DETERMINING CHURN DRIVERS IN MOROCCAN TELECOM SECTOR

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ABSTRACT

This paper investigates churn behavior within the Moroccan telecom sector. The Moroccan telecommunication sector is considered one of the most developed telecom sectors in the African region and one of the most developed economic forces in the country. The privatization of the market, new services, the emergence of new operators, as well as the changing socio-economic factors have contributed to a change in attitude of Moroccan consumers over the past few years. In this study, high churn rate of over 21% has been measured and the mechanism behind customer churn has been examined. Causes of customer churning were investigated through a survey of 500 respondents conducted in Morocco's two most important cities. Logistic regression identified a clear correlation between customer churning behavior and customer personal characteristics, operator services, and the mobile phone characteristics.

INTRODUCTION

The Moroccan telecom sector is highly competitive, with three operators present. It is considered one of the most developed telecom sectors in the African region and one of the most developed economic forces in the country. The strong performance of the telecom sector is the result of many ambitious reforms that were undertaken by the government to reform and modernize the sector. The activity is highly privatized and concentrated between three major players. The transformation of the sector was undertaken in 1997 under the reign of Late Majesty King Hassan II by the law of 24- 96. The changes consist of the separation of postal and telecommunications services, the separation of regulatory and operational activities and the liberalization of the telecommunications sector.

The first reform has given birth to two separate entities: a telecommunication entity called Maroc Telecom (Itissalat Al Maghrib) and a postal-services entity called Postes Maroc (Barid Al Maghrib). Under the same law, the National Regulatory Agency of telecommunication, (Agence National de Reglementation des Telecommunication [ANRT], 2007), was created as the

legislative structure in charge of regulating the Telco's sector. It is a legal and public institution with financial autonomy reporting to the prime minister.

Liberalization and privatization processes were the main measures carried out to accompany the development and the expansion of the sector. The sector witnessed a substantial growth with over 20 million subscribers in 2007, for a penetration rate of 65.66% (ANRT, 2007). The liberalization process, which started in 1999, has opened the sector to public telecommunication operators. Itisallat Al Maghrib has changed its brand name to become known as Maroc Telecom. It is 51% owned by Vivendi Universal. The sector was also opened to international competition. In 1999, a Spanish / Portuguese consortium won the bid for the second GSM license, as of November 2009, Spain's Telefonica SA (TEF) and Portugal Telecom SGPS SA (PT) have agreed to each sell their stakes in Meditel. Meditel is now 100% Moroccan owned. The latest entrant in the sector is Wana corporation; a company belonging to ONA, the most important economic holding in the kingdom.

MOBILE SEGMENT IN MOROCCO

Since the introduction of the first cellular mobiles to the Moroccan market in 1989, mobile telephony has grown to become the most developed segment in telecommunication market, posting high growth rates and generating high profits. The fixed-line segment has been losing territory to the mobile phone sector, which has seen a rapid increase in subscribers especially after the introduction of Meditel. Maroc Telecom is the leading company in the industry. Its market share in terms of customers is 66.54% with more than 13 million subscribers compared to 33.46% for Meditel with over 6 million customers (ANRT, 2007). No official statistics are reported for the 3rd operator, Wana Corporation regarding number of customers or market share. The prepaid segment is more developed than the postpaid segment with over 18 million customers choosing prepaid services out of the 20 million customers.

OBJECTIVE OF THE STUDY

Customer churning intention is generally hard to predict because of the multiplicity of factors involved. Nevertheless, with increasing churn rates, it has become a necessity for Telco's companies to understand customers' values and requirements so that the intensity of churn can be reduced. The main purpose of this study is to determine the factors that make subscribers churn from one telecom operator to another. Is churning related to the subscribers' income? Is it related to the companies' tariffs or product offerings? Or, what other factors may explain customer churning behavior?

Two main research questions are addressed in this paper:
- What are the main triggers that explain customer churning? This question aims at determining the most important factors that customers consider as the main weak points about their carrier that make them switch to another operator.
- Is there a relationship between personal characteristics and churn decisions? We try to identify the personal characteristics that are associated with churn behavior such as gender, age, income, and education level.

LITERATURE REVIEW

Many authors and scholars have addressed this issue in their studies and tried to bring definitions, identify causes and generate solutions for this phenomenon. In this section, different points will be discussed, mainly: cost of churn, type of churn, the main churn drivers and churn management activities. Churn behavior is a common problem faced by telecom companies; it reduces the profitability and hurts the brand image of the company. Liberalization of the market has enlarged the number of operators and increased competition. It is the customer who makes the deliberate choice of selecting the service provider among the existing ones. In this context, Lu (2002) advanced that customers exercise their right to choose among the existing providers and thereby switch from one company to another.

For Kon (2004), "The churn occasion occurs when the quality of her experience falls below a certain threshold either relative to competition (comparison churn) or relative to her own expectations (frustration churn)" (pp. 2, 3). Geppert (2003) defines churning as "the movement of customers from provider to provider in search of better and cheaper products and services" (para. 2). For Richeldi and Perrucci (2002), customers become churners when they suspend their subscription and move to the next competitor.

