

Operator groups line up behind Bango

For many years, Mobile Network Operators (MNOs) have tried to use two advantages to earn revenue from digital content sales: massive consumer reach and a trusted billing relationship with each individual user. Now the growth of the global app store economy offers a new opportunity for MNOs to exert their strengths, and many are turning to Bango in the race to deploy Direct Operator Billing (DOB).

With more than 130 MNO integrations in place, more of the world's operators are leveraging the Bango Platform to deliver operator billing at scale. In some markets – for example Canada – all Google Play and BlackBerry operator billed app sales are processed through the Bango Platform. Recently Middle-Eastern giant Etisalat, needing to accelerate the pace of operator billing deployment, entered into a group-wide partnership with Bango. As a direct consequence Etisalat became the first MNO to offer operator billing for Google Play users in the Middle East region, and has quickly followed this with the launch of DOB for Samsung Galaxy Apps through Bango.

What is driving this strategic move by operators to the Bango Platform? An MNO integration into the Bango Payment Platform is “one to many”. That is, instead of demanding the time and resource to build connections into each individual app store, MNOs can plug into Bango once and are automatically connected to the big app store ecosystems. The platform delivers significant technical advantages which enable

phone users to be automatically identified and billed in a single click. In addition, Bango's market hardened platform – the result of more than 500 engineer years – provides certainty of connection quality and service reliability. MNOs connected to the platform are accessing this investment in human and infrastructure resources, which delivers continuous availability of operator billing required by app stores.

Operators do not need to make an expensive and extensive investment in developing a centralized billing “hub”. Instead, the Bango Platform goes directly to local billing systems to unify billing integration for app stores and digital merchants. For app stores these direct, local connections deliver a critical performance improvement from operator billed payments.

Bango's partnerships with Etisalat and others are further evidence of how MNOs and MNO groups are supporting the Bango Platform as “the gold standard” for enabling operator billing in app stores. These partnerships go beyond a normal business to business relationship: App store and MNO partners are endorsing Bango's platform approach, entrusting a specialist third party to deliver frictionless payment at massive scale.

With a reach that exceeds 1 billion consumers, and increasing momentum as more MNOs and app stores are integrated into the platform, Bango and its partners are uniquely placed to drive the app store economy forward.



CEO message

Ray Anderson, CEO and Founder

In the year to June 2014, app stores sold \$18BN worth of games, music, movies, books and a vast range of other applications. Sales for 2014 will grow to exceed \$23BN, and there are strong signs that this pace of growth will continue over the next 5 years.

The speed that consumers are moving to smartphones is a key factor fueling this growth in digital content consumption. But analysts point out that it is the extreme ease of purchase that has also changed the whole value proposition for digital content. Click to buy is now an easy option.

I am delighted that Bango is enabling this revolution in purchasing behavior. We are liberating the power and penetration of operator billing for leading app stores.

Mobile operators tell me they see great value in supporting Bango as the global platform that will make operator billed payments as easy for app stores to offer to their customers as credit card payments. More operators are now demonstrating their support for a global standard by announcing that they will use the Bango Platform for every app store. Our app store partners chose the Bango Platform because it makes the fragmented and complex world of operator billing simple to deliver on a global scale. They also love the sophisticated technology in the Bango Platform that uniquely boosts the probability of a successful payment compared with traditional direct-connect route of operator specific hubs.

From the birth of operator billing more than ten years ago, Bango has continuously evolved the Bango Platform to provide this vital capability. We will continue to deliver this “quality at scale” and innovate to improve the payment experience to support the extraordinary growth in app store sales.

App stores partner with Bango



The Bango Payment Platform gives app stores the full potential of Direct Operator Billing. When an app store integrates with the Bango Platform, it is connected to a powerful “payment processor” system for operator billed payments. With over 130 direct billing integrations live around the world, Bango makes operator billing a core feature for app stores.

The Bango Payment Platform gives you control over all your operator billing routes. The performance is optimized through distributed, local systems to deliver the highest quality user experience, and conversion rate success.

Unique Bango technology authenticates users for one-click operator payment, even when not connected over operator data networks. As mobile operators continue to off load data to Wi-Fi networks, this vital advantage ensures that operator-billed payments can still grow.

