Title: Visualization for Collaboration and Discovery in Online 3D Environment

Date: 2013, 21 Sep (The Science Circle Seminor)

Speaker: Hajime Nishimura, JAMSTEC (Yan Lauria in SL.)

Participants: 8-Bit (8bitbiologist), Chantal (nymf.hathaway), Chuck Kalok, comet Morigi, Dae Miami, Draceina Pinion, Dugong Janus, Giovanni Tweak, Laci Luckstone, Nukiri Kenin, motoko Moonwall, Patsy Stradjinski, ⓆⓊⒶⒺⓏⒶⓇ (quaezar.agnomen), Shailey Garfield, Stephen Xootfly, Tulpa (jes.cobalt), Vic Michalak,

Jes: Hi everyone, and welcome to today's Science Circle presentation with Yan.
I'm Jes Cobalt, I work as the co-director of the Science Circle. I'm responsible for our presentations and educators for Asia and Oceania times.
In the current calendar Asia & Oceania contributes two presentations:
Yan's "Visualization for collaboration and Discovery in multi-user online 3D environment" and Amara Shan's "Bell's Turtle -How Modern Agriculture Threatens Freshwater Turtles in Australia"
For the next calendar we like to encourage more presentations during hours convenient for our scientists, educators and students in this timeframe!
So if you're interested in presenting for us, drop me an IM or an email and I'll get back to you promptly. ツ
Yan will be using text chat for this presentation "Visualization for collaboration and Discovery in multi-user online 3D environment".
Which will be recorded and uploaded as a PDF file on the Science Circle website.
We'll probably take photos, so if you want to see them go to: http://sciencecircle.org/
LinkedIn- http://www.linkedin.com/company/science-circle
or our facebook page- https://www.facebook.com/groups/155012474522202/
If you didn't get Yan's topic card send me an IM and I'll send it to you.
This presentation includes shared media (Web on a Prim including YouTube), so please use a SL Viewer ver.3 compatible viewer / Adobe Flash & Shockwave.
Use group IM if you need help in that regard.
Let's have an awesome hour everyone, and enjoy!

Chantal: Applauds! ツ

Nukiri: ¸.•*`(¸.•*´ `*•.¸)`*•.¸

Yan: Thank you Jes
At first, let me introduce Dugong. Dugong please.
He is practically Co-curator of Abyss Observatory.
He provides Orca's Family above you. Look up!
You all can ride on them. Please enjoy changing view point.^^
Say something, Dugong?

Dugong: Well...

Chuck: awesome

8-Bit: whoa

Dugong: Just enjoy full-scale sea animals in-world

Vic: Yes!! Thank you!

Yan: Thanks^^

He also create Blue Whale outside of Pyramid.

Skeleton is created by famous Aley.

Vic: Even a pyramid is too small for a blue whale...

Yan: yes^^

Then self-introduction.

This photo is classroom of underwater glider made by pet bottle.

Hajime Nishimura (Yan Lauria in SL)

SL: Curator of Abyss Observatory
RL: Coordinator for Earth Observation Data Integration
Data Research Center for Marine-Earth Sciences (DrC)
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Science Fiction collector of Marine, Earth, Ecosystem themes
Organizer of Underwater Vehicle Competition for students

motoko: pachi pachi pachi pachi

Yan: I'm a curator of Abyss Observatory,

Ocean science museum at "Second Earth 3" and "Farwell" under construction.

In RL, I'm a coordinator of Environment Data Integration and Analysis, JAMSTEC.

I engaged in development of deep submersible, oceanographic research vessel, and science drill ship, and I also engaged in planning and organizing Climate Prediction Research.

Out of office, I am Sci-Fi fan, reviewer/ collector, and I organize underwater vehicle competition for students.

So Abyss is visualization of my past projects and my hobby.

Vic: Don't forget sea creature tamer!

Yan: ahaha

Then, Why Multi-user Online 3D Environment?

We are living in 3D world.

SL has high resolution, real time, interactive, simulate physics,

Especially, SL has a lot of good creators and good Marketplace.

But people don't realize how it is wonderful.

People are familiar with very high quality CG movies, but the scenes are taken by very long time rendering.

"Realtime" allows "Interactive" remotely.

People, who don't have Virtual World experience, can't understand how wonderful "Interactive" remotely is!

There is possibility for most comprehensive Archives of Human knowledge, for remote education, Self-learning, for Inter-disciplinary and Trans-disciplinary collaboration.

Why Multi-user Online 3D Environment?

- We are living in 3D world.
  "Multi-user Online 3D Environment" is most expressive means for remote communication.
  - High quality 3D (+ time = 4D)
  - Real-time/ Interactive
  - Physics simulation
  - Multi-user/ good community
  - Easy creation/ good marketplace/ good creators
  - Borderless
- Possibility for
  - most comprehensive Archives of Human knowledge.
  - remote education, Self-learning
  - Inter-disciplinary and Trans-disciplinary collaboration experiments.

