Transcript of Project Update

Summative Assessment 2: Development Individual Project

Software engineering Project Management

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Intro and Agenda

Good afternoon, everyone. My name is Ruben Marques, and I am the Project Management Consultant hired to bridge the operational gaps between Synful Computing and English Digital Computers EDC.

We are gathered here today to discuss the encountered alignment challenges between the engineered deliverables and the client's strategic requirements.

During this session, I will offer a detailed review on the advancements and elaborate on revised requirements that have emerged from recent stakeholder input. I will address the implementation schedule in detail, highlight our budgetary considerations, and explain our risk-mitigation approaches.

Looking at our agenda for this session, to ensure we cover all aspects, I have structured the presentation into the following key topics:

Project Overview: We will briefly revisit the initial objectives to understand where the divergence occurred

Current Status: I will provide an update on our manufacturing status, specifically addressing the inventory currently sitting in our warehouse and the quality issues identified.

Updated Requirements: We will examine the specific modifications to the system requirements based on EDC's formal complaint and explain the necessity of each change.

Proposed Solutions: I will outline how we intend to satisfy EDC's expectations while simultaneously addressing the broader consumer market.

Project Timeline: I will present the revised project phases and specific sprint plans for final delivery.

Budget and Cost Analysis: We have assessed the financial impact of our modifications to ensure the project remains profitable.

Risk Management: We will explore the potential risks and strategies for effective management.

User Acceptance Testing: I will detail the testing procedures and the implementation process.

Conclusion: Finally, we will conclude with the immediate next steps required to execute this plan.

Project Overview

Now, let us begin with the Project Overview.

As you all know, this project initiated in 1982 with a shared vision: both parties agreed to deliver a high-performance machine based on the Motorola 68k architecture, positioned to serve both individual hobbyists and corporate users.

However, as we moved to production, we experienced requirements volatility and stakeholder misalignment.

The latest feedback from EDC, indicates that the current build fails to meet their standards. EDC has stressed the importance of a stationary workstation unit, which deviates significantly from the initial portable concept our engineering team pursued.

Furthermore, there is a need for enhanced specifications to meet standards, processing power, memory and operating system compatibility.

The stakes could not be higher, since the project faces a potential Contract Breach, carrying a £1 million liability.

This feedback has compelled us to reconsider our design and manufacturing approach. So, we must ensure alignment with EDC's operational needs while also improving the overall user experience for the normal consumer.

We must balance the Triangle of Project Management of Time, Cost and Scope, so we must be intelligent about how we adjust Scope to deliver quality (Gemino et al., 2020)

Current Status

We have reached a significant manufacturing milestone by producing 1,000 units of the base model. However, recent quality assurance testing has revealed a critical defect due to Electromagnetic Interference, where the motors from the internal drives are causing random system resets.

In a traditional scenario, one might suggest scrapping these units. However, as an Asset Recovery Strategy, we simply cannot afford to write off so much inventory, due to budget.

Therefore, our immediate status involves a Remedial Rework Phase. Instead of discarding, we are applying copper tape to the drive cages and installing additional grounding straps to divert the interference, making the units saleable.

Simultaneously, we have confirmed that the soldered architecture of these 1,000 units cannot be upgraded to meet EDC's new specs. This leaves us with a standpoint, where we have 1,000 units that need repair, and zero units that meet EDC's requirements.

This status drives us to pivot to a new architecture for future production, while salvaging the current stock.

Updated Requirements and assumptions

Following EDC's input and a comprehensive evaluation of market trends, we have applied the MoSCoW prioritisation technique to structure our scope (Borhan et al., 2022).

We Must Have these following components (Critical for EDC Contract):

68000 CPU: The base 68008 chip is insufficient. We must upgrade to the full Motorola 68000 to provide the 16-bit bus width and performance required for business applications.

512KB RAM: To support multitasking and future GUI environments, the memory must be quadrupled from 128KB to 512KB.

Industry Standard OS: Proprietary software is of most importance for businesses. We have selected CP/M-68k from TRW as the mandatory operating system, which permits EDC to run standard business tools immediately, and they already have

some familiarity with this system inside their company, since they mentioned previously using it in a department.

Connectivity: We must provide SCSI expansion capabilities and dual serial ports for networking.