Churning behavior is synonym to customer turnover. Another definition is given by Neslin, Sunil, Wagner, Junxiang and Mason (2006); they define customer churn as "the propensity of the customer to cease doing business with a company in a given period of time" (para. 1). In this context, Ghosh (2007) introduces the cross-buying concept, while Eppen, Ward, A. H., Ward, R. and Kipp (1991), advance that customers who signed up for more than one service within a single company tend to be more loyal than those who contract for one service. This cross-buying behavior increases the loyalty and reduces churn attitude.

Cost of Churning

Customer churning, customer migration or customer loss, as it is called, has been treated as a main concern because of the different costs associated with it. When customers change their current service provider to another, costs are imposed to the losing company and not on the customers. Ken (2006) argues that the highly competitive nature of the telecommunication sector and the absence of a differentiation strategy in terms of products and services offered are what make subscribers churn from one company to another. Customers are always looking for innovative and original products; if their actual provider cannot meet their needs, their loyalty and retention are in question. As disloyalty increases, churn rate tends to rise, leading to minimization of the firm's value. Churn is considered a "profit killer." As the customer base decreases, the revenues associated go down.

According to statistics, the global telecommunication industry is recording huge losses that amount to billions of dollars due to churning. The rule of thumb known by marketers is that it costs 5 times more to acquire a new customer than to retain the existing one. So, it is preferable for companies to not lose the path of their existing customer base and focus on actions and measures to reduce churn. Sometimes, a new customer may churn before the company recovers the whole acquisition costs (Xevelonakis, 2004).

Defecting customers damage the brand name of their previous service provider, especially when unsatisfied customers tell others about their bad experience (Nemec, 2001) and complain about the company to numerous friend and acquaintances (Kumra, 2006).

Churn Drivers

A number of researchers and academics have studied factors that cause churn. It is important to investigate why customers are leaving before selecting the appropriate churn-reduction mechanisms. For Fox and Poje (2002), better price is the main factor but not the "prevailing reason"; i.e. offering lower price does not necessarily mean higher customer loyalty. They also reveal that customers churn to the competitor who best matches their needs in terms of service features, quality, technology and service quality. The probability that a subscriber will change the actual carrier depends on the satisfaction level reached in addition to factors related to service attributes including call quality, tariff level, handsets, brand image, and income. In addition to these service attributes, Kumar (2007) has indicated that the transparency level of any company is highly associated to customer satisfaction. When a specific firm adopts transparent marketing, communicates transparent tariffs and makes information available, it increases the customer confidence and therefore their satisfaction.

Geppert (2003) summarizes in his article the most important factors explaining the churn attitude:
- Price: Higher prices than those of competitors, changing fees constantly or lack of transparency regarding services and products provide customers with high incentives to switch.
- Customer service quality: The manners with which services and products are delivered to customers play a crucial role in their satisfaction. Lack of reliability, responsiveness and availability of staff would drive the customers to terminate their relationship with the actual provider.
- Payment Loopholes: "Customers may attempt to 'game the system' by generating high usage volumes and avoiding payment by constantly churning to the next competitor" (Geppert, 2003, para. 6).
- Lack of responsiveness: No response to customer complaints or no answer to their problems lead to poor service and therefore to ending the contract.
- Privacy concerns: Any attempt to use personal information for specific purposes or to divulge it to other parties could break the relationship. Companies have the responsibility and the duty to keep all information they have about their customer secret and not to use it for communication or telemarketing purposes.
- Lack of features: Customers are always looking for innovative and original products. Customers will churn if their actual carrier is unable to provide them with what they need, when and where they need it.
- New technology or new products introduced by competitors: customers could switch companies if the next competitor introduces new products, launches new services or brings new technology never used before to the market.
- New competitors enter the market: offering interesting incentives and attractive offers may cause some customers to churn.

- Billing or services disputes: Continuous billing errors, incorrect payment or disputes about services can lead to customer churning.

Another important point to mention as a churn driver is the absence of switching costs when a customer makes a decision to cease business with its current telecom operator. Switching costs are barriers preventing customers from changing service provider; without them, churners can easily switch between the various service providers.

Churn Management

Since it is difficult to detect the potential churners, it is necessary for the Telco firms to take the necessary actions to identify those with the intention to churn before they solidify their act and lead to profit decrease. Customers switch easily when the competitors offer what they consider to be in their best interest. Mutanen (2006) pointed out that customer lifetime value is a valuable asset for business life. Customers have to feel a strong affiliation with the company so they can continue doing business with it. The idea here is that the more involved they feel, the less likely customers are to churn. Brodsky (2006) stated, "Winning is not just about closing the sale. You win when you close the sale and also lay the foundation for a good relationship that will allow you to keep the customer for a long, long time" (para. 1). The Telco firm has to focus on customer retention rate rather than sales volume it wants to achieve; since without customer base, no sales volume can be recorded.