Chuck: we are blessed to have so many creative people in-world

Chantal: yes they do an amazing job!

Yan: Yes!

Next, please remark important concepts.

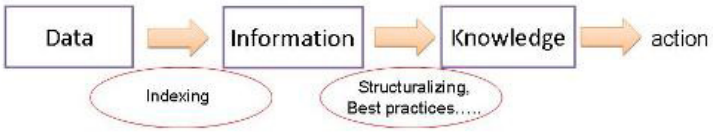
It is "How to create "Knowledge" from "Data"?

"Data" becomes "Information" by indexing.

It means people can search by adding key words.

Next, "Information" becomes "Knowledge" by structuralizing.

How to create Knowledge from Data? (1/2)



Information Seeking Mantra

Ben Shneiderman (1996)

- Overview
- Zoom and filter.....interactive
- Details-on-demand .....interactive
- View Relationships
- History
- Extract

Chuck: seeing it sometimes requires a paradigm shift

Yan: What is "structuralizing"?

Then, did you hear "Information Seeking Mantra"?.

This is very useful strategy.

"Overview", first.

It is like we draw back camera when we arrived new SIM

Next," Zoom and filter".

Zooming camera is primary technique of SL.

Vic: Good analogies!

Yan: aha

Dae: What kind of data and information are we talking about Yan

Yan: don't use Zoom for under skirt

Next, "Details-on-demand".

Giovanni: lol

Yan: We get notecard or URL jump by touch in SL.

Chuck: LOL

motoko: ^^;

Yan: but SL residents don't like get notecard and URL jump

Nukiri: mhmmm

Yan: that is our problem

Next, "View Relationships".

We can find relation if museum curator arranged objects carefully.

and finally, you "Extract" important findings and save for your purpose.

Do you realize above strategy are like our SL activity?

8-Bit: Yes, very much

Yan: Visitors are seeking information in SL.

It means curators need to design own museum navigation in considering with above visitor's strategy.

Vic, ok?

Vic: Yes, teleporting is like hyperlinking outside the website

Yan: Then, "Structuralizing Information" is essential for social knowledge but not formulated well yet.

"Show relations between Whole and Parts, and Part and Part"

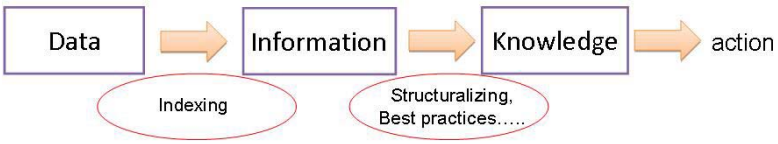
Do you realize it is same strategy as "Seeking Information"?

"Classification" is classical method but weak for new category.

"Mapping" is useful in SL to show relation between contents.

Last "Curation" is to arrange contents under some contexts, such as story, history, process, etc.

How to create Knowledge from Data? (2/2)



Structuralizing Information

- Show relations between "Whole and Parts", and "a Part and the other Part "
- Classification/ Taxonomy
- Berry picking search
- Mapping on evaluation axes….GIS, etc.
- Visualization
- Curating/ Curation

Yan: Do you also realize "Structuralizing Information" is also like SL activity?

not visitor-side but curator-side.

Yes, "Information Seeking" and "Structuralizing Information" are both side of the coin.

Yan: Then, Advantage of SL

SL's easy creation enable us to visualize own idea by oneself

It is very important advantage!

Once we visualize, we can easily collaborate.

Language depends on nations and disciplines. But visualization is borderless.

These are Abyss collaboration.

Advantages of SL (1/3)

- SL provide us object oriented intuitive 3D modeling method which enable us to visualize own idea by ourselves.
- Once we visualize own ideas, SL enable us to collaborate inter-disciplinary and multi-disciplinary beyond distance and time zone difference.

Example of Abyss Observatory

- More than 10 creators and a scripter from Japan, USA, France, UK and Colombia collaborate and contribute, NOAA, The Open University, UK, National Institute of Education, Singapore are supported.

Vic: It can be difficult to convey complex relatedness well on a flat medium and the 3D environment is easily editable. That is why the Abyss is such a great space to illustrate

such as complex topic.

Yan: There are many contributors participate here

Shailey, Draceina, Dugong, comet

thank you all^^

motoko: ^^

Shailey: Thank you, Yan - it is a great pleasure.

