



*Partnership for FINANCE
in a DIGITAL AFRICA*

Client

How can advances in UX help meet user needs and enhance engagement?



Caribou
Digital

Learning Themes 5

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NOTES

The views presented in this paper are those of the author(s) and the Partnership, and do not necessarily represent the views of the Mastercard Foundation or Caribou Digital.

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ABOUT THE PARTNERSHIP

The Mastercard Foundation Partnership for Finance in a Digital Africa (the "Partnership"), an initiative of the Foundation's Financial Inclusion Program, catalyzes knowledge and insights to promote meaningful financial inclusion in an increasingly digital world. Led and hosted by Caribou Digital, the Partnership works closely with leading organizations and companies across the digital finance space. By aggregating and synthesizing knowledge, conducting research to address key gaps, and identifying implications for the diverse actors working in the space, the Partnership strives to inform decisions with facts, and to accelerate meaningful financial inclusion for people across sub-Saharan Africa.

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What we know

To attract and maintain new users, digital finance (DF) providers have strived to lower the barrier to entry at every point of interaction. This is particularly true of the technological interfaces (applications) that customers use to conduct financial transactions. DF providers largely believe that easy to use applications can persuade customers to transact more frequently, build trust through transparency, and drive the customer to engage in positive financial habits, such as saving.

Beyond user experience (ux) at the interface level, digital finance providers are also using emerging digital attributes¹ to break down barriers to entry and enhance customer engagement. Such attributes—ranging from real-time customer interaction to gamification—are defining the next generation of digital financial services (dfs).

In this Snapshot we discuss several themes which illustrate how advances in ux are helping to meet financial needs, improve customer experience, and drive uptake and usage of digital financial services. While much of this innovation is taking place across advanced technology channels such as smartphone apps and web-based services, in many markets ussd remains a popular channel of engagement. We therefore continue to see ux improvements at the ussd level despite the availability of more sophisticated technology solutions.

USSD — an old friend or foe?

The spread of digital finance, primarily in the form of mobile money, was largely facilitated by unstructured supplementary service data (ussd), a communication protocol that enabled mnos to deploy mobile financial services at low cost to nearly all mobile phones.

Nowadays, df providers deliver their products across a variety of channels from ussd and sim toolkits (stk), to interactive voice response (ivr), mobile apps, and the internet.

Ussd, still the primary channel for digital financial services,² relies on a text-based hierarchical menu interface that has limitations and poses several usability difficulties. From poor navigation and discoverability (such as complex hierarchical menus behind which digital finance applications are hidden), to confusing user interface (ui) components,³ these limitations have increased transaction costs, negatively affected customers' trust in the system,⁴ and, worst of all, excluded low literacy customers.

As with product design, evidence suggests that, historically, western, developed-market logic has governed decisions around technology infrastructure. This can have a negative effect on users living in lower-income countries where western customs, such as the use of latin characters and the direction of reading, are unfamiliar concepts.⁵

Although ussd poses many challenges, research suggests that there is often a higher preference for ussd than for other modes of access. In Zambia, research found a predisposition for ussd due to familiarity based on the use of airtime top-ups, faster response time, fewer session timeouts, and easy and consistent

1 CGAP, "The Global Landscape of Digital Finance Innovations."

2 Scharwatt et al., "State of the Industry 2014: Mobile Financial Services for the Unbanked."

3 Medhi, Gautama, and Toyama, "A Comparison of Mobile Money-Transfer UIs for Non-Literate and Semi-Literate Users."

4 Bankable Frontier Associates, "Emerging Risks to Consumer Protection in Branchless Banking: Key Findings from Colombia Case Study"; Zimmerman and Baur, "Understanding How Consumer Risks in Digital Social Payments Can Erode Their Financial Inclusion Potential."

5 Loudon, "A Platform Studies Approach to the Role of Technology in the ICTD Ecosystem"; West and Lehrer, "Financial Inclusion for the Poorest Women in Pakistan."

menus for bill payments.⁶ Research in Kenya similarly found that most low-income, first-time smartphone users access services through USSD rather than app-based or web-based services.⁷ The report noted that “USSD offers the ubiquity, affordability, simplicity, and familiarity people need and already use on a wide variety of devices.”

