

Transcript for the Synputer Presentation

Slide 1 – Intro Slide

My name is Sam and welcome to my presentation on the Synputer. The purpose of this presentation is to provide an update for the Synputer. I'll start by listing out the updated requirements, then I'll go over the project constraints, risks, and assumptions, then I'll show how we plan to address the complaint made by EDC (English Digital Computers), then I'll compare the initial design to the updated design, then I'll go over the project plan, budget, and key milestones for the project before ending with our projected sales.

Slide 2 – Updated Requirements

The first requirement is that the Synputer must support a Graphical User Interface (GUI).

The second requirement is that the Synputer must handle advanced graphics and sound, and it should be capable of running older games.

The third requirement is that the device must be portable, as research indicates that portability is important to our potential customers.

The fourth requirement is that the device must have enough ports for two joysticks and a mouse so it can be used for gaming.

The fifth requirement is that the device must be upgradable to ensure it remains future proof.

The sixth requirement is that the device must utilise industry standard storage to avoid any compatibility issues.

The seventh requirement is that the device must have SCSI (Small Computer System Interface) and networking capabilities.

The eighth requirement is that the Synputer must run on an industry standard operating system (OS) so that new users do not need to learn a completely new system.

The ninth requirement is that the Synputer must come with a troubleshooting guide to help users fix common issues and minimise frustration.

The tenth requirement is that the device must have at least 512 kilobytes of RAM (Random Access Memory) in order to support multitasking and the GUI (Graphical User Interface).

The eleventh requirement is that the Synputer must have an external keyboard port to accommodate foreign keyboards.

The final requirement is that the price of the Synputer must not increase by more than 10% following the design changes.

Slide 3 – Constraints, Risks and Assumptions

In 1969, Dr Martin Barnes proposed the concept of the iron triangle of project management in his doctoral thesis 'Time and Cost in Contract Control' (Barnes, 1969). He theorised that every project involves three key constraints, budget, time and scope, and that these constraints are interconnected, meaning that any change to one constraint will impact the other two.

We categorised risks based on likelihood and severity, using the levels defined by the National Counter Terrorism Security Office to determine which risks are acceptable.

I made the following project assumptions an adequate number of skilled workers will be available throughout the project to fulfil their roles and responsibilities, the required raw materials will be readily available from approved suppliers throughout the project, appropriate facilities and workspaces will be provided for team members, external support services will be available throughout the project life cycle, the necessary machinery and equipment will be in good working condition and available for use throughout the project, the required technology infrastructure and systems will be in place to support the project, the cost of materials will not exceed the estimated amounts and will remain stable throughout the project, subcontractor costs will align with budget estimates, currency fluctuations will not significantly impact overall project costs, the project will be completed within the allocated budget, the project will not require additional features, functionalities, or scope expansions, the project team will have a clear understanding of the scope and requirements, there will be no major misunderstandings or misinterpretations between the project team and key stakeholders, the project scope will not be affected by external factors, all key stakeholders will provide their insights and there will be no significant changes in stakeholder expectations during the project, there will be no significant changes that impact compliance requirements, there will be no major changes in government policies that could disrupt project operations or introduce new risks, social factors will not significantly affect the project's acceptance or support within the community or stakeholder groups, the project will comply with relevant environmental regulations and standards, natural disasters, extreme weather events, or climate conditions will not significantly impact project operations, timelines, or resource availability, technological advancements will not render the project obsolete, the project team will have sufficient time to complete all activities, a reasonable amount of time will be allocated for review and approval processes, resource availability will align with the project schedule and will not cause significant delays, the project will be delivered within the specified timeline, project deliverables will meet or exceed the specified quality standards, the project team will follow quality assurance processes throughout the project life cycle, testing and validation activities will be performed to ensure the quality of project deliverables, stakeholders will approve project outcomes without significant revisions, the project will adhere to industry best practises and recognised quality frameworks, the project team will address any identified quality issues or defects, key stakeholders will participate and provide input and feedback throughout the project, stakeholder expectations will be well defined at the beginning of the project, stakeholders will be available for meetings, reviews and approvals,

stakeholders will have a shared understanding of the project scope, goals and outcomes, the project will be developed using the Scrum framework created by Jeff Sunderland and Jeff McKenna in the early 1990s (Sunderland et al., 1993) to improve productivity and quality through sprints and sprint-related activities such as Sprint Retrospectives and the project will follow team governance guidelines and requirements.

