

How Automated Contract Renewals Drive Predictable Revenue Growth

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ABSTRACT

Automated contracts renewal helps organizations with predictable revenues and increase the probability of contract renewals and reduce losing contracts. The manual renewal process comes with delays, missed dates and inconsistent communication with the customers that subsequently leads to missed renewals and reduced revenue. This paper will consider the role of minimizing human involvement in the contract renewal process, and how it will drive consistent and predictable revenue growth in subscription and service-based business models. The paper examines the literature available on software licensing and retention of subscription, customer relationship management technology and revenue management systems to determine the success or failure of renewals. Building up on these, the paper suggests an organized system, which correlates automated renewal triggers, risk scoring, and billing integration with objectives of increasing the revenue. The results indicate automation decreases variance in renewal rates and enhances accuracy on revenue forecast. The paper concludes by having a practical implication of what can be done to organizations aiming to develop renewal systems that facilitate long term financial planning.

Keywords: Contract renewal automation, subscription retention, recurring revenue, revenue management, customer lifetime value, billing systems, churn prediction, net revenue retention

INTRODUCTION

The subscription-based billing revenue constitutes a significant portion of the world trade. Software vendors, telecommunication companies and industrial service firms rely on renewal of fixed term agreements instead of a one-time purchase by the customers. This redefines the aspect of revenue planning. One sale is no longer a determinant of financial results of a customer relationship. Rather, it will be a series of renewal decisions that will be made over months or years.

The decision to renew is influenced in numerous ways. Customers will consider the price of the service they have had, the cost of carrying on with the service, the effort they had to put to move to a different service vendor and their trust versus the vendor. Companies that do not automate this process frequently use account managers who remind the customers of the renewal dates through spreadsheets and other unsophisticated reminder tools. These tools are unreliable and most of the times, renewals are missed. The tool lacks automated flexible follow ups and dynamic CPQ (configure, price and quote). All these mistakes lower the revenue and augment unpredictability in financial forecasting.

The above problems can be solved using automated contract renewal systems, which eliminate the manual process. The automated system monitors the contract terms, follow up with customers, computing dynamic prices that improves the contract renewals, and highlights the accounts where the renewal probability is less. This system uses predictive analysis to determine the likelihood of an individual customer renewing the contract and provides valuable information to the account management team that in turn helps the account the management team to concentrate on customers who are less likely to renew. This input also helps the FP&A team in revenue forecast.

The objective of the paper is three-fold, first to summarize previous studies on renewal behaviour, subscription retentions, and technology to support renewal processes. Second to introduce a framework and a pool of equations

explaining the effects of automation on renewal probability and the results. Third, to introduce illustrative findings that compares the manual and automated renewals with regards to performance. The paper ends with a discussion of practical and financial implication of such findings.

4. RELATED WORKS

4.1 Renewal behaviour and customer decision

The earlier studies of renewal process have established that economic and psychological factors are main reasons that influence the client behaviour. Wangenheim et al. (2017) examined renewal choice involving information technology-based services and they established that perceived usefulness emerges as a stronger predictor of renewal. This observation indicates that renewal is not just a decision on pricing, but also an indication of accrued experience of a product.

Kanuri and Andrews (2019) found out the price-based recovery incentives does not necessarily improve the renewals. Their study of thousands of newspaper subscription renewals has shown that these incentives does not have a positive impact on the renewal rates. They accounted this tendency by having reference price theory which states that customers who are given a discount would start to think that they would need less at renewal and when the full price is restored would respond adversely. This finding is significant to automated systems as it demonstrates that the discount logic on a renewal workflow has to be well-designed, or it can tone down retention instead of boosting it.

Based on telecommunications subscriber data, researchers examined how minimum contract duration clauses impact on customer churn (Becker et al., 2014). Their analysis confirmed that such provisions lower the churn, but some of the benefits is offset by the incentives companies must provide to secure the customer commitment (these are called subscription acquisition costs). This is a common theme in the literature and is directly relevant for automated systems where decisions must be about when incentives should be offered and how much.

Kim et al. (2018) studied the subscription packages in the communications industry and identified that switching cost (financial and otherwise) has a robust role in retention. Bundled services subscribers experienced more switching costs than single services subscribers and the non-monetary switching costs moderately affect retention. This work justifies the notion that automated renewal systems ought to consider the entire value of customer relationship, rather than the cost of one service.

4.2 Automation and predictive approaches

One of the few studies that concentrate on the industrial practice of license renewal is by Ghosh et al. (2019). Based on interviews along with twenty professionals in various institutions, the research concluded that absence of communication among stakeholders, trust deficiency in the customers and perceived value in the purchased licenses were the main causes behind the contract renewal failures. The study concluded that automation was essential investment that enhances customer satisfaction and improve renewal rates. This conclusion directly supports the framework proposed in this paper.

