THE THEN AND THE NOW OF COMPUTER GAMES

KEGS DIGIT FESTIVAL 2013

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- IT'S **HARD** FOR ORGANISERS OF SCHOOL **TECHNOLOGY** EVENTS TO FIND A TOPIC EVERYONE CAN **RELATE** TO
  - **CHOCOLATE** MIGHT WORK, BUT IT DOESN'T HAVE A FORMAL DIGITAL CONNECTION...
- **AHA**! HOW ABOUT **COMPUTER GAMES**?
- **EVERY** TECHY PLAYS **GAMES**!
  - EXCEPT THOSE WHO BELIEVE THAT STUFF ABOUT HOW GAMES ARE ADDICTIVE AND MAKE YOU KILL PEOPLE
- SO **HERE** I AM...

- STAR WARS: THE OLD REPUBLIC, BIOWARE, 2011

- THE MOST **EXPENSIVE** GAME YET MADE
  - I PLAYED 6H/DAY FOR **137 DAYS** IN 2012

WOW

- WORLD OF WARCRAFT, BLIZZARD, 2004

- I ACCRUED **225 DAYS** OF /PLAYED FOR THIS
  - I QUIT LAST YEAR WHEN **PANDAS** BECAME PLAYABLE

- # EVERQUEST, SONY ONLINE ENTERTAINMENT, 1999

- # I NEVER PLAYED EVERQUEST...

DIKUMUD

- # 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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- MULTI-USER DUNGEON, 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 WASN'T BASED ON **ANYTHING**

  – WHY **I'M** GIVING THIS TALK AND **YOU'RE NOT**

- HERE'S A PICTURE OF THE **HUMBER BRIDGE**

- IT'S STILL BEING **BUILT** AT THIS POINT

- THAT'S **NOT** TO SAY THAT IN 35 YEARS YOU WON'T BE GIVING A TALK **SIMILAR** TO THIS ONE, BUT FOR YOUR OWN FIELD

- THE **BEST** THING ABOUT MAKING GAMES IS THAT **WHATEVER** YOU'RE DOING, YOU'RE THE **FIRST** PERSON TO DO IT

  – YOU ARE BY **DEFINITION** A **PIONEER**

- ALL **YOU** HAVE TO DO IN ORDER TO BE UP HERE IN 2048 IS **NOT DIE**

- (TELL THEM YOUR DIJKSTRA ANECDOTE)

- THERE'S ACTUALLY SOMETHING **ELSE** YOU NEED TO DO TO GIVE TALKS LIKE THIS WHEN YOU'RE **OLD** AND **GREY**

- YOU NEED TO **ENJOY** YOUR SUBJECT

- FOR SOME PEOPLE, DEVELOPING GAMES IS SIMPLY A **MEANS TO AN END**

- THEY MERELY WANT TO APPEAR **COOLER** THAN BRAIN SURGEONS AND ROCKET SCIENTISTS
  - PROGRAMMERS ARE PAID **150%** MORE IN EVERYDAY SOFTWARE DEVELOPMENT THAN IN GAMES

- IF YOU **DO** ENJOY YOUR SUBJECT, THOUGH, YOU'LL KEEP WORKING IN IT BECAUSE IT'S **FUN**

- NON-PROGRAMMERS FIND IT **ASTONISHING** THAT PROGRAMMERS **LIKE** PROGRAMMING
  - "THEY DO IT IN THEIR **SPARE TIME**?!"

- LOGICALLY, IF YOU **ARE** GOING TO SPEND THE **REST OF YOUR LIFE** THINKING ABOUT SOMETHING, YOU'D **BETTER** FIND IT FUN OR YOU'RE **STUFFED**

