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COURSEWORK SUBMISSION FORM

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Introduction

This report aims to overview and recommend suitable hardware and software solutions for team members of a new local IT company.

Start-up company Odyssey specializes in making mobile applications for Android and IOS. A variety of applications includes health-tracking utilities, meditations and yoga, workout and weight-loss programs. Odyssey team consists of 1 Project Manager, 2 graphical and UI/UX Designers, 1 Android Developers, 1 Apple Developer, and 1 QA Software Tester. While the company is relatively new and has a limited budget, it still owns a small office in the center of the Tashkent.

Review of hardware, software solutions and tools

Configuration details for computers

First of all, the startup company should acquire proper affordable computer hardware. Taking into consideration a low budget prioritizing laptop over stationary PC for developers, designers and tester would be a better option. Modern laptops are light, comfortable and easy to transfer, therefore team members can work both at the office and distantly. On the other hand, Project manager might spend more time at the office, coordinating and watching employees work, therefore Desktop, in this case, might a great choice. Choosing between Operating System, we focused more on laptops with Windows OS as it is much cheaper compared with Apple production (1). The suggested screen size would be 13-15 inches with an anti-glare surface. Moving to CPU, we think Intel Core i5/i7 would cover all requirements of developers and designers. Choosing 8GB or more RAM is crucial for allowing users to use several programs simultaneously. Furthermore, even though the SSD storage type can store less but provides faster devise performance than HDD, we provided laptops with both configurations. The company has an office and naturally, electricity supply, Nevertheless, it is important to have 8 hours Battery life, as programming and designing require intensive computing power. It is noteworthy to mention that laptops for designers are more powerful, in terms of graphic card, processor and screen resolution. Regarding software tester, laptops as for developers are suggested.

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№	Name and Price	OS	Descriptions	Benefits	Limitations
Developers					
1	Acer Aspire E 15 **Price:** 599$ ([Amazon](#))	Windows 10 Home 64-bit	**Processor**: Intel Core i5-8250U 1.6GHz Quad-Core, Turbo Boost up to 3.4 GHz **Ram**: 8 GB DDR4 **Storage**: 256GB SSD **Graphics**: NVIDIA GeForce MX150 2GB DDR5 VRAM **Display**: 15.6-inch Full HD ComfyView LED-Backlit IPS Screen, 1920 x 1080 pixels Resolution **Battery life**: Up to 15 hours **Weight** 2.4kg (1)	Low price Strong performance Lots of ports Good battery life Comfortable keyboard Big touchpad Great for Android Studio, Visual Studio or PostgreSQL (2)	Bulky design Filled with bloatware
2	ASUS VivoBook F510UA **Price:** 515$ ([Amazon](#))	Windows 10 Home 64-bit	**Processor**: 8th Generation Intel Core i5-8250U 1.6GHz, Quad-Core, Turbo Boost up to 3.4GHz **Ram**: 8GB DDR4 (Upgradable) **Storage**: 1TB HDD **Graphics**: Intel UHD Graphics 620 **Display**: 15.6-inch Full HD anti-glare display, 1920 x 1080 pixels Resolution **Battery life**: 5 hours **Weight** 1.7 kg	Low price Sleek design Large FHD display Both types of USB ports Strong performance Anti-glare display Comfortable keyboard Supports multitasking	Lacks touch support Keyboard not backlit Short battery life No SSD in test model (1)

3	Apple MacBook Air **Price:** 1,034$ ([Amazon](#))	macOS	**Processor**: 8th Generation Intel Core i5 1.6GHz, Dual-Core, Turbo Boost up to 3.6GHz **Ram**: 8GB DDR4 **Storage**: 128GB SSD **Graphics**: Intel UHD Graphics 617 **Display**: Retina display, 13.3-inch, 2,560 x 1,600 pixels Resolution **Battery life**: up to 11 hours **Weight: 1.25kg**	True Tone (adjusting screen colors to light temperature, great for long work hours) Good battery life Sleek design Multitasking Touch ID High-resolution display	Underpowered CPU Expensive Expensive to upgrade Limited storage capacity Only two Thunderbolt 3 (USB-C) ports (1)
4	Lenovo ThinkPad E590 **Price:** 687.11$ ([Amazon](#))	Windows 10 Pro 64	**Processor**: AMD Ryzen 5 3500U 2.10 GHz, Quad-Core, Turbo Boost up to 3.70 GHz **Ram**: 8 GB DDR4 (Upgradable) **Storage**: 256GB SSD **Graphics**: AMD Radeon RX 550 **Display**: 15.6-inch, Full HD 1920 x 1080 pixels Resolution **Battery life**: up to 10 hours **Weight: 2.12 kg**	Anti-glare display Windows 10 Pro (better security) 1 Year Warranty Many ports and card slot Good battery life Strong build quality and performance Great for Android coding and graphically intensive work	Poor display color reproduction Inconvenient microSD card slot (3,4)
Designers					

| 1 | Acer Predator Helios 300

Price:

