ISB CTO

Fireside Chat with Rakshit Daga, Chief Product and Technology Officer, bigbasket.com

In this interview, Rakshit Daga, discusses his unique role and the interplay between technology, product development, and business in the company. He emphasizes the importance of balancing short-term problem-solving with long-term strategic vision. He also highlights how the company responded to the challenges posed by the COVID-19 lockdown by rapidly innovating and testing new features while maintaining a stable platform. Following the acquisition by the Tata Group, BigBasket has continued to operate independently while benefiting from access to talent and best practices within the group. Daga's advice for aspiring CTOs is to develop the ability to both deep-dive into problem-solving and take a broader, strategic view.

Sunil Rawlani (SR): Hello everyone. Welcome to the very exciting session I have today. I have a very eminent speaker, who is a in the unique position of being a product and a technology officer. And this is a company that everybody knows as BigBasket, but it's now also a Tata Group company. So, how are you, Rakshit today?

Rakshit Daga (RD): Hey. Hi, Sunil. It's a pleasure to be here, and very happy to talk to your audience today, I'm doing great. Thank you for having me. Thank you.

SR: So, just a little bit to understand about product and technology at BigBasket, so that our viewers can be more informed on the role that technology is playing today in product organisations as well as take that learning away into service organisations, right? So, maybe you could start by just talking about your role itself. CPTOs, Chief Product and Technology Officer is not a very common role.

RD: So, very tactically what it means is that I had the product, technology and the IT wings of the organisation, right? But in reality, I mean, I think the way it's shaped is kind of a strategic role where we realised that a lot of what we bring to our customer base is driven by technology and the product thinking. And both these teams work very closely together. And given my background, where I was running a startup before I joined BigBasket, and I've also been involved with various organisations— big and small— in strategic business roles, as well as technology roles, as well as product rules.

So, I thought I had a little bit of a mix of all of that background and sort of, could bring the business understanding to the table along with the technology understanding. So, having done a startup, my own startup, where I was everybody— from the waterboy, to the coder, to the business guy, as well as having worked with product organisations before, and in my role at SAP, as part of the corporate strategy group as well. So, I've seen a fair bit of technology product business. So, from that standpoint, I thought there could be some value that I bring to the table in, across the boundaries of product or technology or business. So, that's really the broad framework of the role.

I'm usually closely working with the various business units trying to understand what are the large problems that we want to solve. And because I originally started off as a developer, I have the technology background to kind of relate and bring these together and actually make things happen. So, that's kind of the role. And going back to your original question, I think we've seen a number of people in the startup industry as well as in the technology world who started playing this role. And then if you look at the profiles of these folks, it's typically something similar to mine. People who've done startups of their own, who've got an understanding of business, have built products from scratch along with starting off as a developer or starting off as a... in an architectural technology, architectural background.

SR: Would it be appropriate to say, it's because you used the word— business technology, so this could be a Chief Business and Technology Officer, if you were to borrow this into other industries?

RD: I mean business. So, for example, I'll talk about the BigBasket context. I can't claim to be an expert in the retail industry per se, right? There's folks like Hari, who's our CEO, who actually brings a lot of the retail expertise to the table. Where I can potentially add value is for example, what should the consumer facing product look like? How should we look at taking the product to the market? How should we look at driving strong analytics? And then... so that's the business facing sort of role, right? What kind of marketing campaigns can you drive from the consumer side? And if you look at the supply chain side, what does it mean to optimise inventory, what does it mean to optimise delivery, and so on. So, these are hardcore business questions.

And in our world, the responsibility of answering these questions in a deep wave falls on the product management organisation. Now, if you combine this with implementing the sophisticated technology or algorithms needed to actually solve these problems, right? Let's take vehicle routing as an example, inventory forecasting as an example. While inventory forecasting is an obvious need for somebody who's a strong player in the supply chain world or especially for organisations that run large warehouses, the technology needed to actually solve some of these problems can range from the really simplistic approaches to real complex approaches, which include things like

machine learning or deep learning and so on. And so there is a good mix of what the product wants or what business wants in such a role, as well as what are the technology approaches that are needed to solve these problems. And so given that I'm able to work closely with the business, and I actually have a background in technology solution, it sort of makes natural sense for me to participate in all of these discussions.

