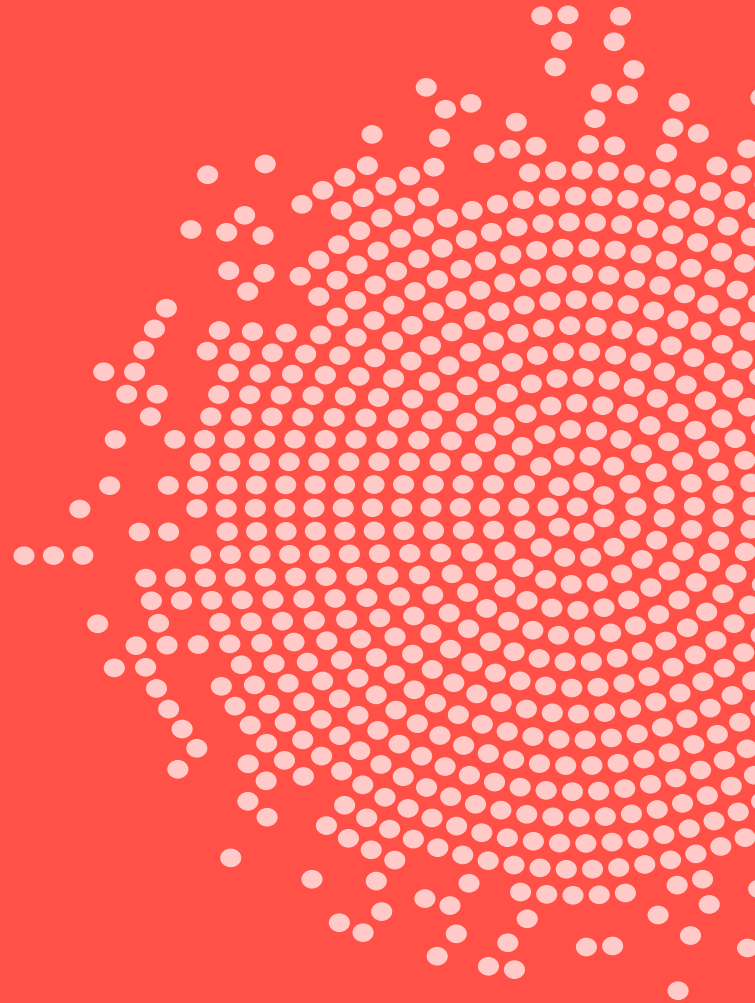


**Build Versus Buy:  
For Great Chat  
That Users Love,  
The Choice is  
Clear**

**PubNub**





Building a new app is a challenge. You have to identify a market, create a compelling solution to a pressing problem, get it launched before the competition, and offer an intuitive experience users readily adopt. But today's users expect more. They want an experience that matches the real world, similar to what they get with apps built by the largest, most well-funded development teams. It's difficult to hit those lofty expectations and stay focused on your core value.

Chat, specifically, has become ubiquitous across most apps because users want to communicate, just as if they were in the real world. Gamers want to challenge their friends, workers to inform their managers, or devices to generate alerts to locations and status—all in realtime. But to add chat to your app, do you build it in-house or buy it from an existing provider?

PubNub has worked with thousands of developers, helping and listening as they built their apps, grown and scaled them, and continuously improved their services. Many have also migrated from in-house chat solutions to PubNub, and they shared with us the risks they left behind and the benefits of moving to PubNub.

What's clear is that building a chat infrastructure is expensive, time consuming, and adds unnecessary risk. It consumes developers, budgets, and focus, which are all taken away from your core app, leaving you with

a longer time-to-market and less features when you do eventually launch. As you grow, you're always at risk of chat conflicting with your core app, requiring catch-up features, consuming maintenance and support resources, and requiring more and more resources to keep chat running, reliable, and robust.