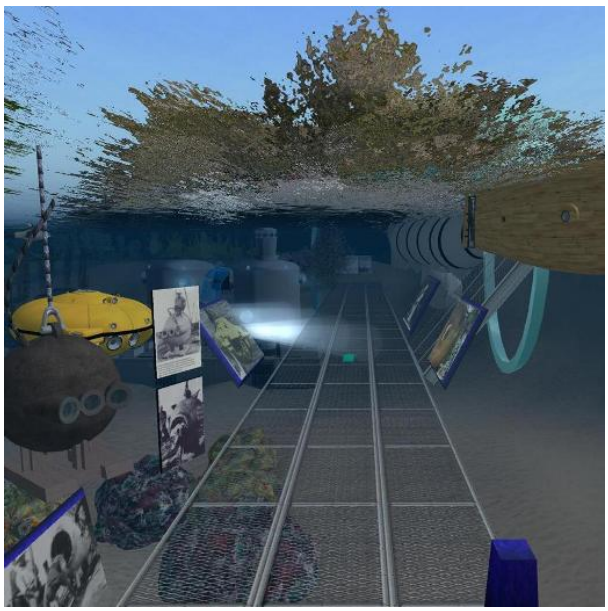
Yan: NOAA's research ship. Ship is created by French creator

and Japanese creators added Water sampler and Remotely operated vehicle.

This is first exhibits of Abyss

Submarine history,

These are 5 creators' submersible from Japan, USA and France in the Abyss.



Yan: Excavation sites of sunken city.

Archaeology and ocean science are different discipline,

but we could exhibit natural disaster and human civilization.

Vic: International and interdisciplinary collaboration at its finest!

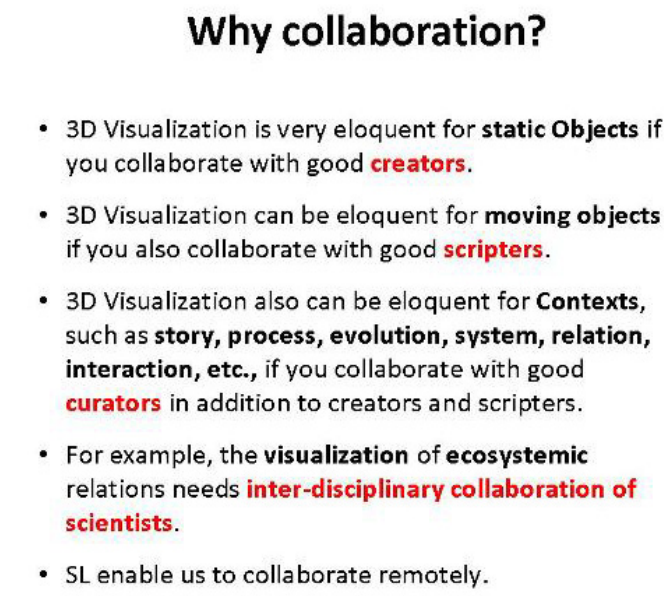
Yan: yes!

Shailey: Yes, indeed Vic.

Yan: Why collaboration?

3D becomes very eloquent if we get help of good creators. like Dugong

If we get help of nice scripter, 3D object can swim livery,



Dugong: ^_^

Chantal: :)))

Yan: If curator arranges creators' works under some contexts, story, history, relation, etc, their works become eloquent.

Museum curator can make new value from them.

Especially, to visualize ecosystem relation, it needs inter-disciplinary collaboration, because ecosystem relates geology, oceanography, biology of various species.

Chantal: Points to the beautiful Orca's above the audience

Yan: yes

As said above, visualization needs various collaborations,

And SL enables us to collaborate remotely.

"Remote inter-disciplinary collaboration" will create new "Value".

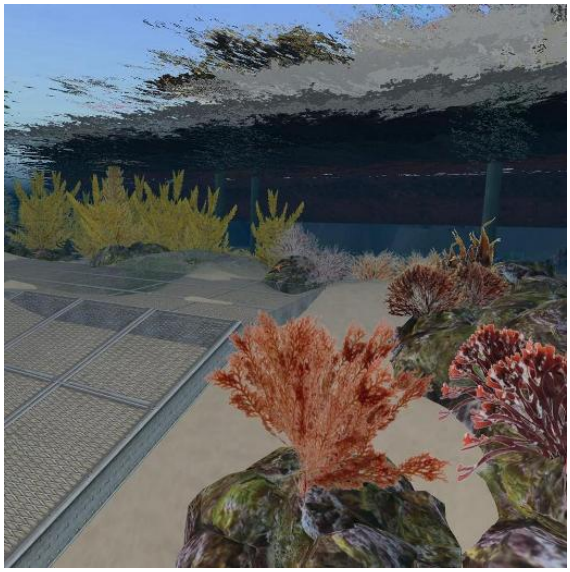
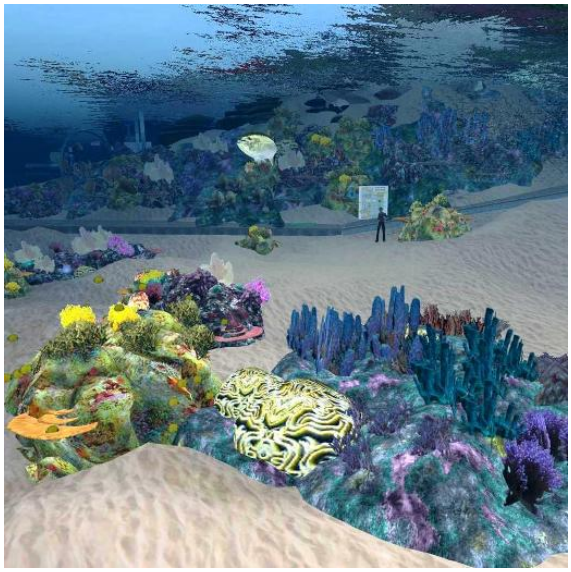
This is my most important purpose.

