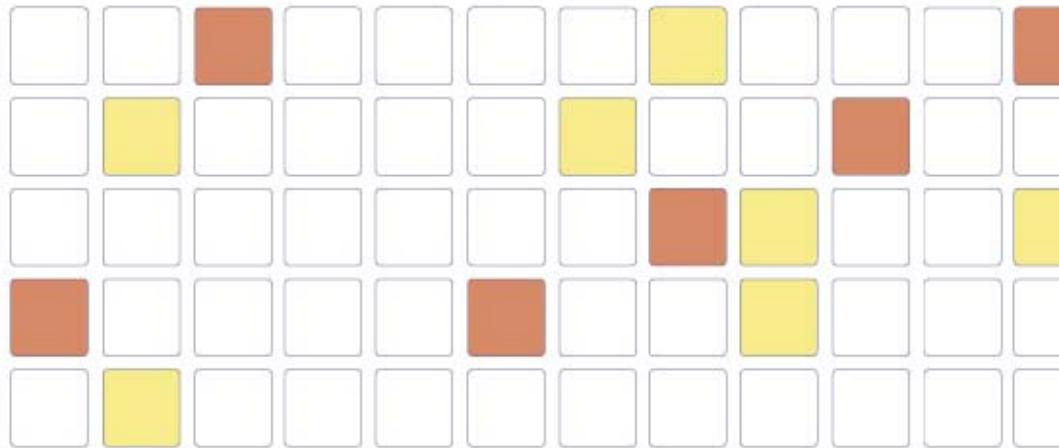




**Mobile Content  
Revenue Leakage:**  
*There's a Hole in the  
Bucket*

**White Paper**  
September 2005



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## Executive Summary

Revenue leakage has been a problem for the wireless industry ever since the early days of voice services when subscribers began roaming into other networks. As the issue of cloning fraud grew, mobile operators implemented revenue assurance solutions to minimize their losses.

As mobile content and media revenues grow there are many parallels to the early wireless voice revenue leakage situation, *iGillott*Research believes that the issues with mobile content and media are more challenging because:

- There are significantly more subscribers using mobile content and media services;
- The mobile content value chain involves multiple players;
- Content and media are requested and downloaded in near real-time;
- Mobile operators' business processes are significantly more complex today than they were 15 or 20 years ago.

Mobile content and media revenue leakage is primarily due to the lack of:

- Business rules enforcement
- Transparency throughout the value chain.

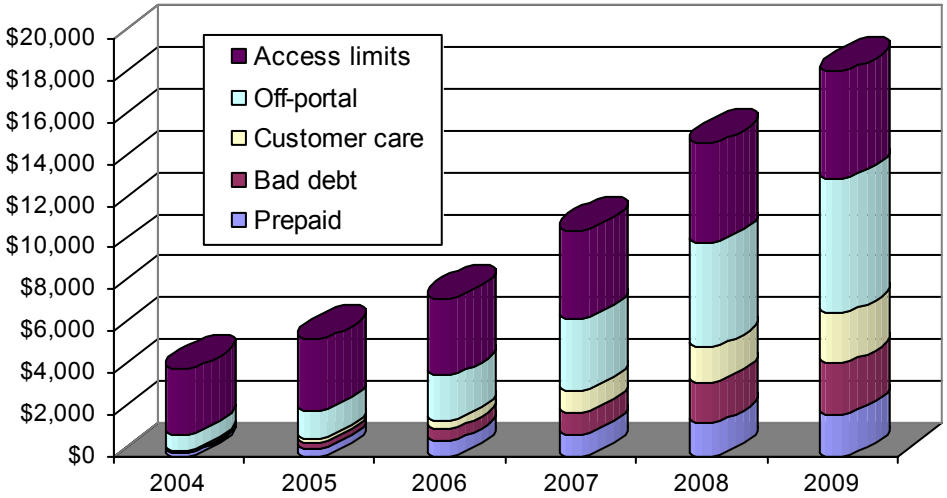
As a result, revenue leakage occurs at several points:

- 1) **Prepaid**, where the prepaid subscriber is able to purchase content greater in value than the available balance in their account.
- 2) **Bad debt**, where the content provider or distributor is paid for content that is subsequently written off on delinquent accounts.
- 3) **Customer care**, where revenue leakage from refunds might exceed the value of the content; also, increased customer care costs for a faulty piece of content or media might also have a negative impact on earnings
- 4) **Off-portal**, where the dollar value of poorly delivered content is then refunded to the subscriber, in addition to cramming charges borne by the mobile operator, and premium SMS fraud.
- 5) **Access limits** not enforced by the mobile operator result in significant lost revenue.

### The Size of the Problem

*iGillott*Research believes the revenue leakage in the mobile content and media business is significant. In our model, revenue leakage equals 18.8 percent of mobile media and content revenue in 2004. By 2009, this percentage rises to 22.9 percent, accounting for nearly \$18.5 billion in lost revenue (Figure 1). In 2004, leakage due to lack of enforcement of access limits accounted for 75 percent of the lost revenue, followed by off-portal content with 18 percent.