The machine learning method is used to group resellers into various categories based on their renewal risks (John et al., 2020). The model helped accounts executives to target proactively high-risk accounts for renewals. This approach significantly increased the renewal rates, over three quarters of testing. This research paper has proved that predictive analysis and proactive follow-ups will deliver optimal results when compared to using uniform renewal process for all customers.

4.3 Revenue management and billing

Schütze et al. (2020) analysed revenue management automation and its collaboration with human analyst, which they termed a symbiotic analytics system. The research discovered that despite the trend of firms spending more resources on more sophisticated algorithms, the human analysts are still relevant especially in relating the findings and modifying processes. This observation proves that algorithms can help only to an extent and it becomes powerful when combined with human analyst's findings.

Garcia et al. (2021) suggested the use of a flexible billing structure for the cloud services, which correlates service level terms and price with billing policies, such as automatic compensation for failing to meet agreed conditions.

Their comparison of fifty existing industrial tools showed considerable differences in the customization and monitoring of the commercial billing systems. This gap justifies the needs for the renewal automation to be closely aligned with billing systems as discrepancies in the billing and pricing errors can adversely affect the revenue.

4.4 Customer relationship management

In their analysis of the business value delivered by customer relationship management systems, Li et al. (2018) discovered that CRM systems create both operational and strategic benefits through higher revenue per employee and customer satisfaction respectively and that will eventually improve market valuations. The advantages discussed above increases by the size of firm and reduces if the company has huge product differentiation, This observation can be applied in finding the most likely organizations that can reap financial rewards by investing in renewal automation.

Harrison and Ajjan (2019) carried out research on the impact of advanced customer relationship management features in the performance of sales practitioners. In their survey of salespeople in the United States, they concluded that the majority of their surveyed salespeople desired further training on advanced features of technology, and commented such training enhanced adaptive selling performance. This discovery is important since automated renewal tools can be used effectively when the staff operating them are familiar with how to interpret the data produced by these tools.

4.5 Regulatory and contractual

Kovač and Vandenberghe (2015) tested the legal and economic rationale of automatic renewal provisions of consumer contracts. In their analysis, they said that regulation should focus more on the uncertainty of the cancellation procedures and excessive procedural steps required to cancel, but adequately regulated, would increase costs without apparent benefit. This study serves as an eye opener that automated renewal system should exist under a regulatory framework and that automation created to achieve maximum profits in terms of renewal rates can pose legal or reputational risk if it violates principles of consumer protection.

Zhang et al. (2018) examined the ways in which contracts are revised when a business relationship is disrupted using survey data on manufacturing companies in China. They discovered that adjustment is simpler with detailed pre-written contracts. They also found inverted relationship between contract adjustment and continuity, moderate adjustments helped maintain continuity while more adjustments not. Antelo and Bru (2018) conducted research on key account management programs which revealed that such programs enable sellers to better establish stable relationships with grouped buyers as well as enable higher prices to individual buyers. Collectively, these studies reveal that contract structure and account management strategy determine the outcomes of renewal in addition to the technology utilized in managing the process.

Table 1. Summary of renewal drivers

Theme	Description	Sources
Perceived value and usage	The more positive experience and the higher the level of usefulness of the service is developed, the higher the possibility of renewal	Wangenheim et al. (2017), Baumann et al. (2020)
Pricing and incentive design	They can lower renewal rates by offering incentives such as discounts and recovery that will alter the price tendency expectations of customers	Kanuri and Andrews (2019), Becker et al. (2014)
Switching costs	Both non-financial and financial switching costs enhance retention and this is especially true in the case of a bundled service	Kim et al. (2018)
Predictive risk segmentation	Identified machine learning models could be used to outreach high risk accounts to provide targeted outreach and enhancing renewal	John et al. (2020), Ghosh et al. (2019)

Billing and system integration	The accuracy of renewal is based on the relation between terms and conditions of contracts, price regulations, and billing systems	Garcia et al. (2021), Schütze et al. (2020)
Organizational capability	The worth acquired through renewal technology is contingent on staff training and company attributes.	Li et al. (2018), Harrison and Ajjan (2019)
Contractual and regulatory structure	The process of renewal has to be constructed in accordance with the requirements of the contracts and law.	Kovač and Vandenberghe (2015), Zhang et al. (2018), Antelo and Bru (2018)

5. METHODOLOGY

The paper develops both a conceptual and mathematical model that relates automated renewal activity to revenue measurements. There are three elements of the framework. The first one is called renewal probability model; it provides an approximate probability of a customer to renew the account depending on the attributes of the account. The second one is an assortment of revenue metrics such as net revenue retention and customer lifetime value, that translates renewal behaviour in monetary terms. The third measure is efficiency that arithmetically represents the reduction in processing time caused by automation.