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**But we can also tell you exactly what it will cost to build your own chat: at least \$130,000 in the just first year, plus the waste of nearly 3 years in cumulative developer time. Compare that with PubNub, which takes just 2 months to deploy and is less than half the cost!**

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01

# What You're Risking with In-house Chat

Healthcare providers are always looking to increase patient convenience, from reducing wait times to easing communication. But as healthcare costs continue to rise, patient retention has also become a concern. Providers must now do more to enhance how they communicate, coordinate, and engage with patients so they not only have a good experience, they also choose to come back. And, while patient care, communication, and coordination present opportunities, every interaction must be in compliance with HIPAA and other industry regulations.

But simply applying technology to a healthcare challenge is no longer

adequate, since consumers have high expectations driven by the fast, easy-to-use, and highly reliable experiences offered by so many consumer-facing applications. Building an engaging solution and having the platform to support it requires a lot of resources to ensure reliability and scalability, but each resource applied to the platform is removed from helping to build the core solution. However, it's not a choice; developers must do both if they want their solution to succeed.

Today's most innovative organizations, some of which you'll read about below, rely on PubNub's feature-rich, reliable, scalable, and HIPAA-compliant infrastructure. PubNub takes care of the platform so developers can focus on time-to-market, usability, and differentiation while giving patients an engaging and satisfying experience, all with cost-saving productivity and efficiency improvements for providers.

## **The Numbers Behind The Numbers**

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We arrived at estimates for time and developer resources based on feedback from hundreds of PubNub customers who've used PubNub Chat to replace in-house systems or serve as their original chat platform. These calculations estimate a developer's salary at \$25 per hour, or roughly \$50,000 per year, to reflect a minimum potential cost, but there are obviously huge differences in developer salaries across the world. For those sourcing developers in tech hubs or major cities, these costs could easily reach three- or four-times the values shown here.

Chat is there to augment your app, but it's not the app. Users expect chat, of course, and they expect it to be good. But delivering an underwhelming or buggy experience could undermine an otherwise spectacular app. So the risk of building in-house chat goes beyond the first-year drag on money and developers. You're now on the hook for ensuring it works flawlessly, has all of the expected features, doesn't conflict with other components, and is constantly maintained and updated.

Chat may seem simple, but it requires a massive realtime infrastructure built by engineers with very specific skills. It's a daunting task, especially when users demand an experience that mimics the best from Slack or WhatsApp yet is seamlessly integrated into your app.

To reduce risks, reduce costs, and put more resources into your core app, it's a better decision to buy chat instead of building it in-house. Here's why.

02

# Basic Chat vs. Great Chat

A common pitfall is underestimating the time and effort it takes to build robust, reliable, and scalable chat. But you can't just build chat. Today's users expect great chat that includes typing indicators, file transfers, groups, channels, privacy controls, and more. As you dig deeper, you realize modern chat is a rich experience, which makes your development efforts more complex, expensive, and risky.

But don't forget the back-end reliability, scalability, and maintenance efforts take more time and money, and add more risk. All of a sudden, the infrastructure required to build, grow, and optimize chat starts to become apparent.



To do it right, you need a team of experienced developers to build the foundation, another team to build the base chat functionality, and then more developers to forever manage, maintain, and upgrade whatever you've built.

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## Great Chat Has...

- Modern, visually appealing, and accessible UI
- Smooth experience with responsive feedback
- Moderation to combat spam, abuse, and trolls
- Realtime messaging
- Robust security and encryption
- Compliant privacy protections
- Global, always on availability
- Reliability at scale to handle growth and traffic spikes
- Easy feature extensions
- Flexible integrations to popular tools and components
- Automation for translations, filtering, and business logic
- Geo-location options
- Realtime notifications
- Realtime analytics and trend reporting

03

# The Real Cost of Great Chat

Truly great chat requires a solid foundation, designed to support reliable growth, and which can support future optimizations. To build and maintain a robust, modern chat that meets user expectations, it requires three stages of development:

- 1. Build & Benchmark:** Spinning up the infrastructure to support the development, computing, and transmission of information, then scoping and building the basic chat app, including user interface; data management; security, permissions, and access controls; encryption and compliance support; and more.

