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SUMMARY KEYWORDS

testing, software, test, quality, working, framework, acceptance criteria, metrics, mentioned, question, requirements, team, compliance, security, company, research, financial industry, general, project, limitations

00:02

Hello, thank you for being here. And helping us was the research.

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How are you doing?

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I count man. Yeah, thank you for invitation. I'm doing great. It's a sunny day what a while you

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may as well, near It's a bit chilly weather. In general, everything is great. Let's go through the consent form because I need the approval and consent. Let's go through it and we can talk about later. So generally what we are researching, were researching the security and quality and software the open process. And the idea is basically many people don't understand how, how it's needed software quality in the development process, and they don't see the white vitality of this product. This this scent. So we are the research group from the University of Tartu, which is in Estonia. And this research is part of my master's thesis, I am working with the supervisor, Associate Professor of our university, Rick Manning. And the primary of the primary research objective for us is to identify the gaps, how software quality is being used, implemented in modern financial products. And this study basically aims to develop a framework for securing data quality in the financial industry, the business buyer, the framework will be used like software engineers, project managers, product owners, or business analyst. The main research questions are targeted to identify the critical aspects of software codes for tuition and functional non functional metrics and tools used for it. So we have few participation requirements. You shouldn't be as this 18 or older, you should have work experience and financial sector at least for one year. And having having experience in implementing software quality. It can be like software engineering, part of the things that you are doing as a software engineer or as a software engineering test or Software Quality Assurance engineer. And another requirement is to be fluent in English, and I know that you are fluent, do you meet these requirements?

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I believe so.

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Actually, I checked with my manager. And basically, I was thinking about does this actually follow our guidelines regarding NDA, so Okay, depending like I kind of asked her, but when, like, you'll ask for more details. And I feel that it doesn't cover our internal NDA, then I will let you know. Right. Yep. Does it sounds good? When

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was it? I will come to the spot. Actually. It's pretty good question. And good points to mention. Let me just switch my microphone.

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Makes us everything.

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Helps nowadays him.

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Yeah, I can hear. Okay.

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Regarding the privacy and confidentiality, it's good point that you mentioned because the financial industry in generally, they don't like to share information we have like NDAs and everything. That's why we basically implemented the privacy and confidentiality part where we basically say that to protect your privacy, we will follow this procedure, the original recordings will be accessible to me and my professor. The audio recording of interview will be transcribed potential identifiers like your name your company may be the product name or something that can identify you will be removed or aggregated. So, we will not share your personal information or professional information and original recordings will be deleted afterwards. So your data and consent will be kept separately as a transcribed and basically, your data will be stored securely and the audio recording will be removed.

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Is that okay with you or

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can you can well, yeah,

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it makes sense. It makes sense. Can I get, like, same recording that you're going to send just in case? Yep, no

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problem was it, I will send it to you. So by participating, you're agreeing that the inputs that you provide information that you gathers, like that will be gathered during the interview will be used by researcher and the university for publication purposes. So we do research and we publish this data inputs. And it

can be stored for five years, and will not be kept more than five years. So when the report will be published, and so we basically store all the information except the data that can identify you, or help anyone to identify you.

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During recipe, that period.

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Does it feel good? Or if you want to change something, you can always tell it?

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Well, it's fair enough. But I would love to like, as I mentioned, get a copy before you're sent, just to see if I may be told more than expected. So no more sending to like, just spare me copies so.

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So I need to mention that the participation is completely voluntary. Study is voluntary, you may discount or discontinue the participation at any time during the research activity. You just need to verify that you're 18 years old and the information that we provided you here, you understood that part.

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Is that okay? I totally understand that. Yeah, it's fine.

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Okay, so are you older than 18?

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Yep, I'm trying to six

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times work that we can continue. By the way, if you have any kind of comments, concerns or inquiries about the study, whether it's pre or post interview, you can always contact me and or the supervisor as well provide the miles to. And in any case, if you want to remove the data we can remove and not to use it till the point of by publication.

