AN EXPLORATION OF MOBILE APPLICATION DEVELOPMENT PROCESSES

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Abstract—The mobile device market has witnessed swift industrial growth over the last decade. The quick expansion of this new computing platform has almost outpaced the software engineering processes customized to mobile application development. However, there are still a number of defects and lack of research tasks in growth process of the mobile apps. There still continues to be some deficit in the improvement criterions and using the very best policies which indicate the mobile device for a number of probable attacks. These deficiencies need to be analysed carefully and extra work is needed. Our analysis capitalizes in the direction of much better understanding of the present mobile application development processes, likewise inspect the problems and problems provoked, and explores the very best and perfect methods which could be successfully applied and implemented to evaluate as well as exaggerate the generation of the mobile app development process.

Index Terms—Mobile devices, mobile apps, mobile app development, mobile computing, mobile issues and challenges, mobile development best practices

I. INTRODUCTION

As mobile platforms continue to advance in performance, users are expecting their mobile devices to provide functionality similar to their desktop computer applications. However, the development of mobile applications (mobile apps) is still considered to be complex, and various methodologies adopted towards the development of such technologies is inadequate. Traditional software engineering approaches and methods used in the development of desktop applications may not be directly applicable to a mobile environment [1, 2]. Therefore, it is critical to develop and adopt appropriate methodologies for the development of mobile applications as there are a number of key issues and challenges that are different from traditional enterprise applications. However, the development of mobile software is still unwieldy and a methodology geared towards supporting the development of such mobile applications is still inadequate. There is still lack of research initiatives and insufficient understanding of real issues and challenges faced during the development of mobile apps. This exposes the mobile device to prospective attacks which need to be addressed promptly and require further work that motivates this study.

The current paper addresses these key questions systematically. The objective of our study was to gain a better understanding of the mobile application development process currently adopted by mobile developers worldwide and the various issues and challenges associated with it.

II. RELATED WORKS

Although the mobile application development practice is much alike to that of software engineering process, it also adds some other requirements for which the conventional software development process has to be modified. There are some characteristics that distinguish a mobile application from a traditional desktop application. There are a lot of important things that are identified when examining the complete cycle of the procedure of emerging a mobile application from business encounter and progress to provision and advertising. A few studies have recognized and acknowledged the essential challenges in mobile development. The research performed by Anthony Wasserman [2] spotted many issues that are associated with mobile application development which are based on development procedures, frontend design, portability of the app, privacy and security.
Harleen K. Flora et al [3] from an online survey, enquired about the entire mobile application development process lifecycle. From these results based on the survey, they presented work on the primary characteristics which segregate the mobile applications from the traditional ones. Also their study contributed towards better understanding of the current methodologies in mobile application development.

V. Rahimian et al [1] examined the challenges in mobile app development by investigating the current status of mobile software development techniques. They identified an application development procedure centred on which a new agile procedure is constructed. This can be used for efficient development of mobile application software. These challenges are imperative and must be taken into account during the early stages of the app development procedure in order to reduce the effect of deprived selections made. Nevertheless, lesser number of researches are known to have scrutinized and emphasized the best policies and practices for mobile application development processes.

III. MOBILE APPLICATION DEVELOPMENT AND THEIR BEST PRACTICES

The increasing demand for mobile gadgets, the accelerating territory for the mobile apps, and the mounting competition for wireless networks altogether make the app development a production with immense capability. The wireless communication system has been turned out to be more dependable on mobile application development and the problems encountered is also high. Careful scheduling and production of a definite mobile application development course can result in successful outcome of the app. However, there are still numerous challenges which are viewed and discussed by the developers in the current field. The most conspicuous challenges and concerns faced by the app creators which are associated with hardware and software are discussed. Also the ultimate practices that should be considered to overcome these challenges are mentioned below.

Compatibility with various platforms:
With a number of mobile operating systems existing these days, developers need to plan and make their apps in such a way that the app runs on another various devices and thus compatible with all operating systems. Many industries limit their emphasis only to one platform which decreases the range of their app to the users. Sustaining and to keep the apps efficient across various platforms is moderately tough and challenging.

Best practice: We should have a steady look across platforms so that it creates familiarity across devices and platforms and encourages higher adoption and ensure that main logic of the app remains unchanged across the platforms and it is recommended to integrate with other management solutions.

Incongruity of hardware utilities: The power of processor for the mobile gadgets like computing energy, processor efficiency, inadequate power supply and memory availability is restricted when compared to that of the desktop computers. This is challenging to a certain extent because while creating an app, some of the functions that are used by mobile apps must be disabled as they demand a hefty volume of memory space and very firm processor swiftness.

Best Practice: The actions of the app development in the marketplace need to be supervised. It helps in knowing other features that can be added to make the app more effective to use. It also helps to check the features which are not used in the way that the app creators expect them to work and thus they can be modified in a way that it works according to the processor power of the mobile device.

Improper estimation of requirements: One more challenging aspect is the deficiency and improbability in the essential requirements as the ongoing project can be easily deviated if the business is not sure about its requirements. A few developers find it considerably challenging in analysing the requirements.

Best practice: Business plan and logic must be conferred after meeting, examining and recording the customer’s necessity and the planning approach must include better user communication, performance, and partial resource operation, followed by frequent and fast repetitions of necessities assessments to have respect for situation.

Total cost and scheduled time: The cost is also a main factor why most of the mobile app projects become unsuccessful, primarily due to low funding. A common myth about mobile app development projects is that these app development tasks are trivial and therefore
involve a very low cost. But creating and to develop a mobile app is an intricate process and may also can cost very much for app developing groups. A low quality product is likely to be delivered from the developer who is working on limited budget for those which require a high budget.

