HOW MUCH IS THAT DRAGON IN THE WINDOW?

WHY WE NEED ARTISTS TO BEHAVE LIKE PROGRAMMERS

CONTENT AWARD VIENNA

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- THIS IS A TALK ABOUT A **PROBLEM** FACED BY PEOPLE WHO WANT TO MAKE **WORLDS** INSIDE **COMPUTERS**

- BY "WORLD" HERE, I MEAN **3D SPACES**

- A LOT OF THESE PEOPLE ARE **GAME** DESIGNERS
  - BECAUSE GAMES ARE **COOL** AND **FUN**!

- **OTHERS** ARE PHYSICISTS, ARCHITECTS, BIOLOGISTS, HISTORIANS, TOWN PLANNERS, ...

- THE PROBLEM IS BIGGEST FOR THE DESIGNERS OF **MMORPGS**, OR **VIRTUAL WORLDS**
  - **I** AM SUCH A DESIGNER

- TO **EXPLAIN** THE PROBLEM, I'M GOING TO TAKE YOU ON A QUICK **JOURNEY** INTO THE PAST

  - AS A **SIDE-EFFECT**, YOU'LL FIND OUT WHY IT'S **ME** GIVING THIS TALK AND NOT SOMEONE **ELSE**...

• RIFT, TRION WORLDS, 2011:

- ## THE LORD OF THE RINGS ONLINE, TURBINE, 2007:

- WORLD OF WARCRAFT, BLIZZARD, 2004:

- **EVERQUEST, SONY ONLINE ENTERTAINMENT, 1999**

DIKUMUD, COPENHAGEN UNIVERSITY, 1990

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[x2] A barrel has been left here.
An angry-looking statue of Hoturi is standing here.
An angry-looking statue of Priapus is standing here.
A statue of Odin is standing behind the altar.
A Sign for Newbies is here.
You are a guest here until you save yourself.

If you need
to get to your guild, use the guild medallion in your inventory. If you lose
it, pray to the statue of Odin for another.


105m/202e/38hlook
Temple of Udgaard
    You are inside the small and humble village temple in Udgaard.  A simple
stone altar, with strange stone carvings, is placed against the north wall.  A
small humble donation room is to the east.  The temple exit is south to the
Village Square.
[x2] A barrel has been left here.
An angry-looking statue of Hoturi is standing here.
An angry-looking statue of Priapus is standing here.
A statue of Odin is standing behind the altar.
A Sign for Newbies is here.

105m/202e/38h
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• ABERMUD, ALAN COX, 1987

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Your wimpy value is set to 15. See 'help change' to see what that means.

The Temple Of Paradise
    You stand in the Temple of Paradise, a huge sandstone structure whose
walls are decorated with ancient carvings and runes, some so old that even
the priests no longer know their meanings.
    A single set of steps lead south, descending the huge mound upon which the
temple is built and ending in the forests below.
A roaring fire burns here.  Its flames make the temple sparkle and glitter.
    At your feet a huge sacrificial pit allows you to give valuables to the gods
in the hope of being rewarded.
A furled umbrella lies here.

Obvious exits are:
North : Welcome Center
South : Forest Track
 Down : Forest Track

Last login: Wed Sep  7 17:43:26 2005


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- MUD, ROY TRUBSHAW & RICHARD BARTLE, 1978

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Narrow road between lands.
You are stood on a narrow road between The Land and whence you came.
To the north and south are the small foothills of a pair of majestic
mountains, with a large wall running round. To the west the road
continues, where in the distance you can see a thatched cottage
opposite an ancient cemetery. The way out is to the east, where a
shroud of mist covers the secret pass by which you entered The
Land. It is raining.
*w
Narrow road.
You are on a narrow east-west road with a forest to the north and
Gorse scrub to the south. It is raining. A splendid necklace lies
on the ground.
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- MUD DIDN'T COME FROM **ANYTHING**