Richeldi and Perrucci (2002) advanced that "Churn management has emerged as a crucial competitive weapon, and a foundation for an entire range of customer-focused marketing efforts" (p. 4, para. 2). Churn management helps the company categorize the customer base into loyal customers and customers with probability of churn. Specific attention is given to the customer records in terms of expenses, call frequency, usage of company's services, and avoidance of payment and so forth. Eechambadi (2006) suggests developing retention strategies as churn management techniques. Carriers must ensure that customers are not only satisfied but are also deriving value from this relationship: the Telcos should accompany the customer along the buying process and ensure that they are using and enjoying the service. Weiland (2006) proposes loyalty programs as a way to reduce churn behavior. Rewarding the loyal customers who spend more will, no doubt, reduce their propensity to churn. The reward could take the form of fidelity points, bonuses, gifts, free subscription fees and other forms. Risky customers could be targeted with specific campaigns and promotions.

Hypothesis Development

The literature review has shown that churning behavior is the result of three main factors. These factors are grouped in three categories which are: organization, products and personal characteristics.

Organizational characteristics

By organizational factors we refer to the churn drivers that are embedded in companies' features. We have identified these factors as: (1) tariffs, (2) coverage network quality, (3) frequency of

billing errors, (4) customer service quality, (5) transparency, (6) technical assistance, (7) privacy concerns, (8) diversity of promotions and (9) reactivity to complaints (Fox & Poje, 2002; Geppert, 2003; Kumar, 2007; Nemec, 2001; Xevelonakis, 2004).

Tariffs: Fox and Poje (2002) advanced that one factor that pleases customers is their ability to make purchases at affordable tariffs. The gain for any customer is the lower price he or she has to pay in exchange of high quality products. A company that is capable of satisfying this concern will not face as severe churn rate as a company that charges higher prices.

Coverage network quality: Bad quality coverage is associated with different technical problems that the company's infrastructure might face (Geppert, 2003) and affect the success of communication; like problems with antennae, inability to receive or make calls and so forth. As long as the client does not face this kind of problem, he or she will have fewer propensities to churn.

Frequency of billing errors: Billing errors consist of reporting inaccurate charges and significant errors in customers' bills. In most of the cases, subscribers are overpaying. The errors could either come from the carriers or the customers' banks. Geppert (2003) argues that if customers have experienced frequent billing errors while as clients to a specific company, there is higher probability that a churn decision will be taken.

Customer service quality: Telecom operators as service providers are highly judged by the quality of their customer service. According to Xevelonakis (2004), if the service is not good enough, if the employees do not serve clients in the best way and if the clients are not well informed about products or service, they can easily switch to the competition.

Transparency level: The lack of transparency we are talking about is the choice of operators to not communicate full information about prices, products and services to their customers, including incomplete information about price, terms and conditions of service (Kumar, 2007). It includes: lack of transparency about tariffs, lack of transparency about products or service and mislead advertising.

Technical assistance: Nemec (2001) defines poor technical assistance as the inability of carriers to offer help and facilitation when and where it is needed. Examples of technical problems that subscribers are facing are: cuts and interruptions in communications, bad sound quality or difficulty starting communications or reception. If this type of problem occurs frequently, it will increase the probability for subscribers to switch.

Privacy concerns: telecom operators should ensure the respect for privacy of their customer base (Geppert, 2003). Any disclosures of personal information degrade loyalty.

Reactivity to customer complaints: Geppert (2003) and Fox and Poje (2002) advanced that the lack of responsiveness to customers request is not a good practice to keep the customer satisfied and therefore loyal. Telecom operators with high responsiveness and reactivity have less customer churn.

Frequency and diversification of the promotions: The ANRT has identified that diversified, frequent, interesting promotions are a successful way to gain customer acceptance and satisfaction. This satisfaction could lead, if well maintained and developed, to customer retention and therefore customer loyalty.

Personal characteristics

Studies have shown that personal characteristics play a major role in brand loyalty. Therefore, income, age, education level, gender and profession (social ranking) affect churn decision for a specific customer (Evanschitzky & Wunderlich, 2006; Jinhadra & Singh, 2005; Madden, Savage, & Neal, 1999; Snijder & Heijden, 2007; Sharp, 2005).

Income: Studies have shown that low-income subscribers are more likely to churn (Madden et al., 1999). Low-income customers are always looking for the better price/ quality combination. If subscribers find the prices charged not competitive, they will easily switch to the competitor. On the other hand, the high-income group is less price-sensitive and difficult to please; they want to churn for other reasons than price charged. We expect that higher income households are also less likely to churn.

Gender: advanced that gender plays a crucial role in consumer behavior. Men behave differently than women. Women are more difficult to please than men. Decisions are made on distinct bases. Females are shown to be more loyal than men. For the cellular market, Snijder and Heijden (2007) found that women have a higher switching rate because their purchase decision is based on more information than a man's decision. Therefore, it is interesting to let gender moderate switch intentions.

