

WHY MAKE GAMES?

GAMEFOUNDERS - KUALA LUMPUR

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INTRODUCTION

- SO, YOU SHOULD NOW BE **WELL** ON YOUR WAY TO CREATING YOUR **MASTERPIECE** HERE AT GAMEFOUNDERS
- I PROBABLY **CAN'T** GIVE YOU MUCH **DESIGN** ADVICE OF **PRACTICAL** USE AT THIS STAGE
 - YOU WOULDN'T BE ABLE TO **ACT** ON IT EVEN IF YOU **DIDN'T** KNOW IT ALREADY
- I THOUGHT THAT **INSTEAD** I'D TALK ABOUT SOMETHING WITH **LONG-TERM** VALUE
 - SOMETHING A LITTLE MORE **CHEERFUL**

THE FUTURE

- **YOU** ARE GOING TO **DIE**
- **KNOWING** THIS, WHY DO YOU WANT TO SPEND YOUR **ENTIRE** ADULT LIFE MAKING **GAMES?**
- WHY NOT WRITE **NOVELS?** DRIVE **TRUCKS?** AUTHENTICATE **NUCLEAR** POWER STATION SOFTWARE? PRACTISE **LAW?** FEED THE **POOR?**
- YOU **COULD** DO – OR TRY TO DO – ANY OF THESE THINGS
- **WHY** MAKE GAMES?

QUILT AND TAPESTRY



• QUILT



TAPESTRY

WHY MAKE GAMES?

- SOME **POSSIBLE** ANSWERS:
 - FOR THE **MONEY** (HA HA HA!)
 - TO WORK IN A WONDERFUL, **CREATIVE** INDUSTRY
 - PURELY BY **ACCIDENT**
 - YOU WANT A NEW **CHALLENGE**
 - YOU GET TO **CREATE** WHAT YOU LIKE TO **PLAY**
 - YOU'RE ONLY OBEYING ORDERS
 - IT'S PART OF YOUR GRAND SCHEME FOR **WORLD DOMINATION**
 - MAKING GAMES IS **FUN!**

COMMONEST ANSWERS

- I'VE HEARD **ALL** OF THESE ANSWERS OVER THE YEARS
- NEVERTHELESS, MOST **DESIGNERS** WILL REPLY THAT THEY FIND DESIGNING GAMES **FUN**
- MOST **NON-DESIGNERS** WILL REPLY THAT THEY WANT TO WORK IN A WONDERFUL, **CREATIVE** INDUSTRY
- IT'S EASY TO SEE WHY THIS WORKS FOR **DESIGNERS**, BUT WHAT ABOUT **THE NON-DESIGNER** ANSWER?

NON-DESIGNERS

- IF YOU'RE A **PROGRAMMER**, THE FUN IS IN THE **PROGRAMMING**
- YOU'LL **HAPPILY** PROGRAM SOFTWARE YOU WON'T USE
- SO WHY PROGRAM **GAMES** WHEN YOU COULD PROGRAM **WASHING MACHINES** FOR **150%** OF A GAME PROGRAMMER'S SALARY?
- IT'S BECAUSE, ALMOST **UNIQUELY**, GAMES ALLOW YOU TO DO **CREATIVE** PROGRAMMING
– TAPESTRIES RATHER THAN QUILTS

PLAYERS V DEVELOPERS

- **PLAYERS** MAKE GAMES BECAUSE THEY WANT TO EXPERIENCE THE **END** RESULT
- DEVELOPERS ARE INTERESTED IN **CREATING** THAT WHICH CAN BE **EXPERIENCED**
- DEVELOPERS DON'T WANT TO MAKE GAMES THAT **THEY** WANT TO PLAY, THEY WANT TO MAKE GAMES THAT **PEOPLE** WANT TO PLAY
 - ALTHOUGH THEY **MAY** WANT TO PLAY IT SO THEY CAN SEE THEIR **HANDIWORK**
 - OR **NOT**, IF YOU MAINLY PROGRAM **TOOLS**...