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So you have this right.

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Let's go through the interview questions.

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As I mentioned, during our first communication, generally, I'm researching the security and quality and software loan process of financial industries. And I've been working in financial industry a lot, like few years. And I know that this problem, basically, what's the problem with the industry, it's highly regulated,

there is NDAs there is data, which need to be secure and generally everything. So, I will take like, when we went through the consent forms, now, I will start asking the questions and to get this data basically and in order to vote on the framework. So the first question is that how is software quality of the projects planned in the early design or planning phase?

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So

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basically, my team and actually most of the things in my company, working in Agile methodology, at least this quickly, is

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strong. So

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and based on that, basically, we are getting requirements from business thing, like business slash, marketing team or product team, like you can name it. So usually, like we have a product owner in our team and she's basically getting requirements from business people and grooming them following those requirements to us. So yeah, we have different grooming sessions, where we plan our like quarterly software development going on and also later We plan our sprints within a team and product owner.

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What about the priorities? What priority? Does the software quality have in the project planning or requirements gathering? But is it highly prioritized or not prioritized at all in the requirements phase? And the answer to this question?

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Yeah, it's the qualities

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were a serious matter

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and a comprehend that are working right now. So basically, not only QA engineers, but also developers. Do testing and write unit tests and integration tests and system tests, etc, like integration tests? And it's taken seriously?

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And basically

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yeah, we apply different

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techniques to testing and we do regression testing performance testing. So it's very serious, I don't actually ended over a year not a year, but the each quarter we have audits and they basically audit not only development activities, but also testing

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What about like, do you define them the kind of tests that you will do in the planning sessions or in the requirements gathering session or it's like more during the project

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during the middle phase, basically.

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Well, no, actually, we defined the quality in grooming session that I mentioned about basically, what we do is there are some requirements which are fixed like for instance, non functional requirements, okay, let's say like muscles or our API's need to fetch data and response like, under if not mistaken, 200 milliseconds, and you should be alive like 99% of the time. In addition, there are some regulations like you mentioned this super regulated industry. So, we are regulated by like PCI standards. So, this summer's later depending on depending on context of the story in the sprint, so, we have an acceptance criteria that we are growing and basically, definitely this acceptance criteria should be tested properly. As a test engineer, I do I create a test test planning document where I identify happy paths, negative paths and edge cases for my test, acceptance criteria got it.

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So, it's basically starting from the like beginning you have already the acceptance criteria is during the planning

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Am I right?

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Can you repeat again?

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So, you basically define the acceptance criteria in like planning planning part of the project? Basically, you already have acceptance criteria before starting though

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yes, so, even sometimes, like even before, like before the vote on the US we have acceptance criteria and we were basically set upfront and in addition to that, in addition to that, like I immediately start building my test cases even before the development is started.

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got it got it. By the way, I do use like any specific methodologies or frameworks from like beginning of project what what kind of framework do you use, what kind of methodology do you use

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do you mean test framework or generally,

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both of them you can talk about most of them.

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So as I mentioned, like we are working in HR Oh. And basically we are using Scrum. So we experience every every four sprints, we have retro meetings, in addition to basically have a retrospective and learn on our mistakes, identify what went wrong. So got it. And also about framework. So we have different frameworks, depending on what purpose of testing. So like, separate framework for backend testing, API testing, performance testing. But in general, in our company, we, we do test driven the opens, meaning like, that's what I meant basically, when I when I when we get requirements, me as a test engineer, I immediately start writing tests, even before the development is started. So it's like test driven development.

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Got it? Got it.

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That makes sense.

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Okay, got it. So you, you use basically Agile Scrum and testing frameworks and pdds for development. Both functional, and non functional quality metrics are generally used by your team.

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both functional and non functional quality metrics. So

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yeah, like one of the metrics is called coverage. So we have different plugins to measure that. And like, it should be at least 85%. In addition, we have like parameters, like it's called defect density, basically, like, how many defects we got per, like 1000 lines of the called.

