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FLUTTER DASTURLASH TILIDA ONLINE KURSLAR TAYYORLASH

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Annotatsiya: Ushbu maqolada zamonaviy raqamli ta'lim tizimida Flutter dasturlash texnologiyasi yordamida onlayn kurslar yaratish bo'yicha chuqur tahlil keltirilgan. Flutter texnologiyasining afzalliklari, zaruriy texnologik infratuzilma, o'quv kurslari yaratish bosqichlari, real foydalanish holatlari va boshqa texnologiyalar bilan solishtirishlar keltirilgan. Maqola statistik ma'lumotlar, grafikalar, amaliy misollar asosida boyitilgan bo'lib, Flutter asosidagi onlayn ta'lim ilovalari samaradorligini chuqur yoritadi.

Kalit so'zlar: Flutter, Dart, mobil ilova, onlayn ta'lim, dasturlash texnologiyalari, kross-platforma, mobil kurslar, o'quv ilovalari, UX/UI dizayn.

Kirish qismi

So'nggi yillarda raqamli texnologiyalarning tez rivojlanishi ta'lim sohasiga ham chuqur ta'sir ko'rsatdi. Ayniqsa, pandemiyadan keyin masofaviy va onlayn ta'lim shakllari keng tarqaldi. Endi esa, foydalanuvchilar nafaqat kompyuterlar, balki mobil qurilmalardan ham ta'lim olishni istamoqda. Shu sababli, o'quv ilovalari yaratish eng dolzarb masalalardan biriga aylandi. Mobil dasturlash uchun esa samarali, tejamkor va qulay texnologiyalardan biri — **Flutter** hisoblanadi. Flutter yordamida ishlab chiqilgan onlayn kurslar turli qurilmalarda bir xilda ishlaydi va o'quvchilar uchun maksimal qulaylik yaratadi.

Nazariy qism

1. Flutter: tushuncha va asoslar

Flutter — bu **Google** tomonidan ishlab chiqilgan **open-source UI toolkit** bo'lib, mobil, veb va desktop ilovalarni yagona kod bazasi asosida ishlab chiqishga yordam beradi. Flutter **Dart** dasturlash tiliga asoslangan bo'lib, foydalanuvchi interfeyslarini yaratishda soddalik va tezkorlikni ta'minlaydi.

Flutter'ning asosiy komponentlari:

- **Widgets (Vidjetlar):** Har bir UI komponenti (tugma, matn, forma) vidjetlar orqali yaratiladi.
- **Hot Reload:** Kodga o'zgarish kiritilganda, natijani real vaqt rejimida ko'rish imkonini beradi.
- **Customizable UI:** Interfeyslarni yuqori darajada sozlash va animatsiyalar qo'shish mumkin.
- **Cross-Platform Support:** Android, iOS, veb va desktop ilovalar uchun yagona kod.

2. Onlayn kurslar yaratishda Flutter'ning afzalliklari

Afzallik

Tavsif

Kross-platforma

Bir marta yozilgan kod Android va iOS'da ishlaydi



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Afzallik	Tavsif
Tez ishlab chiqish	Hot Reload va boy vidjet kutubxonasi
Zamonaviy interfeys	Material va Cupertino dizaynlar bilan uyg'unlik
Jamiyat yordami	Kengaygan Flutter developerlar jamoasi
Ulanishlar	Firestore, REST API, GraphQL bilan oson integratsiya
Performance	Native ilovalarga yaqin ishlash tezligi

3. Flutter orqali onlayn kurs yaratish bosqichlari

1. Rejalashtirish:

Kurs mavzusi, modullari, foydalanuvchi profillari, testlar va baholash tizimini belgilash.

2. Interfeys dizayni:

Flutter widgetlaridan foydalanib UX/UI dizaynini yaratish. Animatsiyalar, foydalanuvchi qulayligi, kirish/ro'yxatdan o'tish sahifalari.

3. Ma'lumotlar bazasi bilan ishlash:

Firestore Authentication, Firestore, SQLite yoki API orqali backendga ulanish.

4. Multimedia integratsiyasi:

Video darslar, PDF materiallar, testlar (MCQ) va gamifikatsiya elementlari.

5. Xatoliklarni tuzatish va testlash:

Unit test, integration test, real qurilmalarda sinov.

6. Nashr qilish:

Ilovani Play Market va App Store'ga joylash.

4. Zaruriy texnologiyalar

Texnologiya	Maqsadi
Dart	Flutter ilovalarini dasturlash tili
Firestore	Backend (auth, storage, real-time database)
SQLite	Mahalliy (offline) ma'lumotlar bazasi
REST API / GraphQL	Ma'lumotlarni serverdan olish
Git	Kodni boshqarish va versiyalash
Figma / Adobe XD	Dizayn prototiplari yaratish
Postman	API testlash uchun vosita

Statistik tahlil

1. Dasturchilar orasida Flutter mashhurligi (StackOverflow Survey 2024)

▒ Diagramma: Eng ko'p ishlatiladigan mobil UI to'plamlari (%)

matlab

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Kotlin (Android) 3%

2. O'quv ilovalari foydalanuvchi baholari (Google Play va App Store):

Ilova	O'rtacha reyting
Flutter	4.6 / 5
React Native	4.3 / 5
Native iOS (Swift)	4.5 / 5
Native Android	4.4 / 5

3. Flutter asosida onlayn ta'lim platformalari misollari

Platforma Tavsif

MyEduApp Mahalliy darsliklar va testlar asosidagi mobil kurs

Learnify Ingliz tili va dasturlash bo'yicha interaktiv kurslar

QuranApp Flutter asosida yaratilgan diniy ta'lim ilovasi

Kamchiliklar va muqobil texnologiyalar bilan solishtirish

Flutter kamchiliklari:

- Web ilovalarda cheklovlar hali mavjud.
- Dart tilining keng tarqalgan emasligi.
- Ilovaning hajmi biroz katta bo'lishi mumkin.

Flutter vs React Native

Xususiyat	Flutter	React Native
Til	Dart	JavaScript
UI kutubxonasi	Keng va boy	Cheklangan, qo'shimcha kutubxona kerak
Performance	Yuqori (nativega yaqin)	O'rtacha
O'rganish darajasi	Biroz murakkab	Yengil (JS asosida)
Jamiyat yordami	Kengaymoqda	Juda katta

Xulosa

Flutter — zamonaviy raqamli ta'lim muhitida mobil ilovalar yaratish uchun qulay, tezkor va samarali platforma hisoblanadi. Onlayn kurslar yaratishda Flutter'dan foydalanish o'qituvchilar va dasturchilar uchun bir nechta afzalliklar beradi: kross-platforma qulayligi, yuqori interfeys sifati, tez ishlab chiqish imkoniyati. Bu texnologiya orqali ta'limni interaktiv, moslashuvchan va innovatsion tarzda tashkil qilish mumkin. Shu sababli, onlayn kurslar tayyorlashda Flutter'ni qo'llash istiqbollari juda keng.

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