FLUTTER PROGRAMMING LANGUAGE IN CREATING MOBILE APPLICATIONS

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Abstract: *This article provides a comprehensive overview of the role and significance of the Flutter programming language in creating mobile applications. It discusses the advantages of Flutter, its role in developing cross-platform applications, its architecture, working mechanism, and its superiority over other cross-platform technologies. Additionally, the efficiency and speed of Flutter are analyzed using real-world application examples developed with Flutter.*

Keywords: *Flutter, Mobile Applications, Cross-platform, Programming Language, Dart, Mobile Development, UI/UX, Google*

Introduction Nowadays, mobile applications are becoming an integral part of our lives. Mobile applications are increasingly used in every organization, business, and even in personal settings to manage various processes. Currently, cross-platform application development is becoming more popular as it allows creating applications for different platforms using a single code base. In this field, Flutter is one of the most advanced technologies, enabling developers to create high-quality and efficient applications for Android and iOS platforms.

Theoretical Part

History and Development of Flutter The Flutter programming system was initially introduced in 2015 under the name 'Sky.' Later, it was developed by Google and officially presented to developers as Flutter in 2017. The 1.0 version of Flutter was released in 2018, becoming the primary tool for creating cross-platform applications. The growth and evolution of Flutter continued, and now the 3.0 version is available, offering many new features and tools.

Flutter's Working Principle and Architecture The working principle of Flutter is based on the concept of 'widgets.' Every interface element is called a widget, and they are combined to create the desired appearance. Dart language is used for programming in Flutter. The main components of Flutter include:

- **Flutter Engine**: Written in C++, it uses the 'Skia' engine to create graphical interfaces.
- **Foundation Library**: Provides essential functions and data structures.
- **Widget Framework**: Used to create UI elements and build the interface.

Advantages of Flutter and Its Cross-Platform Capabilities The main advantages of Flutter include:

- **Cross-platform Capabilities**: With Flutter, you can create applications for Android, iOS, web, and even desktop using a single code base.
- **Hot Reload Functionality**: Allows developers to see code changes in real-time, speeding up the development process.

- **Rich Widget Library:** Flutter offers many pre-built widgets, enabling the creation of various interfaces.
- **High Performance:** Due to the 'Skia' engine, Flutter applications work quickly, and the interface is smooth.

Real-World Applications of Flutter Today, many large companies and organizations use Flutter. For example:

- **Alibaba:** The largest online shopping platform in China has developed some of its applications using Flutter.
- **Google Ads:** The Google Ads mobile app is also written in Flutter and works efficiently due to its cross-platform capabilities.
- **Reflectly:** The meditation and mood tracking app Reflectly uses Flutter and stands out for its high performance.

Conclusion Today, Flutter is one of the most efficient tools for creating mobile applications. Its cross-platform capabilities, rich widget library, and high speed make it the preferred choice for many developers. Developing applications with Flutter is not only quick but also efficient and high-quality, making it a leading technology in cross-platform development. It is expected that Flutter will continue to evolve, opening new horizons in mobile application development.

REFERENCES:

1. Muxtaram Boboqulova Xamroyevna. (2024). GEYZENBERG NOANIQLIK PRINTSIPINING UMUMIY TUZILISHI . TADQIQOTLAR.UZ, 34(3), 3–12.

2. Muxtaram Boboqulova Xamroyevna. (2024). THERMODYNAMICS OF LIVING SYSTEMS. Multidisciplinary Journal of Science and Technology, 4(3), 303–308.

3. Muxtaram Boboqulova Xamroyevna. (2024). QUYOSH ENERGIYASIDAN FOYDALANISH . TADQIQOTLAR.UZ, 34(2), 213–220.

4. Xamroyevna, M. B. (2024). Klassik fizika rivojlanishida kvant fizikasining orni. Ta'limning zamonaviy transformatsiyasi, 6(1), 9-19.

5. Xamroyevna, M. B. (2024). ELEKTRON MIKROSKOPIYA USULLARINI TIBBIYOTDA AHAMIYATI. *PEDAGOG*, *7*(4), 273-280.

6. Boboqulova, M. X. (2024). FIZIKANING ISTIQBOLLI TADQIQOTLARI. *PEDAGOG*, *7*(5), 277-283.

7. Tursunov, B. J., & Allanazarov, G. O. (2019). Perspektivnye tehnologii proizvodstva po uluchsheniyu kachestva benzina. *Theory and practice of contemporary science*, *3*(45), 305-308.