Age: For Jinhadra and Singh (2005), it is a rule of thumb known by marketers that younger consumers have less well-formed brand preferences and can be swayed into becoming loyal to another brand. Older consumers are believed to have already settled into buying habits that cannot be shifted, and are hence assumed to be brand-loyal. On the other hand, Sharp (2005) suggests that age has no significant impact on brand loyalty. Churning has to do with the number of brands competing in the industry and the practices they use to attract customers.

Education level: Evanschitzky and Wunderlich (2006) has advanced that highly educated people usually engage more in information gathering and use more information prior to decision making, while less well educated people rely on less information. We expect, therefore, that better educated consumers seek alternative information about a specific company, apart from their satisfaction level, whereas less well educated consumers see satisfaction as an important key information signal on which to base their purchase decision.

Products Characteristics

Product features play a major role in preventing customers from churning. As long as the operator offers what customers are interested in terms of product quality, features and originality, the churn rate could be reduced (Fox & Poje, 2002; Weiland, 2006).

Phone model: Mobiles are no longer used for function but also for fashion. Clients rely on their operators to provide them with the latest models (Fox & Poje, 2002) and new technologies to keep up with the latest trend in telecommunication movements. We hypothesized here that if new, interesting and original models are offered, there is less tendency to churn.

Type of contract: Weiland (2006) advanced that prepaid customers, not locked in any contract with the operator, have the higher propensity to churn. This segment is characterized by its volatile nature as well as the anonymous identity of its customer base.

CONCEPTUAL FRAMEWORK OF THE MODEL

From the literature review above, the following conceptual framework could be developed. In this framework, the main triggers are grouped into three categories potentially linked to churning intention.
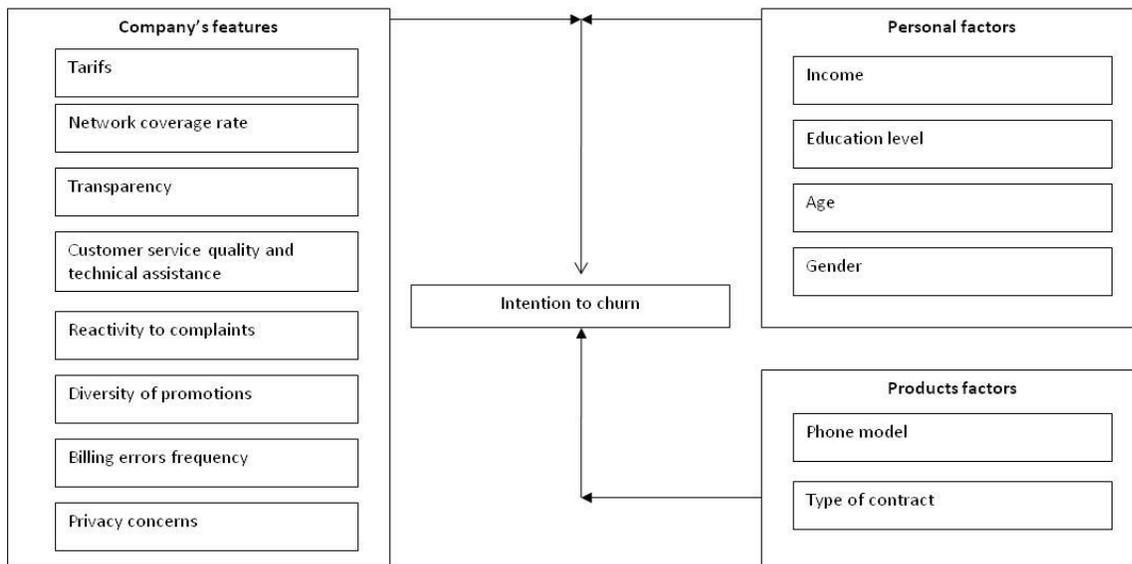

FIGURE 1. CONCEPTUAL FRAMEWORK OF THE RESEARCH

METHODOLOGY

Survey Instrument

A survey was designed to test the potential churning factors given above and questionnaires were administered face to face to respondents in the capital city Casablanca. A first pilot study was conducted in the city of Fez with 30 respondents randomly selected. Only interval questions were used to compute this reliability test. The "Cronbach Alpha" was calculated to be 0.733, which indicates that the questionnaire is reliable.

Sample Selection

Since we are investigating churning intention, customers having two or more operators were not considered in this study. The questionnaire was distributed to 450 people in Casablanca. Casablanca was chosen since the majority of subscribers are concentrated in the Rabat/ Casablanca region. In telecom jargon, this area is known as "Golden Area."