FIRST QUESTION

- WHEN I **INTERVIEW** PROSPECTIVE GAMES STUDENTS, I ALWAYS ASK THIS QUESTION:
 - “WHY DO YOU **WANT** TO BE A GAME DEVELOPER?”
- 90% OF THEM WILL **BEGIN** THEIR REPLY LIKE THIS:
 - “EVER SINCE I WAS A **SMALL CHILD** I’VE **LOVED** PLAYING GAMES”
- THIS IS LIKE SAYING YOU WANT TO BE AN **ARCHITECT** OR **BRICKLAYER** BECAUSE YOU ENJOY LIVING IN **HOUSES**

DEVELOPING AND PLAYING

- **DEVELOPING** GAMES IS NOT THE SAME AS **PLAYING** THEM
- DEVELOPERS DON'T MAKE GAMES TO **PLAY** THEM, THEY MAKE THEM TO **MAKE** THEM
- SO **WHY**, THEN? WHY DO THEY WANT TO **MAKE GAMES**?
- THE ANSWER IS THAT THEY WANT TO **SAY** SOMETHING
 - SOMETHING THEY CAN'T SAY **EXCEPT** THROUGH GAMES

ART

- PEOPLE WHO WORK ON GAMES ARE ALL **ARTISTS** IN THEIR OWN FIELDS
- THEY WANT TO **SAY** SOMETHING THROUGH THE PARTICULAR **MEDIUM** THEY HAVE CHOSEN
- AS FOR **WHAT** THEY WANT TO SAY, WELL THEY DON'T FULLY **KNOW!**
- IF THEY **DID** KNOW, THEY COULD JUST SAY IT IN **WORDS** INSTEAD OF IN PROGRAMS, VOICE ACTING, ANIMATIONS, IMAGES, MUSIC, ...
 - EVEN **QA** HAS AN ARTISTIC SIDE TO IT

"THE" ARTIST

- THE ARTIST FOR THE GAME AS A **WHOLE** IS THE **LEAD DESIGNER**
- THIS IS BECAUSE OF WHERE THE ARTISTIC **PAYLOAD** OF GAMES LIES:
 - IN THE **GAMEPLAY**
- **OTHER** MEDIA CAN ALSO CARRY AN ARTISTIC PAYLOAD IN NARRATIVE, IMAGERY, SOUND, ...
- ONLY **GAMES** HAVE **GAMEPLAY**
- THE LEAD DESIGNER **DETERMINES** THE GAMEPLAY, SO IS "THE" ARTIST FOR THE GAME

DIRECTORS

- THIS IS LIKE IN FILM, WHERE THE **DIRECTOR** DETERMINES WHAT THE **VIEWER** SEES
- THE **LEAD DESIGNER** DETERMINES WHAT THE **PLAYER** PLAYS
- JUST AS **MOVIES** HAVE SCREENWRITERS, ACTORS, COSTUME DESIGNERS, MAKE-UP ARTISTS, CINEMATOGRAPHERS, ...
- SO **GAMES** HAVE CREATIVES IN ALL AREAS
- GAMES LET YOU **SAY THINGS** YOU CAN'T SAY **ANYWHERE** ELSE

SAY?

- WHAT DO I MEAN BY "**SAY**" HERE?
- WELL, YOU'RE TRYING TO **ARTICULATE** SOMETHING **IMPORTANT** TO YOU
 - ABOUT YOU, THE WORLD, YOUR ART, ...
- YOU MAY BE SAYING IT TO AN AUDIENCE OF **MANY** – THE **PLAYERS**
- OR TO AN AUDIENCE OF **ONE** – **YOURSELF**
- YOU WON'T KNOW WHAT IT **IS** UNTIL YOU **SAY** IT, THOUGH
 - AND EVEN **THEN** YOU MAY NOT UNDERSTAND IT

EXAMPLE

- RATHER THAN SPEAK IN **VAGUE** TERMS, HOW ABOUT I GIVE AN **EXAMPLE**?
- THIS WILL BE A **DESIGN**-FOCUSED EXAMPLE, AS I'M A **DESIGNER**
- I'M **HOPING** THE NON-DESIGNERS WILL BE ABLE TO **MAP ONTO** IT
- REMEMBER: YOU'RE **ARTISTS**, NOT MERE **TECHNICIANS**
 - WHETHER YOU **LIKE** IT OR NOT
 - BECAUSE IF **NOT**, WHY ARE YOU EVEN **HERE**?

TSW

- THE SECRET WORLD, FUNCOM, 2012



- WHEN I **QUIT** IN MAY 2015 I WAS **50TH** IN ITS HIGH SCORE LIST (OUT OF ~50,000)

SW:TOR

- 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 LEFT WHEN **PANDAS** BECAME PLAYABLE

EQ

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



- **I NEVER PLAYED EVERQUEST...**

- DIKUMUD, COPENHAGEN UNIVERSITY, 1990

```
[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
```

ABERMUD

- *ABERMUD, ALAN COX, 1987*

```
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
```

```
>
```

MUD

- MULTI-USER DUNGEON, ROY TRUBSHAW & RICHARD BARTLE, 1978

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.