**Figure 1: Worldwide Mobile Content and Media Revenue Leakage by Type, 2004 - 2009**



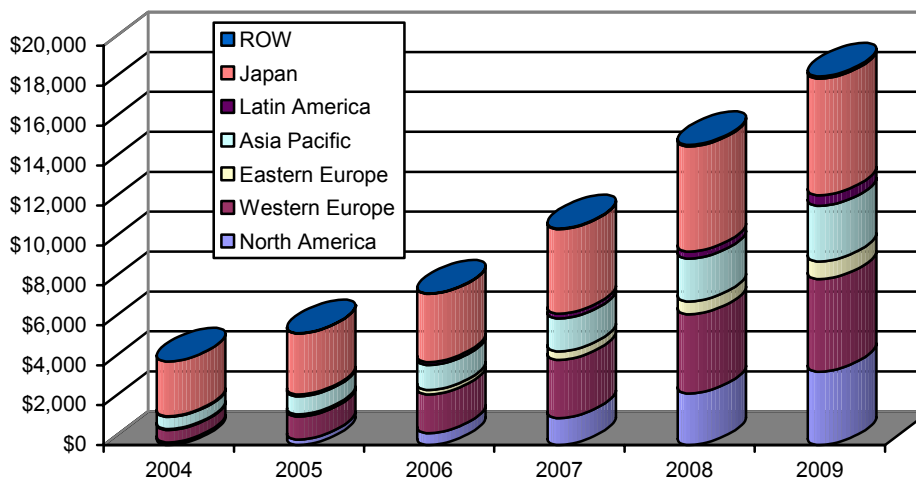
Source: iGillottResearch, 2005

Looking forward to 2009, customer care related revenue leakage shows the highest growth, while the largest dollar loss is again due to non-enforcement of access limits.

Since Japan has the largest mobile content and media business in the world, it follows that it has also experienced the largest leakage in 2004 (Figure 2). While the same is true in 2009, the revenue leakage in other regions is far more significant, especially in North America, Western Europe and Asia Pacific.

To put these figures in perspective, the worldwide revenue leakage due to mobile content and media in 2004 was equivalent to the annual revenues generated by 8.7 million U.S. subscribers.

**Figure 2: Worldwide Mobile Content and Media Revenue Leakage by Region, 2004 - 2009**



Source: *iGillottResearch*, 2005

## Revenue Assurance Solutions

The good news is that solutions to address the majority of the revenue leakage occurring today in the mobile content and media industry currently exist. Implemented quickly, these solutions will address the revenue leakage over the long term and potentially save the wireless industry billions in lost revenue. Obviously, some revenue leakage issues can be addressed more easily than others, while others will require a fundamental shift in the way the mobile operators approach the content and media business.

Based on the analysis in this white paper, *iGillottResearch* believes that revenue leakage can be reduced in the following areas:

- **Prepaid:** All of this revenue leakage is addressed by enforcement of real time business rules, authorizing the transaction (performing a balance check and possibly other content control checks) in advance of delivery.
- **Bad debt:** This issue can be entirely addressed by implementing a mechanism to completely reverse transactions on bad debt accounts and reflect customer refunds against the settlement process.
- **Customer care** revenue leakage is in large part addressed by tracking and maintaining a history of each transaction, and by the customer care representative having full visibility into historical transaction status information. Increased customer care costs associated with poorly designed or distributed content are harder to enforce since a change in the legal contract between the mobile operator and the content provider is required. However, tracking and maintaining a history of each transaction would enable the mobile operator to enforce chargebacks for customer care. In addition, transaction-level visibility provides the ability to offer self-care,

whereby the subscriber can view and challenge charges for individual purchases, hence saving the cost of a customer care call.

- **Off-portal** revenue leakage can be addressed in large part by pre-authorizing transactions before delivery occurs, such that the transaction is checked against a credit limit (either pre-paid and post-paid) and also against any rules determining appropriate content for that user. Premium SMS fraud can be addressed by authentication and visibility throughout the entire value chain.
- **Access limits** not enforced by the mobile operator result in significant lost revenue. The simple answer is for the mobile operator to enforce these limits – in this case, 100 percent of revenue leakage can be addressed. The situation with each mobile operator will be different – some will choose to do so while others will prefer to take no action and simply not recognize this category of revenue leakage.

## Defining Revenue Assurance

The basic aim of revenue assurance is to reduce the amount of revenue leakage. In any complex business process, there is the opportunity at each stage for monies to "leak" due to a variety of factors. Note that revenue leakage is not necessarily due to fraud or illegal activities, but can occur for innocent reasons. For example, a company may issue an invoice to a vendor with payment terms of 30 days, after which one percent interest per month is applied to the account by the company's accounting system. However, the vendor may separately negotiate payment terms of 60 days for that particular invoice with their company contact. If the company fails to update their accounting system to reflect the change, then one percent of the invoice amount will have been "lost."

Revenue leakage first became a problem for the wireless industry when the voice market started its rapid expansion:

- Fraud became a problem when handsets could be cloned. By copying a valid handset identity, fraudulent users were able to use the mobile operators' networks almost without limit.
- Increased roaming traffic led to significant increases in revenues and complexity, which required more advanced billing and rating systems, as well as intercarrier settlement, to correctly account for roaming tariffs.
- When a call was dropped, subscribers would call and complain. The customer care representative would in many cases issue a credit to the account which would exceed the actual cost of the call.

All of these issues were addressed as the wireless market evolved. As the revenues grew, so did the losses until they reached a level significant enough for the mobile operators to take action. Up until that time, revenue leakage had been seen as more of an annoyance than a serious business problem.