Subscription

Among the total number of respondents, Maroc Telecom subscribers are the highest proportion among the respondents (42%), followed by Meditel customers (40.1%) and Wana customers (17.9%). These numbers are consistent with the actual market structure identified earlier (telecom overview: market size for both operators). Of the total respondents, 21.1% have already switched to another Telecom carrier while 78.9% have remained with the same operator.

Time of Previous Subscription

The analysis of this information will help us measure the degree of loyalty of subscribers. It is known that the longer the period a customer keeps doing business with the same provider, the more his or her loyalty increases.

We observed that among the 93 churners, 39 subscribers have contracted services with their previous operators for less than 1 year. Twenty-nine subscribers have remained with their previous operator from 1 to 2 years, and 15 subscribers have kept their operator for a period from 2 to 3 years, 4 churners remained with their initial service provider for 3 to 4 years, and only 6 subscribers had a long affiliation with their carriers.

Satisfaction Level of Subscribers

More than half of the subscribers interviewed are satisfied with the nature of service provided by their telecom carrier. 33.6% of clients claim to be totally satisfied, 58.7% are satisfied, while 5.9% are unsatisfied with the current services and only 1.8% are totally unsatisfied with their current mobile phone operator.

Subscribers Intending to Churn

Among the 441 respondents, 31.1% of subscribers express their willingness to switch operator, compared to 68.9% who have no intention to churn (Table 1).

TABLE 1. RESPONDENTS INTENTION TO CHURN INTENTION TO CHURN

Intention to churn	Frequency	Percent
Yes	137	31.1
No	304	68.9
Total	441	100.0

The total number of potential churners is 137, which is more than the number of unsatisfied customers (116) identified.

From table 2, we observe that not only dissatisfied clients are willing to switch but also those with a high satisfaction level are interested in churning. Indeed, 25 very satisfied subscribers would be willing to switch operator, as well as 69 satisfied clients. On the other hand, 21 unsatisfied customers have no intention to churn and 1 totally unsatisfied customer rejects the idea of churning. We can classify these subscribers as: satisfied switchers, dissatisfied switchers, satisfied loyal or dissatisfied loyal.

TABLE 2. LEVEL OF SATISFACTION AND CHURN INTENTION

	Change of operator		Total
	No	Yes	
Totally unsatisfied	1	22	23
Unsatisfied	72	21	93
Satisfied	143	69	212
Very satisfied	88	25	113
Total	304	137	441

Type of Contract

As the market structure reveals, prepaid segments dominate over the post paid segment. It is also the case for our research which indicates consistency with the actual Moroccan market: 81.4% of the respondents fall into prepaid segments, while 18.6% are within the postpaid segment.

Demographic Profile of the Respondents

- Gender: among the total respondents; 42.2% are women and 57.8% are men. The official statistics about Moroccan population reveal that there are more women than men (50.7% and 49.3% respectively). This discrepancy can be explained by the fact that men were more willing to participate in the survey than women.

- Age: 40.8% of the total respondents are between 21 and 30 years, 29.9% are between 31 and 40 years, 13.6% are between 41 and 50 years. Those aged below 20 years count for 13.4% and those aged more than 51 years count for 2.3%. According to the official census, the highest proportion of the Moroccan population fall into the group of 15-24 and 25-60 (31.2% below the age of 14, 60.7% between 15 and 59 and 8.1% more than 60 years) (Haut Commissariat au Plan, 2004).

- Education level: among the total respondents 38.3% have baccalaureate (high school) degree, 27.9% have license degree or equivalent, 14.5% have their secondary school. Those with master or doctorate count for 8.4% and 3.2% respectively. Subscribers with no education count for 5%, those with primary school background count for 2.3%.

Subscribers with other degree count for 0.5%. Since the questionnaire was distributed in Casablanca (urban area), the majority of the participants fall within the educated population. According to the 2004 statistics, 24.5% of the Moroccan population has completed only their secondary school, 15.2% have their baccalaureate, and 8.7% are pursuing their university studies (Haut Commissariat au Plan, 2004).

Personal Characteristics of the Potential Churners

- Gender: 59.1% among those who revealed their intention to churn are male.
- Age: 51.8% of the future churners are between the age of 21 and 30 years. The second highest proportion takes place within the 31 to 40 age group. Subscribers with age exceeding 40 years show less interest in changing.
- Education level: Subscribers with license or baccalaureate degrees showed the highest propensity to churn (46% and 25.5%, respectively). Subscribers with no education or primary education show the least interest to switch to another operator.
- Income: lower income groups (<1500 Moroccan Dirham (DH)) are the subscribers (36.4%) that are most likely to churn, followed by the subscribers (24.8%) within the 1501 to 3000DH income interval. Subscribers with an income of more than 7000 DH show the least likelihood to churn.

Determining the Reasons for Not Churning

Respondents gave the following reasons for their intention not to switch from one operator to another.