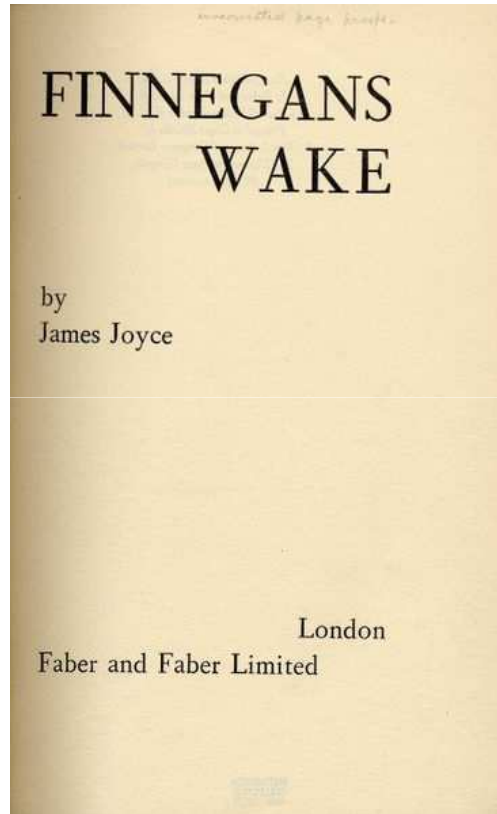- FUN ALONE STILL ISN'T **ENOUGH**, THOUGH

- TO DO SOMETHING **ONLY** BECAUSE YOU LIKE IT IS MERE **HEDONISM**

- THERE'S NO PRESSURE TO **PUSH** AT THE **BOUNDARIES** IF YOU'RE HAPPY WITH THEM WHERE THEY ARE

- THERE'S **SLIGHTLY** MORE IF "PUSHING AT BOUNDARIES" IS **WHAT** YOU FIND FUN, BUT YOU STILL LACK **DIRECTION**

- IF YOU **REALLY** WANT TO EXCEL IN YOUR FIELD, YOU NEED TO **BELIEVE** IN IT

- MY DAD WAS A **GAMER**, MY MUM WAS A **STORYTELLER**
- MY DAD WAS A **GAS FITTER**, MY MUM WAS A **SCHOOL MEALS COOK**
- WE **EXISTED** ON A **COUNCIL ESTATE**
- WE **LIVED** IN OUR IMAGINATIONS!
- IN MY FORMATIVE YEARS, I SAW **MISERY** AND **INJUSTICE** IN THE WORLD AROUND ME
  - I WANTED TO MAKE A **BETTER** WORLD
- **SO I DID**

- I REALLY OUGHT TO **READ** THIS SOME TIME..

FINNEGANS WAKE

by James Joyce

London
Faber and Faber Limited

- THEN, I'LL NEVER HAVE TO READ IT **EVER** AGAIN

- VIRTUAL WORLDS WERE **INDEPENDENTLY** INVENTED ON AT LEAST **5** OTHER OCCASIONS
  - *SCEPTRE OF GOTH (ORIGINALLY E*M*P*I*R*E)*
    - ALAN KLIETZ, 1978
  - *AVATAR*
    - BRUCE MAGGS, ANDREW SHAPIRA & DAVID SIDES, 1979
  - *ISLAND OF KESMAI*
    - KELTON FLINN & JOHN TAYLOR, 1981
  - *HABITAT*
    - RANDY FARMER & CHIP MORNINGSTAR, 1985
  - *MONSTER*
    - RICH SKRENTA, 1989

- THIS BEING THE CASE, WHY IS IT THAT ALMOST **ALL** TODAY'S MMOS DESCEND FROM *MUD*?

- YOU DON'T HAVE TO BE A **GENIUS** TO COME UP WITH THE IDEA OF A COMPUTER-MODERATED SHARED PERSISTENT ENVIRONMENT YOU INTERACT WITH USING A SINGLE CHARACTER

- YOU **DO** NEED TO HAVE A **REASON** TO DO SO

- **MY** REASON WAS TO GIVE PEOPLE A **PLACE** THEY COULD GO TO **BE** AND **BECOME** **THEMSELVES**

- MOST OF THE **OTHER** PEOPLE WHO INVENTED VIRTUAL WORLDS WANTED TO **PLAY** THEM
  – CHIP AND RANDY WERE THE EXCEPTIONS
- **I** WANTED **OTHER PEOPLE** TO PLAY *MUD*
- I SAW VIRTUAL WORLDS AS A WAY TO MAKE THE **REAL** WORLD A **BETTER** PLACE
- I THEREFORE **GAVE AWAY** THE CODE TO ANYONE WHO WANTED IT AND MADE IT **FREE**
- THE OTHERS EITHER **GUARDED** THEIR CODE OR IT WAS **NON-TRANSPORTABLE** ANYWAY