Voice revenue leakage was addressed in three main ways:

- Increased visibility throughout the entire business process, from subscriber acquisition and handset activation to customer care, billing and rating.
- Intercarrier settlement to correctly account for roaming revenues.
- Business rules enforcement, including the deployment of fraud detection and prevention systems.

## Mobile Content and Media Revenue Leakage

As mobile content and media revenues grow, *iGillottResearch* believes the associated revenue leakage is also increasing. There are many parallels to the early wireless voice situation but in many ways the issues with mobile content and media are more challenging because:

- There are significantly more subscribers using mobile content and media services than were using wireless voice services fifteen years ago.

- The mobile content and media ecosystem involves multiple players. Revenue loss can occur as transactions traverse the interfaces between players.
- Content and media are requested, downloaded and accessed in near real-time, whereas voice services were historically rated and billed in batch processes at the end of the month.
- The mobile operators' business processes in general are far more complex, oftentimes with multiple billing, rating, customer care, point-of-sale and network support systems.

Mobile content and media revenue leakage is primarily due to two main problems:

- Lack of business rules enforcement.
- Lack of transparency throughout the value chain.

### **Lack of business rules enforcement**

As with any service or product, mobile content and media are provided to the subscriber with rules as to how they will be used and how the mobile operator will account for the content. If these rules are not enforced, revenue leakage occurs. There are several ways in which this occurs, each of which is outlined in the following examples.

- **Access limits** – a large amount of mobile content is provided with access limits, usually on the number of times the content may be viewed or used, or limiting the content use to a period of time. For example, a ringtone may have a life of 30 days, after which the subscriber has to either renew the license or download a new tone. Many games are sold with a life of 90 days or for a set number of plays.

Many operators are reluctant to enforce access limits, believing that the subscriber is more likely to churn if a ringtone is disabled.

Given the competitive nature of the wireless industry and the focus on churn and retention, many operators are reluctant to enforce access limits, believing that the subscriber is more likely to churn if a ringtone is disabled, for example. However, each time that an access limit is not enforced results in lost revenue for the operator.

- **Prepaid accounts** – many of the world's mobile subscribers use prepaid accounts or cards for their wireless services. Before a voice call is made on a prepaid account, the mobile operator's business systems check the balance of the prepaid account in **real time** to ensure that sufficient funds exist for the call. In many cases, a call will be terminated once the prepaid account balance reaches zero. However, the same does not usually occur with mobile content and media services.

For example, a prepaid subscriber may have one euro in their account but request to purchase a game for 5 euros. Business rules would say that the purchase would be denied due to insufficient funds. However, in many cases there is no link between the content and media distribution system and the prepaid accounting system, so the purchase is allowed. The mobile operator has therefore lost four euros in this case.

### **Lack of transparency**

One of the keys to reducing revenue leakage for mobile content and media services is to increase the visibility and transparency throughout the value chain. At present, the mobile

operator is unable to determine the status of each transaction and to reconcile transaction events with the actual revenues billed and collected. Consider the following examples:

- **Customer care refunds** – just as in the early days of wireless voice services, customer care representatives can refund an amount greater than the value of the content if they do not have visibility into the actual content transaction.

Suppose a subscriber decides to buy a ringtone for \$3 and starts to download the content. The download does not complete however, as the subscriber briefly moves out of mobile data service coverage. The subscriber then contacts customer care and requests that their account be credited due to the poor service – the subscriber in this case is a long standing customer and is not pleased as they have had several problems with their account in recent months. The customer care representative, seeing the recent history, works hard to please the subscriber and prevent churn, and credits the account for \$3, the price of the ringtone.

The subscriber then hangs up and finds that the ringtone download was actually successful – when the handset moved back into mobile data service coverage, the connection was reestablished and the ringtone downloaded. Hence, the subscriber has obtained the ringtone and a credit for \$3. The mobile operator has therefore lost \$3 in revenue (and will also likely incur the cost of paying the ringtone provider a few dollars!).

A second example would be when the ringtone never downloads correctly. Again, the customer care representative refunds the price of the ringtone to the subscriber's account. But unless the content and media distribution system reconciles the request for a ringtone with the actual successful download of the ringtone, revenue leakage can occur since the mobile operator will pay the content distributor or provider for the ringtone. In other words, if the content provider is paid based on content download requests and not successful downloads, revenue leakage occurs.

Finally, if a content provider is distributing a faulty piece of content or media (for example a game that will not run on the handset) that results in an increase in calls to customer care, the mobile operator should bill the content provider for the cost of the customer care. Each call to customer care costs the mobile operator between \$7 and \$15. Hence, a faulty game can significantly increase the mobile operator's customer care costs -- expenses that are currently not recovered from the guilty party, the content provider.

- **Bad debt collections** – bad debt accounts are not uncommon in the wireless industry, just as in other service industries. For example, assume content is downloaded and billed to a postpaid account that is subsequently delinquent. If the mobile operator then pays the content provider or distributor for the content, then revenue leakage occurs since the operator incurs the cost of the bad debt content.
- **Premium SMS delivery** – one of the biggest issues in the wireless industry involves off-portal premium SMS content. In many cases, the mobile operator has little or no visibility into the content delivered to the handset, even though the charges for the content will be put on the subscriber's bill by the operator. Leakage occurs in several areas, such as when the subscriber does not receive the premium SMS content they request, calls customer service and demands a refund. Even though the subscriber is usually supposed to contact the premium SMS provider for refunds, the mobile operator often finds themselves obligated to issue a refund for the sake of customer satisfaction – the pressure of churn again comes into play here.