1,100$

(Amazon) | Windows 10 Home 64-bit | **Processor:** 9th Generation Intel Core i7-9750H, 6 Core, Turbo Boost up to 4.5GHz

RAM: 16GB DDR4

Storage: 256 GB SSD

Graphics: NVIDIA GeForce GTX 1660 Ti 6GB GDDR6 VRAM

Display: 15.6 inches Full HD, 1920 x 1080) Widescreen LED backlit IPS Display(144Hz Refresh Rate)

Battery life: 3.5 hours

Weight: 2.3 kg | Sleek design

Strong build quality and performance

Comfortable keyboard 144Hz display

Good port selection | Short battery life

Limited storage capacity

Poorly designed cooling system (5-7) |
| 2 | HP Envy 13t
Price:

1080$

(Amazon) | Windows 10 Home 64-bit | **Processor**: 8th Generation Intel Core i7-8565U 1.8 GHz (Turbo Boost up to 4.6GHz) Whiskey Lake Processor

RAM: 16GB DDR4

Storage: 512 GB SSD

Graphics: NVidia GeForce MX250 2GB DDR5 Graphics

Display: 13.3-Inch 4K IPS, 1080 Resolution WLED-backlit Touchscreen Display

Battery: Up to 12 hours

Weight: 2.2kg | Good battery life

Strong build quality and performance

Touchpad

Screen protection

Sleek metal styling

Comfortable keyboard

Supports fast charging: 50% battery life for 45 minutes | No HDMI or Thunderbolt 3 port

Bad audio output (better with HP Audio Boost)

Inconsistent multi-core performance (8,9) |

3	HP Omen 15 **Price:** 793$ ([Amazon](#))	Windows 10 Home 64-bit	**Processor**:8th Generation Intel Core i7-8750H Processor, 6-Core, 2.2GHz up to 4.1GHz **RAM**: 12GB DDR4 **Storage**: 128SSD, 1TB SATA HDD **Graphics**: NVIDIA GeForce GTX 1050 Ti **Display: 15.6-inch, 3840 x 2160 (4K) IPS with G-Sync** **Battery**: Up to 6 hours **Weight**: 2.45 kg	Affordable Price Strong performance Sleek design Comfortable keyboard and touchpad Bright Display	Slow Hard Drive Average battery life Thermal throttling under stress (10)
4	Lenovo ThinkPad E590 **Price:** 687.11$ ([Amazon](#))	Windows 10 Pro 64	[Same Laptop suggested for Developers (see above section)](#)		
Project Manager					
1	Apple MacBook Air **Price:** 1,034$ ([Amazon](#))	macOS	[Same Laptop suggested for Developers (see above section)](#)		

2	Dell - Inspiron All-In-One **Price**: 650$ ([Bestbuy.com](#))	Windows 10 Home 64	**Processor:**AMD A9-9425 3.1 Ghz **RAM:** 8 GB DDR4 **Storage:** 256 SSD **Graphics:** AMD Radeon R5 **Display(Monitor):** 23.8-inch, LED Touch-Screen, 1920 x 1080 Resolution Full HD **Dimensions(W x D x H):** 21.6 x 1.6 x 14.1 **Ports:** 2 x USB 2.0 Type A Ports, 1 HDMI Output, microphone and headphone jacks.	Advanced multitasking Many ports Bluetooth 4.1 interface syncs with compatible devices Sleek design Very compact Included Trend Micro Internet Security (3-Device) (6 Month Subscription) - Android|Mac|Windows|iOS [Digital]	The bundled keyboard and mouse are low-quality and plasticky No USB connections on the front No USB 3.0 ports Not included a built-in DVD/CD drive
3	Lenovo - IdeaCentre 310S **Price:** 360$ [LG - 24" IPS LED FHD FreeSync Monitor](#) **Price:** 110$ [Logitech - MK270 Wireless Keyboard and Mouse](#) **Price:** 23$	Windows 10 Home 64	**Processor:** AMD A9-9425, 3.1 GHz **RAM:** 4GB DDR4 SDRAM **Storage:** 1TB SATA HDD **Graphics:** AMD Radeon R5 **Display(Monitor):** IPS, 1920 x 1080 **Dimensions (W x D x H):** 11.69 x 3.54 x 13.54 **Ports:** 2 x USB 3.0, 4 x USB 2.0, 2 x Headphone (Front / Rear), 2 x Microphone (Front / Rear), 1 x Audio Out (Rear) HDMI-Out VGA, 7-in-1 card reader	Compact Powerful, long-lasting performance Microsoft Office included Large amount of ports Low price DVD/CD burner Wireless network Easy set-up	HDD is slower than SSD Low storage capacity Depends on electricity supply Available to use only at the workplace Poor cooling system

