

# EMERGING TECH TRENDS: ALA'S TRENDS LIBRARY & THE NMC HORIZON REPORT

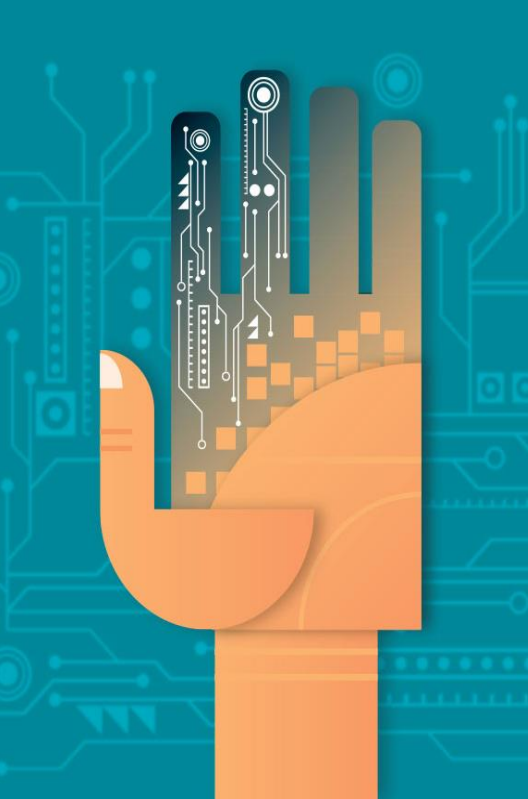


**Sandy Avila, Barry University School of Law**

July 23, 2015

SEFLIN 2015

Connections: Libraries, Users, & Technology



 **The Internet of Everything**  
CONNECTING THE UNCONNECTED



# Why It All Matters?

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Libraries and their staff are considered key collaborators for projects addressing all kinds of social issues. What **we do** and **how we do it** has a far-reaching impact.

**We need to ask the questions.**

**Where are we? Where are we going?**

**How does it all fit together?**



# Remember this....

# THINK GLOBALLY ACT LOCALLY

Peace Resource Project 888-822-7075 [www.peaceproject.com](http://www.peaceproject.com) (MS#10)



# Because We Are Not Alone!

*Connections can be made between*



*People  
to People*



*People  
to Machines*



*Machines  
to Machines*

# ALA's Trends Library

<http://www.ala.org/transforminglibraries/future/trends>

The collection developed to understand how trends are developing and why they matter. Continually updated.

**Organized into 7 categories (STEEPED):**

**Society**

**Environment**

**Technology**

**Politics (and Government)**

**Education**

**Economics**

**Demographics**

# Center for the Future of Libraries



## **The Center for the Future of Libraries works to:**

- Identify emerging trends relevant to libraries and the communities they serve
- Promote futuring and innovation techniques to help librarians and library professionals shape their future
- Build connections with experts and innovative thinkers to help libraries address emerging issues