Then for Should Have’s

While EDC highlights a GUI, and market trends see it as a key selling point, software development takes time. Therefore, the requirement is that the hardware must be GUI Ready. By shipping with the 68000 CPU and 512KB RAM, we ensure the machine can run the GEM environment when it is released at a later date.

It Won't Have

Portability: We are formally abandoning the "Luggable" concept per EDC’s request for a desktop form factor.

A Solid State Storage: The engineering team failed to produce a viable solid-state drive. We will revert to the internal cartridge system combined with a standard floppy drive to mitigate this failure.

To meet these "Must Haves" and working around the soldering, we will leverage the Pro Expansion Board as our primary integration method for all EDC units.

We are also assuming the following:

The 3,000 pre-orders already taken by Marketing are assumed to be consumer/home market demand and are treated as a separate revenue stream from the 2,000-unit EDC contract.

The 1,000 units already in production are Base Edition units and are suitable for consumer delivery after minor EMI rework and are not intended for EDC deployment.

The Pro Expansion Board is assumed to be an optional aftermarket upgrade purchased only by advanced users and therefore excluded from the consumer manufacturing cost model.

Manufacturing capacity can be temporarily increased to support rework and dual production.

EDC accepts phased delivery with CLI first and GUI later.
It is assumed that EDC accepts CP/M-68k CLI delivery with GEM provided as an upgrade at future date.

It is assumed that the HBConv 60% conversion failure only affects EDC migration and is eliminated by using native CP/M-68k for business users.

Proposed Solutions for EDC and Market Demands

To effectively resolve EDC's needs while addressing the broader market, we faced a strategic choice. Do we build one single system for the consumer market and EDC, or two distinct systems?

Given the constraint of 1,000 units already being in production, and the differences in user needs, we have decided to pursue a Two System Approach, specifically a Base Edition for Synful consumers and a Professional Edition for EDC. Here is how this accommodates our different user groups:

For Existing Users and Hobbyists:

We have 3,000 pre-orders from home users. These customers prioritise price and gaming. We will fulfil the first wave of these orders through reworked 1,000-unit inventory. These machines will run the HyperBasic system and the SynEM emulator for backward compatibility. In addition, we will market the Pro Expansion Board as an optional upsell, meaning that users can upgrade to better hardware at their own expense.

For EDC, their 2,000 units will be a distinct, more business-oriented build.

These units will have the Pro Board pre-installed, and the Must Have requirements that were previously mentioned.

This tiered product structure allows us to leverage our old inventory for the general market while delivering a high-specification product to our business partner.

Project Timeline Overview

Let us now examine the revised Project Timeline.

We have structured the recovery into distinct phases with aggressive but realistic deadlines.

Phase 1: Rework & Procurement for 8 weeks, split into two separate sprints:

Sprint 1 focuses on the EMI rework on the existing 1,000 units.

Sprint 2 focuses on procuring 2,000 Pro Expansion Boards and the necessary 68000 CPUs.

Phase 2: Integration and Prototyping for 4 weeks.

We will produce the final prototype of the EDC Edition and confirm that the CP/M-68k command-line interface is stable on this new hardware.

Phase 3: User Acceptance Testing for 2 weeks.

This is our critical path milestone where we should deliver the troubleshooting guide and the prototypes to EDC for a strict 2-week sign-off period.

Phase 4: Production and Fulfilment for 8 weeks.

Upon UAT sign-off, we commence full-scale assembly of the 2,000 Professional units.

Phase 5: The GUI Upgrade post launch to market and EDC.

We must acknowledge Brooks' Law, that states that adding manpower to a late software project makes it later (Brooks, 1975). Since TRW has quoted 38 weeks for the GEM it will follow as an optional software update, completing the final Should Have requirement.

Budget and Cost Analysis

Let us now turn to the financial viability of this recovery plan.

We have conducted a Cost Breakdown Structure analysis using the Volume Pricing Tiers from our supplier agreements to ensure estimated expenses and profit.

First, for the workstation specific for EDC, we can leverage the volume pricing for the Motorola 68000 CPU, 512KB of RAM, Mixed module with floppy and cartridge, External Keyboard and SCI Controller and the Pro expansion board, reaching a Hardware unit price of approximately £183.00.

Now, regarding the Software Licensing,we faced a critical decision.