8. Турсунов, Б. Ж., & Алланазаров, Г. О. (2019). Перспективные технологии производства по улучшению качества бензина. *Теория и практика современной науки*, (3 (45)), 305-308.

9. Tursunov, B. Z. (2023). Analysis of Concepts About the Effect of an Explosion in Solid Wednesday. *American Journal of Public Diplomacy and International Studies (2993-2157)*, *1*(10), 296-304.

10. Tursunov, B. Z. (2023). Methods of Control of Explosion Energy Distribution in Rocks. *Intersections of Faith and Culture: American Journal of Religious and Cultural Studies (2993-2599)*, *1*(10), 108-117.

11. Tursunov, B. Z. (2023). WASTE-FREE TECHNOLOGY FOR ENRICHMENT OF PURIFIC COPPER-ZINC ORE. *American Journal of Public Diplomacy and International Studies (2993-2157)*, *1*(9), 288-293.

12. Akbarovna, I. S. (2024). PROCEDURE FOR CREATING PSYCHOLOGICAL TEST PROGRAMS. *PEDAGOG*, *7*(6), 153-159.

13. Akbarovna, I. S. (2024). ЗДОРОВАЯ СЕМЕЙНАЯ СРЕДА КАК СОЦИАЛЬНЫЙ ФАКТОР ПОДГОТОВКИ МОЛОДЕЖИ К СЕМЕЙНОЙ ЖИЗНИ. *MASTERS*, *2*(5), 98-104.

14. Akbarovna, I. S. (2024). SPORTCHILAR FAOLIYATINI O'RGANISHNING UMUMIY PSIXOLOGIK USULLARI. *WORLD OF SCIENCE*, *7*(5), 536-543.

15. Akbarovna, I. S. (2024). A HEALTHY FAMILY ENVIRONMENT AS A SOCIAL FACTOR IN PREPARING YOUNG PEOPLE FOR FAMILY LIFE. *WORLD OF SCIENCE*, *7*(5), 529-535.

16. Akbarovna, I. S. (2024). ПСИХОЛОГИЧЕСКИЕ ФАКТОРЫ ФОРМИРОВАНИЯ ЗДОРОВОГО ОБРАЗА ЖИЗНИ ЧЕРЕЗ ПЛАН СПОРТИВНЫХ ИГР. *WORLD OF SCIENCE*, *7*(5), 521-528.

17. Akbarovna, I. S. (2024). SPORT O ‘YINLARI REJASI ORQALI SOG ‘LOM TURMUSH TARZINI SHAKLLANTIRISHNING PSIXOLOGIK OMILLAR. *MASTERS*, *2*(5), 91-97.

18. Akbarovna, I. S. (2024). MAKTABGACHA TA'LIMDA Qiyosiy PEDAGOGIKANING AHAMIYATI. *WORLD OF SCIENCE*, *7*(8), 8-13.

19. Akbarovna, I. S. (2024). PROFESSIONAL SKILLS OF THE TEACHER. *WORLD OF SCIENCE*, *7*(8), 1-7.

20. Akbarovna, I. S. (2024). ПРОФЕССИОНАЛЬНЫЕ НАВЫКИ УЧИТЕЛЯ. *PSIXOLOGIYA VA SOTSIOLOGIYA ILMIY JURNALI*, *2*(7), 7-13.

21. Akbarovna, I. S. (2024). ЗНАЧЕНИЕ СРАВНИТЕЛЬНОЙ ПЕДАГОГИКИ В ДОШКОЛЬНОМ ОБРАЗОВАНИИ. *PSIXOLOGIYA VA SOTSIOLOGIYA ILMIY JURNALI*, *2*(7), 14-20.

22. Akbarovna, I. S. (2024). O'QITUVCHINING KASBIY MALAKALARI. *MASTERS*, *2*(8), 15-21.

23. Akbarovna, I. S. (2024). THE IMPORTANCE OF COMPARATIVE PEDAGOGY IN PRESCHOOL EDUCATION. *MASTERS*, *2*(8), 22-27.

24. Ikromova, S. A. (2023). FACTORS IN THE DEVELOPMENT OF IMMUNITY TO DESTRUCTIVE IDEAS IN ADOLESCENTS. *Innovation in Science, Education and Technology*.

25. Ikromova, S. A. (2023). SHAXS OG ‘ISHGAN XULQINING KO ‘RINISHLARI VA DESTRUKTIV AXBOROTLARNING KO ‘RINISHLARI. *Educational Research in Universal Sciences*, *2*(11), 528-532.