# **Eight Relevant Tech Trends**

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**Connected Learning**

**Data Everywhere**

**Drones**

**Flipped Learning**

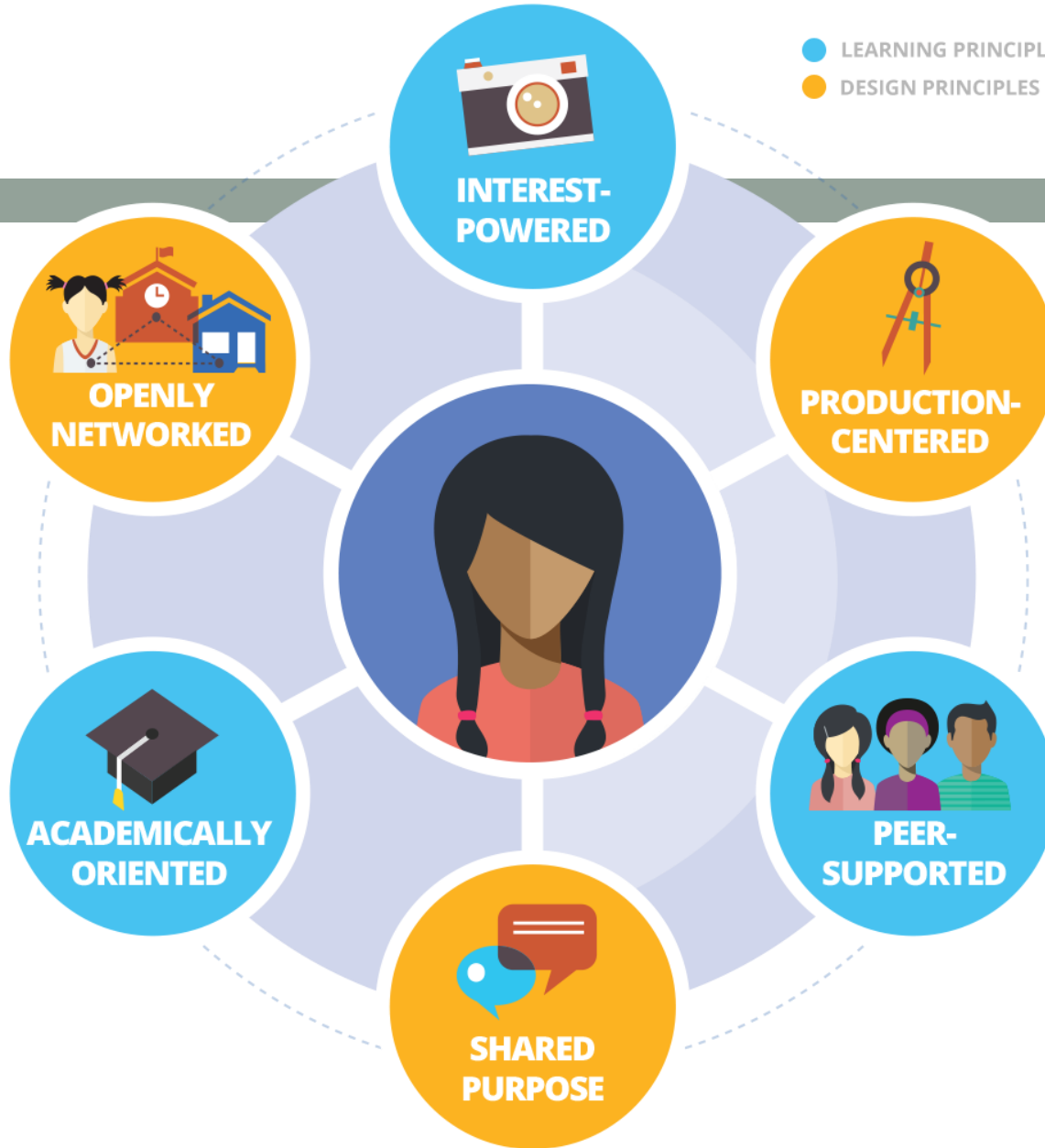
**Gamification**

**Internet of Things**

**Robots**

**Unplugged**

- LEARNING PRINCIPLES
- DESIGN PRINCIPLES



# Connected Learning

Learning that is “highly social, interest-driven, and oriented toward educational, economic, and civic opportunity.”

## How It's Developing:

Students achieve higher-order learning outcomes when work is focused on topics that are personally interesting.

Develop skills and knowledge that will be meaningful in future work and social settings.

## Why It Matters:

Libraries can encourage exploration and interaction; helps to re-engage learners.

Libraries can lend support on the idea that learners achieve best when learning is reinforced; why not in the library space?

2012-02-08 01:24:31 POST https://api.path.com/3/contacts/add  
2012-02-08 01:24:32 ← 200 application/x-plist, 55B

Request

Host: api.path.com

User-Agent: Path/2.0.5 CFNetwork/548.0.4 Darwin/11.0.0

Content-Length: 11384

Accept: \*/\*

Authorization: Basic [REDACTED]

Content-Type: multipart/form-data; boundary=9BFE2C09-0B0A-4280-014C-2E48D9FA06E3

Accept-Charset: utf-8

X-PATH-CLIENT: iOS/2.0.5

X-PATH-CLIENT-OS: Asia/Singapore

X-PATH-CLIENT-LANG: en\_SG

X-PATH-CLIENT-COUNTRY: en

X-PATH-CLIENT-REGION: en-us


Accept-Language: gzip, deflate

Connection: keep-alive

Proxy-Connection: keep-alive

Content-Disposition: form-data; name="post" (once)

5.-8.G.t.u.7.8.9.1.....



The image shows a hiker with a large backpack walking away on a dirt path in a forest. A semi-transparent window in the upper left displays network request details for a POST to https://api.path.com/3/contacts/add. The response is 200 application/x-plist with a size of 55B. The request headers include Host, User-Agent, Content-Length, Accept, Authorization (Basic), Content-Type, Accept-Charset, X-PATH-CLIENT, X-PATH-CLIENT-OS, X-PATH-CLIENT-OS, X-PATH-CLIENT-LANG, X-PATH-CLIENT-COUNTRY, X-PATH-CLIENT-REGION, Accept-Language, Accept-Encoding, Connection, and Proxy-Connection. The response header includes Content-Disposition. Various floating icons are present: a camera icon in the top right, a location pin icon in the middle right, a location pin icon in the middle left, a music note icon in the bottom left, a person icon in the bottom left, a location pin icon in the bottom left, a red X icon in the bottom left, and a moon icon in the bottom left.