	Total Price: 493$ ([Bestbuy.com](#))				
4	Lenovo ThinkPad E590 **Price**: 687.11$ ([Amazon](#))	Windows 10 Pro 64	[Same Laptop suggested for Developers (see above section)](#)		
Software tester					
[Laptops as for Developers](#)					

Configuration details for server

№	Name and Price	Description	Benefits	Limitations
1	Dell PowerEdge T30 Price: 469,99$ ([Amazon](#))	**Processor**: Intel Xeon E3-1225 v5 **Ram**: Up to 64GB **Storage**: 1 TB SATA, up to six SATA HDD **Graphics: Intel HD Graphics P530** **Bays:** Four **Connectivity**: 10 x USB ports, HDMI, DisplayPort, VGA, serial, PS2, Gigabit Ethernet **Dimensions (W x D x H)**:	Low price Compact and quiet Upgradable Low energy consumption Fast quad-core Xeon processor Room for six internal disks Fix USB 3.0 slots Perfect	Single Gigabit network port No hot-swapping of disks No Operating System (11)

		17.5 x 43.5 x 36cm	alternative to an office workplace	
2	Lenovo ThinkServerTS150 **Price:** Approximately 500-700$	**Processor**: Intel Xeon E3-1200 v6 **Ram**: Up to 64GB **Storage**: 1 TB SATA, Up to 40TB HDD **Bays:** Four **Connectivity**: 8 x USB 3.0, serial, video, 2 x DisplayPort, audio, Gigabit Ethernet **Dimensions (W x D x H)**: 17.5 x 37.5 x 43cm	Upgradable Compact and quiet Low-energy consumption	No hot swapping Slow base CPU (11)
3	Synology DiskStation DS419slim **Price:** 353,99$ ([newegg](#))	**Processor**: Marvell Armada 385 88F6820 dual-core 1.33GHz **Ram**: 512MB **Storage**: Up to 20TB **Bays:** Four **Connectivity**: USB 3.0 port, two gigabit Ethernet ports that support link aggregation, and a power jack	Fast to setup Low price Mobile apps Up to 200 users Hot swapping Operating system - DiskStation Manager Cloud solution 24-hour backup device Light weight Compact and quiet Low energy	Only uses proprietary apps Drives not included Only accepts 2.5-inch drives Limited storage capacity (12,13)

			consumption Lots of available apps Anywhere access with iOS and Android ready mobile apps	11

Software solutions

On premises oriented

№	Name and Price	OS/Browser support	Descriptions	Benefits	Limitations
Developers (Android)					
1	Android Studio **Price:** free	Windows, macOS and Linux	Official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA . Powerful code editor and developer tools. **Basic requirements:** ● Microsoft Windows 7/8/10 (32-bit or 64-bit) ● 3 GB RAM minimum, 8 GB RAM recommended (plus 1 GB for the Android Emulator) ● 2 GB of available disk space minimum, 4 GB recommended ● 1280 x 800 minimum screen resolution	Fast and feature-rich emulator Free Android app and library modules Google App Engine modules Built-in cloud solution support for Google cloud platform Inbuilt Android Virtual Device to test Android applications. Open-source software Auto-completion facility	Good for small business Requires high amount of RAM and processing power Difficult multitasking Consumes a lot of memory (14)