SR: In fact, you already answered in some way a question I had is, how does technology respond to the business, and how do you influence the business itself? So, I guess what you're saying is it works like a two-way street.

RD: Absolutely, I think you hit the nail on the head. It's absolutely a two-way street, and there are for example, there are situations where we may say, "Look if you to run the business in a certain way, the technology might be much easier to build or much faster to build", right? So, we constantly have these discussions between the product team, the engineering teams, the business teams where we are trying to arrive at a happy middle ground, which is a combination of agility, robustness, scale and so on, right? So, and that's one of the core tenets of our business for a company like BigBasket, where speed to market is essentially key.

We are constantly trying to figure out ways to optimise how we bring product to market. It there's a lot of investment in and thought that we bring to the table to see how fast we can implement something, how fast can we roll it out, what is the experiment we can drive with it, right? We don't really want to disrupt the whole business in one go. We typically pick one or two locations and we experiment and look at the results. And from that standpoint, it's a whole, a large data-driven exercise; not only within the technology and product teams, but also the business really runs on the data that the tech engine or the product engine is producing.

SR: Is there an example in particular that you have, you might have several, but can you use one?

RD: Yeah so, so I talked about inventory forecasting for example, right? Like you can... So, there is no deterministic signs to how much you should keep an inventory, right? Like for example, anybody who does warehousing knows that too much inventory is of course, capital lockdown and especially in the perishable case, there's a lot of write off that happens if you're not able to sell what you have. Too little inventory is, of course, loss of business. So now, you really want to arrive at an optimal solution, which is a combination, which is exactly right. There's no such thing as exactly right when you're doing e-commerce or when you're doing online or you're running an online grocery engine.

So, what you try and do is experiment with different algorithms and different approaches, and you test them right? So, for example, we could have at the simplest end of the spectrum, we could have a very statistical algorithm which is just using mean and standard deviations and so on and so forth to calculate potential inventory that you want to store in a warehouse. At the high end of the spectrum, you could use a lot of the new tools which are currently based on deep learning or other machine learning approaches. And I give you one more example, right? A lot of our associates in the warehouses, they seem to have some human intuition around how much inventory is going to get consumed, right?

So now, given that you have all these wide spectrum of possibilities on how you could calculate what is likely to sell today, how do you build a tool and a technology platform which allows you to experiment with these different numbers and figure out what's working best for the business? So, that's just one example of many. in terms of how technology, product and business, ends up working together.

SR: The answer I'm actually getting is that, technology is completely embedded in intrinsic, and nothing happens without technology except for something that you touched, is the human intuition aspect is, perhaps, you've turned everybody into data sciences in the organisation.

RD: That's right. And I think, see one other very interesting thing that I've learned over my career in Bigbasket is there's a lot of human intuition in play. And one of my jobs is really trying to understand that human intuition and see if I can codify it, right? Can I create a rule book out of it? Can I create ML, AI engine, out of the human intelligence? Right? So, there's two parts to the job: one is to understand what a certain successful human is doing to make it work, right? Get that deep understanding from that expert, and then translate it into product requirements and then translate it into an engineering solution. That's a beautiful, and joyful journey in itself, right? And I think a measure of our success would be if you're able to harness all the creativity, and the innovation that is happening at the ground level and actually codify it into the rules that you could run, for example, across the country, on all our locations or all our warehouses.

SR: Yes, I think, that would be where I can see a definite progressive path. Something that, you know, when you say this, it comes to mind is the big turning point for companies like yours, was the lockdown. I remember my own experience, how the world just closed down on you, and every shop was closed. And if you had, if you were a caregiver like I was and you had a bunch of people to look after, then your responsibility becomes that much more to source for them. And because you can't get out, you can't go out anywhere, even if you can go, it's the shop is closed. If the shop is open, the product is not in stock. And this really great turned was a pivotal turning point for

BigBasket. So, I'm sure there were a lot of challenges from technology to people to supply chain. Can you please help us understand how you know your journey was, and how you evolved in that whole process and how that has made you a much more mature organisation that you are today?

RD: So, that's an excellent question. I think the lockdown was indeed a pivotal moment in BigBasket's history. And I distinctly remember the night the Prime Minister announced the lockdown, traffic to BigBasket went through the roof, right? We saw 6X more traffic just as soon as he announced, we just saw 6X more traffic on our platforms. And obviously when every piece of infrastructure got tested at its seams; there were pieces that broke.