# Data Everywhere

Not a new trend, but technology has greatly improved opportunities to **collect, store, and analyze customer data and personal information.**

## How It's Developing:

Explosion of mobile devices and internet connectivity drives data collection.

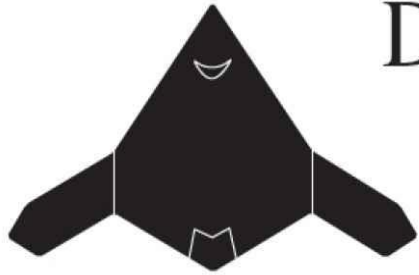
As data is seen as more valuable, new business models may emerge.

## Why It Matters:

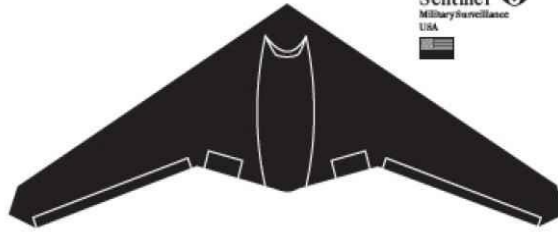
Libraries as data collectors, can improve products and services by analyzing their own data better.

Libraries may be asked to serve as repositories for data sets, archive data sets, or make data accessible digitally.

# DRONE SURVIVAL GUIDE



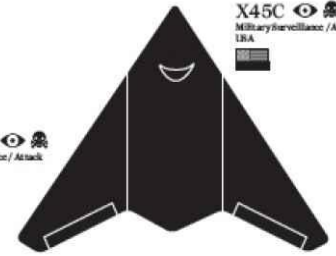
**X47C**   
Military Surveillance / Attack  
USA



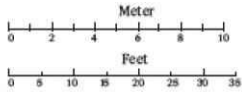
**Sentinel**   
Military Surveillance  
USA



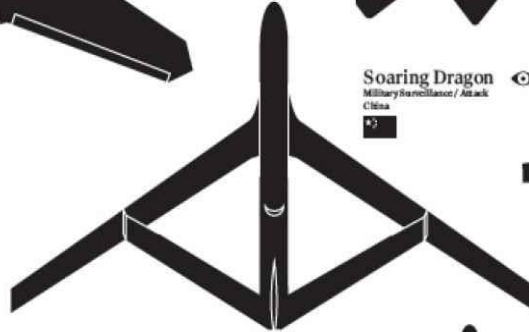
**nEUOn**   
Military Surveillance / Attack  
France



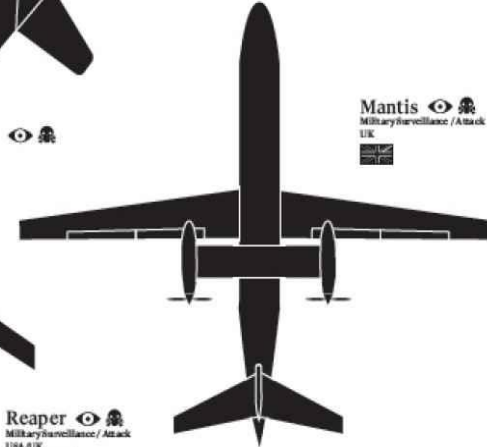
**X45C**   
Military Surveillance / Attack  
USA



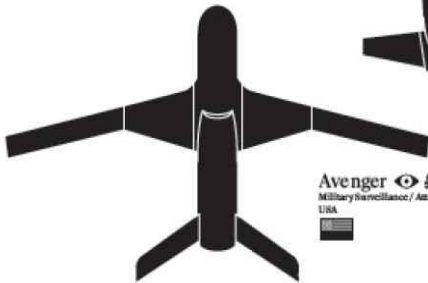
**Global Hawk**   
Military Surveillance  
USA



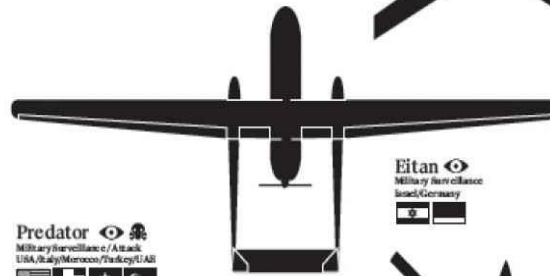
**Soaring Dragon**   
Military Surveillance / Attack  
China