The same platform constantly monitors all direct billing integrations, ensuring that operators can meet their SLA obligations to app store partners. Bango provides settlement processes that handle multiple currencies, taxation requirements and order-to-cash reporting.

These capabilities explain why Bango has been chosen to provide operator billing by the leading global app stores including Google Play, Amazon, BlackBerry World, Facebook, Firefox Marketplace and Windows Phone Store.

Bango technology ensures that operator billing gives app store users the same payment experience they are familiar with for card payments, and delivers this performance at a scale that is many times bigger than card payments.

Bango advantages for app stores:

- One simple integration gives app stores over 130 mobile operators immediately
- Bango technology does the hard work, greatly reducing time to market
- 24/7 platform operations center pro-actively monitors all billing integrations
- Unique ability to authenticate users so more can be billed, even on Wi-Fi connections
- Real-time purchasing insights from every operator connections with Bango Dashboard



Driving deeper operator integrations

Dramatically improve time-to-market and quality

Every operator has their own billing platform, with its own selection of distributed systems, networking and Application Programming Interfaces (APIs). They all have their own security policies and range of capabilities. In most cases these payment systems are bespoke home grown platforms, but where industry standard products are used, they are typically heavily customized to meet specific operator requirements. In some cases an operator will have more than one billing platform, either at the local or group level. All this means that most of the work required to integrate with a new operator will be brand new.

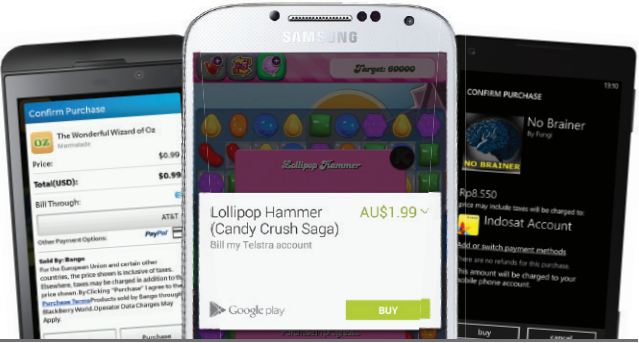
The deep and varied operator integration experience that Bango has gained over the last fourteen years has allowed us to create a unique Billing Integration Template (BIT) solution. This technology allows Bango to quickly select the correct BITs required for each operator billing system, completing over 80% of the work before any customization is required. This dramatically improves time to market and quality, while at the same time lowering risk and cost.

To guarantee fast performance, high reliability and support for full app store capabilities requires deep, complex integrations with the operators most trusted and privileged APIs. These APIs

give direct access to subscribers authentication details and finance systems, so permission is naturally only provided to a very select few, under very controlled circumstances.

Bango has partnerships with all of the leading app stores that offer operator billing today, many of these are exclusive. This has ensured the deepest, most advanced integrations with operators secure APIs and systems.

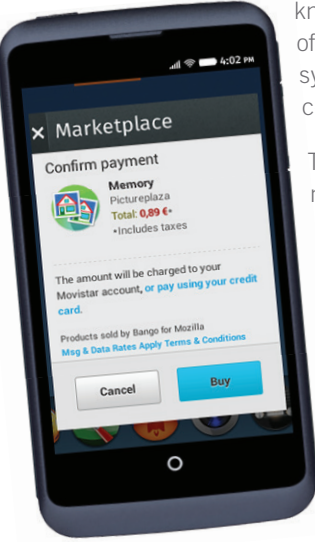
Nobody else has so many major app store partners, processing so many live transactions with so many operators around the world. Only Bango can ensure such quality, performance and reliability, allowing you to deliver the payment experience your app store customers expect and demand.



Bango and Mozilla

Mozilla launched their Firefox OS and Firefox Marketplace in mid-2013. This new content ecosystem for “the next billion” smartphone users was the first to ‘bake in’ Direct Operator Billing from day one. Mozilla chose Bango as their payment partner. Bango manages the entire payment process, from the initial payment interface through to developer out payment.

Bango’s involvement in the Firefox OS consumer journey begins when the consumer taps ‘buy’. This opens a Bango-hosted payment flow within a trusted execution environment window, known as ‘Trusted UI’. This Trusted UI offers silo’d cookie storage, elevated system permissions, and access to certain OS-level APIs.