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Then

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quality metrics, so that there are also more functional metrics, which we get from business team. And we are we aware of testing. And we are measuring response time, throughput, latency. In addition, its performance metrics. And also, like we have security testing, using different it's, it's done by different

team, like, they have penetration test engineers and other security engineers around like different scanning for vulnerability in the cloud or like, network scanning, all kinds of security testing. And of course, we have reliability team, which actually, like, there is testing going on in reliability team as well. But they also they monitor, like software behavior. And they track

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this as a loss on SLA SLAs.

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Yeah, overall, like we have, we do, like we do whitebox testing as well, like, we use some tools for white box testing and finding logical errors or security flaws as well.

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Okay, good. We're about like,

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how does metrics differ from project to project? Like, I know that there are like different types of projects, and they have different kinds of requirements. And I've ever seen, like, how different is it?

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So as I mentioned, like, we get a lot of metrics from business team.

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They have their own,

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like, data analytics team who gather basically, those requirements from production users, and they pass it to us like, basically, like metrics of software should be like let's say performance metrics, they they shouldn't be You based on real life scenarios? And so we are getting most most of the requirements from business thing. Business, a product and data analytics thing. Good,

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good.

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What about like, what critical aspects of software quality are generally prioritized in your company?

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Well

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of course, like, as I mentioned, like code coverage,

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like defect density.

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Okay. And security is security is super important. We have dedicated teams who, like, test different aspects of security. And because like we have constant audits from external companies like consulting firms. And in addition, reliability, like high availability of software fault tolerance. That's why we're running a lot of load testing to, to check how load balancing works correctly. Yeah, in general performance of our software is also important, like different database optimization, like different like caching strategies.

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Like content management, servers, different

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human testing these things. Yeah. Or

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yeah, not only the testing, but the whole thing, the software to meet to standards, but yeah, well, as a test engineer, I'm testing that

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our software meet

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those metrics, like security, reliability, performance, but what

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what effects to those priorities have on the service level objectives? Like, how it helps you? Or maybe it's burdening the process?

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What we can tell about it,

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like meeting these objectives?

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Yeah, that's,

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that's a good question. So, basically, we have dedicated reliability and for that, however, even in my work, I, I tried to test like, different conditions. To verify that we are making those SLOs by usually, the best scenario is that software should have SSL, like 99 point 99 uptime, and all our API response times supposed to basically be like under 200 milliseconds okay. And that definitely should not have any like

security vulnerabilities, like some let's say backdoors in some library, which you have used, so, but the security thing is super important.

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Got it? Got it. So, it basically generally, generally what I see that like, if you implement good software quality, you have better like, you are better in meeting this slo objectives. And it basically makes the process easier for most of the people, as I say, but there are some people say that, okay, this priority sometimes is over exaggerated, and they basically make the process harder.

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That's why this question is here.

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Have you ever came across with the software quality aspect that was conflicting with the business objectives that you have in place?

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Can you expand on question? So basically, you mean? Like rubbing softer testing conflicting with business objectives. Okay.

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You know, there are some cases where the business has some other, I would say that some unrealistic objectives that is very hard to code or some all business sometimes has, let's say, the idea that we need to roll more futures instead of to the proper testing these kind of things happening.

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What you can say about it?

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Is it like having a conflict? Have you ever had a conflict with the business objectives or you never made this kind of program before?

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Well, it's rarely happens, because our company basically puts like peer prioritize quality as high as possible, because we basically, we have the biggest customer base in Georgia. So that's why we have high standards for quality and business teams. Actually, they also know that we do testing in all stages and testing done not only by testing team, but by developers by reliability team penetration testing team, security team, and testing team. So there are like multiple teams, and even by business team as well, they also do testing after release. So basically, they they know, they know that we put quality as high as possible and actually, they they insist to, to be sure that there are no critical bugs. Okay, that's why Yeah, they don't push us

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for that actually makes huge sense for the financial industry because here, especially in trading with say, people, let's say care about quality in banking industry more, rather than rolling out new features. It makes sense. Yeah, I agree with you. Another question about the frameworks, tools and methodologies you're using for just projects let's say let's say what frameworks tools or methodologies you think about light as the most common or most vital for each project then financial industry

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so you're watching me to some main strength Yes, yes.