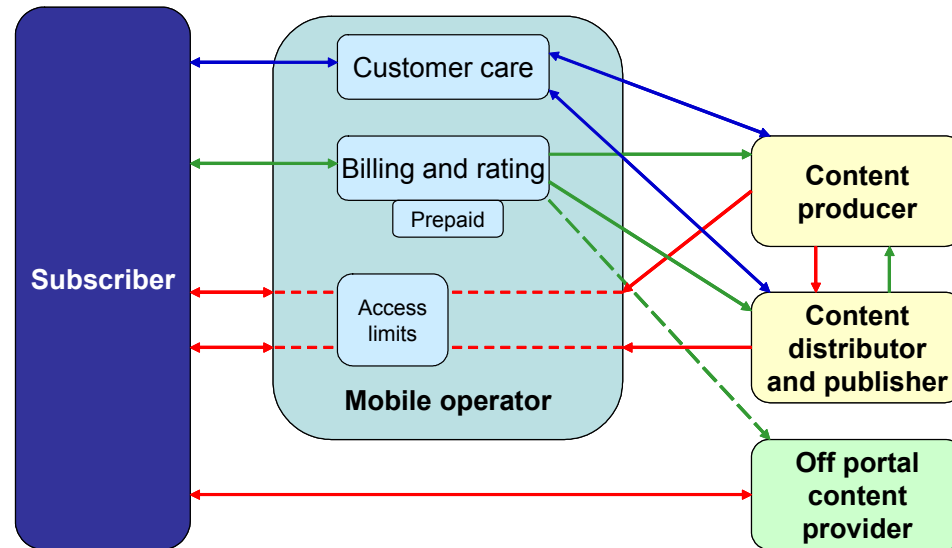
The second issue with off-portal premium SMS services is cramming. This is the equivalent to spam in email, where a third party SMS provider continually sends SMS to a subscriber. In some cases, the subscriber may have signed up for a service and inadvertently authorized the SMS provider to send a seemingly unlimited number of messages. The mobile operators are often caught in the middle of this issue, since the subscriber may demand charges for these unwanted SMS be removed from their bills.

## Mobile Content and Media Revenue Leakage

One of the main goals of this white paper is to define the amount of revenue leakage through the mobile content and media value chain. Before doing so, however, we need to define the players and their roles at each stage of the ecosystem.

### Mobile Content and Media Value Chain

**Figure 3: Mobile Content and Media Value Chain**



Key:  
Red – Content and media flow  
Green – currency flow  
Blue – customer care relationships  
Source: *iGillottResearch*, 2005

#### Subscriber

From the subscriber's viewpoint, the mobile operator is often seen as the sole provider of content and media even though a major brand may also be involved. The role of the other players in the value chain are invisible to the subscriber – this explains why the mobile operator is usually the first call the subscriber makes when something does not work as expected.

The role of the subscriber in the value chain, of course, is to select, request, download and then pay for content and media over the mobile device. While this is simple, revenue leakage occurs due to bad debt when the subscriber fails to pay the bill. While this may be a simple error and not intently fraudulent, the net effect on the operator is that monies are not collected.

#### Mobile Operator

The mobile operator is the lynch pin to the whole mobile content and media value chain. In addition to providing the mobile device, the network and customer care, the operator is

also seen as the main provider of the content itself. The operator is also responsible for billing and rating the content, collecting revenues from the subscriber base, and paying the content provider for the content and media consumed.

The mobile operator is the lynch pin to the whole value chain, responsible for billing and rating the content, collecting revenues from the subscriber base, and paying the content provider for the content and media consumed.

Mobile operators are also responsible for selecting which content and media they will offer. To an increasing degree, content and media is used as a market differentiator for the mobile operator – Vodafone Live! is a good example of this strategy and is an approach to the market that many other operators have emulated.

Since the operator sits in the middle of the value chain and has relationships with most of the other players, their role in revenue assurance is significant. And if the mobile operator does not address revenue assurance, leakage throughout the whole value chain can be significant.

### **Content producers and providers**

Content providers and producers can take many forms, from aggregators of ringtones and other content to major media brands, sports teams, TV production companies, and Hollywood Studios. In some cases, the mobile operators are also creating original content to provide additional market differentiation – an example would be Verizon Wireless with their Vcast content which is prepared and owned by Verizon Wireless.

The content providers usually have relationships with the mobile operators to make their content and media available to the subscriber base. Even when content is provided off the mobile operator's portal, the mobile network and supplied device are still used to acquire and use the content.

### **Distributors and Publishers**

As the name suggests, distributors are solely responsible for collecting and disseminating content to the mobile operators. In many cases, the content producers do not want or are not capable of distributing their content to the mobile operators. A third party publisher is then involved who negotiates contracts, ensures the content meets the mobile operators business and technical requirements, bills the operators accordingly, and reconciles with the content producers.

### **Off-carrier Portals**

Many of the revenue leakage problems in the wireless industry occur in off-carrier purchasing channels, through the use of premium SMS as a payment mechanism.