The payment flow was designed to match the Marketplace’s UI (known as ‘Gaia’), and while a single line reveals Bango as the merchant of record, there is no overt Bango branding. The result is an HTML5 based payment flow that feels ‘native’.

Users are authenticated either automatically, using operator-enriched HTTP headers, or via two-factor SMS authentication.

Where possible, Bango will use APIs offered by the Trusted UI to make this process as simple as possible, for example, using the SMS API to offer ‘silent’ SMS authentication.

With each transaction, Mozilla passes Bango a hash of the user’s Persona ID (Mozilla’s authentication system). Bango stores this persona ID alongside the user’s Bango User ID, generated during the first-time authentication, and allows Bango to make all subsequent payments, regardless of platform, in one-click – delivering on the DOB promise of frictionless payment.

The default payment method in Firefox marketplace is Direct Operator Billing, where available, though consumers can choose credit card if they prefer. Mozilla has targeted their new devices and store at emerging markets, with 15 live markets in summer 2014. Early Direct Operator Billing markets to go live include several across Latin America. Some markets, including Venezuela and Brazil have initially launched with credit card payment, in anticipation of future DOB capability.

“Bango [enables] Firefox Marketplace to provide flexible monetization for developers and simple payment options for users, with tailored support as Firefox OS devices reach new markets around the globe.”

- Rick Fant, Vice President, Apps and Marketplace for Mozilla

From the app developer’s perspective, the on-boarding process couldn’t be simpler. Bango exposes a custom web service to Mozilla, so that app configuration, submitting out-payment details, etc. within the Bango system is completely transparent. Bango also offers a hosted, customized, version of its reporting tools to Mozilla for use by their developers. This tool allows developers to access a range of payment analytic reports, and to view generated Self Billing Invoices (SBIs) to track the progress of their app. Payment is triggered at month end, provided the minimum \$50 threshold has been met.

DOB is the natural choice for an app store designed for developing world markets, where credit card penetration tends to be low. For Mozilla, a partnership with Bango is the natural choice: No other payment provider is partnered with a range of the world’s largest app stores. No other payment provider can boast more than 130 existing DOB integrations worldwide.

Direct Operator Billing 101: What’s it all about....?

What is DOB?

Direct Operator Billing (also known as Direct Carrier Billing or DCB, Mobile Operator Billing or MCB, Mobile Operator Billing or MOB) directly charges the consumer’s post-pay mobile phone bill or deducts funds from their pre-pay account, without the need to register personal details. This leads to a significant uplift in sales. A major app store in Europe, a region with traditionally high credit card use, recently revealed a 3x sales uplift immediately after turning on Bango Direct Operator Billing.

How does DOB work?

It uses programmatic interfaces directly into the mobile network operator’s billing platform, which requires additional security, management, reporting and third party settlement services. These capabilities have been developed by many MNOs and additionally supplied by specialist billing platform providers such as Intel and IBM. These DOB systems were initially used for the MNOs own content services (portals) but were made available to third party payment platforms, notably Bango, from as early as 2001. Today, nearly 180 network operators provide this sophisticated 3rd party billing and the realization that the unique coverage and simplicity of DOB is a powerful revenue generator is causing many more operators to upgrade their systems.

Operator billing systems currently collect payments worth over a trillion dollars (\$1,000 billion) per year for voice, text and data services globally.

Why DOB is better than the alternatives?

The first attempt to open-up this billing opportunity used SMS messaging. This is an indirect method of payment, which charges the consumer a fee above the standard SMS rate to send, or receive, a text message. A share of this additional fee is then paid to the third party providing the content or service. This approach is relatively simple to implement using the existing systems that process the fees paid to send messages to or from other operators or countries.