Two things happened: while demand shot through the roof, I think through a lot of the workforce a little bit of panic had set in, and bunch of the workforce had actually started leaving for their hometowns, especially the folks who worked as delivery guys, and people who worked on the warehouses, right? So, we were caught in this unique situation, where the demand was super high, the number of people available on the operational side to fulfill the demand had actually completely dropped off the cliff. And it took us a week to figure out, right, because there were other operational issues to sort out. For example, we needed to get permits for our vehicles to move around various cities and each of the local business heads were needed to talk to the local government officials, and make these permits happen and so on. But what it really meant from our product and technology standpoint is that we had a very critical problem to solve immediately. A: how can we continue the business, at the same time continue to cater to the demand. And we also felt that we were providing an essential service in that time because getting grocery home was a genuine need.

And we wanted to figure out how to do this in the most fairway possible, right, not have somebody. For example, BigBasket does slotted delivery, and for each slot there is a specific amount of capacity that we plan for. And in the COVID days, the capacity would run out in no time. As soon as you'd open the slot, within two minutes, the slot would be gone, right? And there were a lot of our customers who had relied on us for many years, who were not able to get these slots. So, you can imagine the situation, right? There's not enough people to fulfil the orders. Your usual customers are struggling to find slots and so on.

So, what we did was as a product in tech or along with the founders, we actually sort of worked in a war room for multiple days at a stretch, right? And I think in a two to three-week period— I still have that spreadsheet with me— we built around 60 innovations, right, just to address the COVID situation. And this was a speed, and I'm really proud to say my team pulled together, and everybody was working pretty much round the clock trying to make things happen. We were building things, deploying them, etc. And a lot of that creativity, a lot of that innovation that happened in those 2-3 weeks has actually made its way into the platform over time. But it was just such a pivotal moment, right? When you actually have your whole team thinking together, working together, making things happen, trying to actually approach the whole thing as a service that we are providing to the country. And basically, the big mantra was trying to do more with less, right? And innovation was happening at all fronts. From a purely infrastructure standpoint, we're trying to make sure that our systems are scaling up because even though people weren't able to get slots, everybody was coming to the BigBasket app and the website every few minutes just to check if it's possible or not.

SR: Yeah, people had few choices.

RD: People had very few choices. So, to give you an example of some of the innovations that we brought in in that short period of time, we invented a token system saying that, "Look, even if the slot is not available, we'll give you a window. If you come back in that time window..."

SR: You would have had to go back and code all this in real time.

RD: We did, we did. And that's where, like I said, that's where I'm really proud to say my team stepped up in such a big way, right? And we were able to code 60 different pieces of functionality in the two-to-three-week period and take it to production and make it happen.

SR: And then, but you also have to carry that from your app or your systems down to your fulfillment as well, right?

RD: Absolutely, Absolutely. So, for example, we realised that we didn't have enough delivery people. We also realised that a lot of societies were looking at pooling orders. So, we actually created a system where you could do bulk deliveries to a society and create a small utility where folks who are running the homeowner's association are able to actually go and distribute it to individual houses, right? We created a system where if you're a senior citizen or if you're somebody in need, you could bypass the slot ordering process, right? Customer service could actually take your order directly and we would make sure that deliveries would happen, right? And this was like, this was our initiative to take care of people who don't have help in any other way. So, a bunch of these innovations happened and many of those stayed on in the platform and have really defined how our product is shaped up, right? So, and when the second wave happened, right, if you remember, there were two waves, and when the second wave happened and demand again shot through the roof, we were much, much better prepared because

a lot of the framework, a lot of the innovation was already built into the platform and we were able to leverage it again and respond much, much faster this time around.

SR: What is the sort of technology architecture that you can share with us that allowed you to respond in real time almost?

RD: So, the technology history is over more than a decade long, right? So originally, we started off as a monolithic architecture. I think in BigBasket's history, we've always believed in the principle of actually building most of the tech in-house. So, most of the technology stack right from the app to the supply chain software is actually being built and developed in-house. And I'm a firm believer that and in fact, I think this was probably one of the smartest decisions our founders made because when we build this in-house, we are able to innovate on the processes. We are able to think about what our customers actually want.