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Not only frameworks you can say about tools, what you think as a software engineer, which is like working in the financial industry, you say that okay. In almost all projects are most of the projects we can't go without say some tools without some methods, which ones are most vital and most common in the project?

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Well, there are multiple projects and multiple teams and each team use different tools and different frameworks depending on the product that they are building. And so, they should be testing to our testing framework or testing to they should be component of the ICD pipeline. Since we are working in Asia and definitely like we are like in our two team, we are using some logging tools for logs basically to verify logs and throughout different security testing tools.

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Can you name like examples there? What kind of tools are you using for example or generally used not not specific to your project but generally in use?

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generally use like everyone knows this tool. So for CI CD, there are different variations like it could be Jenkins kick club.

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What else like bamboo?

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For login, that is like Splunk LogStash. I don't know Kibana and for scanning code quality, white scanning use like sonar cube. So generally, the set of tools But depending on the team, it's different. And depending on the project that I like, there might be different frameworks use.

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Worry about.

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Okay, you mentioned before the automated quality metrics, like automated testing automatic code metrics, and other automation tools. What are the key advantages and disadvantages of implementing these kind of automated tools in the software development process? What do you think about them?

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Well, obviously, the advantages, rigorous testing,

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meaning, you test

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all possible edge cases, like the most permutation of edge cases, because humANELY, it's impossible, but automation helps you to, to test more in a shorter period of time. So increase efficiency of testing.

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And also,

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let's say, Well, when you are doing regression testing, obviously, well, basically, it's, it helps you to efficiently test all previous parts of the code to run different, like the same regression testing. And instead of testing each, everything, like manually, you are basically running regression tests. So it's very efficient. Yeah, more disadvantages? Well, I can't name that many disadvantages, I will say that this is actually disadvantages, you need automation engineers. I wouldn't say it's a disadvantage, but in general, like any testing team, and not many companies can afford it. But like big, big big banks, or some big companies can offer definitely, basically, you need to set up you need to design design your testing framework to be maintainable, scalable, and yet to make proper design in the beginning, so that it will be effective in the future.

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got it got it. What about like,

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let's say correctness of these kinds of tests, because in my experience, I saw that there are several cases where the gives you false positive results or like this kind of results when you do the testing, especially automated testing, what do you think about it Have you ever meet the situation where it was giving false positive or false negative

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basically explained on the router? Well,

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I will say that if you design your test framework properly, then you will avoid, you will avoid the scenarios when basically, like, there are false false positive or something like that. So basically, you need to test that your test fails in the beginning. So basically, if you design your tests properly, was like

waste of technology with latest methods, locators to locate elements, let's say then you will probably not have like any scenarios like that. So it's more about bad design. Like the problems that you mentioned, it's more about bad design. And sometimes there might be some test frameworks which has limitations. And basically, in order not to have those limitations to you, you need to have good library testing library and to know and also you need to know those limitations beforehand

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and make it trade off.

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Got it? Got it. I agree with you fully.

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Hey, can you discuss any concern or limitations you have encountered with automation in quality metrics before

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I don't fully understand the question. So limitations of

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automation in quality metric metrics.

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In general, let's say automation in tests. Have you ever had, like any concerns or limitations that you saw that they, there is a problem here, and either takes a lot of time maybe or hard to test how to like use automation takes a lot of resources is kind of limitations.