- AS IT WAS **FREE**, MANY PEOPLE PLAYED *MUD*
- SOME WROTE THEIR **OWN** VIRTUAL WORLDS BASED ON IT
  - *ABERMUD*, FOR EXAMPLE
- THESE IN TURN INSPIRED **OTHERS**
  - *DIKUMUD*, FOR EXAMPLE
- EVENTUALLY THERE WERE **THOUSANDS** OF MUDS ON THE NASCENT INTERNET
  - IN 1994, THEY ACCOUNTED FOR **10%** OF ALL INTERNET TRAFFIC

- BECAUSE OF THIS, THERE WERE **HUNDREDS** OF PEOPLE WHO COULD **CODE** MUDS FOR EVERY **ONE** WHO WORKED ON ANY OF THE OTHERS

- THUS, WHEN **PROFESSIONAL** VIDEOGAME DEVELOPERS MOVED IN, THEY GOT ALMOST **ALL** THEIR DESIGNERS AND CODERS FROM **MUDS**

- IF I HADN'T BEEN SO **OUTRAGED** WITH WORKING CLASS LIFE IN 1970S BRITAIN, THIS **WOULDN'T** HAVE HAPPENED

  – THEY'D HAVE COME FROM *10K* OR *SOG* INSTEAD

- IF **YOU** FEEL YOUR SUBJECT LETS YOU **SAY** SOMETHING OR **HELP** SOMEONE OR **BUILD** **BRIDGES** OR WHATEVER, **YOU** ARE IN A GOOD PLACE

- FULL-TIME SCIENTISTS AND TECHNOLOGISTS NEED **IDEALISM** TO DIRECT THEM

- OF COURSE, WHEN YOU REACH **MY** AGE THEN **CYNICISM** AND **DESPAIR** HAVE TAKEN OVER
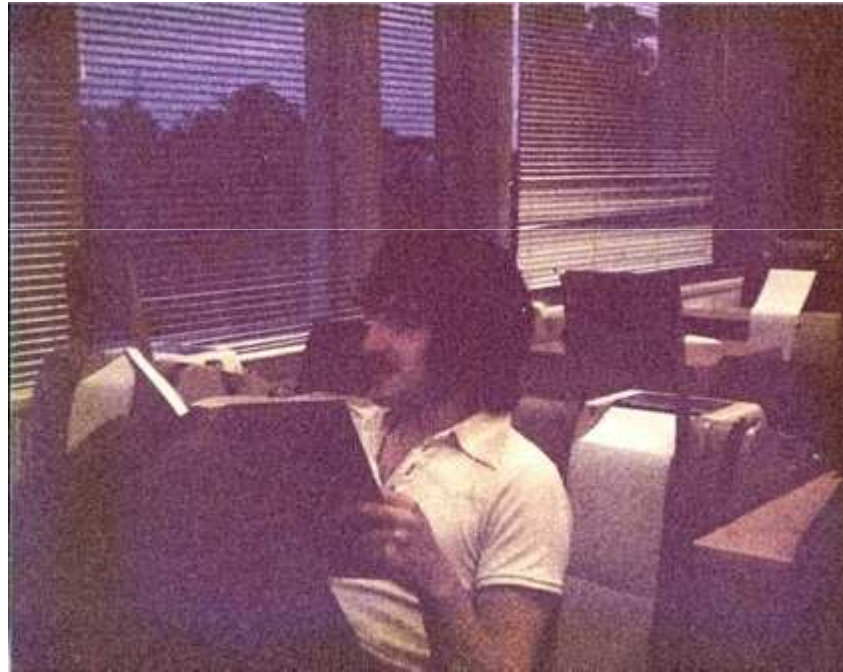
  – THESE **ALSO** WORK AS DRIVERS, THOUGH!