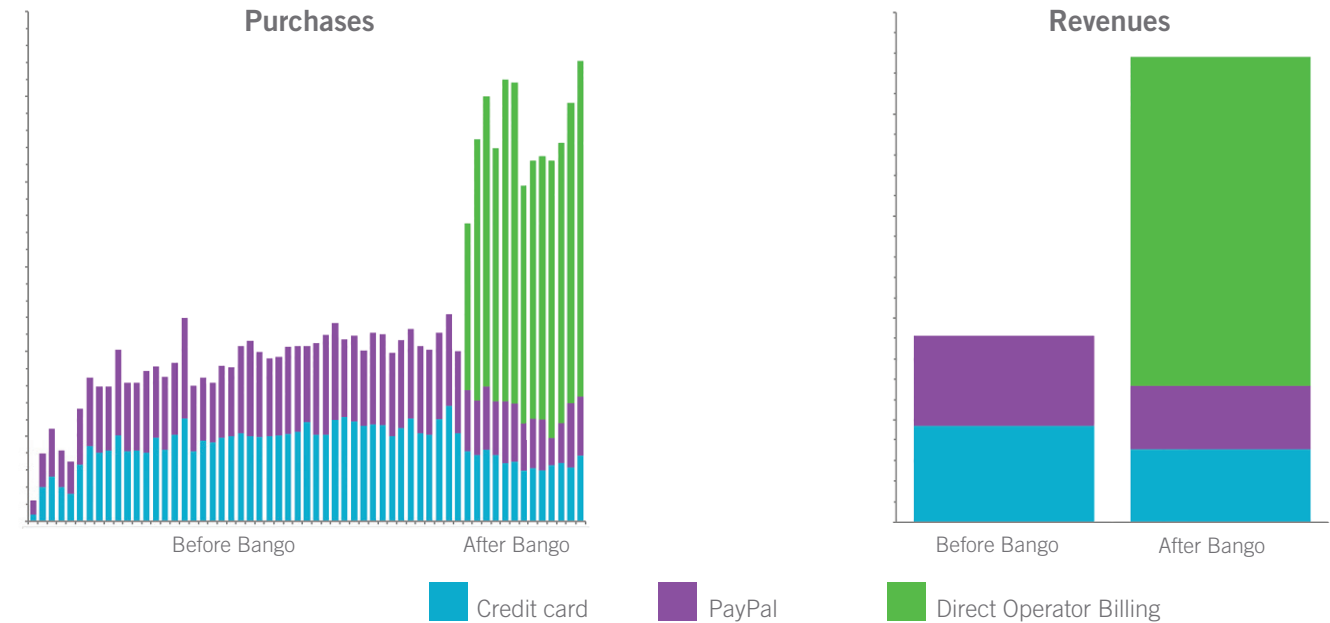
The limitations of this Premium SMS approach means that it has been susceptible to overcharging and undercharging consumers, few price points are available and tax may be incorrectly treated on payments through SMS. Consequently indirect SMS charging has been regulated into a stranglehold in many markets and last year the USA operators withdrew SMS completely for third party content purchases.

Who uses DOB?

Every mobile subscriber who has a billing agreement in place with an operator. They pay for operator services either through a monthly contract arrangement (post-pay, like a credit card) or by top-up to an account (pre-pay like a debit card). The existence of billions of these account relationships across every country offers an efficient and attractive payment channel for billing additional, third party products and services. In countries where online card payments show a low uptake, DOB is essential to generate the levels of paid app downloads developers expect.

Operator billing capitalizes on the trillion dollar billing flow already managed by operators across 6 billion end users, and with increasing sophistication has become an essential technology to grow digital content monetization. The chart on the left shows just how much difference DOB makes to app stores sales.

Daily payments for an app store in Europe - before and after adding Bango Direct Operator Billing



Inside an operator's billing system

Despite there being several common types of payment platforms in use today, it is almost impossible to find any two operator billing APIs that are exactly the same.

When dealing with just one or two individual operators, this may not appear to be a huge problem. The magnitude of the task becomes apparent when you roll out your app store on a global scale. Just by requiring each operator to implement your own API, it soon adds up to a lot of bespoke development work. Where operator time and resources are limited, this can be a huge problem leading to launch delays and failed projects.

In an ideal world you would only integrate your app store once, then this single integration could be replicated over and over again across all operators that you are interested in. Effectively 'flicking a switch' to connect each operator on your target list.