Best practice: Before evolving the real mobile application, companies must have a precise cause to generate one. In addition to this earlier study, it has to be done to guarantee that it is just not only the regeneration of a current app and enhance extra feature, utility and productivity. For this resolution, an appropriate idea must be intended with a definite set of activities, thus setting effective plan to appeal the possible users and so proper cost estimate can also be done. Also in this subsection, we present the most prominent challenges faced by mobile app developers related to hardware issues emerging from our study results:

Cross platform compatibility: With a myriad of mobile platforms available currently, mobile companies have to design and develop their apps to run on multiple devices and offer cross platform compatibility. Due to the highly fragmented nature of hardware, software, tool and technology needed to build apps on various platforms, 45% of participants believed that developers are required to put in a lot of analysis and effort which at times becomes extremely complex and costly. Most businesses restrict their focus to a single platform which reduces the reach of their applications. For cross platform development, there are chances of less documentation, in addition, maintaining and keeping applications updated across multiple platforms with limited resources is quite challenging. Varying hardware complexities: Mobile phone hardware constantly changes with respect to memory, speed, graphics processing, etc. Furthermore, the processing capability of mobile devices in terms of computational power, processing speed, limited power availability, real time data streams, and memory capacity is much limited as compared to desktop computers.

Mobile developer participants have highlighted this as a potential challenge because while developing a mobile app, they have to disable few utilities used by multimedia and graphic mobile apps as they require a large amount of memory and fast processing speed. Hence, mobile developers find it challenging to keep mobile apps capable of error-free operation in both high-end as well as low-end hardware devices.

Challenges related to software

Inexperienced resources: When building a mobile app, it is important to follow the style guidelines and behaviour of each mobile device. Less than 10% of participants showed their concern on lack of knowledgeable and experienced resources to code for variety of mobile devices. In addition, they believed that cultural difference in team may bring conflicts and diversion in team work which may not result in creation of successful mobile app.

Insufficient & uncertain requirements: Another challenging factor reported is the insufficient and uncertainty in requirements as project can easily get taken off track if business is not clear on the iterative requirements. Approximately 25% of participant's finds it considerably challenging to assess the effort required at the beginning of the cycle and note they spend a lot of time understanding and analysing customer's requirements increasing their workload with developing, integrating, and testing the apps.

Budget and Schedule: The budget issue is one of the key factors why mobile projects fail, mainly due to slow approval process of funding. It is generally mistaken that mobile development projects are small and hence require low budget. Developing a mobile app is in itself a complex process that involves several steps and stages of development, testing and deployment. This process is not only arduous and tedious, but can also prove to be very expensive for mobile app developers. A mobile developer with advance funds for their project works with a free mind, without having to worry about the expenses they would have to incur on their app. Mobile developers working on tight schedules and highly limited budgets to meet deadlines are left with two options, either to deliver a poor quality application to meet the deadline, or miss the deadline.

User Experience (UX): Mobile device is unlike a desktop computer as gestures, sensors and location data play a key role in many mobile apps. Over 50% of the participants indicated that the smaller display, screen layouts and different styles of user interaction have a major impact in designing a mobile...
app. Some enterprise app developers treat mobile devices as just another screen and extend enterprise applications to mobile devices without realizing that user interactions and behaviors are vastly different. This makes for an unintuitive and cumbersome experience for users, resulting in low adoption and usage of the application.

User Interface (UI): The user interfaces for mobile apps may get design ideas from traditional applications. But, it must be redesigned to make most effective use of the screen and the mobile user interface paradigm such as widgets, touch, physical motion and keyboard, including both the user input and the associated motion and location information. Mobile developers find it challenging to make best possible use of limited screenspace, and user interface design takes on greater importance than ever.

User input technology: A mobile keypad is more suited for number entry instead of text entry where small buttons and labels limit user efficiency in entering data. Moreover, mobile devices have the capability to receive input from in-built sources, such as GPS and camera besides directly receiving the input from the end user. The input methods offered for mobile devices are intricate and require a certain level of proficiency. Identifying the non-keyboard ways to gather and deliver information to the user is a relatively challenging when building a mobile app.

Form factors: Survey respondents believed small screen size and low screen resolution to be quite challenging while developing a mobile app. A smaller form factor means that fewer amounts of data can be displayed at one time and user requires clarity, simplicity and expects to find the information effortlessly. In addition, low display resolution can degrade the quality of multimedia information displayed on the mobile device screen. As a result, developers are required to put a lot of time and effort to design and display the most relevant information required by user at the point in the application.

Data access: Backend integration to enterprise services was reported as one of the major mobile app development concerns by the participants as it requires a lot of prior research, planning, and actual development.

IV. CONCLUSION

Our analysis has provided a much better, more objective understanding of the actual problems experienced by the mobile application developers these days, beyond unbiased accounts. The outcomes of this investigation will contribute towards a much better understanding of mobile application development problems and challenges. These effects will assist in greater understanding of problems and its answers in development of mobile applications. These can be properly applied to ease the difficulties which are actually implemented and this will improve the action of mobile applications. In mobile program development, the best practices and issues that are discussed are the primary research topics and these will help us to good app development.

REFERENCES


Biography

Dr. G. Shankar Lingam completed his MCA in Chaitanya Degree & P.G College and M.Tech in CSE from Ramappa Engineering College respectively. He is having teaching experience of more than 20 years in various Under Graduate and Post Graduate courses. He has guided lots of students in various Under Graduate and Post Graduate Research Projects. At Present, he is working Professor, Dept. of CSE, Chaitanya Institute of Technology & Science, Warangal, Telangana, India.