**Mantis**   
Military Surveillance / Attack  
UK



**Avenger**   
Military Surveillance / Attack  
USA



**Eitan**   
Military Surveillance  
Israel/Germany



**Reaper**   
Military Surveillance / Attack  
USA/UK



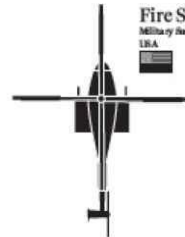
**Barracuda**   
Military Surveillance  
France/Germany



**Herti**   
Surveillance  
UK



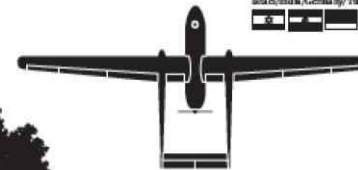
**Predator**   
Military Surveillance / Attack  
USA/Italy/Mexico/India/UK



**Fire Scout**   
Military Surveillance / Attack  
USA



**Hummingbird**   
Military Surveillance / Attack  
USA



**Heron**   
Military Surveillance  
Israel/India/Greece/Turkey



**Hermes**   
Military Surveillance  
Israel



**Shadow**   
Military Surveillance  
USA/NATO



**Rustom I**   
Military Surveillance  
India



**WASP III**   
Military Reconnaissance  
USA/NATO



**Scan Eagle**   
Military Surveillance  
USA/NATO



**Harpy**   
Military Attack  
Israel



**Killer Bee**   
Surveillance  
USA



**Raven**   
Military Reconnaissance  
USA/NATO



**Air robot**   
Domestic Surveillance  
UK



**Aeryon Scout**   
Domestic Surveillance  
Canada



**AR Parrot**   
Consumer Photography  
USA

# Drones

Drones or Unmanned Aerial Vehicles (UAVs)- research, transportation and delivery, artistic production, news coverage and reporting, law enforcement and surveillance, and entertainment.

## How It's Developing:

Manufacturing of drones has increased since 2014- Amazon Prime Air, UPS, Google.

Over 1,500 different kinds of drones are currently being manufactured for multiple capabilities.

## Why It Matters:

Libraries can partner with projects that seek to improve internet access to underserved areas.

Libraries can work using drones to improve outreach efforts, deliver resources, or to transport equipment.

# The Flipped Classroom

DURING



Students practice applying key concepts with feedback

IN CLASS

GOAL

GOAL

GOAL

Students prepare to participate in class activities

BEFORE



AFTER

Students check their understanding and extend their learning



OUT OF CLASS



# Flipped Learning

Flipped classrooms, backward classrooms, inverted classrooms or reverse teaching- utilizes model where students review content online via video lectures prior to class. Students and teachers work through solving questions together.

## **How It's Developing:**

Since 2007 technology is improving face-to-face student classroom time. Initiatives like Khan Academy provide support by offering free instructional videos.

## **Why It Matters:**

Library instruction may seek to adopt flipped learning models.

Continued access to and management of learning elements may fall to library and information professionals.

Students and other learners may seek quiet spaces to focus and study.

# THE BUSINESS OF GAMIFICATION

## WHAT IS GAMIFICATION?



Gamification is the use of elements of game play in non-game contexts



It provides rewards and engagement for customers

## HOW GAMIFICATION WORKS:

### 5 COMMON MECHANICS



#### POINTS

Measure a user's achievements in relation to others  
Can double as currency to exchange for rewards



#### BADGES

Reward achievements visually



#### LEVELS

Encourage users to progress and unlock new rewards



#### LEADERBOARDS

Organise players by rank



#### CHALLENGES

Encourage engagement by offering specific tasks to complete

### 4 MAIN WAYS TO DRIVE ENGAGEMENT



#### ACCELERATED FEEDBACK CYCLES



#### CLEAR GOALS AND RULES OF PLAY



#### A COMPELLING NARRATIVE



#### CHALLENGING BUT ACHIEVABLE TASKS

## Do Educational VIDEO GAMES ACTUALLY WORK?

As video games become increasingly popular tools in the classroom, it begs the question: Do they actually work?

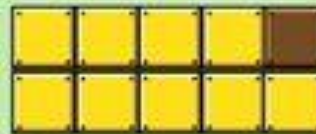
While the jury is still out, some studies have found several benefits to gaming. However, some teachers are still skeptical.