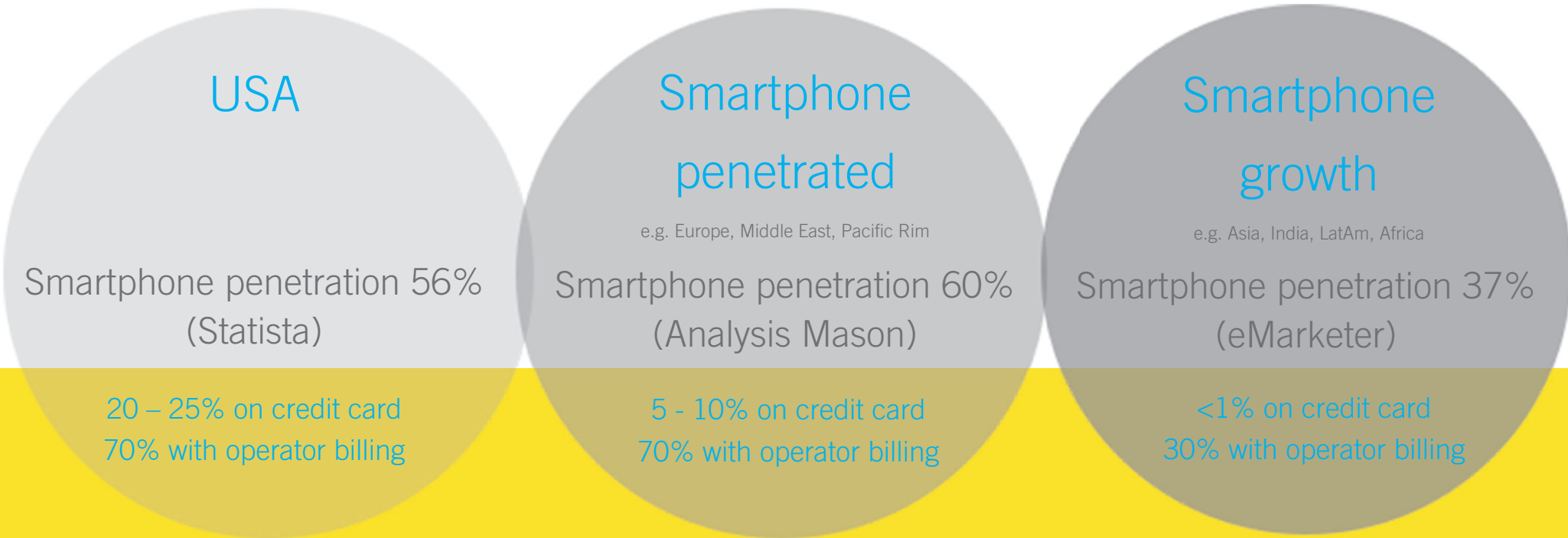
The Bango Platform gets you close to this ideal world, acting as a single "enablement layer" between your store and hundreds of mobile operator billing systems. By integrating once with Bango you do not have to be concerned with individual operator connections. You only have to focus on one integration with Bango, through our existing payment APIs, or by using a hosted version of your own unique API on our servers. If the operators update or change their APIs this is not a problem for you, Bango handles the changes on your behalf. Even if your app store has requirements that do not fit neatly with existing operator capabilities (e.g. 2 step charging and refunds), Bango has created several adaption models that can be used to bridge the gap.

When integrating your app store with an operators payment platforms, as a minimum, 6 key areas need to be addressed. (See integration checklist on the right).