2	IntelliJ IDEA **Price:** free IntelliJ IDEA Ultimate **Price:** 1st year 499$, 2nd year 399$, 3rd year and onwards 299$	Windows, macOS and Linux	A Java IDE with support for Java 8 and Java EE 7, new tools for Android development, the editor enhancements developed by JetBrains. **Basic requirements:** ● 1 GB RAM minimum, 2 GB RAM recommended. ● 300 MB hard disk space + at least 1 GB for caches. ● 1024 x 768 minimum screen resolution.	Documentation Free trial Wide range of Tools Good learning experience Great developer communities	Heavy program Difficult for beginners No cloud solutions Expensive (15,16)
Developers (IOS)					
1	XCode 11 **Price:** free	macOS	Apple's proprietary integrated development environment (IDE) allowing to develop applications for iPad, Mac and Apple Watch. Supports any feature or technology currently available on iOS and iPhone, for which it makes native apps.	Built-in sprite editor Built-in testing "playground" Highly specialized Free Best for IOS applications Version Editor Split windows Powerful interface builder and debugging tools	The Swift coding is complicated Not so much plugins There is much better options Only for Mac computers (17,18)

2	AppCode **Price:** Free 30-days Trial **Price:** 1st year 199$, 2nd year 159$, 3rd year and onwards 119$	macOS	Integrated development environment (IDE) designed by JetBrains for MacOS/IOS development. It allows to build apps for Apple devices. **Basic requirements:** • 2GB RAM (recommended 8GB) • 3,5GB of Disk Space (recommended 5GB) • 1024 x 768 minimum screen resolution • 11.3 Xcode	Fully compatible with Xcode Seamless integration with Git, CocoaPods, Jira and others Support many languages Efficient project navigation Smart completion Reliable refactorings Productive unit testing better code editor	Does not support whole IOS/Mac development cycle No interface designer No UI creation Only for Mac computers Hard debugging Cannot run without Xcode (19-21)
For development of IOS programs on Windows OS, see section "Hybrid"					
3	Git **Price:** free	Windows, macOS	Distributed source control system that helps software developers to track and manage multiple revisions of the same project	Good Documentations Simple to use Collaboration Fast Synchronizing multiple programmers on the same codebase	Difficult for people who don't use command line Complicated to learn (22)
Designers					

1	Adobe Experience Design XD **Price:** 552$ per year	Windows, MacOS, Android, IOS	UX tool for businesses that helps create designs for web and mobile via prototyping, sharing, collaboration, and more. **Basic requirements:** ● RAM: 4 GB ● 2GB hard disk space ● 1280 x 800 resolution ● Intel® or AMD processor with 64-bit support	User-friendly Easy to use and learn Filling UI is simple Available to preview on phones	Lags on android preview Animating UI is complicated No CSS export (23,24)
2	Balsamiq Wireframes **Price:** 98$ per user	Windows, MacOS	Rapid wireframing software that enables lean teams to collaborate, make mockups, control versions, and run user test. **Basic requirements:** **Mac OS X** ● macOS 10.12.6 (macOS Sierra) ● 4GB of memory ● 100MB disk space (plus space for backups) **Windows** ● Windows 7 with SP2 ● 4GB of memory ● 150MB disk space (plus space for backups)	User Friendly Fast Designed for Collaboration Integrated with Cloud Drive, Jira Many options Ability to convert a design to a PDF Cloud support	limited UI elements Requires a lot of RAM Limited collaboration options Subjective design (25, 26)

3	Axure RP Free 30-days Trial Axure RP 9 Team **Price:** $ 49 per user, per month	Windows, macoS	All-in-one software design prototyping tool used by UX designers to plan, prototype and hand off projects to developers, all without code. **Basic Requirements:** **Windows** ● Windows 7, 8, or 10. ● 2 GB memory (RAM) minimum, 4 GB recommended. ● 1 GHz processor. ● 5 GB disk space **Mac OS** ● macOS 10.9+ ● 2 GB memory (RAM) minimum, 4 GB recommended. ● Mac computer with 64-bit Intel processor. ● 5 GB disk space.	Team Project hosting on Cloud Secure Third-Party widgets and Sketch Integration Version Control UI/UX Prototyping Quickly test ideas Great collaboration Revision History	Expensive Large prototype slows performance Hard to learn Outdated Interface (27,29)
4	Sketch **Price**: 99$ per year	macOS	Creating, prototyping, collaborating and turning ideas into incredible products with the definitive platform for digital design. **Basic Requirements:** ● macOS High Sierra (10.13.4) or newer ● 2GB RAM ● 1GB disk space	User-friendly UI and UX is simple Automatic project saving	Only mac support. Occasional crashes when files are big Only English is supported (30,31)
Project Manager					