- The inability to conserve the same number when switching is the prevailing reason (26.1%) that inhibits customers from switching to another operator. It is worth mentioning that the ANRT approved the portability of numbers in March 2007, but due to some technical problems and tariff negotiations between operators, customers were unable to use this service until May, 2007. In addition, few customers were informed about the new service.
- Professional reasons are the second important reason (23.6%) that inhibits subscriber churn. In most cases, the employee is using the operator chosen by his company.
- In the third place, we have found other factors especially personal reasons as another explanation for their decision to remain with the same operator (14.7%).
- Debt level accumulated by the subscriber is also an important factor (12.7%) limiting the churn behavior. Telecom operator will not end the relationship with this type of client until they settle their bill. In addition, subscribers keep the relationship going to avoid legal action from their provider.
- Loyal customers that spend months or years to collect bonus points are also more reluctant to churn (12.7% of all churners).
- Subscribers engaged in long term contracts with the carrier are the kind of clients that want stability and permanence of relationship. Churn will rarely occur (only 10.2% of all churners).

One dependant variable (Y) is used, to delineate the subscriber intention to churn; Y=1, if the respondent reveals his churn interest, Y=0, otherwise. For this case, two types of independent variables were used in the logistic regression: scale and dummy variables.

- Dummy variables: Dummy variables included in the analysis are: gender (1=male, 0=female) and type of contract (1=prepaid, 0=postpaid).
- Scale variables: Interval scale data used in the analysis are: tariffs, coverage quality, transparency, privacy, billing-error frequency, customer service quality, technical assistance, promotions, reactivity to complaints and mobile models. Respondents were given a 5 point Likert scale to assess their perception for each factor. Education level of the respondents is also a scale variable. The categories range from 1-illiterate to 8 -post graduate degree holder. Each scale increase represents an average increase of 3.5 years in education level of subscribers. The variable was constructed to identify the relationship between the education levels and churn attitude. Income is also a scale variable used, the scale ranges from receiving the lowest (category 1) to the highest income (category 8). Each scale increase represents an approximate increase of 2000DH in subscribers' income. This variable was included to see whether income of customers affects their decision to churn. Age of the respondent is another variable used in the analysis. Each scale increase represents a 10-year increase in subscribers' age. This variable was constructed to see whether there is a relationship between age of the subscriber and churning intention.

THE MODEL

Three models were developed. In the first model, we intend to correlate the binary dependant variable "intention to churn" to the following organizational factors: tariffs, coverage network quality, frequency of billing errors, transparency level, quality of customer service, technical assistance, mobile models, reactivity to complaints, promotions and privacy. The second model investigates intention to churn as a function of products' characteristics (type of contract and mobile models). In the third model, we will try to detect whether personal characteristics have an effect on churn decision (age, income, education level, and gender). We use logit units for each of the models. Moreover since we have a set of independent variables that are measured at different scales or in different units, we should use standardized logistic regression so as to be able to compare the strength of the relationship between the dependent variable and the various independent variables.

The first model can be developed as follows:

$$P= \alpha+ + \beta_1(tar)+ \beta_2(cov)+ \beta_3(err)+ \beta_4(transp)+ \beta_5 (ser)+ \beta_6 (tech)+ \beta_7 (priv)+ \beta_8 \ (comp)+ \beta_9 (pro)+\acute{\epsilon}$$

Where tar= tariffs, cov= coverage network quality, errors= the frequency of errors, transp =transparency level, tech= technical assistance, priv= privacy, pro= promotions, comp= response to complaints and mod= model phones, $\acute{\epsilon}$= error

The second model is expressed as:

$$P = \alpha+ \beta_1(mod)+ \beta_2(typ)+ \acute{\epsilon}$$

Where model= mobile model and type= type of contracts and $\acute{\epsilon}$= error
And the third model as:

P = α+ β₁(age)+ β₂(inc)+ β₃(edu)+ β₄(gen)+ έ

$$P = \alpha + \beta_1(age) + \beta_2(inc) + \beta_3(edu) + \beta_4(gen) + \acute{\varepsilon}$$

Where age= age of the subscriber, inc= income, edu= education level and gen= gender and έ= error

Verifying Multicollinearity

The multicollinearity in the logistic regression is the result of strong relationships between independent variables. The existence of multicollinearity could cause large standard errors and therefore, affect hypothesis testing results. Multicollinearity may also result in wrong signs and magnitudes of regression coefficient estimates, and consequently in incorrect conclusions about relationships between independent and dependent variables. The first step is to check for possible correlation between the proposed independent variables. A correlation matrix detects the variables with strong correlations. Variables that are highly correlated should be dropped from the model.

RESEARCH RESULTS

Regression Model Based on Organizational Characteristics

Before presenting the model, it is necessary to verify the multicollinearity between these independent variables. As shown in the table (Table 3) below, no strong correlations are observed between variables. Hence, all the predictors are included in the model.