When the first content and media services were first made available, the mobile operators controlled the content themselves and were responsible for all of the distribution, billing and collections. As the number of subscribers increased and the market expanded, third party content providers and producers decided to start offering content directly to the subscriber, bypassing the mobile operator. These so-called off-carrier portals are independent of the mobile operator but may use premium SMS to bill the subscriber for their content and media. Hence, the mobile operator becomes involved in the billing process but is unable to control the quality of the content provided.

Since the off-portal provider is separate from the mobile operator, the purchase experience, user interfaces, and customer support available vary enormously. There is no consistency, which is often frustrating for the mobile operator since they are stuck between an unhappy subscriber and the off-portal provider.

As this paper will show, many of the revenue leakage problems in the wireless industry occur in off-carrier purchasing channels, through the use of premium SMS as a payment mechanism.

### **Customer care**

Many of the larger mobile operators outsource all or part of their customer care systems and operations to a third party provider. In many cases, when a subscriber calls customer care they are not talking to an employee of the mobile operator, but a third party.

One of the main issues customer care organizations face is keeping up to date with increasingly complex products and services. Content and media services are particularly challenging, due to the variety and range of providers. Revenue leakage can be limited if the mobile operator provides customer care representatives transaction-level visibility for content purchases and a mechanism to refund against a specific purchase. And the costs of customer care can be vastly reduced if a self-care facility is available to divert calls that would otherwise be directed to agents. Transaction-level visibility makes possible the introduction of such a self-care mechanism.

### **Billing and rating**

As with customer care, many operators outsource all or part of the billing and rating function to third parties. It is rare today for a major operator to use a single billing system. As most large operators have been formed through mergers and acquisitions, their billing and rating systems tend to be amalgamations as well.

For content and media, billing and rating becomes critical since significant revenue leakage occurs when incorrectly delivered content is billed to the content provider or distributor but not to the subscriber.

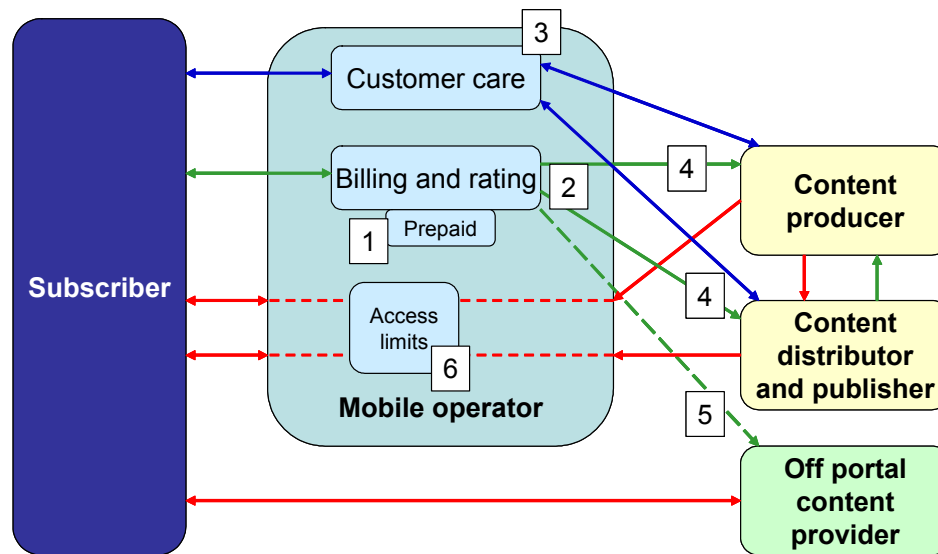
## **Revenue leakage in the value chain**

As discussed in the previous section, revenue leakage occurs at several points in the content and media delivery process (the numbers refer to the leakage points in Figure 4):

- **Prepaid**, where the prepaid subscriber is able to purchase content greater in value than the available balance in their account [1]. This revenue leakage may be intentionally fraudulent or simply an error on the subscriber's part.
- **Bad debt**, where the content provider or distributor is paid for content that is subsequently written off on delinquent accounts [2]. Again, this revenue leakage may be intentionally fraudulent or simply an error on the subscriber's part.
- **Customer care** has several scenarios that contribute to revenue leakage:
  - The customer care representative refunds an amount greater than the price of the content downloaded to the subscriber's account [3].

- The customer care representative refunds the price of the content that the subscriber says was not correctly downloaded, even though the content was correctly received by the handset [3].
- The customer care representative refunds the price of the content to the subscriber who was unable to download content, but the content provider is subsequently paid for the content [4].
- Increased customer care costs associated with poorly designed or distributed content are not charged back to the content provider or distributor [4].

**Figure 4: Revenue Leakage Points in the Mobile Content and Media Value Chain**



Key:  
 Red – Content and media flow  
 Green – currency flow  
 Blue – customer care relationships  
 Source: *iGillottResearch*, 2005

- **Off-portal** revenue leakage due to [5]:
  - Poorly delivered content that the mobile operator then refunds to the subscriber, and cramming charges borne by the mobile operator.
  - Premium SMS fraud as previously explained ( Premium SMS is the most popular Off-portal payment method)
- **Access limits** not enforced by the mobile operator result in significant lost revenue. This may be due to time limits or number of use limits not enforced [6].