1	Alfresco Alfresco Starter Edition **Price**: Approximately 18.500$ per year	Windows, MacOS, Linux, iOS, Android	The software is designed to facilitate teamwork on documents stored within the system. As much a content management platform as it is a document management system	Many different tools Fast Document management Collaboration Tools Custom workflow processes Integrations with Google Docs, Microsoft Office etc. Easily extended	Very expensive for small businesses Lack of transparent pricing Not easy to use Bad mobile application (32-34)
2	Jira **Price:** 10$ per year	Windows, MacOS, Linux, iOS, Android	Project management solution for mapping out, prioritizing, and delegating tasks. System streamlines the app development process from conceptualization to execution.	Available on different platforms Affordable Different features available Variety of charts and graphs Strong security Customizable dashboards and wallboards	Not user-friendly Slow Good for big companies (32, 35)

3	Microsoft Project **Price:** 620$ per year	Windows	Advanced project management platform Great for scheduling projects and finding optimal solutions for distributing workloads across the team.	Built-in reports Easy connection with microsoft office tools Fast start-up Supports detailed task descriptions	Only for windows OS Expensive Only per one PC (36, 37)
Software Tester					
1	Appium **Price:** free	Windows, macOS	Appium is an open source test automation framework for use with native, hybrid and mobile web apps. It drives iOS, Android, and Windows apps using the WebDriver protocol.	Web Testing Supports both Android and IOS Open Source Clear UX/UI	Requires a lot of space Slow for IOS Sometimes loses connection to emulator (38-40)
2	Kobiton Kobiton Team **Price:** 40$ per month	macOS	Mobile testing platform that accelerates delivery and testing of mobile apps by offering manual and automated testing on real devices	Supports varieties of devices Not expensive Manual and autonomous testing Appium Script Generation	Only for IOS Sometimes store is not available (41)
3	TestFlight **Price:** free	IOS mobile app	Mobile application that allows you to instal and beta test apps on your iOS device allowing you to provide feedback to developers on the features you tested in the pre release	User-friendly Minimalistic interface Best app to share the ios apps to clients and	Requires iPhone Only for IOS (42, 43)

			external tester		
			Allows to receive remote logs, crash reports and tester feedback		
			Supported by Apple		
			No need for Tester		

Cloud oriented

№	Name and Price	OS/Browser support	Descriptions	Benefits	Limitation
Developers					
1	AWS Amplify **Price:** Free Tier for 12 month 1000 build minutes per month After - 0.01$ per build minute **Hosting** 0.023$ per GB stored	any Browser	Development platform for building secure, scalable mobile and web applications. Amplify covers the complete mobile application development workflow from version control, code testing, to production deployment, and it easily scales with your business from thousands of users to tens of millions. For IOS, Android, React Native	Easy to use Accessible from everywhere Fast and efficient Vast range of services Good UI Secure Web client	No back-up Sometimes lon responses High price (44)

	per month 0.15$ per GB served		Platform as a Service (PaaS)		
2	Azure App Service	any browser	This program is described in "Hybrid" section (See section below)		
3	Firebase Crashlytics **Price:** free	any browser	Powerful tool to track, prioritize, and fix stability issues that erode app quality, in real time. Software as a Service (SaaS)	Quick Real Time alerts Easy for a non-developer Both for Android and IOS	Old UI Connects with other Google programs (45, 46)
Designers					
1	Balsamiq Wireframes **Price:** 9$ per month	any Browser	Same program was mentioned in "on premises oriented" (see section above) Software as a Service (SaaS)		Bad performance for non-traditional browsers
2	Figma **Price:** free for up to 2 editors and 3 projects Figma	any Browser	Web-based collaborative wireframing and interface design tool. Software as a Service (SaaS)	Great in real-time collaboration Easy to share projects Easy to learn Many options and elements Great for using a	Not intuitive UI Slow with large projects Limited design tools (47)