Therefore, rather than changing the technology channel, many providers have been improving the interface UX. By improving menu layouts with simple, context-appropriate labels, grouping related functionality, and avoiding deep-nested menu trees, providers have improved the usability of USSD apps and, in some cases, impacted revenue generation. In the case of updating menus for interoperable deployments in Tanzania, Tigo realized the importance of menu design and the position of menu options. It created a new menu option, “Transfer to Airtel Money,” to differentiate the new interoperable transaction from the existing on-net P2P option. While uptake of the service was initially slow, when the option was moved up in the menu, the number of transactions to Airtel Money increased by about 20%.⁸

Inclusion and exclusion through UX design

*“Poor people are at best uncomfortable, and at worst fearful, of new technology.”*⁹ This especially relates to “excluded” sectors of society who interact less readily with digital channels and technology. For example, Johnson argues that digital finance product design often features a hidden gender bias that unwittingly contributes to the gender gap in DFS use.¹⁰ For example in Kenya, rural women’s infrequent use of DFS, compared to their male counterparts, often results in forgotten PINs. The recovery of PINs has significant time and cost implications for the women involved, often resulting in a one to two hour walk or an expensive bus ride to the nearest Safaricom shop.¹¹

Similarly, Wyche and Othieno argue that mobile interfaces need to be better aligned with “rural user” [sic] capabilities and usage practices.¹² Many of these underserved sectors of society are not only technologically less capable but lack the literacy

and numeracy skills—and experience with formal financial services—required to comfortably access and use DFS. Exacerbated by complex interfaces and complicated processes, the lack of necessary skills and experience often deters this population from using the service, or forces them to rely on family or friends to carry out transactions on their behalf.¹³ Shared and intermediated use of digital finance is discussed further in Snapshot 7.

Much of this misalignment relates to illiteracy, which strongly correlates with poverty. Consequently, interfaces that require functional literacy further marginalize a population that is already underbanked. UX researchers have conducted studies comparing interfaces, ranging from purely text to rich multimedia including voice interfaces, to identify the best ways to lower the barrier of illiteracy. Results confirm that non-literate or semi-literate users strongly prefer non-text designs over text-based designs and that, while task-completion rates are better for the rich multimedia UI, the spoken-dialogue system is faster and requires less assistance.¹⁴ Design recommendations coming from this strand of research include providing graphical cues, voice-annotation support wherever possible, and local language support in text and audio; minimizing hierarchical structures and non-numeric text input; avoiding soft-key mappings and menus that require scrolling; and integrating human mediators throughout the system.¹⁵

From dumb to smartphones — improved interfaces

The rapid development of mobile technology from dumb phones to smartphones has necessitated a re-think of past design recommendations. For example, while some recommendations remain relevant—avoiding the use of hierarchical menu structures for mobile phones¹⁶ for example—others, such as avoiding the use of soft keys,¹⁷ are no longer as appropriate. This is due to the wide availability of touch screens where “soft keys” are now the norm. The design recommendations in this case need to focus more on avoiding the mixture of input modalities. This particular recommendation will probably need more

⁶ Saini, “Designing User-Friendly USSD Interface for Digital Financial Services.”

⁷ de Reynal and Richter, “Stepping into Digital Life.”

⁸ GSMA, “Choosing a Technical Model for A2A Interoperability: Lessons from Tanzania and Pakistan.”

⁹ CGAP, “Insights into Action: What Human Centered Design Means for Financial Inclusion,” 23.

¹⁰ Johnson, “Financial Exclusion in Kenya: An Analysis of Financial Service Use.”

¹¹ Ibid.

¹² Wyche, Simiyu, and Othieno, “Mobile Phones as Amplifiers of Social Inequality among Rural Kenyan Women,” 2.

¹³ Bankable Frontier Associates, “Emerging Risks to Consumer Protection in Branchless Banking: Key Findings from Colombia Case Study”; Zimmerman and Baur, “Understanding How Consumer Risks in Digital Social Payments Can Erode Their Financial Inclusion Potential.”

¹⁴ Medhi, Gautama, and Toyama, “A Comparison of Mobile Money-Transfer UIs for Non-Literate and Semi-Literate Users.”

¹⁵ Ibid.

¹⁶ Medhi, Gautama, and Toyama; CGAP, “Smartphones & Mobile Money.”

¹⁷ Medhi, Gautama, and Toyama, “A Comparison of Mobile Money-Transfer UIs for Non-Literate and Semi-Literate Users.”

fine-tuning given the growth of voice-driven systems. Generally, continual UX research will be required to keep design recommendations and principles abreast of the technological improvement of mobile phones, the primary tools for client-centric digital finance.