And if you think about it, grocery delivery via e-commerce in India is a unique problem statement in itself. Nobody had done this before. You were discovering how the market works as you actually continue to build. So, when we made the choice to actually build it ourselves, I think it was a really smart choice because it allowed us to be agile, it allowed us to be creative, allowed us to be in a way to build solutions that suited the Indian demographic. So, from an architectural standpoint, we started off as a monolithic architecture. There was a large sort of piece of software that was running over the database and in a single application system. But over the last 3-4 years, we've evolved it to micro services-based architecture, right? So, where there's 100+ different micro services running on different technologies where all of them operate together to actually create the whole BigBasket platform and we've teams that work on, I mean all the technology stacks are multiple in nature. They're very different, right? We do Python, we do Go, we do Java Vertex, we do Java Spring Boot, Spring Boot, we do Node JS. So, based on the use case or the specific part of the technology that you're trying to solve for, we choose the technology stacks. So, the engineering team, for example, is a mix of people who are well-versed in different technologies and different stacks.

SR: What is the opportunity for structured innovation? I can't say them whether, my lockdown was the mother of all needs, and therefore, innovation stemmed from it, and it probably left you. Did it leave you with an innovation culture, for example?

RD: Yeah, so, so we've actually coined the term in BigBasket. Let's use the COVID approach. And, what really means is build something really fast, really innovative in a very focused, structured way where the whole team is coming together, right? And so, now as a leader of the team, it's my job to try and balance out between the COVID way, and continue to keep our system stable and continue to make sure that no serious bugs make its way to the customer and so on and so forth, right? So, what we try to do is have a balanced approach to innovation. But that being said, I think the core culture of the organisation is still that, "Look, if you have a problem to solve or if you have an idea, I think there is ample opportunity for everybody, at all levels, to come up with an idea, pitch it and make sure that it makes its way into execution, right?"

So, having worked in the industry for nearly 25 years, I think this is one organisation where everybody can actually participate in the thinking process, right? No idea is too bad. No idea is. I mean, everybody is completely free to raise an opinion, raise an idea, have a discussion around it. The one thing, though we do well is make sure that all ideas get into execution from a data-oriented standpoint, right? There's a lot of analysis and thinking that happens around every idea that we want to put into execution, to try and understand what is the value to the business, how much is the investment we need to make, is it worth our time, and so on. And there's no possibility of ideas per se. One of the key things that we try to do as a company, and an organisation, is prioritise these ideas in terms of the value that they might bring to the business. So, that's sort of the innovation landscape.

SR: I mean it's great to have an open innovation culture, really is what you talked about. How do you balance that with, you know, stability, reliability? I guess you do a lot of change management, internal change management and how you implement some of these things. You know, what is a quick response to a need versus what is something that you grow for the longer term as well?

RD: So, I think there's two approaches that we follow that this sort of, helped us, sort of keep pace with stability and scale, right? One is really having strong processes in terms of how, for example, the new piece of functionality goes out, right? There's a very structured way, and for example, we work in, in the agile way, we plan our work in sprints, we look at specific outcomes, etc. That being said, once the piece of work is done, we typically don't roll it out to everywhere across the country, right? Because not only is there a chance that you've created some bug inadvertently, but there's also a chance that the operational people are getting exposed to a new way of working, etc. And that requires a little bit of coaching as well.

So, what we typically do is we roll it out to a subset of the audience, right? For example, if it's a consumer facing change, then we typically use a bunch of AB testing. We release it to a small group of people; see how they are interacting with the new functionality. And only when we are confident that it's working as it is expected to or

delivering the value, then we actually do a larger rollout. Similarly, if it's a change that's on the supply chain side or on the operational side, we pick out a location or a warehouse where you want to test it out. We make the deployment only and we operationalise it only for a specific location, make sure it is stabilised. We figure out what it takes for our operational colleagues to use that piece of technology or product and only when they become comfortable with it, we do, we do a larger roll out. So, the balance we are striking is instead of trying to roll it out all in one move, which should of course be faster, we kind of stage it in the sense that we make sure that it's working in a stable way, delivering the value that we anticipated to deliver and then bring it to the larger audience.