**2. Grow & Mature:** Reliability and scalability development to ensure messages get through regardless of user disconnects, lost data, traffic volume spikes, and more, all built on a flexible platform to support integrations, business logic, and advanced features, like profanity filters and translations.

**3. Optimize & Beyond:** Increased scalability and support to maintain, indefinitely, a world-class in-app chat, including operations to handle traffic spikes, monitor systems, balance loads, and log and mitigate errors, plus the ongoing support for future upgrades and realtime features like geo-location, third-party integrations, and more.

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## PubNub Key Features

- Direct and Group Conversation
- Message Receipts
- Typing Indicators
- Unread Message Counts
- Profanity Filters & Moderation
- Message History
- Message Reactions
- Mobile Push Notifications
- Language Translation
- Authorization & Permission Control

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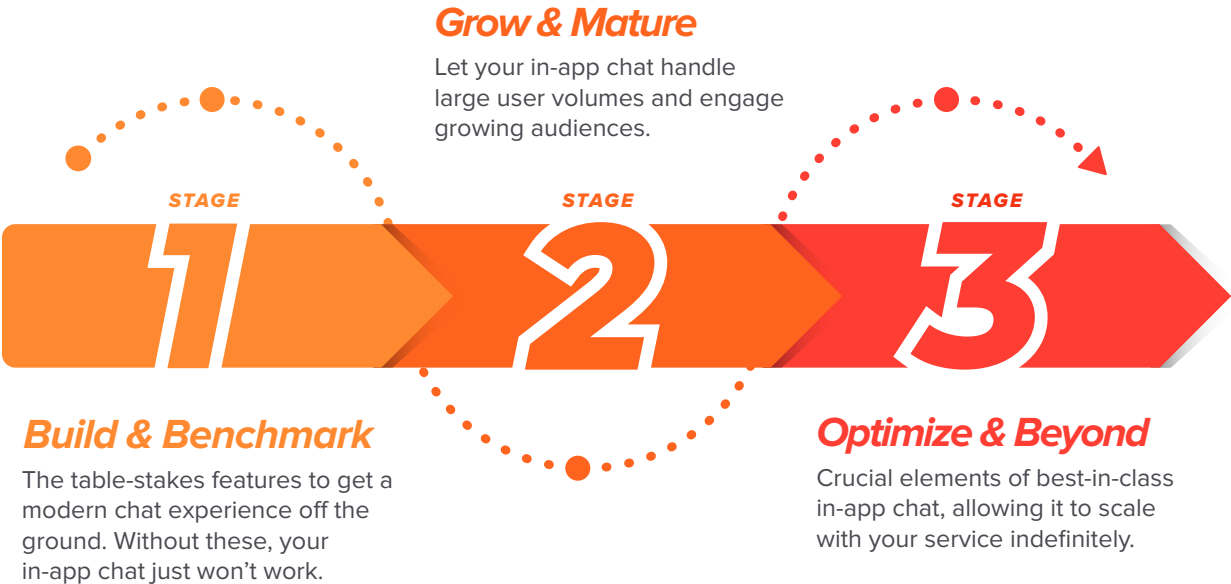
Let's dig into each of these three stages of development to calculate the real cost of great chat.

04

# Building & Benchmarking: 4 Devs, 4 Months, \$64,000

Building chat is like building a complete application, so it requires the foundation, UI, and basic front-end and back-end features to make it work, make it responsive, and include the features both users and developers expect. These are table-stakes features required to build even a minimal chat experience. Without these elements, chat just won't work.

**Building and benchmarking chat requires the effort of 4 developers for 4 months. At a cost of \$25 per hour, that’s equivalent to \$64,000, plus the opportunity cost and slower time-to-market from those lost development resources.** This also does not include the additional ongoing fees related cloud computing and storage, network access, upgraded support and service levels, and more.