- **THIS** IS WHY I GET TO CALL MYSELF A VIRTUAL WORLD DESIGNER

• WHAT DID I NEED TO KNOW TO WRITE *MUD?*

- • MEMORY CORES LINKED ACROSS A MATRIX OF WIRES WITH A READ/WRITE LINE CAN BE USED TO REPRESENT BINARY DIGITS. GROUPS OF THESE CAN BE USED TO STORE DATA AS WORDS. WORDS CAN BE DECODED USING LOGIC CIRCUITS TO OBTAIN INSTRUCTIONS. FLIP-FLOPS CAN BE BUILT FROM NAND GATES AND STRUNG TOGETHER THE MAKE HALF-ADDERS, FULL-ADDERS AND OTHER BASIC OPERATIONS. A FETCH-EXECUTE CYCLE DRIVEN BY A TIMING PULSE CAN MAKE THESE OPERATIONS TAKE PLACE IN SEQUENCE. THE INITIAL INSTRUCTIONS CAN BE LOADED INTO MEMORY FROM A PAPER TAPE WITH HOLES READ BY MAGNETIC BRUSHES (THE HOLES MEAN 1, SPACES MEAN 0). THESE INSTRUCTIONS CAN THEN BE USED TO LOAD FURTHER INSTRUCTIONS FROM MAGNETIC TAPE (9-TRACK WITH A PARITY BIT) AND SO ON IN A SERIES OF STAGES TO BOOT UP THE OPERATING SYSTEM A LAYER AT A TIME. THE OPERATING SYSTEM IS PAGED, SO A PAGE TABLE TRANSLATES THE RELATIVE ADDRESSES USED BY PROGRAMS INTO ABSOLUTE ADDRESSES IN MEMORY. THERE ARE FOUR KINDS OF MEMORY: REGISTERS (VERY FAST BUT ONLY A HANDFUL OF THEM); CACHE (VERY FAST BUT EXPENSIVE, USED TO STORE MEMORY LOCATIONS LIKELY TO BE USED SOON); SHARED (EVERY PROCESS CAN ACCESS IT BUT IT'S NON-WRITEABLE); LOCAL (WRITEABLE BUT ONLY BY ONE PROCESS). PROGRAMS ARE WRITTEN IN AN ASSEMBLY LANGUAGE FROM WHICH AN ASSEMBLER AND A LINKER CAN CREATE A RELOCATABLE BINARY FILE OF EXECUTABLE INSTRUCTIONS. MOST OF THIS WILL CONSIST OF CALLS TO INSTRUCTIONS IMPLEMENTED IN HARDWARE BUT SOME OPERATIONS ARE NOT EXECUTABLE DIRECTLY AND WILL CAUSE AN INTERRUPT THAT IS PICKED UP BY THE OPERATING SYSTEM; THE O/S WILL INTERPRET THESE IN SOFTWARE. ONE OF SEVERAL HUNDRED SUCH SYSTEM CALLS ALLOWS FOR THE SHARED, UNWRITEABLE MEMORY TO BE MADE WRITEABLE, THEREBY ALLOWING MULTIPLE PROCESSES TO COMMUNICATE WITH ONE ANOTHER BY WRITING TO KNOWN ADDRESSES IN THE SHARED MEMORY. A HIGH-LEVEL LANGUAGE IS LIKE AN ASSEMBLY LANGUAGE EXCEPT ITS INSTRUCTIONS DON'T MAP ONE-TO-ONE ONTO MACHINE INSTRUCTIONS OR SYSTEM CALLS. HIGH-LEVEL LANGUAGE COMPILERS TREAT AN INPUT FILE AS DATA FROM WHICH THEY CONSTRUCT THE ASSOCIATED PROGRAMS. YOU CAN WRITE THE COMPILER OF A HIGH-LEVEL LANGUAGE IN EITHER ASSEMBLER OR A HIGH-LEVEL LANGUAGE. TO CREATE A VIRTUAL WORLD, YOU NEED TO DESIGN A LANGUAGE FOR SPECIFYING THE VIRTUAL WORLD, THEN WRITE A COMPILER FOR THAT IN HIGH-LEVEL LANGUAGE, DROPPING A DATA FILE THAT A SECOND PROGRAM CAN INTERPRET AS INSTRUCTIONS. THESE TWO PROGRAMS SHARE ASSEMBLY-LANGUAGE MODULES TO KEEP THE MEMORY ADDRESSES ALIGNED. WHEN PEOPLE RUN THE SECOND PROGRAM, SOME OF THEIR DATA — REPRESENTING THE WORLD — IS SHARED WITH OTHER PEOPLE ALSO RUNNING THE PROGRAM. THEREFORE, IF ONE OF THEM DOES SOMETHING TO CHANGE THE WORLD, SUCH AS OPENING A DOOR, THE WORLD CHANGES FOR THE OTHER PLAYERS, TOO. OH, YOU ALSO NEED TO KNOW HOW TO DESIGN WORLDS, TOO.