The total software suite we have chosen for EDC, combines the CP/M-68k and the CPMReady emulator, that has a combined list price of approximately £90 per unit.

However, given the scale of the EDC order of 2,000 units, we assume that a volume licensing agreement can be negotiated with TRW.

Under this assumption, we model a bundled licence cost of £50 per unit.

The GEM GUI Environment is listed at £99.00, and if we included this in the base unit, our cost would be far above 250£, shattering the budget and causing a loss on every unit sold to EDC.

Hence, we decouple the GUI license. So the model is shipped 'GEM Ready' and stays within budget.

By strictly controlling the Bill of Materials and decoupling the GUI, our final manufacturing cost for the EDC unit stands at £233.00, leaving us with a positive margin of £17.00, ensuring the contract is self-sustaining.

Second, the Base Edition for Consumers:

Our financial position here is robust due to Asset Recovery.

Sunk Costs: We are assuming that the manufacturing capital for these 1,000 units has already been deployed and that the components used are from the base model. Yet, to mitigate the electromagnetic Interference, we have budgeted a £5.00 per unit contingency for the manual shielding rework.

With an estimation of 200£ for the base model, and addition of £5.00, we get a margin of 194,99£ per unit, selling at the marketed £399,99.

This means that there is a cash flow generated by the high-margin consumer pre-orders that effectively subsidises the tighter margins of the EDC contract and covers our development overheads, generating some sort of financial resilience (Titarenko , 2024)

Risk Management

Let us now examine Risk Management. Here are some of the possible risks related to latest status and possible modifications.

Risk 1: System Instability from EMI - Critical Impact:

The risk of shipping machines that reset randomly is our highest quality threat.

To mitigate, we can implement a layered solution. For Base units, manual shielding and for EDC units, the Pro Board architecture can physically separate the CPU and RAM from the noisy drive motors. We will also introduce a strict "Go/No-Go" gate at the prototyping phase. If the interference persists, we pause production to redesign the shielding.

Risk 2: Software Delays - Medium Probability:

Software projects often overrun. If TRW fails to deliver the GEM GUI in 38 weeks, we cannot delay the hardware.

We mitigate this by launching units without initial GEM GUI. So anything related to the GUI should be contractually defined as a post-launch upgrade to manage stakeholder expectations and remove the GUI from the critical path.

Risk 3: Supply Chain (Pro Board Capacity) - High Impact:

The Pro Board supplier is a smaller entity, so an on-time delivery of thousands of units might not be feasible.

We should aim to provide upfront material funding to this supplier to secure priority manufacturing slots and allow them to scale their operations to meet our initial 2,000-unit order (Marnada et al., 2022).

User Acceptance and Deployment

We now examine our strategies for User Acceptance Testing and Final Implementation.
We have allocated a strict two-week window in May 1984 for UAT.

In this phase, EDC must receive a built prototype, and a comprehensive Troubleshooting Guide to address their previous complaints about crashing, and a test script mapped to the specific requirements that we chose to adress.

The goal is to obtain a formal sign-off that the new specification meets their standards and abolishes the threat of the £1 million lawsuit.

Implementation Schedule:

Following User acceptance testing, we move to deployment:

In April 1984 we finalise the system redesign and complete the prototype.

In May 1984 we conduct UAT with EDC stakeholders.

In June 1984 we start full-scale production of the 2,000 EDC units and the remaining Base units.

In August 1984 we officially deliver the hardware to EDC and commence consumer retail shipments.

In November 1984 we release the GEM GUI software update availability.

This organised timeline ensures transparency and allows us to manage stakeholder expectations effectively throughout the recovery process.

Conclusion and next steps

In summary, we have determined the essential adjustments to the overall synputer project. By pivoting to two separate systems, we can fulfill EDC's high-performance specifications and consumer demands, without discarding our existing inventory.

Our Immediate Action Plan is as follows:

Finalise the Redesign: Complete the Pro Expansion Board integration design by April 1984.

Rework Inventory: Commence the EMI shielding rework on the 1,000 base units immediately.

Execute UAT: Secure EDC's formal sign-off in May 1984.

Launch the modified models starting June through August 1984.

We are optimistic that these modifications will meet expectations and strengthen our position in the competitive computing market by turning a potential crisis into a strategic expansion of our product line.

Thank you for your time and attention.

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