Chat, like any other app development, begins with spinning up testing, staging, and production environments. Now it’s time to actually code the features, functionality, and user interface for the basic app, including direct chat, group chat, emojis, filtering, and more. But users expect an experience on par with popular apps, so you’ll have to add typing indicators, search,

read and delivery receipts, push notifications, channels, and more. You'll also need to think about platforms and devices, and if you want to offer desktop and mobile interfaces, management consoles, user levels, and other features.

# Are you willing to take the risk?

Since you're building chat from the ground up, you're taking an incredible risk. Everything from the platform through to the user experience is your responsibility. It has to work as expected, have the features users demand, and, above all, be reliable. You'll need to consider how you handle data, manage updates, work around errors and disconnections, and more. It all takes time to discuss and decide, and then develop and implement, which all impacts your time-to-market, takes time away from your core app, and adds even more risk.

Remember, too, when things go wrong or when bugs cause usability issues, executives, investors, or partners will want to know why. You're on the hook to not only fix it, but to explain why you chose to build it yourself. Is it worth the risk?

05

# Growth & Maturity:

**2 Devs, 2 Months,  
\$16,000**

Future growth and scalability might not be top-of-mind as you begin development of a new app, but they must be considered at this point to support ongoing success. The challenge for in-house chat is that these costs increase as you scale, creating large maintenance workloads and resource drains as you continue investing in, improving, and expanding your core app and chat along with it.



**Supporting chat growth and maturity before you launch requires the effort of 2 developers for 2 months. At a cost of \$25 per hour, that's equivalent to \$16,000, plus the effort and focus it takes away from your core app.**

Reliability, especially at scale, requires global replication, automatic failover, reliable message delivery, and other capabilities that all need to be architected, developed, tested, and deployed. It's also worth considering data replication and creating multiple points of presence and automatic failover to ensure messages are delivered 100% of the time and in realtime, without delay or duplicates.

You'll also have to think about message "catch up" when a user connection drops and guaranteed message delivery as messages need to be stored and forwarded, such as with in-memory caching. These quality of service elements keep users engaged by exceeding their reliability expectations and removing frustrations caused by downtime, interruptions, lost data, or

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## PubNub Chat is...

- **Easy to build**  
Reduce time-to-market with pre-built features, references, and tutorials.
  - **Infinitely customizable**  
Increase development flexibility and create uniquely differentiated experiences.
  - **Field-tested, reliable & widely trusted**  
Reduce risk with 15+ POPs, 1/10 second delivery, and 99.999% uptime.
-

delays during traffic spikes. But faults do happen, so don't forget a playbook of responses to guide resulting actions. And traffic does sometimes spike, so you'll need a custom-built load testing service to simulate a real audience.

Don't forget preparing to extend your app as users demand new features. They might want to integrate with apps you never considered, or to prioritize missing features, like profanity filters or language translation. It all takes time, effort, and money away from the features users are also demanding for your core app.

06

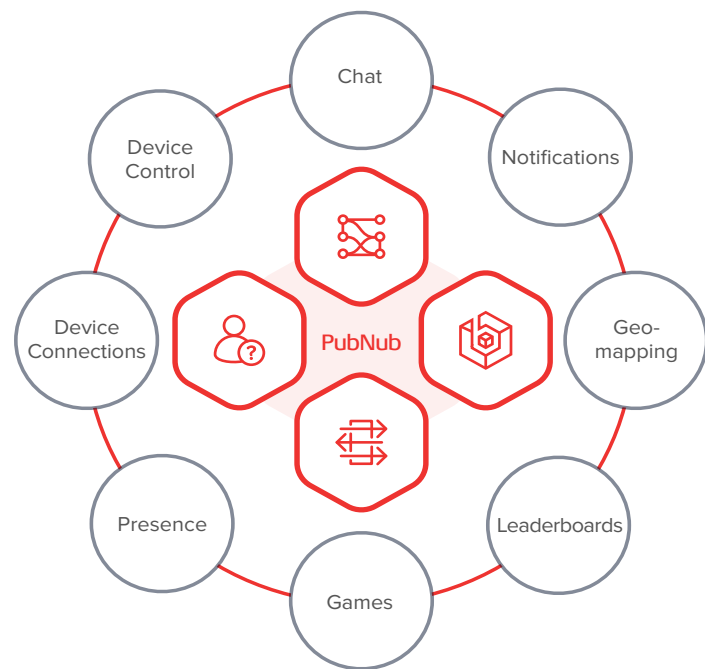
# Optimization & Beyond: 2 Devs, Forever, \$100,000/yr