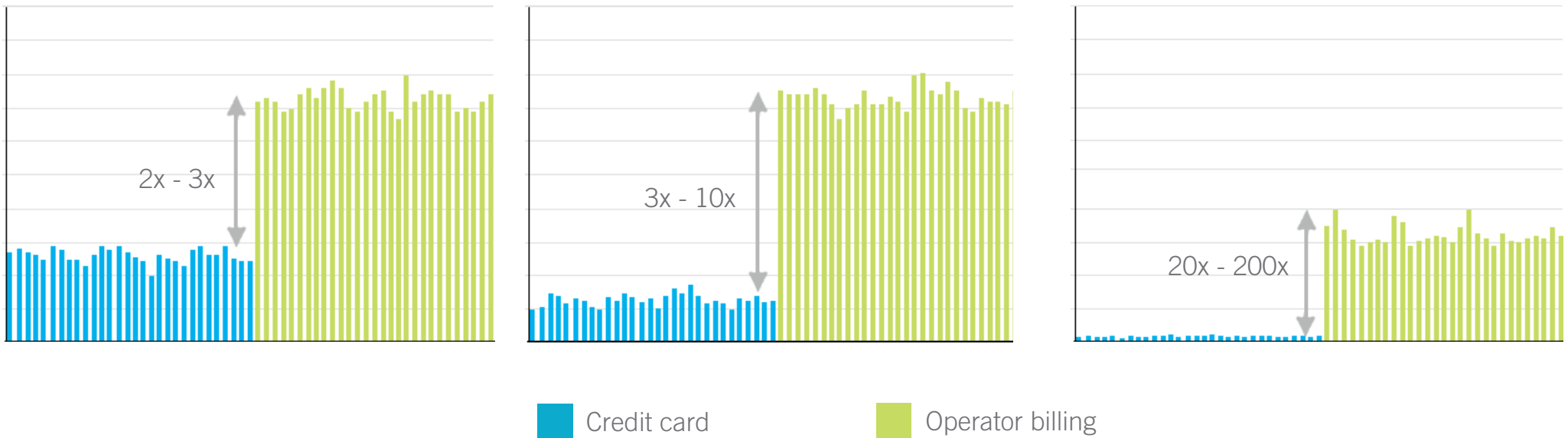
Operator billing integration checklist

- ☐ **User Identification**
Does the operator identify their users based on their mobile number (MSISDN), or is a proprietary identity or "billing token" used? How is this identity shared for billing purposes?
- ☐ **API technology**
Most operators expose some form of payment API that can be called in a "server to server" method/interface by a 3rd party. Is this API open or has it been written for a particular app store interface e.g. DCB3?
- ☐ **Pricing**
The operator may support fully flexible (continuous) pricing or charging may be based on a number of fixed pricepoints/service IDs. Is this going to be compatible with your app store pricing requirements?
- ☐ **SLA**
You will have Service Level requirements, how does the operator monitor and manage compliance? What kind of SLA reporting can the operator provide?
- ☐ **Error codes**
No two payment platforms use the same set of error/status codes. You must be able to correctly interpret these codes so that the user is presented with a meaningful response to each payment request.
- ☐ **Reporting and settlement**
Settlement processes vary considerably from one operator to the next. Mapping the data to fit your reporting requirements can be a significant effort.

Mobile markets and conversion rates



Conversion rates



Bango Dashboard for app stores

Bango Dashboard is designed to help both app stores and mobile operators maximize sales and revenues, to support developer success and grow customer engagement. Bango Dashboard makes it easy to spot the latest apps and content as their sales start to rise, allowing you to quickly promote them to accelerate revenue growth. Equally, knowing when an app's sales have peaked allows you to extend sales with new promotions or move your focus and budgets to the next rising star.

Bango makes it easy to review and minimize payment failures, recommend price points that deliver higher success and understand refunds, including the apps getting refunded most.

For example, a high number of payment failures may be attributed to a popular application with in-app content priced above average. Bango Dashboard makes it simple to discover that the majority of customers are failing because spending limits are being too easily exceeded. A simple adjustment on