- WHAT DO YOU NEED TO KNOW **TODAY** TO WRITE A VIRTUAL WORLD?

- HOW TO RAISE $25,000,000

- OK, SO YOU DO NEED TO KNOW **MORE** THAN THIS TO MAKE A **SUCCESS** OF IT
  - CUSTOMER SERVICE, PROJECT MANAGEMENT, BILLING, SECURITY, DATABASE MANAGEMENT, COMMS, QA, TOOLS-BUILDING, HOW TO DESIGN WORLDS...

- HOWEVER, YOU **ONLY** NEED TO KNOW MORE **BECAUSE** IT'S COSTING $25,000,000

- YOU **WOULDN'T** NEED TO KNOW MORE IF IT WAS COSTING ONLY YOUR **TIME**
  - BECAUSE YOU COULD AFFORD TO TAKE **RISKS**

- THE BASIC **PRINCIPLES** BEHIND TODAY'S MMOS ARE THE **SAME** AS IN THE EARLY DAYS

- INDEED **SOME** MAJOR OBSTACLES HAVE BEEN REMOVED

  - COMPUTERS ARE **STUPENDOUSLY** MORE POWERFUL YET **AMAZINGLY** INEXPENSIVE

  - MOST OF THE **CODE** YOU NEED HAS **ALREADY BEEN WRITTEN** AND IS AVAILABLE FOR **FREE**

    - YES, FOR **FREE** – PROGRAMMERS PROGRAM FOR FUN!

- SO **WHY** THE **EXPENSE**?

WOW

Auction house.
You are standing in a busy auction house. A large stage, adorned with
two immense pumpkins, dominates the scene. The walls are covered with
a wide variety of things that people want to buy (or at least that
people want to sell). Three sets of green curtains draped languidly
on the north wall do their best to lend some grandeur to the hall,
not entirely successfully as they haven't been moved in years.
Auctioneer Fitch stands before you.
Dyunan of Save the Bunnies is here
Sophialla of blood mana is here.
Meatshieldd of Relentless Intent is here
Tezzla of Beyond is here.
Yeahwhatever of Two Man Raid is here.
Magichat of The Forgotten is here.
Imdaboss of Natural Fury is here.
Tonyrocco of Apathy is here.
Ilhercy is here.
Caffine of LochModanYachtClub is here.
Caffine's pet, Whitefang, is here.
*
On the Trade channel, Randam says: "Holy/ret pally lf BH"
*