The growing use of smartphones and the increasing appreciation of design thinking as an approach to product development has spurred a new strand of research activities led largely by design consultancies such as IDEO and Grid. These agencies have partnered with banks and mobile money operators to design digital financial products that simplify use for the client while simultaneously encouraging the client to use more products (e.g., graduating from savings products to investment products). Chen et al. captured the most comprehensive and recent set of principles derived from such activities in their “Smartphones & Mobile Money: Principles for UI/UX Design (1.0).”¹⁸ These principles build on earlier ones from the first wave of research and recommend utilizing the graphical and computing power of the devices to enhance the user’s experience and minimize user-generated errors.¹⁹ There are strong notes of caution emphasizing the need for still simpler interfaces and education to onboard new users. An important emergent practice of note is the open sharing of design knowledge and experience relevant to DFS. This sharing of best practices and failures helps to improve the overall standard and usability of digital financial services applications.

New Functionalities — UX beyond interface

UX in digital finance has expanded beyond its traditional domain of the design of hardware and software interfaces to consider the whole context of engagement between the customer and the digital finance provider. Informed by disciplines such as “behavioral science” and “game/play,” providers have designed new products and services and customer engagement mechanisms to break down barriers to entry, increase customer loyalty, and “nudge” customers into desirable habits.²⁰ UX beyond interface takes many shapes and forms; below we discuss interactive SMS, chatbots, gamification, and the use of UX to mimic analog behaviors. It is important to note

that many of these are available on both feature and smartphones.

— Interactive SMS

The digital revolution has removed human interaction from many elements of our day-to-day lives. These interactions hold tremendous value for poor communities wherein social relationships are embedded in the fabric of everyday life. Digital channels provide promising opportunities to fill these gaps and rebuild relationships between customers and providers.²¹ Technology-to-person innovations are helping to build trust in the service, deliver relevant information, and help individuals manage their financial commitments.

Juntos Finanzas, an automated conversational platform, has run a number of interactive SMS projects with their clients. From driving merchant payments in Tanzania²² to interacting with agent banking clients in Colombia to motivating increased savings behavior,²³ Juntos has helped customers feel more confident about their financial lives and build stronger relationships with their providers.

A similar interactive SMS platform developed by Arifu has also helped drive positive financial behaviors among customers. The platform was used in a project targeting farmers in rural Tanzania in which financial literacy training was delivered, via SMS, to drive digital savings and borrowing behavior.²⁴ The impact of the six-month pilot was impressive. Farmers who accessed Arifu’s learning platform took out larger loan amounts and saved at higher rates than those farmers who did not use the platform.

— Gamification

Gamification involves the use of elements of game design in a non-game context in order to improve user experience, engagement, loyalty, and satisfaction.²⁵ Providers have used gamified applications to give clients a sense of progress, create habits through a “learning by doing culture,” address engagement gaps, and build a social dimension into these digital products.²⁶

Absa, a South African bank, employed the principles of gaming to encourage clients to learn how to use a balance-checking feature on their phones. Teaching this skill through a game enabled Absa to cut

¹⁸ CGAP, “Smartphones & Mobile Money.”

¹⁹ Ibid.

²⁰ Faz, “5 Sources of Untapped Innovation in Digital Finance.”

²¹ Ibid.; Duflos and Tyler, “Voice of the Customers: A Two-Way Dialogue in Digital Finance.”

²² Juntos Global, “The Tigo Pesa – Juntos Partnership: Increasing Merchant Payments through Engaging SMS Conversations.”

²³ Valenzuela, Holle, and Noor, “Juntos Finanzas – A Case Study.”

²⁴ Mazer, “Interactive SMS Drives Digital Savings and Borrowing in Tanzania.”

²⁵ Koning, “Let’s Gamify to Empower the Customer!”

²⁶ Ibid.

costs by reducing the high number of clients visiting branches at the end of each month to ensure they didn't overdraw their accounts.²⁷ Those who played the game increased their transaction volume by 29%, while those who didn't saw a 2% decline in the same period.²⁸

— Chatbots

The dynamics of social interactions and customer relationships are changing. As more daily practices (such as conducting a financial transaction) shift to digital, so do many of our daily interactions. Chatbots present an amazing opportunity to engage with customers across digital devices. As with interactive SMS, chatbots can be used as a platform to answer customer queries, serve as an interactive learning platform, and help customers navigate complex formal finance systems. Gartner predicts that by 2020, 85% of customer interactions will be managed without a human.²⁹ While innovation in the chatbots space seems slow within the context of the developing world, this prediction points to significant development in this space in the coming years. Notable African chatbots relating to financial services currently include Kudi.ai (Nigeria), ABSA ChatBanking (South Africa), Susu.ai (Nigeria), and Tuma Bot (Uganda).