I'll show you 3 ecosystems

Seaweed forest. Coral reef.

These are consist from desert sand bottom, exposed rocks,

ingrained seaweeds and reefs, inhabited small animals…

8-Bit: I think next week will be time for a field trip for my students..

Vic: (Visit them now - they are disappearing)

Chantal: Smiles at 8Bit... love that

Yan: Welcome

They are depending on depth, temperature and food chain.

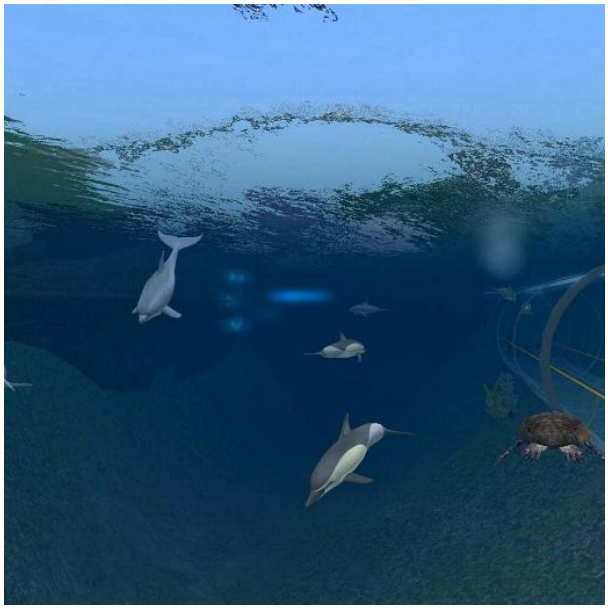
Jes: ✦✦✯□❺✦✦

Yan: This is Hydrothermal ecosystem.

Most frequently dived researcher to Hydrothermal advised me about distance from hot water to each species of deep sea lives.

School of dolphins at Abyss Observatory at Farwell

School is usual form of ocean lives but there are few exhibits of school in SL until now.

Yan: Please see following YouTube.

http://www.youtube.com/watch?v=uzD92u-Lqw0

Yan: This is Japan-Singapore exhibits in SL10B

8-Bit: beautiful

Yan: Next example, Earth simulation

There are two methods to display animation on a sphere.

Yan: Here is Ocean Current Simulation using GIF animation

Can you see? Pls type y or n.

Stephen: y

Dae: y

8-Bit: y

Chantal: Y

Nukiri: n

Patsy: y

Yan: good^^

You need to use v.3 viewer.

Advantage of SL (2/3)

Earth Simulation Animation on a Sphere

- **GIF animation**: using **"Shared Media** (Web on a Prim)" function of Viewers 2 & 3.
  - **Ocean simulation** (OFES) : 1 year ocean current motion (24 scenes).
  .....need less than 100 MB, 256 colors

- YouTube: **Continents drift motion** for 640 million years
  .....no limitation but need to install "Google Chrome", "Adobe flash player" and "shockwave player".

Jes: w!

Laci Luckstone: y

Yan: If you see only white sphere, please touch sphere and zoom.

Can you see file reading bar?

comet Morigi: y

Yan: Demerit is GIF file size need less than 100MB, and limited 256 color,

motoko: y

Yan: and take long time to read large GIF file.

Here is Continents drift using Youtube. Can you see? Pls type y or n.

Dae: y

Laci Luckstone: y

8-Bit: n u.u

Nukiri: n

motoko: ノ y

Stephen: y

Yan: please read yellow panel

There is no limitation of file size and you need not to wait for reading file.

But you need V.3 viewer, Google chrome, Adobe Real player and Shockwave player.

Nukiri: chrome and or Firefox?

Yan: very impressive animation by Chris Scotese

Both are very easy exhibits.

Nukiri: ahhh - GIF finally loaded on other sphere

Dae: For more info click: http://www.scotese.com

Chris would love to work with you

Yan: thank you Dae^^

Yan: Next demonstration,

SL has Havok 2k10 physics engine. We can experiment physical law easily

There are heavy cube and light cube. When I drop the weight, which cube will jump higher?

You know the answer, light cube. Do you agree?