- # THIS IS A DEAD ASLAN

- # DON'T WORRY, KIDS, HE **SOON** RESPAWNS

- A STUDENT ONCE ASKED ME WHY WE WROTE MUD USING **TEXT** RATHER THAN **GRAPHICS**
- **THIS** IS WHY:

- THOSE MACHINES BEHIND ROY ARE **TELETYPES**

- WHAT YOU THINK OF AS HIGH-TECH **NOW** WILL SOON BE **SUPERSEDED** AND **OBSOLETE**

- IT WILL **DO** SO BECAUSE **ALL** TECHNOLOGICAL FIELDS ARE STILL **ADVANCING**

- THIS HAS **SOCIAL** EFFECTS TOO

  – MY FRIENDS THOUGHT I WAS **WEIRD** FOR TAKING SNAPS OF THEM IN 1978

- WHAT'S THE **POINT** OF **LEARNING** IT THEN?

- CONSIDER WHAT ROY AND I **NEEDED** TO KNOW WHEN WE WROTE *MUD*

WHAT YOU NEED TO KNOW TO MAKE A VIRTUAL WORLD (THEN)

- **MEMORY** IS MADE OF SOFT-IRON TOROIDAL **CORES** SUSPENDED ACROSS A GRID OF **WIRES**, WITH A DIAGONAL **SENSE/INHIBIT** WIRE TO READ/WRITE THEM.
- **CIRCUITS** ARE MADE OF WIRES AND **GATES**. AN **AND** GATE IS LIKE TWO SWITCHES IN SERIES; AN **OR** GATE IS LIKE TWO SWITCHES IN PARALLEL. BY COMBINING AND GATES AND (RATHER TRICKIER) **NOT** GATES, YOU CAN MAKE **NAND** GATES, FROM WHICH YOU CAN CONSTRUCT ANY LOGIC CIRCUIT. ONE SUCH CIRCUIT IS A **FLIP-FLOP**, WHICH HAS **TWO** STABLE STATES AND SO WORKS AS ANOTHER (MORE POWER-HUNGRY) FORM OF **MEMORY**. YOU CAN CONNECT FLIP-FLOPS IN A CHAIN TO MAKE A **REGISTER**. BY PASSING THE INPUTS TO THESE FLIP-FLOPS THROUGH A SET OF GATES, YOU CAN EFFECT **OPERATIONS** – SHIFTING A REGISTER'S BIT SETTINGS ALL TO THE LEFT, FOR EXAMPLE (WHICH IS THE SAME AS MULTIPLYING THE NUMBER THE REGISTER REPRESENTS BY 2). ANOTHER ARRANGEMENT OF GATES MAKES A CIRCUIT CALLED A **HALF-ADDER**; COMBINING MULTIPLE HALF-ADDERS WILL ALLOW YOU TO ADD THE CONTENTS OF TWO REGISTERS TOGETHER.
- IN ORDER TO DECIDE WHICH OPERATION TO PERFORM ON A REGISTER, YOU HAVE A SPECIAL **INSTRUCTION REGISTER**. BY USING GATES TO DETECT **COMBINATIONS** OF BITS IN THE INSTRUCTION REGISTER, THE OPERATION IT IDENTIFIES CAN BE DETERMINED. INSTRUCTIONS ARE STORED IN MEMORY, AND THE **ADDRESS** OF THE NEXT INSTRUCTION TO FETCH IS KEPT IN A REGISTER CALLED A **PROGRAM COUNTER**. HAVING **FETCHED** AN INSTRUCTION, IT IS **EXECUTED**, AND THEN THE PROGRAM COUNTER IS **INCREMENTED** SO THE NEXT OPERATION CAN BE FETCHED. OPERATIONS ON THE PROGRAM COUNTER, SUCH AS ADDITION, IMPLEMENT CONCEPTS SUCH AS **JUMPS**.
- A SET OF PANEL **SWITCHES** LOAD INITIAL VALUES INTO REGISTERS. THIS IS TEDIOUS, SO JUST ENOUGH ARE LOADED THAT FURTHER INSTRUCTIONS CAN BE READ FROM **PAPER TAPE**. THESE ALLOW MANY MORE INSTRUCTIONS TO BE LOADED INTO MEMORY FROM A **MAGNETIC TAPE**. THE PROGRAM SO LOADED IS THE **OPERATING SYSTEM**, WHICH WILL ADMINISTER THE COMPUTER (FOR EXAMPLE, MANAGE THE **DEVICES** THAT APPLICATION PROGRAMS RUN).