	Profession al **Price:** 12$ per user per month			shared library	
3	Marvel **Price:** free for 1 user, 1 project Marvel Team **Price:** 42$ per month	any Browser	Web and mobile prototyping software that helps designers collaborate in real time and create interactive hotspots. No coding required. Software as a Service (SaaS)	Great prototyping tool Fast Solid, quality product User-friendly Integration with Sketch Great UI/UX Good customer service	No collaboration with unauthorized users Unauthorized users cannot leave comment on a project Slows when working large projects (48-50)
Project manager					
1	monday.co m 14-days free trial monday.co m pro **Price:** 79$ per year	Windows , macOS, Linux, iOS, Android any browser	One of the market's leading collaboration and communication apps for teams. Syncs all information in a single, accessible hub, and empowers agents and team members to make important decisions together Software as a Service (SaaS)	Ability to see big picture Align goals Easy to use Highly customizable Modern UI Great service support	Only English is available Expensive Unnecessarily confusing pricing and plans. 14-day trial insufficient to learn the app (51, 52)

2	Trello **Price:** 10$ per user per year	any browser, IOS, Android	Collaboration tool that organizes projects into boards Software as a Service (SaaS)	User-friendly Easy to use Email notification tools Great for young start-ups Great filters Affordable	Random usertag names Only 10mb files per attachment (53)
3	Wrike Wrike Profession al (5-15 users) **Price:** 9.8$ per month per 1 user	Windows , macOS, Linux, iOS, Android any broser	Online project management and work collaboration platform that enables teams to deliver work with speed and efficiency Software as a Service (SaaS)	Lots of customizability Integrates with Slack, Google Hangouts, and Adobe Creative Cloud Secure Great communication tools Supports many Languages Resource Management Time & Expense Tracking Supports Adobe extension Great service support	Not entirely easy to use No spell check tool built-in Mobile operations are limited Expensive Bad mobile version (54, 55)
Software tester					

1	AWS Device Farm **Price:** 0.17$ per device, per minute Unlimited testing: 250$+ per month	any browser	An application testing service that lets you improve the quality of your web and mobile apps by testing them across an extensive range of desktop browsers and real mobile devices Software as a Service (SaaS)	Multiple desktop browsers testers Multiple device testers Secure Both IOS and Android testing	Number of inputs to multiple device is restricted Relatively high cost (56)
2	Firebase Test Lab **Price:** Spark Plan free 10 tests per day 5 tests per day Blaze Plan 1$ per device, per hour 5$ per device, per hour	any browsers	Cloud-based infrastructure for testing Android apps Software as a Service (SaaS)	Easy to run Android Studio Integrations Provides test reports include logs, screenshots, and videos Easy to find a crash	Only Android Tied into Google Cloud High potential of data loss (if you occasionally delete code from console) (57-58)

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Cloud-based servers

№	Name and Price	OS/Browser support	Descriptions	Benefits	Limitation
1	Google Cloud Platform **Price**: 1 year free, then 300$ per year	any browser	Google Cloud Platform offers wide range of managed database services across relational and non-relational workloads Infrastructure as a Service (Iaas)	Easily Accessible Powerful Lots of features to back up	Hard to setup Requires Documentation for starting up (59)
2	IBM Cloud **Price:** free, then upgrade and get 200 USD credit	any browser	It allows enterprises of any size to create custom apps and automate infrastructure deployment Software as a Service (SaaS)	Large varieties of products Great security Fast storage capacity	Delayed synchronization File management issues Not user-friendly (60)

| 3 | FireBase Cloud Storage **Price:** Spark Plan free for 5 GB Blaze plan 0.026$ per GB | any browser | Powerful, simple, and cost-effective object storage service built for Google scale. The Firebase SDKs for Cloud Storage add Google security to file uploads and downloads for your Firebase apps, regardless of network quality. Software as a Service (SaaS) | User friendly Strong security High scalability Robust operations Integrated with other Google products Synch with all devices | Runs slowly with large projects (61) |

Hybrid

№	Name and Price	OS/Browser support	Descriptions	Benefits	Limitations
Developers					
1	Visual Studio tools for Xamarin **Price:** 45$ per month Cloud subscription:	Windows, macOS, Linux	Build cloud-connected cross platform mobile apps and games for iOS, Android, and Windows with a single shared .NET code base Software as a Service (SaaS)	Suitable for both Android and IOS application development Project collaboration Documentation Code completion/checking Working with a team on larger	Uses a large amount of memory Slow when dealing with bigger solutions Xamarin Updates/Changes tend to break projects (62, 63))