Please draw your camera to see result

Giovanni: yes

Jes: yes

Yan: Then, 3, 2, 1,…

8-Bit: unless we're in a vacuum

Jes: true!

Nukiri: ???

Yan: yes light cube jump higher^^

Next Seesaw,

Vic: [I remember when one of the astronauts on the moon dropped a feather and a hammer at the same time and both landed at the same time... very impressive back then]

8-Bit: it's still a great jawdropper for the kids

Yan: ahaha

2 cube on one board.

Chantal: Never even saw that footage Vic :(

Yan: Then, which cube will jump higher?

Pls type the answer

Dae: is this for a vacuum

Nukiri: both same

Dae: same

Stephen: same.

Giovanni: lighter higher

Vic: Lighter still - same force but lighter object (I think)

Yan: no air resistance

Nukiri: physics engine here prob not using air resistance

Yan: Then, 3, 2, 1,…

8-Bit: Neat!

Jes: :D

Dae: yes same

Yan: same height^^

Vic: I think you can add resistance in physics engine (or at least friction)

Yan: The board gave same acceleration to both cubes, so same height.

It is same principle as Galileo's experiment at Pisa

We can plan various observation and experiment in SL cheaply, easily and safely.

Vic: Acceleration (A) = v/t (independent of mass) - gotcha

Yan: Then, I'll talk about only one of problems

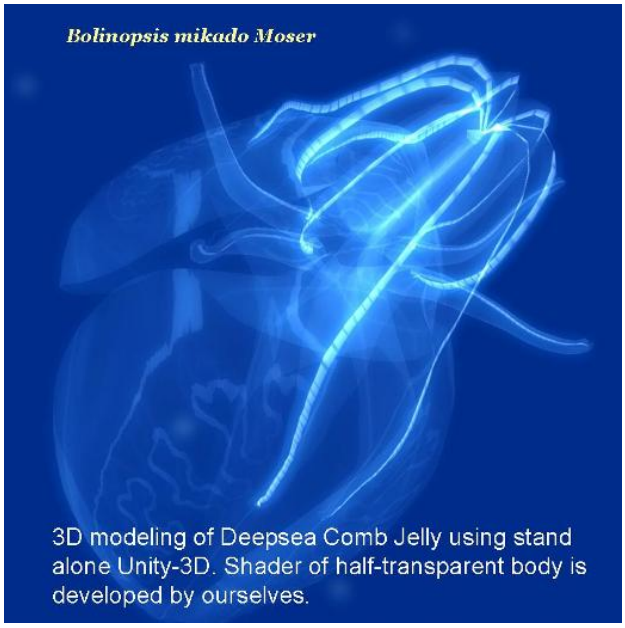
High quality 3D modeling needs professional creators

Problem of SL (1/3)

How to communicate with creators?

- We are living in 3D world, but we are mainly depending on non-3D method for communication, such as speech, writing and 2D drawing.
- **High quality 3D objects** which satisfy scientific needs can be created only by **professional creators**. But communication between researcher and creator is very difficult ,especially for transparent jelly fish.
- Researchers need to develop own capability to use SL easy 3D modeling method. But researchers **don't regard Second Life as a research platform yet**. So we can't involve researchers in collaborating with regards to environments yet.

Yan: This is Deepsea Comb Jelly using Unity-3D.



8-Bit: amazing

Yan: This modeling needs 8 month!

Why?

There are only several clear 2D photos and video by Remote Operated Vehicle.

Vic: Stunning 3D model

Yan: Researchers can re-construct perfect 3D model in his/her mind.

But they don't have enough skill to communicate to the creator.

They should exercise dessan. I don't know the word. drawing training?

Yan: This is another example.

There are many giant squid created by SL creators.

But there are several misunderstandings.

Giant Squid

- There is Back-side and Front-side. Fin is at Back-side and Funnel is at Front-side.
- Back-side color is dark, and front-side color is bright. It means they are living in shallow water not so long ago.
- They will swim back-side up and front-side down.
- Body color quickly changes and has metallic luster.
- Two eyes can look upward prey in brighter background.
- Giant Squid has eyelids and blinks.
- Main propulsion force is by water jet from Funnel. Tentacles and fin on back-side are not use for propulsion.

Shailey: This is beautiful, Yan.

Vic: Like military aircraft and submarines

Dae: yes great use of sl

Nukiri: impressive coloring gradients on model, Yan

Vic: SL is getting sophisticated in design ability - I have seen it evolve - will lead to Uniity3D/HTML5 and Web access in the not too distant future --- then many people will know about the potential of 3D worlds

Shailey: Yes, absolutely, Dae; I don't think that students can forget easily when they see such fantastic 3D structures

Yan: I show this model to Aley, then she improved and tentacles become move

Shailey: Yes, Vic. I do hope so.