- USER PROGRAMS ARE KEPT ON **DISC PACKS**, **CARDS**, **PAPER** AND **MAGNETIC TAPE**. TO WRITE A PROGRAM, YOU USE A **PROGRAMMING LANGUAGE**. THE FIRST PROGRAMS ARE ENTERED USING THE PANEL SWITCHES; THEY ULTIMATELY CREATE A PROGRAM CALLED AN **ASSEMBLER**, WHICH CONVERTS HUMAN-READABLE ASSEMBLY LANGUAGE INTO THE **BINARY** THAT THE COMPUTER ACTUALLY EXECUTES. ASSEMBLY LANGUAGE IS USED TO WRITE THE MAKINGS OF A **COMPILER** FOR A **HIGH-LEVEL LANGUAGE**. COMPILERS TAKE HIGH-LEVEL LANGUAGES AND DROP EITHER ASSEMBLER OR DIRECT BINARY. JUST **ENOUGH** OF THE COMPILER IS WRITTEN IN ASSEMBLER THAT THE REST OF IT CAN BE WRITTEN IN THE LANGUAGE **ITSELF**, A PIECE AT A TIME ACROSS MULTIPLE ITERATIONS.
- HIGH-LEVEL LANGUAGES CAN BE USED TO WRITE **GENERAL-PURPOSE** PROGRAMS. ALMOST EVERY PROGRAM IS SOME COMBINATION OF THE ACTIVITIES PERFORMED BY A COMPILER, A **DATABASE** AND/OR AN OPERATING SYSTEM. YOU NEED TO BE **FLUENT** IN A HIGH-LEVEL LANGUAGE BEFORE YOU CAN PROGRAM MUCH IN IT, BUT THEY'RE ALL BASICALLY THE **SAME** WHEN IT COMES DOWN TO IT. CHOICE OF LANGUAGE IS A BALANCE BETWEEN SPEED OF **EXECUTION**, SPEED OF **WRITING** AND SPEED OF **MAINTENANCE**.
- TO CREATE A **VIRTUAL WORLD**, YOU NEED TO DESIGN YOUR OWN **DATA DEFINITION LANGUAGE** TO SPECIFY THE VIRTUAL WORLD. YOU WRITE YOUR **OWN** COMPILER TO CONVERT IT INTO ASSEMBLY LANGUAGE PLUS SOME INTERMEDIATE CODE THAT YOU CAN **INTERPRET** (THAT IS, EXECUTE IN SOFTWARE RATHER THAN IN HARDWARE). YOU STORE **DETAILS** ABOUT THE PLAYERS AND THE WORLD ITSELF IN A **DATABASE**, WHICH YOU **ALSO** WRITE YOURSELF. WHEN THE VIRTUAL WORLD **RUNS**, IT ACTS LIKE AN OPERATING SYSTEM – CONTINUALLY **PROCESSING** UNTIL IT IS STOPPED OR DECIDES TO STOP.
- IF, WHEN YOU CREATE YOUR VIRTUAL WORLD, YOU **DON'T** KNOW THE WHOLE STORY FROM MEMORY CORES (OR THEIR TRANSISTOR EQUIVALENT) RIGHT THE WAY UP TO WRITE-YOUR-OWN-COMPILER, YOU **WON'T** BE ABLE TO TWEAK EVERY **BIT**, STRETCH EVERY **INSTRUCTION**, PACK EVERY **DATA STRUCTURE** OR TAKE EVERY **SHORTCUT**; LESS OF YOUR WORLD WILL FIT IN THE (IN *MUD'S* CASE) **70K OF MEMORY YOU GET** IN EVENINGS AND WEEKENDS ON THE TIMESHARING SYSTEM. YOU NEED TO KNOW **ALL** THIS IF YOU'RE GOING TO DO IT.

- OH, YOU **ALSO** NEED THAT LITTLE BIT AT THE END WHERE YOU DESIGN THE GAME WORLD ITSELF.

WHAT YOU NEED TO KNOW TO MAKE A VIRTUAL WORLD (NOW)

- HOW TO RAISE £25,000,000.