### Quantifying revenue leakage

As the basis for quantifying mobile content and media revenue leakage, *iGillottResearch* used its worldwide forecasts for subscribers using mobile content and media, ARPU's associated with content and media, and specific data from mobile operator financial

releases. Data from interviews with some of the larger mobile operators about their specific revenue assurance issues was also incorporated.

Table 1 shows the revenues from mobile content and media for 2004 and 2009, with the associated compounded annual growth rates. Note that these figures also include the revenues from the airtime and mobile data delivery charges, as well as the content revenues.

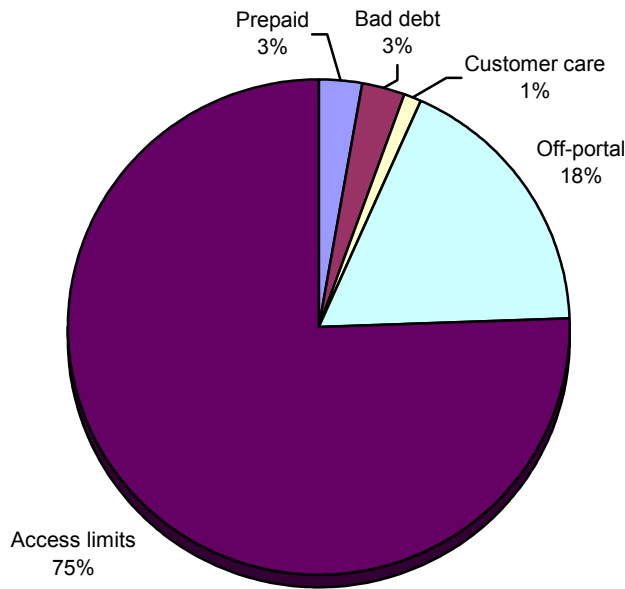
**Table 1: Worldwide Mobile Content and Media Revenue, 2004 and 2009**

	2004	2009	CAGR
North America	\$1,928	\$21,969	62.7%
Western Europe	\$2,102	\$13,606	45.3%
Eastern Europe	\$138	\$2,633	80.4%
Asia Pacific	\$2,573	\$10,677	32.9%
Latin America	\$159	\$2,081	67.3%
Japan	\$15,334	\$29,202	13.7%
ROW	\$29	\$574	82.3%
<b>Total</b>	<b>\$22,262</b>	<b>\$80,742</b>	<b>29.4%</b>

Includes revenues from content and airtime/data connections for delivery  
 Source: *iGillottResearch*, 2005

Starting with these figures, *iGillottResearch* then applied percentages for each of the five types of revenue leakage for each region of the world. The percentage for each type of revenue leakage was different for each region of the world, based on feedback from the mobile operators and the market conditions in that region (Figure 5).

**Figure 5: Worldwide Mobile Content and Media Revenue Leakage by Type, 2004**



Source: *iGillottResearch*, 2005

Figure 5 shows the split of revenue leakage by type for 2004: leakage due to lack of enforcement of access limits accounts for 75 percent of the lost revenue, followed by off-portal content with 18 percent.

Table 2 shows the worldwide forecast revenue leakage by type. In 2004, revenue leakage equals 18.8 percent of mobile media and content revenue – by 2009, this percentage has risen to 22.9 percent, accounting for nearly \$18.5 billion in lost revenue.

The large growth is for customer care related revenue leakage, while the largest dollar loss is due to non-enforcement of access limits.

**Table 2: Worldwide Mobile Content and Media Revenue Leakage by Type, 2004 - 2009**

\$ Millions	2004	2005	2006	2007	2008	2009	CAGR
Prepaid	\$116.7	\$358.7	\$683.2	\$1,029.6	\$1,572.3	\$2,011.2	76.7%
Bad debt	\$111.3	\$312.5	\$616.6	\$1,073.8	\$1,979.9	\$2,422.3	85.2%
Customer care	\$55.6	\$152.5	\$402.3	\$1,042.0	\$1,649.9	\$2,422.3	112.7%
Off-portal	\$741.3	\$1,362.5	\$2,190.1	\$3,444.5	\$5,051.9	\$6,498.2	54.4%
Access limits	\$3,160.0	\$3,410.9	\$3,694.4	\$4,261.0	\$4,773.2	\$5,113.7	10.1%
<b>Total</b>	<b>\$4,185</b>	<b>\$5,597</b>	<b>\$7,587</b>	<b>\$10,851</b>	<b>\$15,027</b>	<b>\$18,468</b>	<b>34.6%</b>
	18.8%	18.3%	18.9%	20.8%	22.8%	22.9%	

Source: iGillottResearch, 2005

Since Japan has the largest mobile content and media business in the world, it follows that it also experiences the largest leakage in 2004 (table 3). While the same is true in 2009, the revenue leakage in other regions is far more significant, especially in North America, Western Europe and Asia Pacific. This forecast assumes that no action is taken by the mobile operators to check the growth in revenue leakage.