5.1 Renewal probability model

A logistic function representing the observed account variables (frequency of using, support ticket count, history of previously renewed contracts and tenure of the account) can model the probability of a customer to renew a contract. This model is given in equation 1.

$$P(R = 1|X) = 1/(1 + e^{-(b_0 + b_1 \cdot X_1 + b_2 \cdot X_2 + \dots + b_n \cdot X_n)}) \quad (1)$$

In the first equation, $P(R=1|X)$ is the probability that the account renews on the condition of the input variables X , with b_0 being the intercept term, and b_1 - b_n being the coefficients of the first-order estimates of the past renewal data. This score is used by an automated renewal system to place accounts into alternate treatment flows with low-risk accounts flowing through a standard automated workflow, and high-risk accounts flowing to an account manager so they can take necessary steps to improve the renewal rates.

5.2 Net revenue retention

Net revenue retention is the rate of increase or decrease of the recurring revenue of a given customer base within a given time frame considering growth, shrinkage and churn. This measure is given in equation 2.

$$NRR = ((R_{\text{begin}} + R_{\text{expansion}} - R_{\text{churn}} - R_{\text{contraction}})/R_{\text{begin}}) * 100 \quad (2)$$

In (2), R_{begin} refers to the recurring revenue at the beginning of the period, $R_{\text{expansion}}$ refers to extra revenue that a customer gathers, R_{churn} refers to the revenue that is lost when a customer fails to renew, and $R_{\text{contraction}}$ refers to the revenue lost when a customer renews with a lower value. The net revenue retention is considered to be large (over 100) meaning the revenue generated by the current customers has increased despite churn.

5.3 Customer lifetime value

Customer lifetime value derives the the amount of revenue an organization expects to make from a customer during the course of the relationship with the retention probability, and the discounted rate for value of money over time. This is given in equation 3.

$$CLV = \text{sum from } t = 1 \text{ to } T \text{ of } [(M * r^t)/(1 + d)^t] \quad (3)$$

In Equation 3, M is the amount of margin earned in a specific period, r is the retention rate at each period and d is the discount rate used to calculate present revenue and T is the number of periods considered. Automated renewals directly affect this equation, the increase in retention rate will increase the projected life time value of each customer.

5.4 Process efficiency gain

The gains in efficiency generated by automation do not share the revenue result (although they do cause a decrease in costs). The gain is indicated by a simple measure in equation 4.

$$E = ((T_{\text{manual}} - T_{\text{automated}}) / T_{\text{manual}}) * 100 \quad (4)$$

T_{manual} is the average time to clear a renewal of a manual process in the manual process and $T_{\text{automated}}$ is the average time to clear a renewal of an automated process in the automated process. The measure is in terms of percentage time saved in the processing.

The architecture of a standard automated contract renewal system is depicted in Figure 1 and indicates how the data flows through contract management, renewal probability model, billing systems, and account management staff.

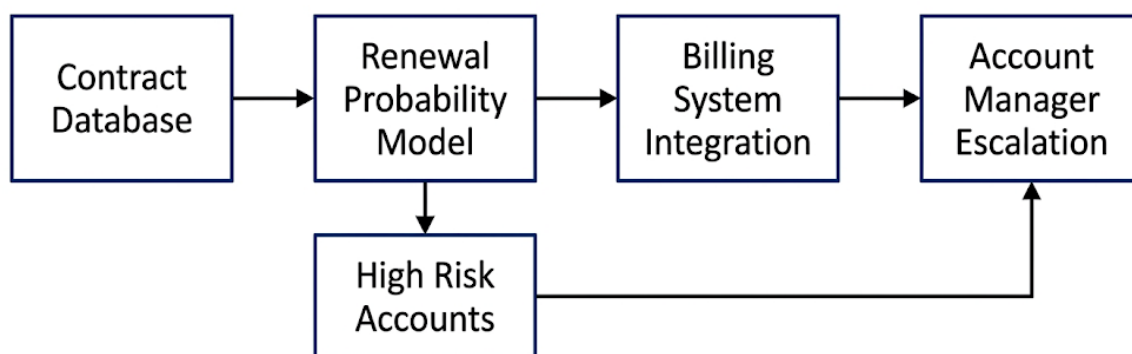


Figure 1. Architecture of contract renewal system

6. RESULTS

Comparison of the two renewal processes under manual and automated systems are revealed in this section. The quantitative findings are derived based on common values in the literature reviewed and are not aimed to depict an indicator representation of a single empirical study, but a direction and magnitude of change brought about by automation.