	45$ per month 539$ per year, License: 499$			projects Video tutorials Library management Good user Interface/user Experience	
2	Azure App Service **Price:** Free account and trial for 12 months	Windows, macOS, Linux, any browser	Platform that accelerates your mobile application development. Add data storage in the cloud, enterprise or social authentication, push notifications or offline sync. Its offerings range from simple marketing and digital presence applications to scalable e-commerce solutions and hyper-scale, customizable applications. Platform as a service (PaaS)	Simple app deployment from Visual Studio Builds mobile apps fast Easy interfaces: Azure CLI and Azure Portal Database Services Can work offline and sync Connect your apps to on-premises data Revision control Open Source Secure	Complex interface Difficult for beginners Problems with Azure Portal Complicated with payment calculations (64, 65)
3	For more programs check "Cloud oriented" and "On premises oriented" sections				
Designers					

1	Axure RP free 30-days Trial Axure RP 9 Team **Price:** $ 49 per user, per month Axure Cloud **Price:** free (28)	Windows, macOS	This program was described in "on premises oriented" section (See section above)		
2	Balsamiq Wireframe	Windows, macOS all browsers	This program was described in "cloud-oriented" section		
3	Figma Professional **Price:** 12$ per user per month	Windows, macOS all browsers	This program was described in "cloud-oriented" section		
4	Sketch **Price:** 99$ per year	macOS any browser	This programm was described in "on-premises" section		

Project Manager					
1	Jira Standard **Price:** 7$ per month per user	Windows, macOS any browser	[This program was described in "on premises oriented" section. (See section above)](#) Software as a Service (SaaS)	Varieties of diagrams. Anonymous access Large storage (250GB) Secure Advanced permissions	Slow Difficulties to track who and when did changes Free option is limited, paid version is for larger scopes.
2	Zoho Projects **Price:** 240$ per year per 6 users	Windows, MacOS, Linux any browser	Powerful cloud-based solution for planning, tracking, and collaborating on projects. Software as a Service (SaaS)	Collaboration software Good for small/medium enterprises Reporting tools for advanced analytics Document management Support many Languages	Limited file filtering Week integration with other programs No automated copying of projects with the same users Limited functionality (66)
3	The Alfresco Digital Business Platform **Price:** free		[This program was described before in "on premises oriented" section (see section above)](#) Platform as a Service (PaaS)	Many Services Speed and Scale Lower operational costs	
Software Tester					

1	Experitest **Price:** 49$ per month	Windows, macOS any Browser	Allows users to create and run Appium, Selenium, XCUITest & Espresso tests against real devices and web browsers.	Test development Visual Testing Integrations with CI, development and testing tools Open source compatibility Automated cross-browser testing Access to Analytics Both for Android and IOS apps	Expensive Not user-friendly (67)
2	For more programs check "Cloud oriented" and "On premises oriented" sections				

Hybrid servers

№	Name and Price	OS/Browser support	Descriptions	Benefits	Limitation
1	Synology Drive **Price**: depends on choose options	Windows, macOS, Linux any browser	Powerful tool from the Synology series designed to sync files between your computers and Synology NAS through the internet. This way, files are always available whenever needed and are never outdated. This is an ideal sharing solution for home offices, SMBs, and enterprises with multiple branches	Integrates with various public cloud services Mobile app for both iOS and Android devices Full data ownership Low risk of data loss Real-time file synchronization	Requires Synology server (68, 69)

				between all devices Real-time file collaboration	30

Justification and recommendations

Hardware

First of all, if a company opts for premises oriented set of programs, better hardware solutions are required. Offering four variants of powerful, yet relatively low price laptops for application developers, we would recommend Acer Aspire E 15 or Acer Aspire E 15. Acer Aspire E, having only one major limitation - bulky design, has strong battery life and powerful system characteristics for such programs as Android Studio. Similarly,
Acer Aspire E would be a great choice for Android developers. Comparing to Asus VivoBook F510UA, which has poor battery life, these two models have enough battery life for a full working day.

As for the IOS developer, Apple MacBook Air is suggested, even though it is expensive. Despite its price, it is the best solution for the IOS developer, because it has a solid battery life, allows multitasking and has a high-resolution display. In addition, some software for IOS development is only available for macOS, for instance Xcode 11 or AppCode.

Turning to solutions for designers, we offered two reasonably priced laptops and two expensive ones. Starting with budget solutions, we again offer Lenovo ThinkPad E590 and HP Omen 15. These laptops cover all required and recommended needs of such as programs Adobe XD or Axure RP. However, it is said that Lenovo

ThinkPad E590 has poor display color reproduction, which might be detrimental to the designing process.