TABLE 3. MULTICOLLINEARITY TABLE FOR ORGANIZATIONAL FACTORS

	tariffs	coverage	errors	service	transparency	technical	privacy	complaints	promotions
tariffs	1								
coverage quality	-0.0477	1							
billing errors	0.0173	0.3996	1						
customer service q	-0.1178	0.4414	0.5066	1					
transparency	0.0456	0.0439	0.0499	0.0222	1				
technical assistance	-0.0955	0.2864	0.4181	0.4489	0.0596	1			
privacy	0.0183	0.2521	0.4602	0.3089	0.0678	0.4683	1		
response to compla	-0.0176	0.3317	0.2365	0.2374	0.0737	0.294	0.421	1	
promotions	0.0092	0.2968	0.293	0.2087	0.0856	0.318	0.4622	0.4146	1

Based on the Stata output, the estimation of the model is summarized in the table below (Table 4):

TABLE 4. STATA OUTPUT FOR ORGANIZATIONAL FACTORS

Intention to churn	b	P>|z|	%
Tariffs	0.4324	0	54.1
Coverage	0.15352	0.182	16.6
Errors	0.13147	0.297	14.1
Transparency	0.38487	0.001	46.9
Service	-0.11517	0.389	-10.9
Privacy	0.29023	0.015	33.7
Promotions	0.68056	0	97.5
Complaints	0.16661	0.119	18.1
Technical	0.31575	0.014	37.1

With b = raw coefficient, P>|z| = p-value for z-test and % = percent change in odds for unit increase in X.

Since the p<0.05 (Prob > chi2=0.000), the overall model is statistically significant. We have 99.5% confidence that at least one of the independent variables contributes to the prediction of the churn behavior.

Coverage, billing errors, customer service quality and response to complaint: Since the p value >0.05, we conclude with 99.5% confidence that there is not enough evidence of a relationship between the churn decision and network coverage quality, billing error and customer service quality, tariffs, transparency, technical assistance, privacy and promotion. Since the p value is <0.05, there is a significant relationship between churn intention and these dependant variables. A one unit increase in standard deviation in operators' tariffs, holding constant the other variable, increases the standard deviation of churning by 54.1%, and similarly, one unit increase in transparency, technical assistance, privacy, and promotion will lead to an increase in churn intention of 46.9 %, 37.1%, 33.7%, and 97.5% respectively.

Churn Intention and Product Characteristics

From the correlation matrix we do not observe strong correlation between the two variables. So, both variables might be used to predict churn behavior. The model is summarized in the table below (Table 5):

TABLE 5. STATA OUTPUT FOR PERSONAL CHARACTERISTICS

Churning intention	b	P>|z|	%
Model	0.10593	0.131	11.2
Contract	0.72178	0.017	105.8

Significance of the model: The model is statistically significant since the p<0.05 (Prob > chi2 = 0.0140). We are 99.5% confident that at least one of the explanatory variables contributes significantly to the prediction of the outcome. Mobile models: since the p value is greater than 0.05, there is not enough statistical evidence of a correlation between phone model and customer intention to churn. Type of contracts: Since the p value is < 0.05, there is a significant relationship between churn intention and type of contract of the subscribers. The standardized coefficient of the variable suggests that as customers move from postpaid to prepaid segments, intention to churn increases by 105.8%

Churn Attitude Explained by Personal Characteristics

The correlation matrix does not report strong correlations between predictors. Hence, all the explanatory variables are included in the model. Based on Stata output, the 3rd model is summarized in the table below (Table 6):

TABLE 6. STRATA OUTPUT FOR PERSONAL CHARACTERISTICS

Churning intention	B	P>|z|	%
Age	-0.23262	0.041	-20.8
Education level	0.04962	0.59	5.1
Income	-0.28283	0	-24.6
Gender	0.1591	0.462	17.2

Significance of the model: The model is statistically significant since the p<0.05 (Prob > chi2= 0.000). At least, one of the four independent variables contributes to the prediction of the model. Regarding gender and Education level we find that since P >0.05 there is not enough statistical evidence to say that these variables contribute to churn intention.

Age: Using a 0.05 significance level, there is enough evidence to say that age contributes significantly to the prediction of churn behavior. The negative sign of the standardized coefficient implies that a 1-unit increase of standard deviation of age decreases the standard deviation of churning by 20.8%, holding constant the other variables.

Income: Using a 0.05 significance level, with 99.5% confidence, we conclude that there is a relationship between the churn decision and the income of subscribers. For every unit increase in standard deviation of the income, the standard deviation of churning decreases by 24.6%.