- TEXT IS **DEAD** FOR CREATING WORLDS NOW

- NO-ONE USED TO **THIS** WILL ACCEPT **THIS**

- SO, PEOPLE WHO WANT TO CREATE THEIR **OWN** WORLDS NEED TO DO IT USING **GRAPHICS**

- **THAT'S** WHAT'S EXPENSIVE
  - ALL **OTHER** EXPENSES **FLOW** FROM THAT

- THE **TOOLS** TO **CREATE** 3D GRAPHICS AREN'T ALL THAT COSTLY GIVEN WHAT YOU GET
  - OK, SO **PROFESSIONALS** USE *3DS MAX* OR *MAYA* AT $3,495 EACH
  - **HOBBYISTS** USE *BLENDER*, WHICH IS FREE!
- THE (NON-PROPRIETARY) ENGINES TO **BUILD** AND **RUN** 3D WORLDS ARE INEXPENSIVE OR FREE, TOO
  - *UNITY PRO* IS $1,500, *TORQUE 3D* IS $179
  - **MANY** GOOD OPEN-SOURCE ENGINES, EG. *OGRE*

- THE THING IS, ONCE **SOMEONE** HAS WRITTEN A PIECE OF CODE TO DO SOMETHING, NO-ONE **ELSE** NEED WRITE IT **EVER AGAIN**
  - THEY **CAN** WRITE IT IF THEY **WANT**, JUST THEY DON'T **HAVE** TO IF THEY CAN FIND A LIBRARY THAT DOES IT **ALREADY**
- THIS IS WHY PROGRAMMERS **HATE** THE IDEA OF SOFTWARE PATENTS
  - MUCH AS **LAWYERS** WOULD HATE THE IDEA OF PATENTS ON **LEGAL DEFENCE** ARGUMENTS

- THE SITUATION WITH **GRAPHICS** IS A LITTLE DIFFERENT...

- # THE ASSETS HAVE TO BE FROM THE SAME GENRE

  - I GUESS THIS **WOULD** BE OK IF YOU WANTED PIRATES AND SPACE COPS IN THE SAME GAME

  - CREDIT: ANDREI SZASZ

personal project ,hard Surface modeling study
Modeling: Zbrush, Rendered in Zbrush & Photoshop

Andrei Szasz - 3d artist
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- # THE ASSETS HAVE TO BE IN THE SAME STYLE

- CREDITS: ANDERSSEIM (LEFT), SUPERCIGALE (RIGHT)

- # THE ASSETS HAVE TO HAVE COMPATIBLE COMPLEXITY

- ## SAME TREE: LOW POLY   HIGH POLY

- CREDIT: ASSAF RAMAN

- THE ASSETS HAVE TO BE **AFFORDABLE**

- 8 LOW-POLY PEOPLE WITH SINGLE ANIMATION $195
  - $95 FOR STATIC MODELS

- ~$25 EACH FROM GOT3D
  - SEEMS REASONABLE?

- EXCEPT FOR A VIRTUAL WORLD I NEED **10,000** OF THEM

  - I REALLY JUST WANT **20** HIGH-POLY MODELS WITH REPLACEABLE FACES, SKIN TONES AND CLOTHES

- ALSO MORE **ANIMATIONS** ARE NEEDED THAN BASIC **WALKING** AND MOOCHING AROUND

- FOR HUMANS, YOU NEED THEM FOR PRETTY WELL **ANYTHING** EVERYDAY THAT A HUMAN CAN DO
  - **PLUS** HITTING THINGS WITH SWORDS

- YOU ALSO NEED **TOOLS** TO LET A NOVICE CHANGE SIZES, TEXTURES, COLOURS, SHADERS ETC. **EASILY**
  - EASILY AS IN "AS EASY AS CHANGING **TEXT** ON A WORD PROCESSOR"

- HOW DOES ART ASSET PROCUREMENT FOR THE NON-ARTIST WORK **TODAY**?
- AS AN **EXPERIMENT**, LET'S SAY I WANT A 3D MODEL OF A RED **PAGODA** WITH WHITE ROOFS, ORIENTAL-LOOKING WITH 7 OR 9 STOREYS
- SOMETHING LIKE **THIS**
  - HWANGNYONGSA, KOREA
    - MODEL (REAL ONE IS RUINED)