Vic: Collaboration between biologists and graphic designers - important for realism

8-Bit: needs skin layers - muscle, bone, nerves, vascular

like GIS, can add layers, remove layers

Vic: THAT would be next step... if prims allow... ㋡

8-Bit: well, in the case of squid, cartilage..

Yan: umm, interesting talk^^

At last, final theme

Shailey: Even after working hard on proving that 3D VWs have a significant role in education and particularly STEM education, I don't think that I have won the battle as yet or overcome the mental barriers of colleagues who have never come and visited 3D VWs themselves

8-Bit: Tough sell Shailey

Chantal: yes sad enough it still is :(

Vic: I agree completely with Shailey (after trying for years to win battles at my university)

Dae: We need to advertise what we do in mainstream journals

8-Bit: But if I can convince a public high school to spend money on virtual space, there is hope yet

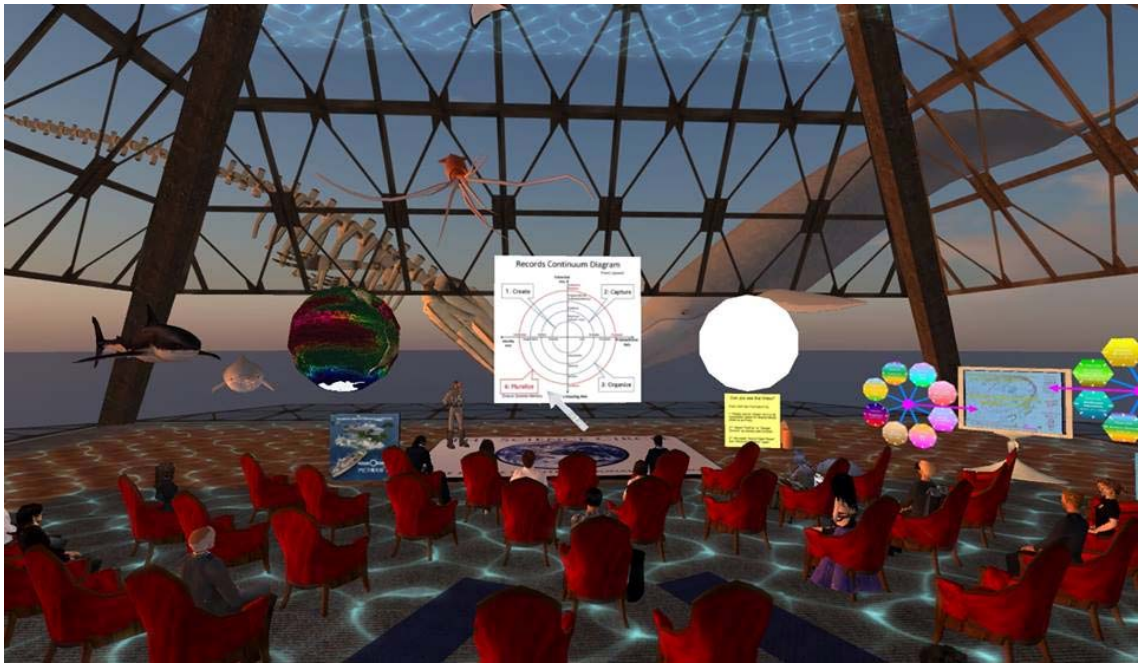
Yan: then, continue^^

Dae: I face the same problem in Virginia USA

Yan: Inter-disciplinary Efforts

I'll read your discussion later^^

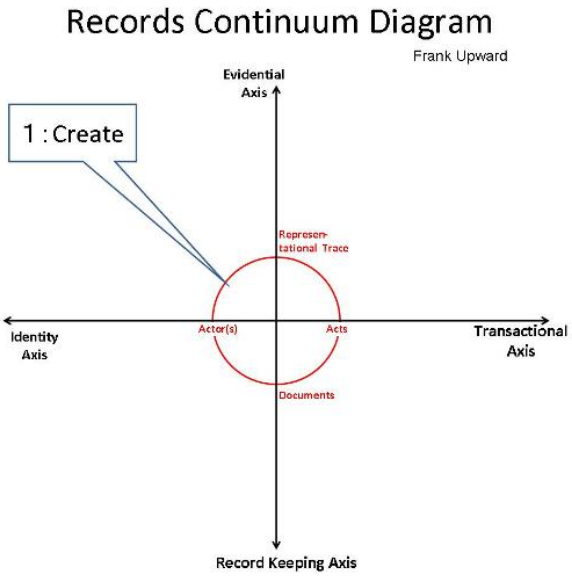
Vic: Yes, I have some strong proponents in my university in graduate nursing and pharmacy programs.