### QUICK LOOK



### THE BENEFITS

In addition to students enjoying video games, some studies conclude that they do have their benefits.



91% Kids are familiar with video games. 81% of school-aged children (ages 2-17) in the U.S. play electronic games.

In today's world, the more comfortable a child is with technology, the better equipped he or she will be to stay on top of it.

At a basic level, video games teach simple hand-eye coordination and motor control.

Games (press down button, move levers) to control their navigation of the games, and can adapt to the pace of the games.

Video games can improve visual spatial skills.



Some video games encourage kids to be helpful and friendly.

### CONCERNS

There's little conclusive proof that educational video games work, and teachers are skeptical.

While students may enjoy playing games, they may forget the skills learned in the game when they're tested later.

Violence in video games can contribute to social behavior problems. A number of experiments show that people had more hostile after playing in simulated realistic, violence situations.

Some teachers and schools believe that other classroom necessities, like books, should be prioritized before video games.

Since students play video games at home, teachers say some parents don't want their kids spending more time playing video games at school.

It can be difficult for teachers to monitor every student and make sure each one is on a gaming level that isn't too difficult or too easy.

Certain computer-based games can boost attention.

# Gamification

The application of game elements and digital game design techniques to non-game settings. Also viewed as game-based learning which is game playing that has defined learning outcomes.

## How It's Developing:

Increasing role in professional training situations, integration in elementary-high school education settings.

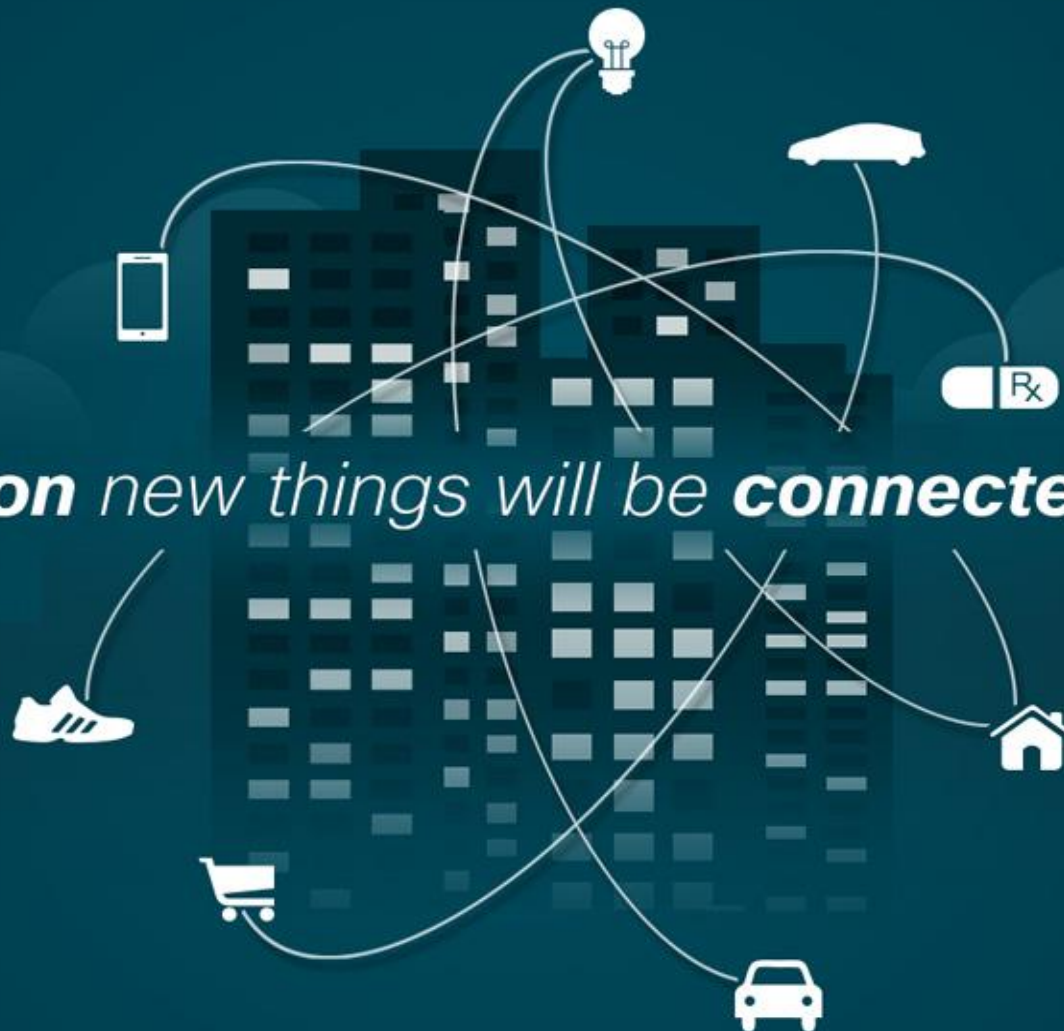
## Why It Matters:

Gaming offers opportunities to develop emerging and traditional forms of literacy. Libraries can help to drive this.