Not so fast — the persistence of paper

Despite the convenience, transparency, and advantages that mobile phones and apps provide, paper, particularly paper receipts, are still important. Issues emerge around the intangibility of DFS where people are accustomed to physical money and physical evidence of transactions.³⁰ Research has shown the valuable role paper receipts continue to play, particularly in branchless banking models. Despite the availability of SMS-based notifications, some studies show that users perceive paper receipts as having more value as proof of a transaction.³¹ Studies examining the role of intermediaries in branchless banking have highlighted how some agents replicate the actions of stamping and producing paper receipts for their clients in order to appear credible and win the trust of their clients.³² The relevance of paper has led researchers and designers to explore designs for a hybrid digital/

paper context. In Mali and Senegal "My Agro," an agricultural retailer than sells farm inputs on layaway, has blended the digital and non-digital in their product design. The retailer allows farmers to gradually pay for farm inputs by purchasing scratch cards that function similar to airtime top-ups. While the scratch card has no use after the code is submitted, farmers keep the card as tangible proof that the electronic value has been sent to their layaway account.³³

Parikh et al.³⁴ and Ratan et al.³⁵ explored and designed systems aimed at maintaining the flexibility of paper while leveraging technology to capture and digitize the information on the paper as it is written. From this they generated important design recommendations on voice feedback for group settings and automated calculations. This also links in with the discussion in [Snapshot 2](#) on blending the digital with the non-digital.

²⁷ Gerhard, "How Absa Bank Empowered Its Customers through Games."

²⁸ Koning, "Customer Empowerment through Gamification Case Study: Absa's Shesha Games."

²⁹ GSMA, "Messaging as a Platform The Operator Opportunity."

³⁰ Chipchase, Lee, and Bill Maurer, "Mobile Money."

³¹ Panjwani et al., "The Paper Slip Should Be There!"

³² Ghosh, "Contextualizing Intermediated Use in the Developing World."

³³ Mattern and Tarazi, "Designing Digital Financial Services for Smallholder Families."

³⁴ Parikh et al., "Mobile Phones and Paper Documents."

³⁵ Ratan et al., "Managing Microfinance with Paper, Pen and Digital Slate."

Notable new learning

Human-centered design UX is becoming the “new normal” for digital finance implementers

Over the course of the last decade, academia and research arms of private institutions have led research in the challenges posed and opportunities afforded by the user experience of DFS applications. While the learning and design recommendations emanating from these works have contributed substantially to our understanding of the creation of usable and inclusive digital financial services, the relative adoption and application of these recommendations and principles in practice was low.

This is changing, however, and primarily as result of the increased participation of professional design firms during the last few years. The participatory, hands-on, and visually engaging approach of these firms have given digital finance implementers the opportunity to learn the methodologies and engage in the practice of UX design in the context of their daily work. This engagement has demystified the creative processes behind human-centered design (HCD) UX research and given the implementers a new way in which they can interact with and learn from their clients about clients' needs. As a result of bringing the methodologies and tools of UX to the activity center of digital finance implementers, the initial skepticism around the use of HCD UX to inform improvements, or the design, of new digital financial services is waning. The adoption of the principles and recommendations is increasing, in no small part because most of these findings are now the results of work done by the implementers themselves.³⁶

A prime example of this trend in adoption and the impact it is having is the experience of UNCDF MM4P's Regional Technical Specialist Nandini Harihareswara:

“I came to MM4P as a skeptic of human centered design (HCD)—this buzzword/acronym was all the rage as I left Washington DC from my former job. When I went to the workshops describing HCD work in financial inclusion, I came away feeling like the work done didn't really amount to much, and didn't really have a lasting impact on the people that we want to be more financially included.