- IF I WERE MAKING A **GAME** WORLD, I'D WANT IT WITH AN **INTERIOR** THAT HAD FLOORS AND A **STAIRCASE** – BUT LET'S NOT BE FUSSY

- I TYPE Hwangnyongsa INTO GOOGLE AND FIND A PRETTY GOOD *SKETCHUP* MODEL EXISTS

- ## THIS IS FINE, EXCEPT:
    - THE ROOFS ARE BLACK BUT I WANTED **WHITE** ROOFS
    - THE WALLS ARE PINK BUT I WANTED **RED** WALLS
    - I DON'T **JUST** GET THE PAGODA, I GET THE SURROUNDING **TEMPLE** COMPLEX TOO AS A SINGLE MODEL
    - IT HAS "MODERATE" COMPLEXITY, SO WILL ONLY LOOK GOOD ALONGSIDE **OTHER** MODELS WITH MODERATE COMPLEXITY
    - NOW I'VE SEEN IT, MAYBE IT WOULD BE BETTER WITH **7** STOREYS, TAPERED A LITTLE MORE?
    - I CAN'T **DOWNLOAD** THIS MODEL, BECAUSE THE RUINS OF THE REAL THING ARE **FRAGILE** AND WOULD **COLLAPSE** IF A TERRORIST **HIT THEM** IN JUST THE RIGHT PLACE

- THERE ARE **MANY** SITES OFFERING 3D MODELS
- TURBOSQUID HAS **45** PAGODAS
  - 122 IF YOU COUNT DUPLICATES IN DIFFERENT FORMATS
  - MEAN PRICE: $77 PER PAGODA
- THIS ONE **IS** ACTUALLY MORE LIKE WHAT I WANT!
- EXCEPT IT
  - NEEDS **TEXTURES**
  - GIVES NO **POLY** COUNT
  - COSTS **$78.90**

- IT'S **NOT HARD** TO FIND AN **INDIVIDUAL** MODEL OF SOMETHING IF YOU **WANT** ONE

- MY PAGODA SEARCH TOOK **20 MINUTES**
  - QUICKER **AND** CHEAPER THAN IF I **PAID** SOMEONE TO **MAKE** ONE FOR ME

- FINDING A SUITABLE 3D MODEL OF **ONE** STATIC OBJECT IS BASICALLY **EASY**

- WHAT'S **HARD** IS FINDING **HUNDREDS** OF **RELATED** OBJECT THAT ALL LOOK **GOOD** TOGETHER

- **IDEALLY**, I COULD GO TO A WEB SITE AND DOWNLOAD A **CONSISTENT** SET OF MODELS, MOST OF WHICH I **WON'T** EVER USE BUT CONCEIVABLY **MIGHT**

- **NO** SUCH WEB SITES **EXIST**

- **THIS** IS WHY GAMES COMPANIES HAVE TO DO ALL THE ARTWORK THEMSELVES

- **THIS** IS WHY IT'S SO **EXPENSIVE**

- HMM, EXCEPT THERE **ARE** SUCH SETS OF MODELS LYING AROUND...

- WHEN I BUY A GAME, I GET A CONSISTENT SET OF MODELS AND ANIMATIONS **IN THE GAME**

- SOMETIMES, I CAN **USE** THESE TO CREATE **MODS** FOR THE GAME
  - USER-CREATED CONTENT
  - COUNTER-STRIKE WAS A MOD FOR *HALF-LIFE*

- I CAN **ALSO** USE THEM **WITHIN** THE GAME ENGINE TO CREATE **MACHINIMA**
  - RATHER **LIMITING**, BUT THERE **ARE** SOME VERY INVENTIVE ONES OUT THERE

- WHAT I **CAN'T** DO IS **EXPORT** MODELS FROM A GAME TO USE IN MY **OWN** GAME
  - WELL, NOT WITHOUT BREAKING EVERY **IP LAW** KNOWN TO HUMANITY