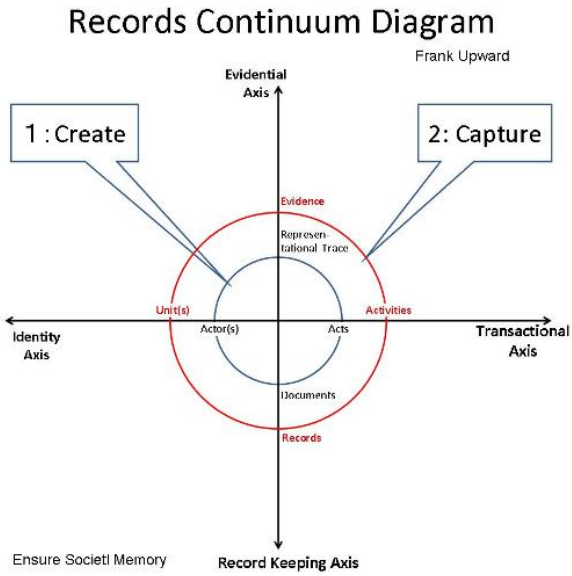


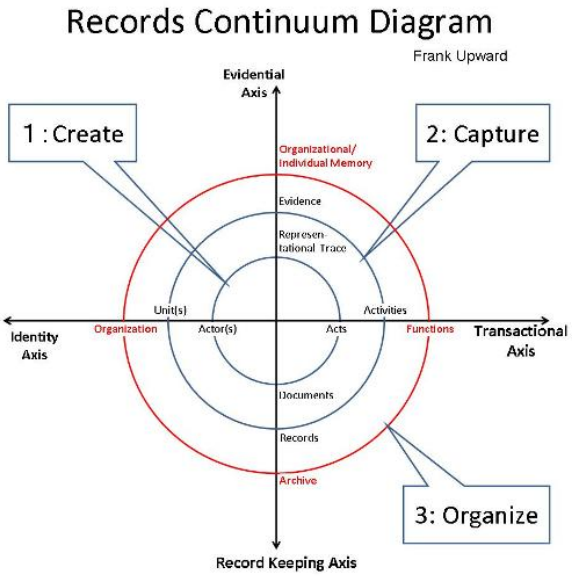
Yan: This is Records Continuum Diagram

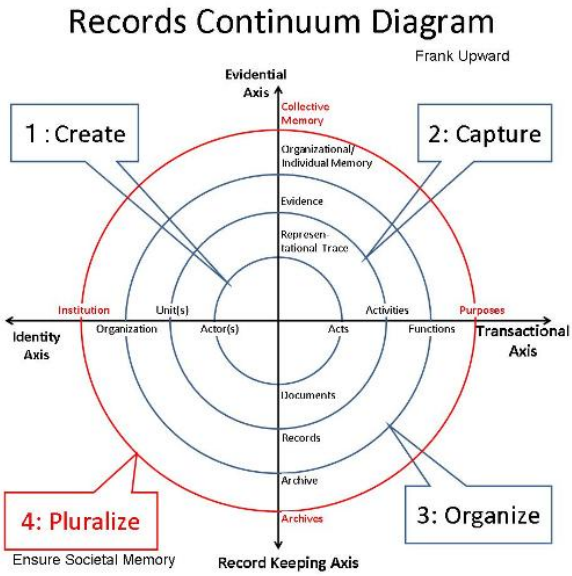
1. create data
2. capture by indexing, etc.
3. organize records in each organization
4. Integrate with other organization records

to ensure social knowledge.









Yan: Usual organizations are struggle from 1 to 2.

Only major data center try to reach stage 3

Vic: The "Integrate" part is hardest and the key

Yan: Yes

Stage 4, There are a few activities to integrate for social knowledge.

Important thing, this diagram says not stage by stage 1, 2, 3…

not 1,2,3.. but simultaneously consider all stage 1 to 4

like a stone into water creates a ripple and spread. Do you understand?

Stephen nods

Chantal: yes ㋡

Vic: That is what we are doing! We are the stones in the water -- if we ripple enough others will understand 3D worlds later...

Yan: yes^^

So I also consider stage 4, inter-disciplinary.

This teleport hub is one of such a model.

Shailey: Yes, indeed Vic - your statement is very encouraging

Yan: Touching upper part shows Natural Science categories.

8-Bit: O.O Who do I need to arm wrestle to get one of these?

Vic: Yan!

Yan: these are lower part

8-Bit: oh uh.. he looks very formidable

Yan: And select one of category,

Vic: Yan would love for you to put them in different spots in SL

8-Bit: look.. at all.. the links.. *swoons*

Yan: I enjoy quest in SL^^

Vic: Much work went into this --- including updating a famous website that used to keep track of all science spaces in SL

Yan: Draceina develop this system

Nukiri: YAY Dracy

Yan: Then, each board is teleporter to the destination

Draceina: ＴＹ

Chantal: applauds for Draceina ツ

8-Bit: I was told that once there was a place to go on Darwin's Voyage on the Beagle.. but the group left second life
and took the entire experience with them

Dae: shame

Vic: I HAVE the Beagle here on STEM Island! Look to the NW

Shailey: Yes, 8-Bit, you are right!