Libraries are recognized as spaces for interest-driven learning and can be used as public gathering spaces.

# THE INTERNET **OF EVERYTHING** IS HERE.

As the Internet evolves, so will we.



**37 billion** new things will be **connected by 2020.**



# Internet of Things

Smaller computing and radio devices, often unseen or built into objects, will sense and transmit data offering greater control and connectivity between objects.

## How It's Developing:

Technology is becoming less expensive and smaller and allowing for the ability to embed computing, wireless communication, and radio devices into objects.

Things to consider will be environmental impact and security and privacy concerns.

## Why It Matters:

Librarians will need to understand the technology in order to answer consumer questions or to assist with implementing/managing a device.

Libraries can be a place to educate public or to circulate devices to familiarize individuals with the products out there.



# Robots

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Robots are moving from industrial and factory settings to everyday work, educational, research, and living spaces; working alongside humans.

## How It's Developing:

Declining cost of sensors and computer power will help robots become quicker and more intelligent hence safer to work greater roles alongside humans. Safety is still the main concern.

## Why It Matters:

Robotics in library programming has gained traction and growing in popularity.

Libraries could play a role in developing new skills for displaced workers once work flows are taken over by robots.

Disconnect. Detox.  
Relax. Refresh. Recharge.



Disconnect to **Connect**  
with your self • family • community



**Do Not Disturb**

**ON**





# Unplugged

The non-technology of the technology trends. Opportunities to unplug are essential, benefiting professional and personal experiences.

## How It's Developing:

Constant connectedness places individuals in danger of cognitive overload; a struggle to achieve focus on what is important.

Push for “device-free zones”, digital detoxes, and unplugging challenges

## Why It Matters:

Libraries can capitalize on the use of quiet spaces or can market “unplug zones” or “digital escapes.”

Library programming and services that encourage quiet reflection or that limit the use of technology.



# NMC Horizon Report

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12 year effort established in 2002 that annually identifies and describes emerging technologies in all sectors of education around the globe.

Report is created by an international body of experts from library management, education, and technology.

The process for collecting and evaluating trends takes place online via the NMC Horizon Project wiki (**[library.wiki.nmc.org](http://library.wiki.nmc.org)**)

# NMC Panel & The Library Edition

**47** library and technology experts from **16 countries** on **5 continents**

The NMC Horizon Report: 2014 Library Edition covers 18 topics- 6 key trends, 6 significant challenges, and **6 important developments in technology**

# 6 Important Tech Developments

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**Electronic Publishing**

**Mobile Apps**

**Bibliometrics and Citation Technologies**

**Open Content**

**The Internet of Things**

**Semantic Web and Linked Data**



## Electronic Publishing



# Electronic Publishing

**Time-to-Adoption:** 1 year or less

Electronic publishing is enabling libraries to produce content, formally through a press or informally through a repository.

Electronic publishing is creating a sea change in how people consume media, research, news, and narratives.

When considering e-publishing strategies, libraries need to consider the various ways in which the content will be consumed by students and faculty.





# Mobile Apps

**Time-to-Adoption:** 1 year or less

Simple but useful apps have found their way into almost every form of human endeavor.

Online app marketplaces provide an easy and highly efficient way to deliver software that reduces distribution and marketing costs significantly.

Apps use location, data, motion detection, gestures, access to social networks, and web search, to seamlessly create a full-featured experience.

Things for libraries to consider- annotation tools, social networks, and GPS locating.





# Bibliometrics & Citation Technologies

**Time-to-Adoption:** 2 -3 years

Coined in 1969, “the set of mathematical and statistical methods to quantitatively analyze citations and content of academic literature.”

Bibliometrics gives researchers a clearer view of where their work fits into the larger scheme of scientific pursuits. Goal is to integrate knowledge into other fields. Used to better gauge an author or journal’s impact in the field, and help researchers efficiently filter through research databases or select the most appropriate journal for publication.

Can be used to support grant applications, attainment of new and tenured positions, and requests for raises or promotions.

Crucial to quantitatively demonstrating quality of an institution’s research and measures.