Slide 4 – Response to EDC's Compliant

EDC (English Digital Computers) expressed significant disappointment with our initial design, going so far as to threaten a £1,000,000 lawsuit for breach of contract if we do not meet at least 80% of their requirements. After conducting a cost benefit analysis, we've decided to fulfil all of EDC's requirements to avoid the legal costs and reputational damage that could arise from a lawsuit.

EDC'S (English Digital Computers) first requirement is that the Synputer must run on an industry standard operating system (OS). To meet this requirement, we will switch from the initial designs in-house Hyper Basic operating system (OS) to MCC OS, a Unix like operating system. This change will help new users avoid the steep learning curve associated with a completely new system. The decision to upgrade from a CLI (Command Line Interface) to a GUI (Graphical User Interface) is based on our market research, which indicated machines with a CLI (Command Line Interface) are viewed as outdated and most people now prefer a GUI (Graphical User Interface) interface. We will be outsourcing the design and development of the UWM Windows Manager GUI (Graphical User Interface) to Micro Computer Consultants (MCC). The project is expected to take a total of 24 weeks; 8 weeks for the design phase and 16 weeks for the coding phase. The cost to switch the default operating system to MCC OS includes expenses for hiring Micro Computer Consultants (MCC) and the licencing fees for the new operating system (OS).

The second requirement from EDC (English Digital Computers) was for the Synputer to support an external keyboard. This requirement will be fulfilled with the SC150 chip and the luggable case. The SC150 chip enables the Synputer to support a keyboard, while the luggable case includes an external keyboard. Making the Synputer portable is crucial for our potential customers in the workplace, as employees who need to collaborate often have to be in close proximity. The cost of the luggable case per machine is £35 when purchased in quantities of 1000 or more and the cost of the SC150 chip is £5 per machine when purchased in quantities of 1000 or more.

The third requirement from EDC (English Digital Computers) was that a Synputer must have at least 512 kilobytes of RAM (Random Access Memory). This requirement will be met through four 128 kilobyte sticks of RAM (Random Access Memory). The reasons for quadrupling the amount of RAM (Random Access Memory) are to enable multitasking, improve performance, and satisfy the minimum GUI (Graphical User Interface) requirements. The cost of the RAM (Random Access Memory) per machine is £10.

The fourth requirement from EDC (English Digital Computers) was that the Synputer must have at least one industry standard storage drive with removable media. This requirement will be met by upgrading the storage from our current solution (2 * Syn Cartridges) to two 3.5-inch floppy disc drives. We are doing this due to the demand for industry standard storage and to avoid any storage related compatibility issues. The cost of the floppy disc drives is £15 per machine.

The fifth requirement from EDC (English Digital Computers) was the Synputer must have SCSI (Small Computer System Interface) expansion capability. This requirement will be met with the Pro Expansion Board as the provided 25 port centronic style connector can be used with an adapter cable for SCSI (Small Computer System Interface) connections. The cost of the Pro Expansion Board is £15 per machine when purchased in quantities of 1000 or more.

The sixth requirement from EDC (English Digital Computers) was that the Central Processing Unit (CPU) must be at least a 68,000 series CPU (Central Processing Unit) and should ideally be upgradable.