Jes: ツ

Vic: I rescued it from Nature's island (Elucian Islands)

Stephen: http://www.nature.com/press_releases/darwingame.html

Yan: We can see Beagle in this SIM but we lost land exhibits

Stephen: Yay, Vic!

Yan: Touching lower part shows the other categories,

Chantal: That's great Stephen, thank you ☺

Shailey: Oh great, Vic

Yan: Art, History, World….

Vic: Yes, they had an entire exhibit on it... I just have the ship (sorry)

Yan: Once rezzed this teleporter, destinations and categories are remotely updated from database.

I hope estate owners will rez at public places. I ask your contribution^^

Vic: That is very impressive Yan! (and Dracy!)

Nukiri: *winces* at thought of keeping database updated, even with robots helping

Yes, very impressive and a good idea to go through one prim

Vic: Yes! (teaches database management systems)

Yan: Final page, this is inter-disciplinary workshop for science exhibits.

Next MIWoSE is here and by Vic.

Dae: You mentioned Unity Yan, my students and I are making progress in web based vw , check out this website

Yan: Vic, do you say something?

Dae: http://www.evwllc.co/oceans/WebPlayer.html

Yan: oh thank you^^

Dae: and vw for ios devices are possible too

Vic: (said too much I'm afraid, but this is exciting stuff...)

Yan: ioS?

Dae: check out Science Island and Geology Island 2 on the app store for ipads, ipod touch 5, and iPhone 5, yes ios

8-Bit: For Mac

Vic: Wow! Thanks, Dae.... always like learning new things at these meetings

Dae: the website I put up: http://www.evwllc.co/oceans/WebPlayer.html works on the mac

Chantal: Thank you Dae!

8-Bit: Yan I will put up at my classroom if you would share a copy of teleporter with me

Yan: So you are December speaker of MIWoSE, Dae^^ Next of Oddprofessor

Please check http://aquarobo.com/abyss/MIWoSE.htm

Stephen thinks Dae walked into that one.

Yan: Thank you very much for your attention^^

Draceina: Thank you

8-Bit: Great Job!!

Yan: Is there any question?

Stephen: Thank you, Yan.

Dae: Great job

Jes: YAY! Thank you so much Yan, for this presentation ツ

Yan: ty^^

Dae: Yan always has interesting presentations

Nukiri: Thank you for your excellent overview

Chantal: Applauds ツ

motoko: pachi pachi pachi pachi!

Vic: What a wonderful presentation! You put a lot of work into this...

Dugong: Great presentation

Patsy: Thank you

Giovanni: Thank you Yan

Jes: agrees, was really awesome Yan ツ

Shailey: Thank you, Yan. I like your systematic and thoughtful approach to analysis and reflection.

Yan: I didn't talk about Abstract all

Nukiri: putting the squid in the audience was dramatic - it almost ate Chantal

Chantal: hehehhehehe

Shailey: Yes, I am with Vic - lot of work would have gone into the preparation.

Stephen: QUESTION: Do you have any instructions or written guidelines so that educators in VW can relatively easily integrate it into classrooms? Some prepackaged learning lessons?

Yan: I wrote only one paper

https://journals.tdl.org/jvwr/article/view/6304

Shailey: A beautiful location!

8-Bit: We need a storehouse of categorized build for education

in a cloud space independent of SL so if the builders leave, the content is still available maybe paid by contributions from Circle and other education related groups

Vic: Stephen -- wish it were so but it takes a lot of work to put that together and SL is usually just a few dedicated individuals on any sim..

Chantal: Sounds like a plan 8-Bit

8-Bit: Great Educators that are also great builders are rare

Chantal: we have a few ☺

8-Bit: But if the educators had access to the builds, more likely to come use the space

Stephen: I understand, Vic. It's a lot of work. One reason I haven't been good at it myself for my stuff.

Yan: I'll write new paper using todays topics

Jes: ☺

Nukiri: Thank you, everyone. have to poof

Quaezar: Bye ☺

Chantal: Waves at everyone leaving

8-Bit: I'm going to go ride the orcas now, if that's ok <.<

Jes: Thanks for coming ^^

Jes: please do 8bit

Patsy: Bye

Yan: ahaha bye, thanks^^

8-Bit: awesome!!

Dugong: If you have time, please try riding orcas above

Chantal: Yan, wonderful presentation!

Yan: thank you all^^

Jes: great Yan ☺ loved it. Thank you

Stephen is off to put that teleport hub on his land

Yan: I need to learn from you all

Chantal: ☺

Jes: seeya Stephen ☺

8-Bit: Yan, if we want copy of teleporter to put up?

Vic: Thank you for all your work! And thank you to all of the contributors to The Abyss!

Quaezar: that's the idea.. we learn from each other