It is also important to mention, that HP Omen 15, additionally to smaller SSD, has a bigger HDD storage type, which is significantly slower than SSD. Moreover, it has an average battery life.

On the other hand, HP Envy 13t and Acer Predator Helios 3000 offer better characteristics, such as 16 GB Ram, solid processor(i7 9th and 8th generations) and fast graphics cards. Even though Acer Predator is considered to be a gaming laptop, its features are perfectly suited for designing. To conclude, we would say that all four laptops are suitable for graphic design purposes.

Considering project manager hardware requirements, we suggested much lighter options comparing to design solutions. We suggested two desktops and two laptops.

Dell - Inspiron All-In-One is a great budget desktop solution for office, due to a large number of ports, design and included Internet service program. Not having built-in DVD/CD drive we would suggest Lenovo - IdeaCentre 310S with already included Microsoft Office Package and DVD/CD burner. Another recommended solution would be laptop Lenovo ThinkPad E590, as it has good battery life, many ports and Windows 10 Pro 64, which means better security for the manager.

Moving to servers, if Odysseus decides to choose on-premises or hybrid set, we would recommend Synology DiskStation DS419slim. It has many advantages, compared to Lenovo ThinkServer TS150 and Dell PowerEdge T30 such as low price, included OS, 24-hour backup and cross-platform accessibility. Moreover, it goes with special cloud storage Synology Drive, therefore it might be a good

all-included solution for a small company with the opportunity to grow with company needs.

Software

We have grouped all software solutions into 3 categories, on-premises, cloud-based and hybrid. For Android application development we would suggest Android studio, as it is free, supported by Google, extremely fast and has build-in Android emulator. For IOS developers - best option would be Xcode, as it is official Apple programm and also free. Other options might be Visual Studio tools for Xamarin, which support both Android and IOS app development on both Windows and macOS. Moreover, it also includes cloud version with relative high cost subscription. It is also recommended to use Git to keep track of application versions and Firebase Crashlytics to repair crashes on the way.

Turning to solutions for designers, we analyzed different applications from all categories, and from that we suggest to consider using Adode XD, Figma/Figma Professional and Sketch. Adobe XD has almost minimum requirements to use (4GB RAM) and can be run on every suggested hardware. Moreover, the price is quite affordable for 2 designers. Similarly, Sketch is also suitable option, but only for macOS. In addition, Sketch can be used both on-premise and in the cloud. Finally, Figma offers many tools for collaboration, ability to perform on every computer, which has Internet connection. It is affordable and perfect for scaled companies.

Taking into consideration all project management tools, we found out, that the best option would be either cloud-based or hybrid. On-premises solutions, such as

Alfresco or Microsoft Project are extremely expensive for small businesses such as Odyssey. Moreover, all on-premises solutions are suitable for large enterprises and for small companies it would be difficult to use, set up and pay. In comparison, the hybrid set is both suitable for large and small businesses, however, hybrid solutions do not offer mobile applications for its users, so project management can only be regulated on laptops or desktops. Having approximately the same price as hybrid solutions, cloud-based offer both mobile applications, web-versions and apps on Windows, macOS, etc. Moreover, cloud-based software is perfectly correlated with young start-ups, as it is easy to use, affordable and also has a mobile application, to manage all tasks, assignments, and charts almost everywhere. Choosing from cloud-based solutions, we suggest using monday.com.

The best option for testing application would be on-premise programm Appium as it is free and suitable for both IOS and Android, other options are quite expensive for start-up company.

Finally, if company decides not to purchase on-premises servers, we would recommend Google Cloud Platform, as it has Android Studio support and many other cloud-services for application development.

Conclusion

To conclude, the optimum approach to equip start-up company Odyssey with relevant software and hardware solutions would be a hybrid set. It allows for combining the best options from on-premise and cloud-based settings. Opting for the best program solution for every team member, we focus on price, reliability, and functionality. As many on-premise programs have limits in functionality cloud-based programs allow scalability. Therefore, Odyssey might opt for more advanced payment plans in the future, as the company will grow and develop.

Links

During this report, we used following tools:

Google Docs

https://docs.google.com/document/d/1oTxcxy9SYWLYg54ipD48XkX752a6ZVlfhXxyzIc_dnI/edit?usp=sharing

Github

https://github.com/00008402/FIT.CW1.8402.8446

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