26. Ikromova, S. A. (2023). Cognitive processes and their description in psychology. *TECHNICAL SCIENCE RESEARCH IN UZBEKISTAN*, *1*(5), 115-133.

27. Akbarovna, I. S. (2023). NEGATIVE AND POSITIVE CHANGES IN ADOLESCENT BEHAVIOR. *TECHNICAL SCIENCE RESEARCH IN UZBEKISTAN*, *1*(5), 192-197.

28. Akbarovna, I. S. (2023). SOCIO-PSYCHOLOGICAL FACTORS OF BEHAVIOR FORMATION IN ADOLESCENTS. *TECHNICAL SCIENCE RESEARCH IN UZBEKISTAN*, *1*(5), 184-191.

29. Akbarovna, I. S. (2023). O'smirlarda destruktiv axborotlarga nisbatan mafkuraviy immunitet shakllantirish.

30. Ikromova, S. A. (2023). Formation of Ideological Immunity to Destructive Information. *Intersections of Faith and Culture: American Journal of Religious and Cultural Studies (2993-2599)*, *1*(9), 50-54.

31. Akbarovna, I. S. (2023). Adolescence during Destructive Behavior Appearances the Problem Learning Condition. *Intersections of Faith and Culture: American Journal of Religious and Cultural Studies (2993-2599)*, *1*(9), 105-109.

32. Akbarovna, I. S. (2023). MILLIY HARAKATLI O'YINLARNING BOLALAR TARBIYASIDAGI IJTIMOIY-PSIXOLOGIK XUSUSIYATLARI.

33. Ikromova, S. A. (2024). BASICS OF PSYCHOLOGICAL SERVICES. *PEDAGOG*, *7*(5), 670-676.

34. Ikromova, S. A. (2022). MILLIY VA DINIY QADRIYATLARNING INSON TARBIYASIDAGI O'RNI. *Экономика и социум*, (12-2 (103)), 675-678.

35. Икромова, С. А. (2024). ЭТАПЫ ПСИХОЛОГИЧЕСКОЙ КОНСУЛЬТАЦИИ. *Multidisciplinary Journal of Science and Technology*, *4*(3), 875-881.

36. Akbarovna, I. S. (2024). MATEMATIK TUSHUNCHALARNI SHAKLLANISHINING AHAMIYATI. *Multidisciplinary Journal of Science and Technology*, *4*(3), 900-905.

37. Akbarovna, I. S. (2024). THE IMPORTANCE OF FORMING MATHEMATICAL CONCEPTS. *Multidisciplinary Journal of Science and Technology*, *4*(3), 912-917.

38. Akbarovna, I. S. (2024). PEDAGOGIK MAHORAT ASOSLARINI O'ZLASHTIRISH. *Multidisciplinary Journal of Science and Technology*, *4*(3), 888-893.

39. Jalolov, T. S. (2024). DJANGO В ВЕБ-ПРОГРАММИРОВАНИИ. *MASTERS*, *2*(5), 136-142.

40. Jalolov, T. S. (2024). YUQORI HAJMLI MA'LUMOTLARNI QAYTA ISHLASHDA PYTHON KUTUBXONALARI. *MASTERS*, *2*(5), 121-128.

41. Jalolov, T. S. (2024). PYTHON-DA API-LARDAN FOYDALANISH: KENG QAMROVLI QO'LLANMA. *MASTERS*, *2*(5), 113-120.

42. Jalolov, T. S. (2024). DJANGONING VEB-DASTURLASHDAGI ROLI. *WORLD OF SCIENCE*, *7*(5), 576-582.

43. Jalolov, T. S. (2024). LEVERAGING APIS IN PYTHON: A COMPREHENSIVE GUIDE. *WORLD OF SCIENCE*, *7*(5), 544-552.

44. Jalolov, T. S. (2024). МАТЕМАТИЧЕСКОМ СТАТИСТИЧЕСКОМ АНАЛИЗЕ В PYTHON. *MASTERS*, *2*(5), 151-158.

45. Jalolov, T. S. (2024). ИСПОЛЬЗОВАНИЕ API В PYTHON: ПОДРОБНОЕ РУКОВОДСТВО. *WORLD OF SCIENCE*, *7*(5), 553-560.

46. Jalolov, T. S. (2024). PYTHON LIBRARIES IN HIGH VOLUME DATA PROCESSING. *WORLD OF SCIENCE*, *7*(5), 561-567.

47. Jalolov, T. S. (2024). DJANGO'S ROLE IN WEB PROGRAMMING. *MASTERS*, *2*(5), 129-135.

48. Jalolov, T. S. (2024). PYTHONDA MATEMATIK STATISTIK TAHLIL HAQIDA. *WORLD OF SCIENCE*, *7*(5), 583-590.

49. Ashurov, J. (2023). TA'LIMDA AXBOROT TEXNOLOGIYALARI FANI O 'QITISHDA INNOVATSION TA'LIM TEXNOLOGIYALARINING AHAMIYATI. *Theoretical aspects in the formation of pedagogical sciences*, *3*(4), 105-109.