*

- MUD WASN'T BASED ON **ANYTHING**
– WHICH IS WHY **I'M** TALKING AND YOU'RE **NOT...**

IN PART...

- THAT **ISN'T** TO SAY THAT IN 35 YEARS YOU WON'T BE GIVING A TALK **SIMILAR** TO THIS ONE, BUT FOR YOUR **OWN** AREA OF EXPERTISE
- 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 2051 IS **NOT DIE**
- (TELL THEM YOUR DIJKSTRA ANECDOTE?)

YET MORE TO IT

- 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 WORK
- FOR SOME PEOPLE, DEVELOPING GAMES IS SIMPLY A **MEANS TO AN END**
- THEY MERELY WANT TO APPEAR **COOLER** THAN BRAIN SURGEONS AND ROCKET SCIENTISTS
- THIS IS **NO** BASIS ON WHICH TO BUILD A **LIFE** IN GAME DEVELOPMENT

FUN

- IF YOU **DO** ENJOY YOUR WORK, THOUGH, YOU'LL KEEP AT 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

BEYOND FUN

- 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 WHAT YOU DO, YOU NEED TO **BELIEVE** IN IT

WHY MUD?

- 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** IN **SOCIAL HOUSING**
- 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**

BEAR KOMBAT

- HERE'S A PICTURE OF TWO **BEAR CUBS** FIGHTING



- **RAWR!**

REINVENTION

- 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

REASON

- 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**

LEGACY

- 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

HISTORY

- 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

COMMERCIALISATION

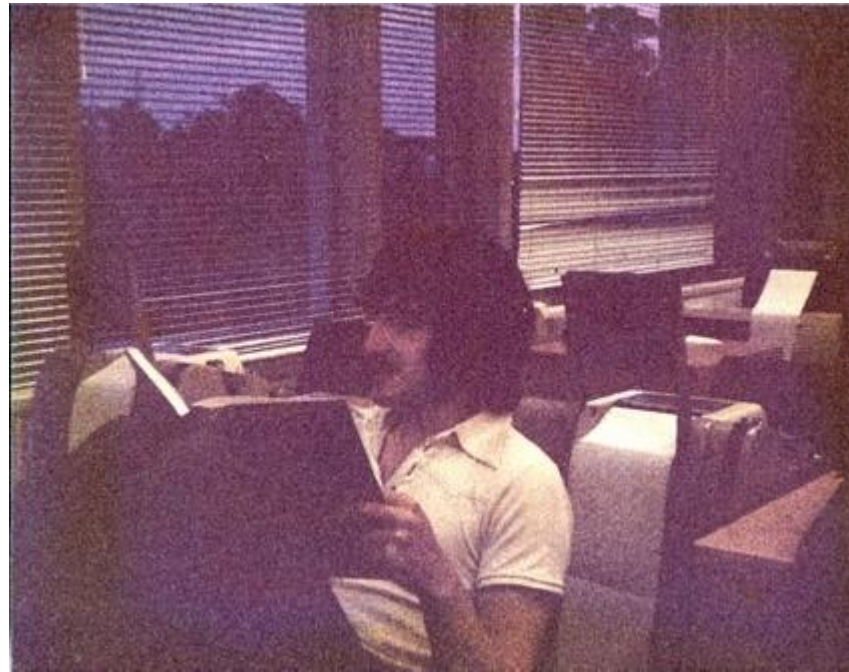
- BECAUSE OF THIS, THERE WERE **HUNDREDS** OF PEOPLE WHO COULD **CODE** MUDS FOR EVERY **ONE** WHO WORKED ON ANY OF THE OTHERS
- THUS, WHEN **PROFESSIONAL** VIDEOGAME DEVELOPERS MOVED IN, THEY GOT ALMOST **ALL** THEIR DESIGNERS AND CODERS FROM **MUDS**
- IF ROY AND I HADN'T BEEN SO **OUTRAGED** WITH WORKING CLASS LIFE IN 1970S BRITAIN, THIS **WOULDN'T** HAVE HAPPENED
 - THEY'D HAVE COME FROM *10K* OR *SOG* INSTEAD

IDEALISM

- IF **YOU** FEEL YOUR WORK LETS YOU **SAY** SOMETHING OR **HELP** SOMEONE OR **BUILD BRIDGES** OR WHATEVER, **YOU** ARE IN A GOOD PLACE
- FULL-TIME GAME DEVELOPERS NEED **IDEALISM** TO **DIRECT** THEM THROUGH THEIR **ART**
- OF COURSE, WHEN YOU REACH **MY** AGE THEN **CYNICISM** AND **DESPAIR** HAVE TAKEN OVER
 - THESE **ALSO** WORK AS DRIVERS, THOUGH!