As your product grows and your user base expands, you'll need to constantly upgrade, maintain, expand, and rework your chat and its supporting infrastructure. You'll need dedicated resources to handle traffic spikes, monitor systems, balance loads, log and mitigate errors, and ensure future upgrades are implemented seamlessly. But that's just scratching the surface.

Ongoing optimization isn't just making sure your chat doesn't go down; it's making sure your core infrastructure is also stable. To optimize for growth, you'll have to build a log system, identify error messages, and have someone manage the corrections. You'll have to create a load balancing scheme (like Nginx or HAProxy) and manage how traffic flows between data centers and cloud regions to ensure data reliability between endpoints. Don't forget quality assurance, deploying security patches, and upgrading individual components.

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**Continuously optimizing chat to support future growth requires the effort of 2 developers, forever, for minimal annual cost of \$100,000. Since it took 6 months to build your in-house chat, that's another 6 months of optimization costs in the first year, or \$50,000.**



You'll face even more costs, delays, and risks when adding new or enhanced features to either chat or your core app. Maybe users want geo-location features or internal

teams want realtime analytics to discover trends and find opportunities. Your infrastructure will also need to support growing numbers of users and simultaneous conversations. You might need to invest in more infrastructure and even refocus developers to add or extend chat features.

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**Add it all up and the first-year cost of building in-house chat starts at \$130,000 and consumes 32 developer-months.**

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07

# Stop the math!

## PubNub is better, faster, less expensive, and easier.

PubNub Chat is less than half the cost of building chat in-house. But it's not the lower cost in dollars, it's the lower cost in developer resources that makes PubNub so attractive.

With pricing that averages around \$4,000 per month to handle roughly 200,000 monthly active users, the first-year cost of PubNub is just \$48,000. Add in 2 developers for 2 months to deploy PubNub and the total first-year

cost is \$64,000. Compare that with building in-house, which consumes nearly 3 years in developer-months and \$130,000 in actual costs. Just imagine what you could add to your core app with 3 more years of development resources! Or, put another way, imagine how far behind your core app will be without those resources.

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<b>FIRST-YEAR RESOURCES</b>	TOTAL DEVELOPER TIME	TOTAL FEES
Built In-House	32 Developer-Months	\$ 130,000
 <b>PubNub</b>	4 Developer-Months	\$ 64,000

Worse yet, the cost to develop in-house does not decrease as you scale back for an app targeting much less traffic. More usage, however, balloons the costs well beyond \$130,000 and 32 developer-months. With PubNub, however, our elastic pricing tracks with expected usage, giving you the flexibility to pay less initially and increase as demand grows.

But PubNub isn't just less expensive, it frees up 28 developer-months for you to build a better core app, add more features, and create more engaging experiences for your users. Imagine aiming a single developer for more than 2 years at any combination of features or functionality. PubNub gives you incredible flexibility to launch faster, with a better app, and with a

better chance of success.

PubNub also gives you everything you need from day one. It's infinitely customizable, has a 99.999% uptime guarantee, has less than 100 millisecond latency worldwide, and offers over 75 SDKs and more than 50 pre-built integrations. PubNub Chat further adds HIPAA, GDPR, and EU-US Privacy Shield compliant, and offers point-to-point and end-to-end encryption.

Every dollar and minute wasted on non-core functionality means less time making your app better and releasing it faster. PubNub gives you reliable, world-class chat in less time and with less resources so you can focus on what's important.

Move faster. Innovate where it matters. Grow your audience. Leave the chat to us so you can focus on more important things. To learn more, visit [pubnub.com](https://pubnub.com).



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