# Open Content

**unlocking your potential**



# Open Content



**Time-to-Adoption:** 2-3 years

Open content uses open licensing schemes to encourage, not only the sharing of information, but the sharing of pedagogies and experiences.

The movement toward open content reflects a growing shift in the way scholars conceptualize education to a view that is more about the process of learning than the information conveyed.

Content is growing in breadth and quality and available free over the Internet.

Libraries situated to lead open content initiatives.

OER (Open Education Resources) are being coordinated by academic libraries.

# HOW THE INTERNET OF THINGS

IS RAISING YOUR IQ

## CONNECTED HOME

Overnight charge is calculated automatically updates alarm clock and turns on coffee-maker timer

Lights & temperature gears down as you leave home

Monitor & optimize energy consumption with smart meters & appliances

## CONNECTED CITY

Optimize parking resources, reduce pollution & street congestion via connected parking & tolling systems

Maximize resource utilization & plan for future parking locations with real-time analytics

## CONNECTED CAR

Find an open parking spot or electric charging station using maps

Reserve a spot & pay with mobile wallet

What exactly is the "INTERNET of THINGS"?

Smart Systems and the Internet of Things are driven by a combination of:

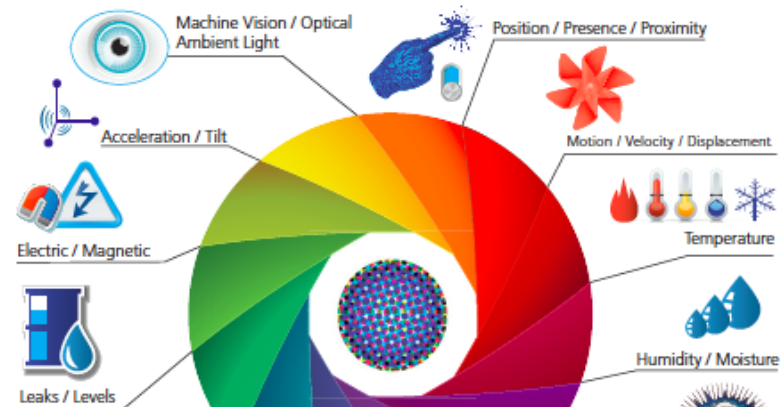
1 SENSORS & ACTUATORS

2 CONNECTIVITY

3 PEOPLE & PROCESSES

## 1 SENSORS & ACTUATORS

We are giving our world a digital nervous system. Location data using GPS sensors. Eyes and ears using cameras and microphones, along with sensory organs that can measure everything from temperature to pressure changes.



# The Internet of Things

**Time-to-Adoption:** 4-5 years

A network of connected objects that link the physical world with the world of information through the web.

Embedded chips, sensors, and tiny processors attached to an object.

Simple connections allow for remote management, status monitoring, tracking, and alerts.