- IF SETS LIKE THE ONES MADE FOR INDIVIDUAL GAMES WERE AVAILABLE ON THE **MARKET**, I COULD USE THEM TO MAKE MY **OWN** WORLDS
  - SO COULD ANYONE **ELSE** WHO WANTED TO MAKE THEIR OWN WORLDS

- YES, I'D PAY **$100** FOR THAT

- NOW YOU'RE ALL SITTING HERE **POLITELY**
  - ALBEIT SAYING **IMPOLITE** THINGS OVER TWITTER
- HOWEVER, I DON'T SUPPOSE MANY OF YOU ACTUALLY **WANT** TO MAKE INDIE VIDEOGAMES
- THERE ARE LOTS OF **OTHER** THINGS YOU COULD USE INTEGRATED 3D ASSET SETS FOR, THOUGH!
- WHEN GAME DESIGNERS DESIGN GAMES, THEY FREQUENTLY BUILD A **PROTOTYPE** FIRST
- 3D WORLDS CAN **ALSO** BE USED TO PROTOTYPE **OTHER** THINGS

- FILM-MAKERS WILL OFTEN SHOOT **TEST** SCENES
- **FEW** WOULD SHOOT AN ENTIRE **MOVIE** USING INTERNS INSTEAD OF ACTORS, THOUGH
  - RETAKES AND RESHOOTS FROM EVERY ANGLE WOULD **STILL** BE **CRAZILY** EXPENSIVE
- BUT IF THEY COULD DO IT IN **SOFTWARE**?
  - DOWNLOAD A "FILM NOIR" LIBRARY
  - QUICKLY ASSEMBLE AND FLESH OUT 3D SCENES
  - COMPETENT ANIMATIONS FOR ACTION
  - TEXT OR COMPUTER-GENERATED SPEECH FOR DIALOGUE

- YOU **COULD** PUT TOGETHER A DECENT **MOVIE** PROTOTYPE WITH SUCH A SYSTEM
  - GET YOUR **CAMERA ANGLES** SORTED
  - TEST YOUR **PACING**
  - HONE THE **DIALOGUE**
  - SHOW YOUR **ACTORS** WHAT YOU EXPECT OF THEM
  - LET YOUR WARDROBE, PROPS AND SCENERY PEOPLE CREATE **INVENTORIES** OF WHAT THEY'LL NEED
  - COMPOSE **MUSIC** THAT FITS THE ACTION BETTER
  - CREATE AN AUDIT TRAIL FOR **CONTINUITY**

- **GAMES** USE PROTOTYPES BECAUSE MISTAKES ARE **CHEAP** TO CORRECT BEFORE PRODUCTION STARTS

- THE **SAME** APPLIES TO MOVIES, BUT AT THE MOMENT THEY TYPICALLY PROTOTYPE ONLY THROUGH **STORYBOARDING**

- SOME ANIMATION COMPANIES **DO** USE GAMES-LIKE PROTOTYPING
  - **PIXAR** IS A LEADER HERE

- **LIVE ACTION** MOVIES COULD DO IT **TOO**

- WE'RE SEEING **SOME** OF THIS HAPPENING NOW AT A GRASS ROOTS LEVEL

- *SECOND LIFE* ALLOWS USERS TO CREATE **OBJECTS** AND **ANIMATIONS** IN 3D SPACE

- MOST OF THESE ARE **AWFUL**, BUT IF EVEN **1%** ARE GOOD THAT'S STILL A **LOT** OF GOOD

- THERE ARE SOME COMPANIES USING *SL* TO **PROTOTYPE** TV SHOWS, CARTOONS & COMMERCIALS

  – THEY STILL HAVE TO USE DIGITAL **ACTORS**, THOUGH

- *SECOND LIFE'S* ART/ANIMATION ASSETS ARE **NOT** IN A CONSISTENT **STYLE**

- THEY'RE **NOT** AVAILABLE IN RELATED **SETS**

  – UNLESS YOU WANT TO DO A PORN MOVIE...