The CPU (Central Processing Unit) requirement will be met by upgrading from a Motorola 68,008 CPU (Central Processing Unit) to a Motorola 68,000 CPU (Central Processing Unit). We've made this choice for two reasons; firstly, it provides better performance when compared to the Motorola 68,008 CPU (Central Processing Unit) and secondly, as highlighted by Jacob Nielsen in his book 'Usability Engineering' (Nielsen, 1994), the time required to complete a task significantly impacts user experience. The Motorola 68,000 CPU (Central Processing Unit) costs £8 per machine when purchased in quantities of 1000 or more.

The upgradeability requirement will be satisfied by upgrading to an A-83 socketed board, allowing users to upgrade the CPU (Central Processing Unit) to a better model such as the EP7500FE. Our market research shows that customers prefer machines that can be upgraded. This preference is influenced by Moore's Law (Moore, 1965), which states the number of transistors on a microchip doubles approximately every two years. As a result, computers can become obsolete in just a few years. The A-83 socketed board costs £25 per machine when purchased in quantities of 1000 or more.

The seventh requirement from EDC (English Digital Computers) was that the Synputer must support networking capabilities for at least 2 RS 422/485 compliant serial ports. This requirement will be met with the SC100 chip as it supports 2 channel MPX (Multi-Pointer X) serial ports which comply with the RS 422/485 standard. The cost of the SC100 chip is £12 per machine when purchased in quantities of 1000 or more.

The final requirement from EDC (English Digital Computers) was that the board must support a GUI (Graphical User Interface) system and a mouse.

The mouse requirement will be met with the SC150 chip and the luggable case. The SC150 chip allows the device to support a mouse, and the luggable case has four external ports one of which could be used for a mouse.

The UWM (Ultrix Window Manager) Windows Manager GUI will rely on the GDISP XVX module to fulfil the GUI (Graphical User Interface) requirement. The GDISP XVX module costs £25 per machine when purchased in quantities of 1000 or more. I chose the GDISP XVX module over the GDISP XVZ module because of the higher price of the GDISP XVZ module (£55 instead of £25).

Slide 5 – Initial Design vs Updated Design

The initial design of the Synputer featured a 68,008 series Motorola CPU (Central Processing Unit). It also included four ULA (Uncommitted Logic Array) chips, 2 * 32 kilobyte ROM (Read Only Memory) chips and 4 * 32 kilobyte RAM (Random Access Memory) chips. The system supported monophonic sound and came with two Syn cartridge drives for storage. Additionally, it had one serial port and one joystick port. The unit was housed in a desktop case with internal keyboard and a case mounted speaker and the internal displays resolution was 512 by 256 pixels and it ran on the Hyper Basic operating system (OS).

The original Synputer came with a printed manual which covered basic operations, an introduction to the Hyper Basic programming language, and a comprehensive list of keywords. It also came with four cartridges, 2 for the BASIC Programming Language Converter application and two for the EZ Suite applications.

In the new design, the RAM (Random Access Memory) has been upgraded to 4 * 128 kilobyte RAM (Random Access Memory) chips, the CPU (Central Processing Unit) has been upgraded to a 68,000 series Motorola CPU (Central Processing Unit), the motherboard has been upgraded to a socketed board. It includes the Pro Expansion Board which allows for an additional ULA (Uncommitted Logic Array) chip, the storage has been upgraded to two 3.5-inch floppy disc drives. The IOP-S chip has been replaced with the IOP-X chip, the case has been upgraded to a luggable case to support an external keyboard, the sound chip has been upgraded to a YM2149 sound chip and the default operating system (OS) has been changed to a Unix like operating system (OS).

Slide 6 – Project Plan

We will follow a development pattern similar to that used for the initial design, where development and testing will be split across several sprints, utilising the 2:1:3 ratio for design, manufacturing and testing as proposed by Brooks in his book The Mythical Man Month (Brooks, 1975).

In the first Sprint, we will focus on project planning and design, then in the following sprints, both the hardware and software teams will work on designing, developing and testing the hardware and software for the Synputer.