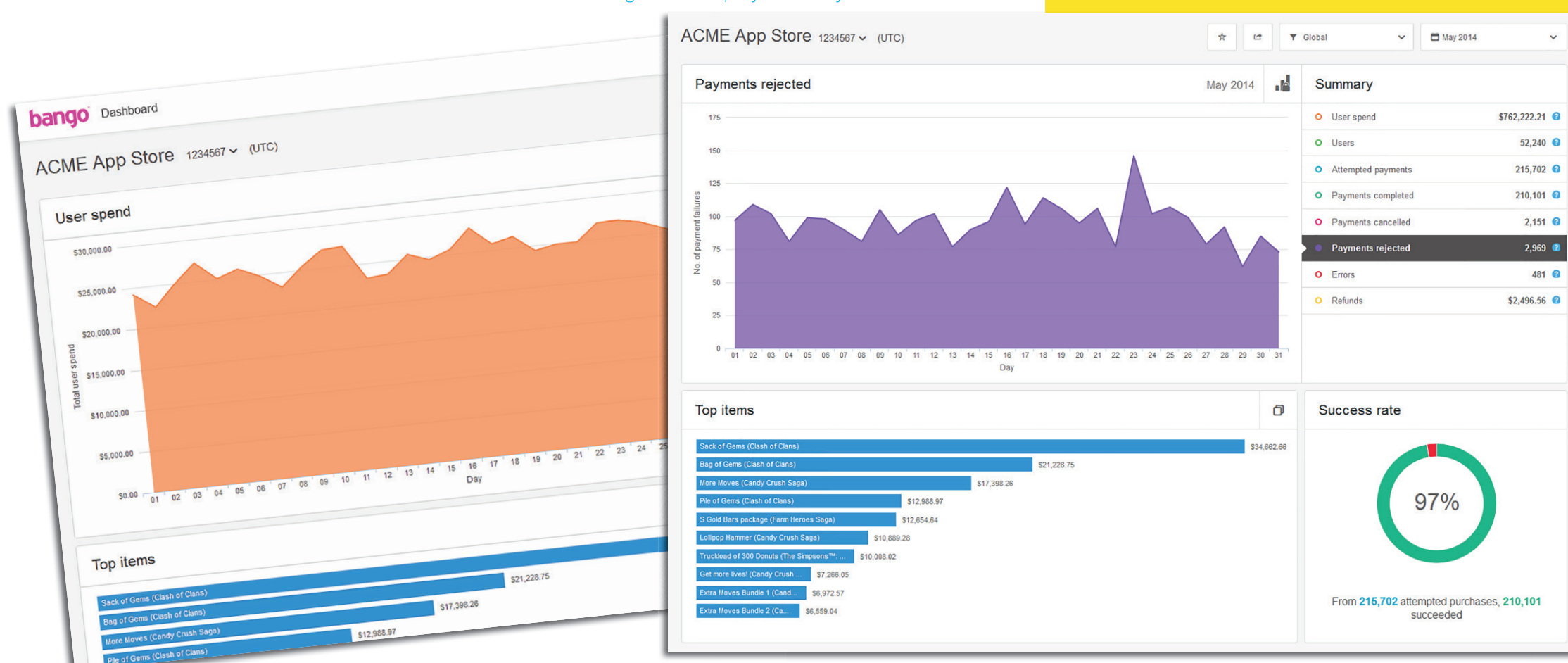
the spend limits would resolve the issue and significantly reduce customer care costs. Alternatively, the application and content can be identified providing details to the developer allowing them to adjust their price and boost sales.

By using simple Bango technology it is also possible to record and analyze each step in the customer experience, the products they select and the choices they make. This can optionally be linked to marketing to better understand campaign success related to customer spend. This is automatic with Bango hosted payment experiences.

Only Bango unifies data across your operator billing partners to deliver a consistent, independent view, making it easy to directly contrast and compare customer trends and engagement in multiple countries. It allows you to work closely with the developers and operators that drive revenues and efficiently spend on marketing and promotion. Using our optional data import APIs it is also easy to include data from other payment systems, including credit cards, PayPal and beyond.

With Bango Dashboard you can:

- Review the top developers, their highest or fastest selling apps and in-app payments, by operator and country
- Compare peak sales by hour in the day, or day of the week, and across multiple weeks or months
- Quickly see how many customers you have, how much they are spending, the products they are buying and the breakdown of payments started, completed or failed
- See detail about payment failures – including cancellations, errors and rejections; such as spend limits being reached, customers with insufficient funds on their pre-paid account or blocked accounts



Beware of BOB! Mobile payments in disguise

Not all mobile payment providers are the same. Don't fall victim.

In this white paper Bango shines a light on Bogus Operator Billing. The dubious mobile payment approach that lurks behind the reassuring language of some "Direct" Operator Billing.

Here's what you'll learn from this white paper:

- What's Bogus about BOB
- Features and benefits of genuine mobile payment methods
- How to avoid falling victim to BOB
- Key questions to ask payment providers

Bango has developed five key questions which go straight to the heart of the matter. These questions should be used by operators and digital merchants alike in order to interrogate mobile payment providers, and to understand the technology and techniques behind the headline claims.

Download your free copy from bango.com/whitepaper



About Bango

In the era of mobile technology, collecting payments has emerged as a central and complex challenge. Bango powers payment and analytics on the mobile web, providing users with a massively smooth payment experience.

Bango's pervasive presence across the web creates a platform effect for partners, identifying hundreds of millions of users and maximizing the number of one-click payments. Global leaders plugging into Bango include Amazon, BlackBerry World, Facebook, Firefox Marketplace, Google Play, Windows Phone Store and major mobile brands.

Contact us

To discuss how you can boost your revenues by integrating with the Bango Payment Platform contact:

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