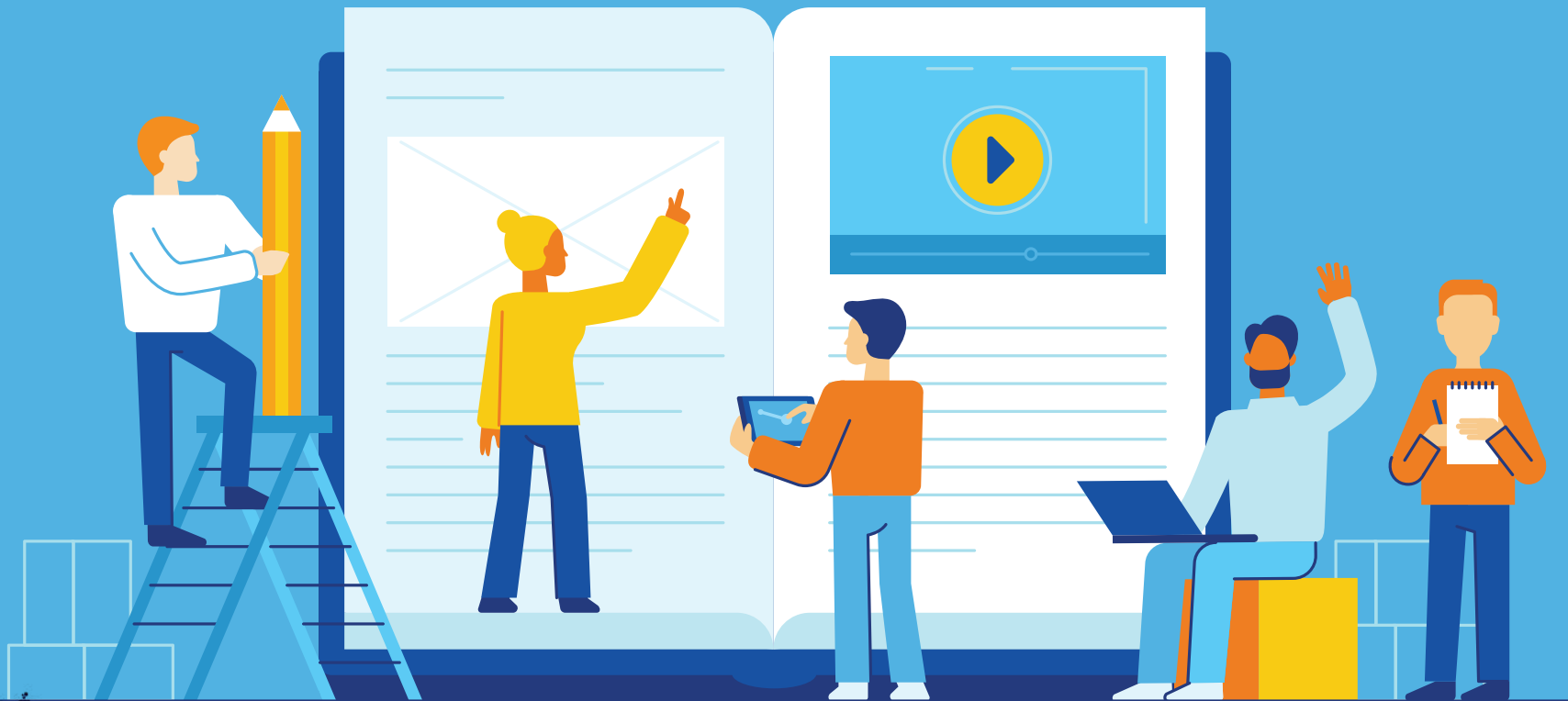
Dane – przyszłość edukacji



Google
BigQuery

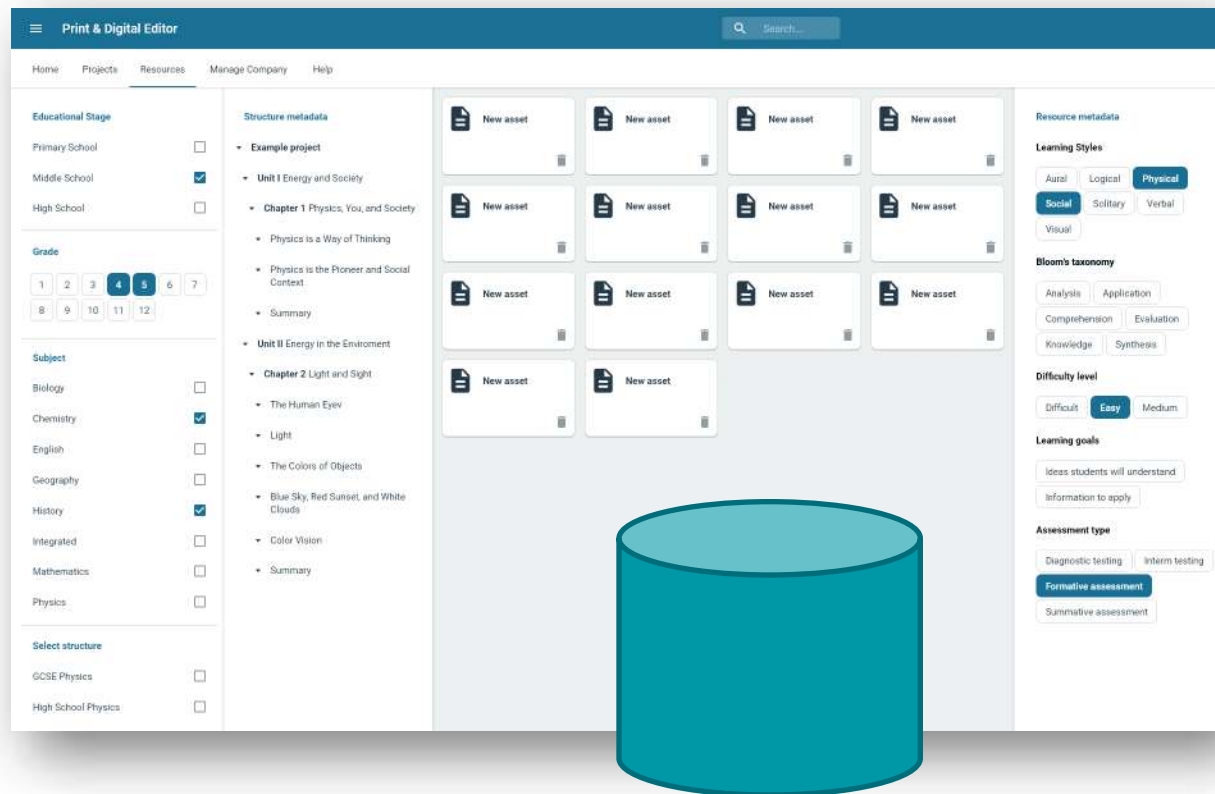


Cyfrowa „dekonstrukcja” istniejących podręczników



Learnetic
Everyone learns differently

Wszystkie zasoby edukacyjne w chmurze (publicznej)



Od biznesu on-premise do Cloud Native Enterprise

Dziękuję za uwagę!

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