- IF ONLY THE DEVELOPERS HAD **ACCESS** TO THE ART AND ANIMATION ASSETS OF, SAY, *THE SIMS 3*, THEY COULD WORK **WONDERS***!*

- IF ONLY **ARTISTS** WERE MORE LIKE **PROGRAMMERS**...

- PROGRAMMERS HAVE DEVISED **STANDARDS** AND PROTOCOLS TO ENABLE WILDLY **DIFFERENT** PIECES OF SOFTWARE TO **WORK** TOGETHER

- WHAT'S REQUIRED IS FOR SIMILAR STANDARDS TO BE APPLIED TO **ART** AND **ANIMATION**

- PEOPLE CAN DO ABOUT AS **MUCH** WITH A SINGLE **3D ASSET** AS THEY CAN WITH A SINGLE **LINE OF CODE**

- THEY NEED FORMAL 3D **ASSET** LIBRARIES, LIKE PROGRAMMERS NEED FORMAL **CODE** LIBRARIES

- PROGRAMMERS HAVE A THRIVING **FREE SOFTWARE** VIBE GOING ON

- THEY REGARD PROGRAMMING AS **FUN**, SO PROGRAM FOR FUN IN THEIR **SPARE TIME**

- THERE'S **NO REASON** THIS COULDN'T WORK FOR ARTISTS AND ANIMATORS

- THE WILLINGNESS TO CONTRIBUTE **IS** OUT THERE

  – THESIMSRESOURCE.COM HAS 31,000 OBJECTS, 13,000 ITEMS OF CLOTHING, 17,000 WALL/FLOOR PATTERNS

- WHAT THEY'RE LACKING IS **ORGANISATION**

- STANDARDS **CAN** DEVELOP FROM AD HOC BEGINNINGS AND REMAIN TRUE TO THEIR IDEALS
  - *WIKIPEDIA!*

- AS FOR WHAT THOSE STANDARDS WOULD **BE** FOR ART & ANIMATION, I **DON'T KNOW**

- I **DO** KNOW THAT LEAD ARTISTS PRODUCE "**BIBLES**" FOR GAMES AND CARTOONS, WHICH AMOUNT TO A SET OF DESIGN **PRINCIPLES**

- IF THEY ALL FOLLOWED THE SAME FORMAL **FORMAT**, THAT WOULD BE A **STANDARD**

- ULTIMATELY, WE SHOULD SEE COLLECTIONS OF 3D ASSETS FREE OR CHEAP FOR **ANYONE** TO USE
- THEN, WE'LL **LIBERATE** PEOPLE TO CREATE NEW CONTENT IN PICTURES LIKE THEY COULD IN TEXT
- GRAPHICAL WORLDS ARE **VERY** DERIVATIVE
  - TEXTUAL WORLDS WERE FAR, **FAR** MORE VARIED
- LET'S LET PEOPLE **TAKE RISKS** ONCE MORE!
- ONCE **SOMEONE** HAS BUILT A 3D MODEL OF SOMETHING, NO-ONE **ELSE** NEED BUILD IT **EVER AGAIN**

- DIGITAL ART HASN'T YET REACHED A **PLATEAU**
  - TODAY'S **HIGH** POLYGON COUNTS ARE TOMORROW'S **LOW** POLYGON COUNTS
- INTELLECTUAL PROPERTY IS **ALSO** AN OBSTACLE
  - ART IS AUTOMATICALLY COPRIGHT; CODE ISN'T
- HOWEVER, I'M OPTIMISTIC THAT **ONE** DAY WE **WILL** BE ABLE TO CREATE WORLDS IN **PICTURES** AS EASILY AS WE CAN IN TEXT
- IF IT'S GOOD ENOUGH FOR **ANTI-PAGODA** TERRORISTS, IT'S GOOD ENOUGH FOR US ALL...