The initial compatibility testing and redesigns for all new components will be completed after one and a half months while MCC (Micro Computing Consultants) work on the Operating System (OS) and the Graphical User Interface (GUI) for the first six months.

After the OS (Operating System) and GUI (Graphical User Interface) have been developed, the software team will concentrate solely on testing the software.

At the beginning of each month, the procurement team will purchase the necessary raw materials (the software licences and disks and hardware components).

Once the initial testing is completed, the hardware team will focus entirely on producing the cases and circuit boards until the 5000 units that are already sold are ready.

Given a maximum capacity of 20 cases per day, it will take just over 8 months to produce the 5000 cases. Similarly, with a maximum capacity of 25 boards per day, it will take approximately six and a half months to produce 5000 boards.

The estimated completion times for the various components for the 2000 machines go into EDC (English Digital Computers) are as follows: the cases will be finished after 100 days and the boards will be finished after 80 days. Since assembling all the components will take some time, we aim to fulfil the contract with EDC (English Digital Computers) by the end of the sixth month.

Once the contract with EDC (English Digital Computers) has been fulfilled the marketing team will begin the marketing campaign for the computer, which will take six months.

The estimated completion times for the various components for the 3000 pre-orders are as follows: the cases will be finished after 150 days and the boards will be finished after 120 days. Due to the time required to assemble all the components for, the pre-orders will aim to deliver all the pre-ordered devices by the end of the 12th month of production.

Slide 7 – Project Budget

Assuming the project is entirely funded through the deal with EDC (English Digital Computers) and the sales to date, the budget for the Synputer is £1,699,970.

Based on the new designs, the cost per machine is £332. The breakdown of the costs is as follows £8 for the CPU (Central Processing Unit), £25 for the ULA (Uncommitted Logic Array) chips, £2.50 for the sound card, £10 for the RAM (Random Access Memory), £8 for the ROM (Read Only Memory), £25 for the socketed boards, £15 for the Pro expansion boards, £32 for the IOP chips, £25 for the GDISP module, £15 for the storage drives, £35 for the case, £7.50 for the keyboard, £99 for the Operating System (OS) discs and licences and £25 for the EZ Suite licence.

The cost of making 5000 machines is £1,660,000 leading to a profit of £39,970 for the first 5000 machines due to the deal with EDC and the pre-orders at the pre agreed price of £399.99.

For the next 5000 machines we expect profits to reach £539,950 excluding operational costs because the increased price results in a profit of £107.99 per machine.

Our pricing strategy is based on our market research, which indicated customers are unwilling to pay more than a 10% premium for the upgraded device. Additionally, we aim to maintain a healthy profit margin, targeting an average gross profit margin of around 25%, which is the standard in the computer services industry.

Slide 8 – Project Milestones

There are five key milestones for our project that must be met for it to be considered a success. The first milestone will be achieved when our design is finalised and approved by the relevant stakeholders. The second milestone will be reached once our initial prototype has been built following the design approval. The third milestone will be met when we fulfil our contract with EDC (English Digital Computers). The fourth milestone will be met when we deliver our pre-orders. The fifth milestone will be met when the marketing for the Synputer is complete and the product is available for purchase by the public.

Slide 9 – Projected Sales

Assuming the only sales to date are from the pre-orders and the deal with EDC (English Digital Computers) and using the average compound annual growth rate (CAGR) of 6% from the Computers Global Market report (The Business Research Company, 2024), we project the total sales for the Synputer over the next five years will amount to £2,274,943.34.

The projected sales after the first year are £1,801,968.20, the projected sales after the second year are £1,910,086.29, the projected sales after the third year are £2,024,691.47, the projected sales after the fourth year are £2,146,172.96 and the projected sales after the fifth year are £2,274,943.34.

Slide 10 – References

To access the recording of the presentation, go to

<https://1drv.ms/v/c/e08399976f28f5bf/EXYsZecjI6hJqRAiS32zxxzEB3pj8onCBolIRAH3m6kD9xg?e=CMz031>