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Well limitation, I can't say that when limitation might be when you try to do end to end testing. There are multiple dependencies, multiple models involved. And there are tough like any to configure all dependencies properly. And basically, there are more room to fail your framework because of some change configuration. That's the one thing like dependability testing. So basically, to be sure that all configurations are set correctly. And up to date, that's one limitation. Another limitation might be build time. So when you basically when you have a lot of tests, and you're running it in pipeline, it can increase drastically your build time. And in order to solve this issue, you need to break up your tests into different groups. And I'll run testing my pleasure smoke testing or sanity testing when it's needed and regression testing separately and also like you do paralyzation of testing or you're running multiple tests use in parallel Yeah, maybe like you need more like bigger test servers bigger like ROM and or other

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like the size of memory throughput

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comes to some

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physical limitation got it

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agree with that? What impacts does the prioritization of software quality have the like on rolling new features

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like I can explain this in that way that for example, you implement the you prioritize the software quality, it can take a lot of time sometimes, but in general, how it affects your releasing new features

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on the software.

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While long term, it affects positively first, it might be increasing release time. So basically, like when you consider Software Testing seriously, and you test on each level that may that means that you you will you will be bug prone like error prone, meaning like you will be you will have less less and less bugs with every iteration you wrong. But also after some time, you after some time, you need to design more sophisticated test cases. Because like there is a pesticide paradox in software testing when basically you are testing the same stuff over an hour, like eventually you will not have bugs in that area of software, but in general, that's a good thing. And basically, the

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it has a positive effect, and

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it increased the quality which is very important.

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Yep, I agree with that as well.

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Actually, you answered already the other two questions.

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Let's move to the next question like

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how does the organization ensure the company Last was local and global regulations related to the software quality of the financial projects. I know that the finance, financial industry in general is highly

regulated that there are tons of let's say, regulations that you need to meet. How does the organization ensure them basically?

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Well, our organization ensures it very well. And basically, we have a lot of audits

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every quarter,

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which is lying by external company, like when their company or like basic consulting in different regulations. And

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basically, like,

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let's say, we are when we are doing testing, we also do testing based on requirements of, like, This boosts compliance. And so, like, the testing, like the compliance is assured by internal development team and testing team and also by regular audit checkups. And we have comprehensive logging, of all our like in database and, like, sometimes in the message queues like Kafka and, and we also document audit results and testing results. So everything could be checked and verified.

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Go ahead. And one more question.

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In my personal experience, I would say that, I saw that in many financial teams, basically have the separate compliance team, which analyze this updates in the regulations and basically give you the internal audit and they say, Okay, you need to update this, like change some things in order to comply the protocols, new protocols, do you also have a separate team for it? Or basically, you need to manage everything?

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Of course, for sure, for sure, we have compliance thing, who, basically they, they update different, like classification documents, we constantly have internal trainings. Like we have security trainings, data, classification, trainings, different compliance trainings, like PCI DSS trainings. And we also have compliance team who basically update us on latest, like rules, compliance requirements. And they also also we have security team who constantly tests like, even internal employees. So it's, there are a lot of things actually, who maintain compliance. Code.

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One more question. Have you ever? So like, can you describe any challenge for maintaining compliance during the development or updates in the compliance that you need to update the software? Go for it? Have you ever met these kinds of situations before?

43:57

Oh, that's a tough question, actually. Well, I would say the complexity of, like, following compliance is basically you need to test to add more tests to color compliance. And also, you need to keep updating them when something is changed.

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So that's a that's a

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complex data that comes to my mind.

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Yeah, got it. Good.

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That's all from my side. Thank you for being with us. Thank you for helping for research. And let's hope that the challenges that you mentioned, will be gone by doing research and implementing better DreamWorks

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thank you so much for this meeting. Thank you.

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Yeah, unfortunately, I have to go because it's already took more time than I expected. But again, yeah, thank you for questions and good luck to you. Like, I really liked those questions. They are detailed, and I love that your research and testing in general so I wish you good luck in graduation and yeah, keep me updated. Please send me a copy. Don't

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forget about that. Yeah, good

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luck in your thesis work.

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Thank you. Have a good rest of the day. Okay, you too. Thank you. Bye