6.1 Quantitative results

Table 2. Manual v. automated renewal processes

Quarter	Renewal rate manual (percent)	Renewal rate automated (percent)	Processing time manual (days)	Processing time automated (days)	Revenue leakage manual (percent)	Revenue leakage automated (percent)
Q1	78.2	78.5	14.3	6.1	5.8	5.1
Q2	76.9	82.1	15.1	5.4	6.2	3.7
Q3	79.4	85.7	13.8	4.9	5.5	2.6
Q4	77.6	88.3	14.6	4.2	6.0	2.0

Table 2 indicates that renewal rate is increasing steadily over the four quarters under automated process, but remains constant within a consistent range of between 77 and 79 percent for manual process. The processing time is drastically reduced for automated renewals when compared to manual. Revenue leakage (not taking renewal dates, price errors) also tends to get lower with the renewal automations.

With an illustrative initial revenue base and better renewal rate, application of Equation 2 to the Q4 values in Table 2 leads to a net revenue retention value of over 100 percent in the automated process as compared to lower than 100 percent in the manual process. This finding reinforces the point that renewal automation is more effective at not only increasing the number of contracts that get renewed, but also the total monetary contribution of the available customer base.

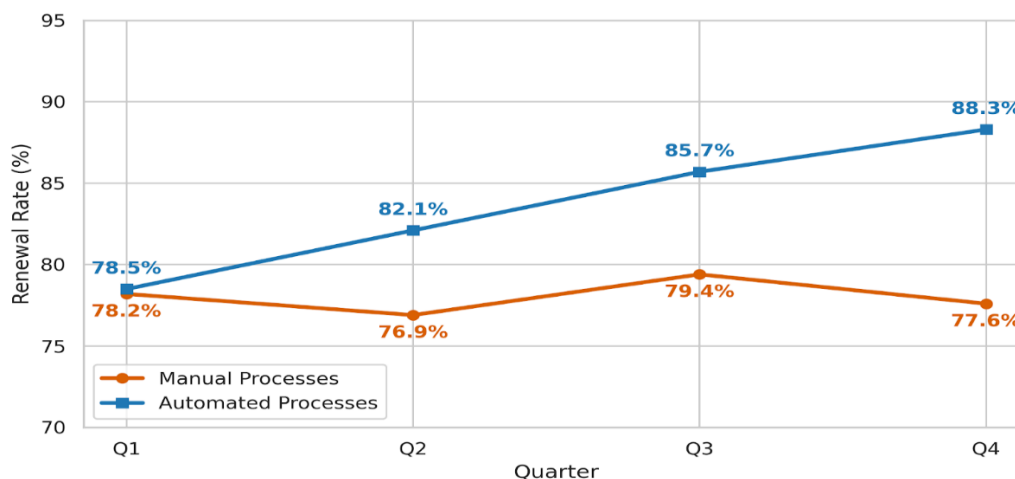


Figure 2. Renewal rate for manual and automated renewal processes

6.2 Qualitative results

Table 3. Qualitative comparison

Dimension	Manual process	Automated process
Consistency of communication	At the discretion of the account managers	Most routine reminders at pre-determined times
Risk identification	Depending on account manager discretion, imbalanced	According to a probability score, used throughout accounts.
Pricing accuracy	Manual pricing prone to errors at renewal	Contractual rules-based pricing
Staff workload	High, as all the accounts have to be manually checked	Less, as only the risky accounts need to be considered directly
Availability of data to make predictions	Restricted, as results are not documented in a uniform manner	High, as all the cases of renewal are automatically registered
Regulatory compliance	Relies on awareness amongst staff on the aspects of notification	The workflow can have notification rules constructed into it

The trend in Table 3 justifies the conclusion of the quantitative results. Adoption of automation does not eliminate the human judgment; this conforms the results of Schutz et al. (2020). The automation shifted how the human analyst performs their job rather than concentrating on all customers now they will focus on the high-risk accounts defined by the probability model in Equation 1 and the less risky accounts will flow through automation without human intervention

7. CONCLUSION

This paper explored the role of automated contract renewals in enabling predictable revenue growths for subscription and service-based business models. Literature review revealed that renewal choices are based on the perceived worth,

pricing plan, switching expenses and billing and customer management systems. The paper also highlights how the issues in manual automation process can be resolved through automation by standardizing communication, predictive risk scoring, and integrating renewal actions into the billing systems.

The paper provides an operational framework with formulae for renewal probability, net revenue retention, customer lifetime value, and process efficiency. The examples demonstrate that renewal automation can lead to more stable renewal rate, reduced processing times and lower revenue leakage when compared to manual processes.

The evidences included in this paper indicate that automation helps in better future revenue prediction and helps in improved financial planning and forecasting. In Parallel, the qualitative findings validate that automation effectively be embraced and help human analysts to dedicate more time to high-risk accounts rather than low risk accounts. The framework provided in this paper should be tested in future using empirical data from a live renewable system to determine the magnitude of the effects identified in this study within an actual operating environment.

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