EARLY DAYS

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



- THOSE MACHINES BEHIND ROY ARE **TELETYPES**

CHANGE

- WHAT YOU THINK OF AS HIGH-TECH **NOW** WILL SOON BE **SUPERSEDED** AND **OBSOLETE**
- WHAT YOU'RE DOING **NOW** WILL HAVE CHANGED BEYOND RECOGNITION IN TWO **DECADES**
- IT WILL **DO** SO BECAUSE **ALL** TECHNOLOGICAL FIELDS ARE STILL **ADVANCING**
 - MY FRIENDS THOUGHT I WAS **WEIRD** FOR TAKING SNAPS OF THEM IN 1978
- 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.

PAST PASSED

- WHAT WE **NEEDED** TO KNOW IN 1978 IS NOW **ARCANE**
- IN **TECHNICAL** TERMS, **NO** MMO DEVELOPER NEEDS TO KNOW **ANY** OF THIS TODAY
- HOWEVER, SOMEONE **NEEDS TO HAVE KNOWN IT**
- SOMEONE ALWAYS **WAS** GOING TO KNOW IT, BUT ROY AND I WERE **DRIVEN** TO KNOW IT **FIRST**
 - EVEN THOUGH WE DIDN'T **KNOW** WE WERE FIRST!

POWER

- SO IT IS WITH WHAT **YOU'RE** DOING **NOW**
- GREAT **SWATHES** OF IT WILL BE COMPLETELY **IRRELEVANT** IN 35 YEARS' TIME
- HOWEVER, SOMEONE – YOU! – **WILL NEED TO HAVE DONE IT**
 - WILL NEED TO HAVE BEEN **PASSIONATE** ENOUGH TO DO IT
- SOMEONE – **YOU?** – WILL HAVE INFLUENCED THE FUTURE
- THIS GIVES YOU **POWER** TODAY!

YOUR OWN INTERESTS

- PLAYING GAMES IS AMONG THE MOST **IMPORTANT** THINGS HUMAN BEINGS **DO**
- FAR FROM BEING SOME **NEW** CULTURAL **FAD**, GAMES **PREDATE** CULTURE
- **ANIMALS** PLAY GAMES
 - I DON'T SEE THEM WRITING **POETRY** OR NOVELS
- EAT **THAT**, LITERATURE!
- IF YOUR GAME DOESN'T SELL, MAKE **ANOTHER**
- THIS TIME, TRY TO **SAY** SOMETHING, NOT TO **SELL** SOMETHING

VINDICATION

- IT'S ONLY WITH THE ADVENT OF COMPUTERS THAT THE **SIGNIFICANCE** OF GAMES HAS GRADUALLY BECOME **RECOGNISED**
- THIS MEANS THERE IS A TRULY **VAST**, UNEXPLORED TERRITORY OUT THERE
- YOU PEOPLE ARE THE **PIONEERS!** **YOU** GET TO OPEN IT UP! **YOU** GET TO BE FIRST TO SEE ITS **WONDERS!**
- AND IF YOU HAVE SOMETHING TO **SAY**, YOU GET TO **CHANGE** WHAT YOU SEE, TOO!

RIGHT TIME

- NOW IS A **MARVELLOUS** TIME TO BE MAKING COMPUTER GAMES – FOR **WHATEVER** REASON
- THE OLD WALLS ARE CRUMBLING, AND THE **GLORIOUS** VISTAS THEY HID ARE WAITING TO BE REVEALED
 - **YOU** GET TO REVEAL THEM
 - **YOU** GET TO BE FIRST TO **UNDERSTAND** THEM
 - **YOU** GET THEORIES **NAMED** AFTER YOU
- MOST **IMPORTANT** OF ALL, YOU GET TO MAKE THE **BETTER GAMES** THAT RESULT!

CONCLUSION

- **HUNDREDS OF THOUSANDS** OF PEOPLE ARE MAKING GAMES
- **MOST** SUCH PEOPLE DON'T KNOW **WHY** THEY'RE MAKING THEM
- THEY HAVE NOTHING OF INTEREST TO **SAY**, SO NOTHING OF INTEREST IS **HEARD**
- 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**