SR: If I might ask a technical question, do you use sandboxing and test environments or you have one version of the app across the country, and inside, and structure it to be able to do these kind of internal rollouts?

RD: So, we use a bunch of approaches. There's of course test environments and sandboxes. We also have feature flags, right where we are able to turn on features for a certain audience, right? We have AB testing, where we say, roll out this functionality randomly to 2% of the audience or 5% of the audience. And then we actually have the ability to measure what is going on with that 2% or 5%. And so, there's a bunch of these tools that we use. And when I said feature flags, for example, let's say, introduce a new way of picking in the warehouse, right? And I want only a certain location to have access to it. We essentially turn on a feature flag saying only for this location is this functionality available. And then we go and train the people who are working in that location and teach them how to use the new product. And only when we are satisfied that this is working properly, then we start gradually rolling out, rolling it out to different locations. So, and that's pretty much become such a standard for us, right? There's a gradual rollout across the country because any mistake could have massive repercussions to the business. So, there's a lot of care we take in terms of making these rollouts.

SR: And the customers are completely oblivious. 24/7 they are just using their apps and going on ordering and they don't realise what you're doing on the backend.

RD: Yeah, and I mean, I think the platform is at such a mature stage, right, where you may see a new piece of functionality, whereas your neighbour might not. And it's maybe you've become part of an AB test, and we are trying to understand how you interact with the new version of the app. And I mean we are collecting data to try and understand user behaviour and then deciding whether we really want to roll this feature out to the larger audience or not.

SR: So, you're able to go down to a user level?

RD: Absolutely, we are right? And typically, one way of experimenting is most end user functionalities first rolled out to BigBasket employees, right? So, I as an employee, get typically get to interact with the newer version of the app. But the interesting thing is this; it's not like it's a different app in the App Store. The functionality is there, but it's hidden for users who are not a BigBasket employee. So, I get whitelisted because I have a BigBasket e-mail ID or I'm known to be a BigBasket employee and once I'm whitelisted, I'm able to see a new piece of functionality.

SR: I guess you have a full feature and version control.

RD: Absolutely, absolutely.

SR: So, tell me after the acquisition by the Tata Group, the what is the impact on innovation and compliance with Group technology standards, if any?

RD: So, see there's no I think major impact as such in a way of working. We still continue to operate independently. What has been wonderful obviously has been the access to a large pool of talent that the Tata Group brings. A lot of the know-how that is already present in the Tata Group, and a lot of access to experts from TCS or from other group companies has become much simpler, right? In addition to this, I think there's obviously the integration effort that we've done with the Tata group, right? So, we as you know, there's the Tata Neu app and BigBasket is part of the Tata Neu app where you're able to order groceries from another app as a source. So, there's been projects which have driven this integration but largely from a product culture standpoint or from a from process standpoint. We continue to operate independently. At the same time, there's a lot of sharing of best practices, right, with group companies like, for example, there is a security group which is across companies and these all the security leaders from the various group companies meet and exchange notes, and try, and understand what everybody's doing to keep our customers secure. And we try, and I mean we see if we can share some knowledge, share some know-how, even take product recommendations from each other and so on, and so forth.

SR: Excellent. A final question from my side, is there a message you would like to leave with people who are aspiring to be CTOs or become more senior CTOs, CTOs, and in a VUCA environment?

RD: So, as far as message to aspiring CTO goes, I think the one thing that's sort of worked well for me is the ability to do a deep dive and get involved in deep solutioning, wherever needed. At the same time, stepping back and

being able to look at the macro picture, look at the business view, being objective about what's possible, what's not possible. So, what I would recommend to aspiring CTOs or Chief Product Officers, is to nurture that ability where you are able to focus on the problem-solving whenever needed and then at the same time look at the bigger picture. So, that to me I think is an essential piece of actually driving a strategic leadership vision in terms of both product business.

SR: Really looking. Look, having a short-term view and a long-term view, looking ahead, looking further, preparing for the 400 metres, as well as the marathon.

RD: It's really, I think, and as you can imagine for an organisation like ours, your daily work routine is a mix of the absolute tactical problem that needs to be solved today. At the same time, keeping your one-year, two-year vision in mind and if you can figure out a way to make both of these things happen together, then I hopefully make you successful.