50. Djo'rayevich, A. J. (2024). THE IMPORTANCE OF USING THE PEDAGOGICAL METHOD OF THE" INSERT" STRATEGY IN INFORMATION TECHNOLOGY PRACTICAL EXERCISES. *Multidisciplinary Journal of Science and Technology*, *4*(3), 425-432.

51. Ashurov, J. D. (2024). AXBOROT TEXNOLOGIYALARI VA JARAYONLARNI MATEMATIK MODELLASHTIRISH FANINI O 'QITISHDA INNOVATSION YONDASHUVGA ASOSLANGAN METODLARNING AHAMIYATI. *Zamonaviy fan va ta'lim yangiliklari xalqaro ilmiy jurnal*, *2*(1), 72-78.

52. Ashurov, J. (2023). OLIY TA'LIM MUASSASALARIDA "RADIOFARMATSEVTIK PREPARATLARNING GAMMA TERAPIYADA QO 'LLANILISHI" MAVZUSINI "FIKR, SABAB, MISOL, UMUMLASHTIRISH (FSMU)" METODI YORDAMIDA YORITISH. *Центральноазиатский журнал образования и инноваций*, *2*(6 Part 4), 175-181.

53. Djorayevich, A. J. (2022). EXPLANATION OF THE TOPIC" USE OF RADIOPHARMACEUTICALS IN GAMMA THERAPY" IN HIGHER EDUCATION INSTITUTIONS USING THE" THOUGHT, REASON, EXAMPLE, GENERALIZATION (THREG)" METHOD.

54. Ашуров, Ж. Д. (2023). ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ И МЕТОДЫ ОБУЧЕНИЯ В ПРЕПОДАВАНИИ ЯДЕРНОЙ МЕДИЦИНЫ СТУДЕНТАМ ВЫСШИХ УЧЕБНЫХ ЗАВЕДЕНИЙ. *Modern Scientific Research International Scientific Journal*, *1*(4), 29-37.

55. Ashurov, J. (2023). THE IMPORTANCE OF USING INNOVATIVE EDUCATIONAL TECHNOLOGIES IN TEACHING THE SCIENCE OF INFORMATION TECHNOLOGY AND MATHEMATICAL MODELING OF PROCESSES. *Development and innovations in science*, *2*(12), 80-86.

56. Ashurov, J. D. (2022). Nuclear medicine in higher education institutions of the republic of uzbekistan: Current status and prospects.

57. Umarov, S. K., Nuritdinov, I., Ashurov, Z. D., & Khallokov, F. K. (2017). Single crystals of TlIn 1–x Co x Se 2 (0≤ x≤ 0.5) solid solutions as effective materials for semiconductor tensometry. *Technical Physics Letters*, *43*, 730-732.

58. Умаров, С. Х., Нуритдинов, И., Ашуров, Ж. Ж., & Халлоков, Ф. К. (2019). Удельные сопротивления и тензорезистивные характеристики кристаллов твердых растворов системы TlInSe _2–CuInSe _2. *Журнал технической физики*, *89*(2), 214-217.

59. Ашуров, Ж. Д. (2023). ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ И МЕТОДЫ ОБУЧЕНИЯ В ПРЕПОДАВАНИИ ЯДЕРНОЙ МЕДИЦИНЫ СТУДЕНТАМ ВЫСШИХ УЧЕБНЫХ ЗАВЕДЕНИЙ. *Modern Scientific Research International Scientific Journal*, *1*(4), 29-37.

60. Djo'rayevich, A. J., & Xojiyevich, B. E. (2022). OLIY TA'LIM MUASSASALARIDA "YADRO TIBBIYOTIDA RADIATSION XAVFSIZLIK" MAVZUSINI O 'QITISHDA MUAMMOLI VAZIYAT METODINI QO 'LLASH. *Farg'ona davlat universiteti*, (5), 69-69.