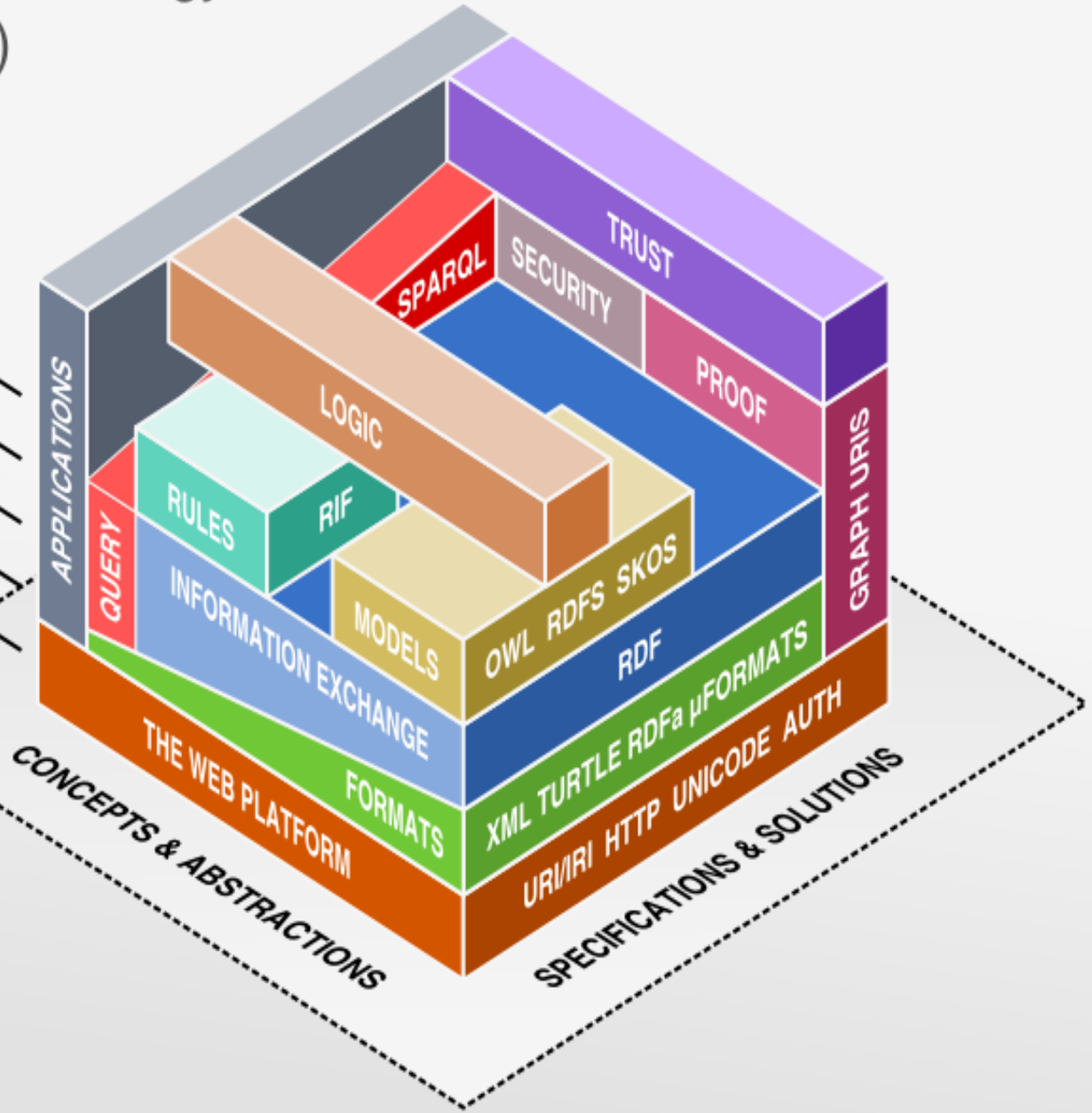
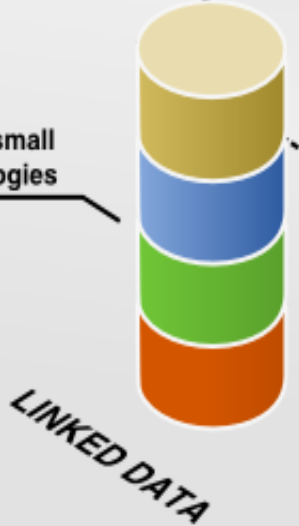
The next step is the evolution of smart objects.

Possibilities are endless- libraries play a role. Connecting patrons interactions with library catalogs online or with previous user experience. Customizable spaces based on patron preferences.

# The Semantic Web Technology Stack (not a piece of cake...)

- Most apps use only a subset of the stack
- Querying allows fine-grained data access
- Standardized information exchange is key
- Formats are necessary, but not too important
- The Semantic Web is based on the Web

Linked Data uses a small selection of technologies



LINKED DATA

# Semantic Web & Linked Data

**Time-to-Adoption:** 4-5 years

Information on the Internet using metadata to make connections and provide answers that would otherwise be elusive or altogether invisible.

Semantic searching is being applied to scientific inquiries, allowing researchers to find relevant information more precisely for effective sifting, querying, and gathering.

Growing emphasis for libraries to have their collections shared across institutions. BIBFRAME- MARC 21 format to linked data: creative work, instance, authority, and annotation.

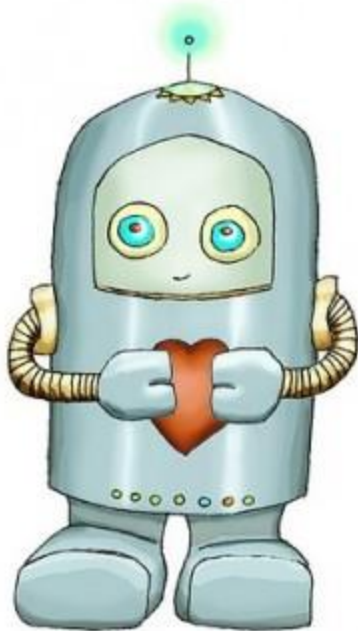
LODLAM- Linked Open Data Libraries, Archives, and Museums



THANK YOU!



Thank you!



Questions

# Contact Information

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407-206-5718