**Table 3: Worldwide Mobile Content and Media Revenue Leakage by Region, 2004 - 2009**

\$ Millions	2004	2005	2006	2007	2008	2009	CAGR
North America	\$128.2	\$277.7	\$591.2	\$1,348.1	\$2,580.1	\$3,679.8	95.7%
Western Europe	\$625.3	\$1,155.7	\$1,942.5	\$2,926.8	\$3,958.9	\$4,625.9	49.2%
Eastern Europe	\$41.0	\$106.6	\$229.6	\$408.4	\$646.2	\$895.3	85.3%
Asia Pacific	\$611.0	\$903.7	\$1,250.6	\$1,655.9	\$2,150.5	\$2,776.0	35.4%
Latin America	\$37.7	\$84.1	\$148.1	\$237.3	\$356.5	\$541.0	70.3%
Japan	\$2,737.2	\$3,060.1	\$3,406.9	\$4,237.7	\$5,264.5	\$5,840.5	16.4%
ROW	\$4.5	\$9.2	\$17.7	\$37.0	\$70.7	\$109.1	88.8%
<b>Total</b>	<b>\$4,185</b>	<b>\$5,597</b>	<b>\$7,587</b>	<b>\$10,851</b>	<b>\$15,027</b>	<b>\$18,468</b>	<b>34.6%</b>

Source: iGillottResearch, 2005

## Approaches to Reducing Revenue Leakage

While the size of the mobile content and media revenue leakage problem may at first seem daunting, there are solutions to the causes of the problems. *iGillottResearch* believes that revenue leakage can be reduced significantly if the mobile operators are willing to take the necessary steps.

Before discussing the solutions required, we should first review the main causes of revenue leakage in the mobile content and media value chain:

- **No line-item product information for care and repudiation** – in many cases, the customer service representative is unable to see the status of the mobile content and media transaction. While a call detail record shows the history and status of each voice call made, the same is not true for mobile content.
- **No visibility between the charging event and download event** – this is one of the biggest issues that leads to significant revenue leakage. Since many mobile operators do not reconcile between the successfully downloaded events and the amount paid to content producers, providers and distributors, revenue leakage occurs when a payment is made for an un-billable or refunded download. Tracking the status of each download and paying the content provider only for downloaded, billed transactions addresses this problem.
- **Lack of uniformity** – one of the problems with the range of content and media available to the mobile subscriber is the lack of uniformity in the quality of the content, the various user interfaces used by some mobile operators, and the lack of consistent business rules enforcement. For example, one customer service representative may refund \$3 for a failed ringtone download, while another may refund \$3.50. The lack of visibility into the transaction status leads to lack of uniformity in the business rules.
- **Customer management issues** – access limit leakage is significant and is mainly due to the mobile operators' fear of churn. While some subscribers will be unhappy if their 30-day ringtone is disabled after 60 days, the problem is not insurmountable. Improved marketing and making the subscribers more aware of the limits set on content and media usage would go some way to addressing this issue. Digital rights management systems available today can be used to enforce limits. The main issue is willingness on the part of the mobile operators.
- **Unintuitive UI** – given the limited space available on the typical mobile handset screen, the limited quality of the user interface in the past is understandable. Many consumers are confused by the operation of many non-intuitive UIs, which may lead to confusion about what they are purchasing and the terms of that purchase.
- **Higher risk of fraud** – the opportunity for fraud in the mobile content and media space is higher than for wireless voice, mainly due to the fact that many operators do not link the prepaid billing and rating systems to the content distribution system. This allows a prepaid subscriber to purchase content greater in value than the balance available in their account. Fraud is also possible from the content provider side of the value chain if the mobile operator is unable to correctly reconcile downloads with billed events.

- **Lack of reporting and auditing** – the final issue is a general lack of reporting and auditing through the mobile content and media distribution value chain. For example, transactions are not usually counted in and out. Reporting on content provided by a particular vendor is also limited, such as the number of customer care calls associated with that content, failed downloads and refunds granted. All of this information is important for the mobile operator as they attempt to recover customer care costs or negotiate a contract renewal.

### **Enforcement of real time business rules**

Enforcement of real time business rules addresses the issue of prepaid subscribers being able to purchase content greater in value than the available account balance. This situation accounts for three percent of the worldwide revenue leakage for mobile content and media.

Real time business rules can be addressed in two ways:

- Authorization of charge against updated customer data. For example, before a purchase is made, checking that the account is in good standing and that a monthly spending limit has not been exceeded.
- Spending limit authorization requires that sufficient funds be available for purchase and that a preset spending limit has not been reached.

Business rules enforcement also addresses revenue leakage due to access limits, which accounts for the majority of revenue leakage in 2004 (75 percent worldwide). By restricting and validating that the content is current and that the number of uses, for example, has not expired, mobile operators can significantly reduce revenue leakage.

Authentication can also be used to address unauthorized access to a subscriber or against the system to avoid cramming. By ensuring that the transaction is authorized and that subscribers only receive content they and the system have authorized, refunds to customer accounts for unwanted transactions is reduced.

### **Maintaining transaction integrity**

Maintaining the integrity of each transaction through the value chain is important for revenue assurance. Unless the state of each transaction is known, it is impossible to accurately reconcile activity in the system or provide an audit trail.

Furthermore, a detailed history of each transaction's activity should be kept for historical review, just as call detail records (CDRs) are kept. This allows the mobile operator to accurately address any conflicts that may arise with the subscriber in the future. For example, if a subscriber claims that a game was not correctly downloaded last month or that a purchase request was never made for a specific ringtone, the customer care representative will be able to access the history for each transaction and show the subscriber what happened when. Maintaining an accurate record of the transaction state is therefore critical.

### **Providing transaction transparency and visibility**

While it may seem a simple issue, the ability to view all transactions in the system is key to revenue assurance. Customer care, billing, rating, marketing, legal (for contract

negotiation) and sales all need access to information regarding the content and media in the system. Visibility should be equivalent to that provided for voice calls today, with the added ability to see transaction state.