Model Summary

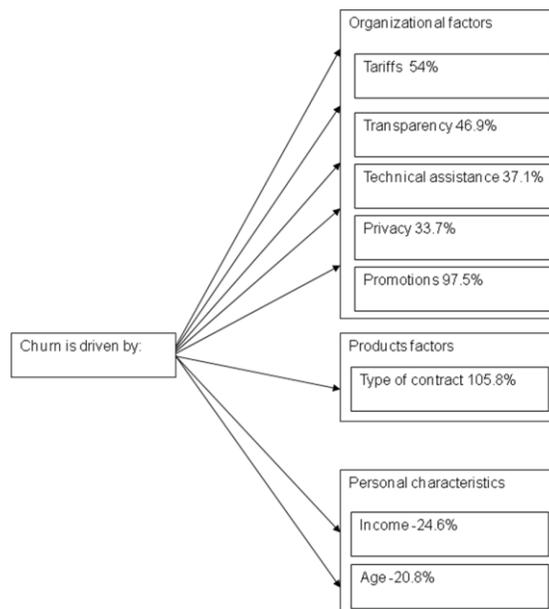The results stated above can be summarized in the following chart:

FIGURE 2. MODEL SUMMARY OF CHURN DRIVERS

CONCLUSIONS, IMPLICATIONS AND LIMITATIONS OF THE RESEARCH

The primary purpose for this paper was to determine the main triggers of churn attitude in the Moroccan telecom sector, also to verify whether the personal characteristics of a specific subscriber influences the churn decision. We have uncovered a positive relationship between the churn attitude and some of the organizational factors. Most obviously, subscribers' intention to churn is linked to perceived difference in tariffs between operators, although communication price is not free and controlled by the national regulatory agency of Telecom sector (ANRT). Transparency level of operators is also an important churn driver; clients have lost their confidence in their current telecom operator either because of misleading advertising or opaque information about tariffs and services. Subsequently customers are more likely to choose a competitor promoting a higher level of transparency.

The findings of the research have shown that the quality of coverage network, customer service quality, response to complaints and billing-error frequency had no statistically significant impact on customer intention to churn. The possible explanation for this is that customer service is not highly used by customers except for information requests or posting complaints, or it may also be that customers do not find service an issue with their operator. Furthermore, Moroccan customers are new to customer support and are unlikely to expect much support from their operator. The insignificance of network coverage as a churn factor can be explained by the fact that the survey was distributed in a major urban area with 100% coverage by the 3 operators. Billing errors are not related to churning since the billing system adopted by the operators is similar (under the control of ANRT).

Technical assistance, degree of privacy respect and diversity of promotions were identified as main churn drivers. Subscribers are not satisfied with the degree of technical assistance provided by their Telco's operator. In general the service is poor; at best customers are given little feedback about the problem faced or their query is not answered at all. This can be attributed to an important lack of technicians to whom sales people can refer customers. Privacy is also a churn factor. Customers are often submitted to repeated unsolicited commercial text or voice messages due to the fact that operators have communicated customers' personal information to affiliate companies for marketing purposes. One may also conclude that the frequency and diversity of the promotions offered by the current telecom operators are perceived as insufficient by their customers and are often a reason to churn to a different operator.

The results of the survey have revealed that mobile models do not affect the churn decision; although some phone models can only be found at a specific operator, phone model is not reason enough for churning. Not surprisingly, prepaid customers are more likely to churn than postpaid customers.

Concerning the personal characteristics of subscribers, the results have revealed that only the age and the income of subscribers are associated with churn attitude. The increase of the subscribers' income does not push them to churn, but, on the contrary, to add another mobile card from other operators. On the other hand, young customers are more likely to churn that older ones.

Implications of the Research

Increasing the satisfaction level has to be set as a priority for all firms. By this satisfaction, we refer to enhancing customer service quality, improving the customer-based approach and offering customer-oriented services. A strong and reactive response service system will build a good interactive communication relationship between both sides and make customers more at ease, hence increasing their trust and loyalty. Mobile operators, to increase retention rate, should create attractive reward programs that compensate current and loyal customers.

In addition, defining a transparent communication plan is the best way to remedy the lack of transparency. These plans must address the right and clear information that subscribers need to know to accomplish their purchases. This information should stipulate the accurate price a subscriber has to pay for a specific service or product. Also, conditions and term of usage for a service should be communicated clearly.

Above all, specific attention should be given to the "risky subscribers;" mobile operators must detect their dissatisfaction factors and try to convert them into loyal customers. A client with fraudulent actions is considered as risky; a customer that has high frequency of complaints is also judged as a risky customer. Developing profiles of risky customers could be done using demographic and geographic attributes as well as service usage patterns.

The real differentiation between operators will be no longer based on price cutting or technology but will be associated with the capability of the carrier to: deliver high quality service, keep subscribers informed, respond to customer requests or complaints, and deliver faster services.

Limitations of the Study

The limitations of the study are the following:
- Information was difficult to access (questionnaires developed before, churn rate for Meditel);
- The study was limited to Casablanca area;
- The results could not be generalized to the whole Moroccan population;
- Analysis of data concerning subscribers with 2 mobile cards is not included because of time; and
- Factor analysis to determine which factors are important was not used
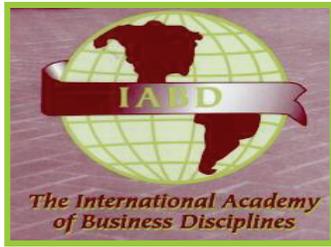
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