Enter 17 Triggers to the stage—UNCDF-MM4P searched around the world for the best HCD firms they could find, and best-in-class they are. Working with them completely changed my mind about using Silicon Valley, iterative testing models.”³⁷

The sharing of design knowledge is increasing (and it's making a difference)

An important catalyst of the increasing adoption of HCD UX practices is the open sharing of design research findings, tools, and methodologies in digestible formats. The findings of the initial wave of UX focused DFS research was captured primarily in academic papers, and dissemination channels were limited to a few journal publications and conferences. This limited the exposure of DFS implementers to this knowledge, and, in cases where they had access, they found it difficult to translate and apply the findings to their work context.

The introduction of free design toolkits like IDEO's Design Kit (<http://www.designkit.org/>) has democratized access to design knowledge and practice.

Coupled with the documentation and sharing of the implementers' own experiences on blogs and other media, other implementers are quickly improving their ability to apply UX in designing usable and inclusive digital financial services. Recently, a collaboration between CGAP and its partners at Wave Money (Microsoft Research, GRID Impact, Karandaaz Pakistan, Small Surfaces, IDEO.org) yielded one of the most comprehensive guides to the UX principles for DFS—"Smartphones & Mobile Money: Principles for UI/UX Design (1.0)."³⁸ The open sharing and digestible presentation of these principles enables implementers to create a digital finance smartphone application and avoid the common pitfalls that hamper the user's experience.

Open access to new UX principles and methodologies from both academia and practitioners is important to the continual adoption and application of these principles by DFS implementers. *Microsave* and My Oral Village have also released a paper detailing how to design a mobile wallet for "the oral segment" (illiterate and partially literate people) by sharing some qualitative resources on how this segment interprets certain signs, memorizes symbols, counts money, etc.³⁹

³⁸ CGAP, "Smartphones & Mobile Money."

³⁹ Valechha et al., "Digital Wallet Adoption for the Oral Segment in India: Concept Development for MOWO (Mobile Wallet for Oral)."

Implications

Responsible and ethical design needs to become a focus

Another important area of UX research, which previously received little attention, is the trade-off between a user's experience and the security of their data and identity. The more secure authentications and schemes tend to be less user friendly and can be a barrier to user adoption. The easier to use schemes are more susceptible to malicious attacks.

There is a critical tension between sharing information across digital finance platforms and privacy. Low-income users often lack the financial or technical know-how to understand how their data is shared and what consumer risks are associated with this data sharing.⁴⁰ Responsible design recognizes that designers are responsible for the choices they make in the design process. The ethical or responsible design process should focus on building products and services people trust to appropriately protect their privacy.

The research consultancy 'IF' highlights a number of responsible design themes that have emerged through their work on "*helping teams build services people trust*".⁴¹ These include "how a service uses data should be clear to users," "blanket transparency is less useful than transparency in context," and "being able to verify what a service does is very useful." As UX across DFS platforms becomes more sophisticated, and digital channels more complex, building trust should become a design problem, rather than the abstract quality of a brand. Ind.ie has created an ethical design manifesto that highlights design requirements in terms of human rights, human effort, and human experience.⁴² A similar approach from the digital finance community will help build not only trust in these services but also confidence and sustained use.

UX research needs to keep abreast of technology, while remaining aware of the persistence of USSD

The next wave of DFS innovation is likely to come from over-the-top (OTT) organizations, such as Facebook, Google, Alipay, and Tencent. These providers are delivering, or plan to deliver, financial services using the internet data supplied by MNOS. As smartphones and internet access become more readily available, so does the prospect of offering OTT services.⁴³ Rapid innovation in mobile phone technology presents more and more ways for users to interact with digital finance applications. However, we need a more nuanced understanding of how these new modes of interaction can be successfully applied. Specifically, we need to review and update existing design recommendations in light of prevailing technology and interaction patterns to ensure that UX continues to contribute positively to the goal of meaningful financial inclusion. However, while we should remain forward looking, we must always keep the end user in mind and seek to understand their persistent use of USSD as a mode of engagement even when more sophisticated offerings are available.

Conclusion

Advances in user experience, from simplified interfaces to the introduction of new digital tools to drive increased engagement, are improving customer experience, better meeting user needs, and ultimately driving more meaningful use of DFS. In a bid to answer some of these UX issues, the digital finance community

40 de Reynal and Richter, "Stepping into Digital Life."