- ON THE TECHNICAL SIDE, YOU NEED TO DECIDE WHICH **KITS**, **TOOLS**, **LIBRARIES** AND **MIDDLEWARE** YOU'RE GOING TO BUY IN TO GET THE FOLLOWING FUNCTIONALITY:

    3D/**GRAPHICS ENGINE**/RENDERER

    AI ENGINE

    ANIMATION PACKAGE

    ART PACKAGE

    ASSET MANAGEMENT SOFTWARE

    AUDIO PACKAGE

    BACK-END **BILLING** SYSTEM

    COMMUNITY **MANAGEMENT** TOOLS

    COMPILER/**DEVELOPMENT ENVIRONMENT**

    DATABASE

    LOAD-BALANCING SYSTEM

    NETWORK LIBRARY

    OBJECT MODELLING/SPECIFICATION SYSTEM

    PATCHING SOFTWARE

    PHYSICS ENGINE

    PROJECT DEVELOPMENT TOOLS

    SECURITY SYSTEM

    TREE-CREATION TOOLS

    WEB-CREATION TOOLS

- HAVING **BOUGHT** THEM IN, YOU AND YOUR **TEAM** OF PROGRAMMERS NEED TO KNOW HOW TO **SEW** THE EXECUTABLE ONES TOGETHER WITH YOUR **OWN** PROGRAM CODE, THEN HOW TO CODE THE GAME **MECHANICS** ON TOP OF THAT, PLUS ALL THE **PROJECT-SPECIFIC** TOOLS YOU REQUIRE, WHILE YOUR **VAST ARMY OF ARTISTS** ARE CREATING THE GRAPHICS YOU'VE SPECIFIED.

- TO DO THIS, YOU HAVE TO HAVE KNOWLEDGE OF EVERY **API** (APPLICATION PROGRAMMING INTERFACE) FOR **EVERY** KIT, TOOL, LIBRARY AND MIDDLEWARE YOU'RE USING.

- IF, WHEN YOU CREATE YOUR VIRTUAL WORLD, YOU **DON'T** KNOW THE WHOLE STORY FROM AUDIO PACKAGE RIGHT THE WAY UP TO WRITE-YOUR-OWN-PLANET-CREATION-TOOLS, YOU **WON'T** BE ABLE TO TWEAK EVERY **OBJECT**, STRETCH EVERY **SCRIPT**, PACK EVERY **DATA STRUCTURE** OR TAKE EVERY **SHORTCUT**; LESS OF YOUR WORLD WILL APPEAR IN THE **3-YEAR WINDOW** YOU GET FOR ITS CONSTRUCTION. YOU NEED TO KNOW **ALL** THIS IF YOU'RE GOING TO DO IT.

- OH, YOU **ALSO** NEED THAT LITTLE BIT AT THE END WHERE YOU DESIGN THE GAME WORLD ITSELF.

WHAT YOU NEED TO KNOW TO MAKE A VIRTUAL WORLD (TOMORROW)

- THAT LITTLE BIT AT THE END WHERE YOU DESIGN THE GAME WORLD ITSELF.

- WHAT WE **NEEDED** TO KNOW IN 1978 IS NOW **ARCANE**
  - IT READS LIKE SOMETHING OUT OF *FINNEGANS WAKE*
- IN **TECHNICAL** TERMS, **NO** MMO DEVELOPER NEEDS TO KNOW **ANY** OF THIS TODAY
- HOWEVER, SOMEONE **NEEDS TO HAVE KNOWN IT**
- IT'S A "**DEEPER** MAGIC FROM **BEFORE** THE DAWN OF TIME"
  - IT **INFORMS** ALL BUT IS ABSTRACTED **AWAY**

- SO IT IS WITH WHAT **YOU'RE** STUDYING **NOW**

- IT'S POSSIBLE THAT **NO-ONE** WILL NEED TO KNOW GREAT **SWATHES** OF IT IN 35 YEARS

- HOWEVER, SOMEONE – YOU! – **WILL** *NEED TO HAVE KNOWN IT*

- SOMEONE - **YOU**? - WILL HAVE INFLUENCED THE FUTURE – THIS GIVES YOU **POWER** *TODAY!*

- YOU MAY BE A LOWLY **TECH GEEK**, BUT IF YOU **BELIEVE** IN WHAT YOU DO, YOU **CAN** CHANGE THE WORLD

- I **KNOW**, BECAUSE I DID IT **MYSELF**