Visibility throughout the value chain allows the mobile operator to balance transactions entering the system with those leaving the system to ensure that all revenue is accurately accounted for.

## **Maintaining Financial Integrity**

Probably the most important area for revenue assurance is maintaining financial integrity throughout the mobile content and media value chain. While this has been done on the voice side of the house for many years, the growth in the mobile content business has meant that some areas have not been addressed by the mobile operators.

### **Refunds and chargebacks**

Several steps can be taken for refunds and chargeback of transactions. For example, the mobile operator should have the ability to reverse any revenue distribution to the content provider for refunds made to the subscriber, to ensure that the content provider is not getting paid for refunded charges.

As noted earlier in this paper, a poor piece of content can significantly increase the mobile operator's customer care costs. The ability to track these calls and then chargeback the content provider or merchant for the additional cost would reduce revenue leakage – for simplicity, the contract between the mobile operator and the content provider could specify a chargeback amount per customer care call. Customer care calls associated with each transaction would then be used to track the chargeback amount required.

### **Bad debt**

Bad debt accounts will always exist for a postpaid service provider, no matter what the product or service provided. Mobile operators have worked hard in the last ten years to reduce the amount of bad debt they carry and the write-offs required. This is a critical financial performance statistic.

By paying content providers and merchants for content on bad debt accounts, the mobile operators increased their revenue leakage by three percent in 2004. This issue can be entirely addressed by implementing a mechanism to completely reverse transactions on bad debt accounts and reflect customer refunds against the settlement process.

## **Addressable Revenue Leakage**

The final question that remains to be answered is how much of the revenue leakage we have discussed can be addressed by the solutions outlined? Obviously, some issues can be addressed more easily than others, while others will require a fundamental shift in the way the mobile operators approach the content and media business (such as enforcing access limits).

Based on the analysis in this white paper, *iGillottResearch* believes that revenue leakage can be reduced in the following areas:

- **Prepaid:** 100 percent of this revenue leakage is addressed by enforcement of real time business rules, linking the transaction request to the prepaid billing and rating system.
- **Bad debt:** This issue can be entirely addressed by changing the point at which the content provider or distributor is paid, such that they are paid after the transaction has been billed and collected successfully. Content providers are therefore not paid for content on bad debt accounts.
- **Customer care** has several scenarios that contribute to revenue leakage:
  - The customer care representative refunds an amount greater than the price of the content downloaded to the subscriber's account. This is entirely addressed by tracking and maintaining a history of each transaction, and by the customer care representative having full visibility to historical transaction status information.
  - The customer care representative refunds the price of the content that the subscriber says was not correctly downloaded, even though the content was correctly received by the handset. Again, this issue is addressed by tracking the transaction status and giving the customer care representative full historical visibility.
  - The customer care representative refunds the price of the content to the subscriber who was unable to download content, but the content provider is subsequently paid for the content. Maintaining transaction and financial integrity addresses this issue.
  - Increased customer care costs associated with poorly designed or distributed content are not charged back to the content provider or distributor. This is harder to enforce since a change in the legal contract between the mobile operator and the content provider is required. The steps outlined above would enable the mobile operator to enforce chargebacks for customer care, however, and hence reduce revenue leakage.
- **Off-portal** revenue leakage due to:
  - Poorly delivered content that the mobile operator then refunds to the subscriber, and cramming charges borne by the mobile operator. These can be addressed in large part by transaction and systems authentication, although in reality some traffic will still make it through to the subscriber from the most determined crammers.
  - Premium SMS fraud can be addressed by pre-authorization and visibility throughout the entire value chain. Revenue leakage due to Premium SMS should be entirely addressable.
- **Access limits** not enforced by the mobile operator result in significant lost revenue. The simple answer is for the mobile operator to enforce these limits – in this case, 100 percent of revenue leakage can be addressed. However, the case with each mobile operator will be different – some will choose to do so while others will prefer to take no action and simply not recognize this category of revenue leakage.

## About *iGillott*Research

*iGillott*Research is a market strategy consultancy *focused* on the wireless and mobile communications industry. Founded by Iain Gillott, one of the wireless industry's leading analysts, we research and analyze the impact new wireless and mobile technologies will have on the industry, on vendors' competitive positioning, and on our clients' strategic business plans.

Our clients typically include service providers, equipment vendors, mobile Internet software providers, wireless ASPs, mobile commerce vendors, and billing, provisioning, and back office solution providers. We offer a range of services to help companies improve their position in the marketplace, clearly define their future direction, and, ultimately, improve their bottom line.

A more complete profile of the company can be found at [www.igillottresearch.com](http://www.igillottresearch.com).

### **Methodology**

To prepare this white paper, *iGillott*Research first interviewed a number of large mobile operators in North America and Western Europe. Revenue leakage is a sensitive issue and as such, the comments of the operators interviewed cannot be attributed. However, their comments have been incorporated into this paper.

The revenue leakage sizing and forecasts were prepared by *iGillott*Research based on its worldwide forecasts for subscribers using mobile content and media, ARPUs associated with content and media, and specific data from mobile operator financial releases. Data from the interviews with some of the larger mobile operators about their specific revenue assurance issues was also incorporated.

### **Disclaimer**

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