41 Sheret, "Designing for Trust."

42 Ind.ie, "Ethical Design."

43 Mondato, "Mobile Money: OTT and Fintech at the Gates."

has looked to more sophisticated digital modes of engagement (such as smartphones, apps, and the Internet), and the various digital attributes available over them. However, in many markets USSD remains a popular technology channel. This is often due to issues of affordability, familiarity, and the dynamics of inclusion and exclusion at play when complex technology interacts with low literacy, tech-fearing individuals. As we shift to more digital modes of engagement, it is important that the conversation around UX keeps abreast of these technological developments while bearing in mind the persistent staying power of less high tech channels. The use of digital attributes and a focus on human-centered product design will help us understand the client better and ensure that advances in UX are aligned with our ultimate goal of meaningful financial inclusion.

10 Must Reads in this space

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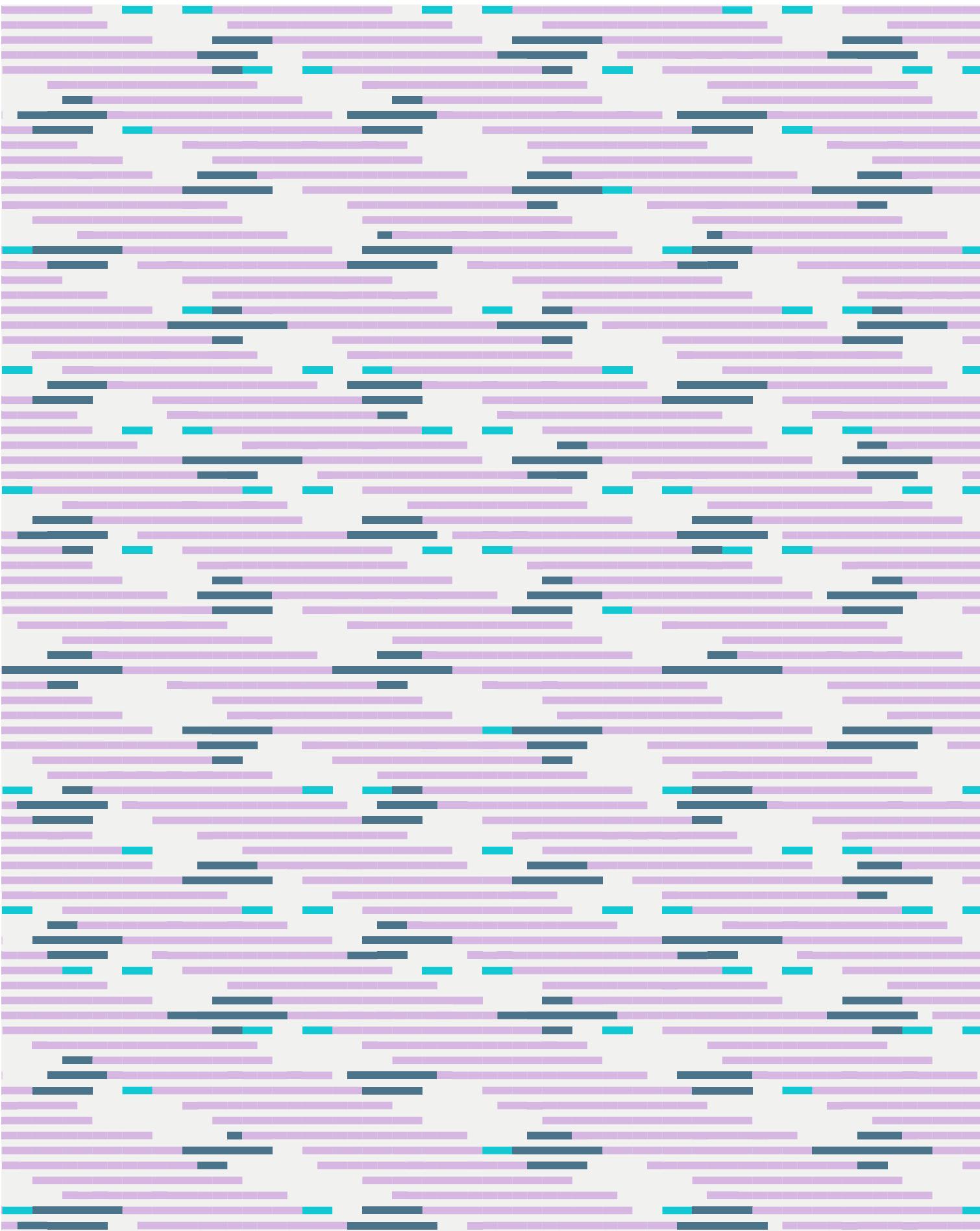
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